PUGMARKS AND FOOTPRINTS:

HUMAN-WILDLIFE ENCOUNTERS AND THE LEGITIMACY OF CONSERVATION IN CENTRAL INDIA

by

DANIEL JOHN READ

(Under the Direction of J. Peter Brosius)

ABSTRACT

Drawing on multispecies ethnography and Marxist political ecology, this research explores how people's encounters with wildlife relate to their beliefs about the legitimacy of conservation institutions in two protected area buffer zones in central India. In India, buffer zones are meant to promote 'human-wildlife coexistence' through institutions that minimize the extent to which humans and wildlife rely on the same natural resources. To do so necessitates transforming complex ecological and economic systems that have emerged from long histories of multispecies encounter and state appropriation of natural resources. This dissertation examines several ways in which efforts to promote 'human-wildlife coexistence' intersect with these histories. Its chapters show (1) how multispecies relationships shaped the colonial appropriation of forests, (2) how wildlife encounters influence the spatial and temporal dimensions of people's economic activities and movement across the landscape, (3) how the position of wildlife within local economies affects the implementation of coexistence programs, and (4) how alternative

ways of living with wildlife emerge from people's efforts to transform their relationships with the state.

To make these arguments, this study draws on ethnographic fieldwork done in the buffer zones of Melghat and Tadoba-Andhari tiger reserves in Maharashtra, India. These buffer zones are home to different *Adivasi* and *Dalit* groups, as well as a variety of wildlife, including tigers, sloth bears, wild boar and snakes. In Melghat, the risk of violent human-wildlife encounters is low, as people mostly encounter wildlife when protecting their crops from herbivores. In Tadoba-Andhari, the risk of violent encounters is high and large carnivores often injure and kill people. These differential risks form the basis on which this research compares how different human-wildlife encounters relate to the implementation of 'human-wildlife coexistence' programs.

This dissertation contributes to environmental anthropology and conservation practice. On the one hand, it draws Marxist political ecology and multispecies ethnography together in a complementary way, showing how nonhumans help define modes of production, shape capitalist appropriation, and contribute to moral economies. On the other hand, it highlights how equitable and effective conservation practices emerge as people who live with wildlife challenge the state's appropriation of natural resources.

INDEX WORDS: Human-wildlife encounters, central India, adivasis, buffer zones, wildlife conservation, Marxist political ecology, multispecies ethnography

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CHAPTER 1

INTRODUCTION:

ENCOUNTERING HUMANS AND WILDLIFE IN CENTRAL INDIA

A. Introduction

Just after breakfast, I was sitting on the kitchen patio preparing for the day's interviews, when Bishram approached me. Bishram was a middle-aged *Korku adivasi* man who worked at the NGO campus where I was staying in the buffer zone of Melghat Tiger Reserve in India. Yesterday, he had asked me to make a short audio recording about tigers and now he wanted to hear the playback to check it over. I obliged, and we listened to what he had said:

> *Mamasana*, which means old man, is a name for the tiger. It got that name because the *adivasis*, the tribal people, said that the tiger has a big moustache. Its head is very big and looks like the face of an old man. Big nose, big teeth, a beard, mustache. That's why the tribal people consider him to be old. If there is ever a big meeting of wildlife, the tiger, or *bagh* or *shere*, would look like the chief of all the animals, because he's the biggest. The jaw, moustache, beard, big face, big tiger. If there is ever a meeting of animals, the tiger would be president of it. A tiger looks like that. That's why he's called *mamasana*. The tribal communities pray to the tiger's descendants. The gods whose names are *mama* or *mami*, these gods are the descendants of tigers.

Bishram approved of the recording. He paused, and then, as if prompted by what he heard, continued yesterday's train of thought. He spoke about tigers' strength and their skill at hunting prey. Wide-eyed and crouching behind the patio wall, he imitated a tiger watching prey from the tall grass. Tip-toeing, he passed me showing how a tiger would follow its prey for some time before striking, and then, picking up speed, he copied how it would move ahead of its prey and

find a good spot for an ambush. Bishram's arms rushed through the air as he demonstrated how a tiger would swipe at an animal's hind legs to bring it down and then bite its prey's neck to kill it. He then switched characters, standing up tall to demonstrate how a person should maintain eye contact and slowly back away if they encountered a tiger in the forest. According to Bishram, a tiger would never attack someone doing these things. Tigers, he said, are sensible. Sloth bears, on the other hand, are cruel. He waved his arm frenetically to imitate how a bear would attack a person regardless of what that person was doing.

Bishram had used the word 'sensible,' in English, twice the day before. He had described how people living in the core area of Melghat Tiger Reserve were sensible. They realized that they were becoming increasingly isolated from the outside world. The Forest Department had been offering hundreds of thousands of rupees to families who decide to relocate outside of the core area, and as more people were taking up the offer, those who remained were finding it harder to get work or to get to hospitals when needed. Therefore, according to Bishram, it was sensible for those who remained to accept the relocation package and leave the core area. If they did not relocate, he said, they would die. The other way he had used 'sensible' was to say that Forest Department staff were not sensible. He recalled how, when Melghat was first declared a tiger reserve, the Forest Department staff were needlessly strict and forceful with people, having little regard for what people would do without employment in the now defunct forestry sector. It was because of how they treated people in Melghat, Bishram said, that the Forest Department staff were not sensible.

During my fieldwork, I had heard many people echo Bishram's sentiments about local people and the Forest Department staff. According to them, people were just trying to get by, and the Forest Department staff, solely concerned with eliminating people's use of forest resources,

could not care less. Political ecologists, conservationists, and activists have used similar refrains to narrate how conservation affects people's lives and livelihoods in different places across the globe. Their accounts have documented how many conservation projects, often in accordance with naïve ideas about pristine wilderness, restructure how people access the natural resources that they have historically relied on. These narratives guided my earlier work (Read 2016) and my thinking as I started my dissertation fieldwork.

However, as I progressed through my time in central India and listened to people like Bishram, the partiality of these narratives, and the discursive effects of their partiality, became increasingly apparent. Bishram used the word 'sensible' as a point of reference for describing both people and tigers. It seemed to signify how the actions of people or tigers were understandable given their circumstances. People were sensible for taking relocation packages because of the increasing isolation of remaining in the core zone. Tigers were sensible for having a clear hunting strategy and not needlessly attacking people. Bishram also equated tigers to old men and suggested that their physical attributes placed them at the top of a social hierarchy of animals. When political ecologies of conservation explore similar relationships between humans and nonhumans, they often do so to show how conservation erodes, or fails to understand, those relationships. That is, political ecological analyses often focus on how conservation restructures people's relationships with nonhumans in accordance with its own vision. In doing so, these analyses tend to imply a unidirectional relationship between conservation and people's relationships with nonhumans: conservation changes multispecies relationships, but multispecies relationships do not change conservation.

My aim in this dissertation is to invert this narrative and show how people's relationships with wildlife restructure conservation. To do so, I draw on 12 months of ethnographic fieldwork

in the northern buffer zone of Melghat Tiger Reserve and western buffer zone of Tadoba-Andhari Tiger Reserve, in the central state of Maharashtra. Across India, buffer zones are designed to promote human-wildlife coexistence. Yet, people's encounters with wildlife in Melghat are quite different from those in Tadoba-Andhari. While similar species live in both reserves, in Melghat, people's encounters with wildlife are generally limited to chasing away crop-raiding animals and harvesting trees and plants from the forest. In Tadoba-Andhari, violent, sometime fatal, encounters with predatory wildlife are much more common. I will show how these different encounters have shaped people's lives and contributed to different conservation outcomes in the two buffer zones.

In this introductory chapter, I outline this dissertation's theoretical framework and ethnographic and historical context. First, I show how conservation literature is moving away from an artificial separation of material and social approaches to human-wildlife interactions and toward an understanding of the relationality of humans and wildlife. I then argue that drawing together multispecies ethnography and Marxist scholarship can build on this understanding of relationality and to provide a theoretical framework for understanding it as a force of history. I then provide an overview of the ethnographic and historical context of human-wildlife interactions in central India, before concluding with an outline of each chapter's main arguments.

B. From Human-Wildlife Interactions to Multispecies Encounters

1. Human-wildlife conflict and coexistence

Conservation literature on human-wildlife interactions has grown rapidly over the last two decades. While interactions with wildlife have been a defining feature of human history, until recently most scholarly attention was given to understanding humans' negative effects on wildlife (Berger 1999; Kerr and Currie 1995; Lande 1998) or on eliminating wildlife that

threaten human well-being (Kinnear, et al. 1998; McAtee 1939; Rangarajan 2012). Most of the more recent conservation literature on human-wildlife interactions focuses on understanding and mitigating conflicts. Human-wildlife conflict has been variously defined as wildlife-related "threats to human life, economic security, or recreation" (Treves and Karanth 2003:1491), "an action by humans or wildlife that has an adverse impact upon the other" (Conover 2001:8), or "perceptions among people that wildlife threaten something they care about" (Peterson, et al. 2010:78). Nyhus (2016) suggests that conservationists' relatively recent interest in mitigating human-wildlife conflict and promoting coexistence stems from a growing awareness of the importance of biological diversity for the maintenance of Earth systems and new values that encourage humans to coexist with and conserve wildlife populations. The larger literature on conflict grew from an early focus on people's interactions with carnivores, as conservationists worried that threats from carnivores to humans lives and livelihoods would eventually pit people against carnivores and the people trying to conserve them (Treves and Karanth 2003). While some conservationists still focus on carnivores (e.g. Carter and Linnell 2016), the realization that non-carnivorous species can pose equal or great risk to humans (Sitati, et al. 2003) expanded the literature to human-wildlife conflict in general. In justifying efforts to mitigate human-wildlife conflicts, conservationists often note how conflicts result in direct economic losses, the loss of human and nonhuman life (Linnell, et al. 2010), enduring psychological trauma (Ogra 2008), possible alienation of people living near wildlife from conservation efforts (Dickman 2010), and future risk to wildlife should conflict occur in contexts that might lead people to kill wildlife in retaliation (Inskip, et al. 2014).

Though not mutually exclusive, conservationists tend to understand the nature and origins of human-wildlife conflict in either material or social terms (Redpath, et al. 2013). Material

approaches tend to attribute conflict to interspecies competition for limited resources (Nyhus 2016; Sukumar 1994; Woodroffe, et al. 2005b). In other words, conflict occurs when people and wildlife rely on the same resources, or when the resources they depend upon spatially overlap (Banerjee, et al. 2013; Dhanwatey, et al. 2013; Miller, et al. 2016a). Competition for these natural resources results in conflicts that are physically harmful to wildlife, domestic animals, crops, and humans (Goodrich 2010; Karanth, et al. 2012a; Karanth, et al. 2013). As solutions, material approaches advocate spatially separating people and wildlife through zoning initiatives, minimizing the extent to which humans and wildlife rely on the same natural resources, and compensating for material losses with payments or other insurance options (Dickman, et al. 2011; Holland, et al. 2018; Karanth, et al. 2018).

Social approaches tend to attribute conflict to changing political economic systems that increase the vulnerability of people to wildlife (Margulies and Karanth 2018; Massé 2016). They also recognize that interspecies conflicts often reflect conflicts between humans about wildlife, such as conservation's emphasis on saving large species that often pose direct threats to the humans living near them (Knight 2000; Madden 2004; Woodroffe and Redpath 2015). These approaches emphasize how systems of inequality influence people's risk of experiencing human-wildlife conflict and their understandings of such conflicts and risk, as well as how conflicts feedback to reproduce inequalities (Barua, et al. 2013; Gore and Kahler 2012; Inskip, et al. 2013; Ogra 2008). As solutions, social approaches advocate understanding how people experiencing human-wildlife conflict think it should be mitigated (Harihar, et al. 2015; Ogra 2009; Rust 2016), using conflict management and mediation techniques to facilitate stakeholder dialogue (Miller, et al. 2017; Redpath, et al. 2013), and educating people about wildlife behavior through outreach programs (Gore, et al. 2008).

While much of the literature on human-wildlife interactions remains focused on conflict, the term 'human-wildlife conflict' is not without its detractors. Peterson, et al. (2010) argues that the term 'human-wildlife conflict' is problematic because of how often denotes conflicts between humans about wildlife, and because it dichotomizes humans and nature, posing the latter as a threat to the former. Contrary to this implication, a separate line of research on human-wildlife interactions has documented the numerous ways that wildlife benefit humans, which include regulating zoonotic disease and ecosystem processes, consuming waste, controlling rodent populations, and enhancing psychological well-being (Braczkowski, et al. 2018; Curtin 2009; Thinley, et al. 2018; Wolfe, et al. 2018; Yirga, et al. 2016). Building on this body of research and acknowledging critiques of the term 'human-wildlife conflict,' many conservationists have turned their attention to theorizing and promoting a positive model of 'human-wildlife coexistence' that goes beyond mitigating human-wildlife conflicts. Though initially implied as the absence of human-wildlife conflict (Woodroffe, et al. 2005b) or the spatial co-occurrence of humans and wildlife (Carter, et al. 2012), Carter and Linnell (2016:575) have recently supplied a more robust definition of coexistence, as a:

> dynamic but sustainable state in which humans and large carnivores co-adapt to living in shared landscapes where human interactions with carnivores are governed by effective institutions that ensure long-term carnivore population persistence, social legitimacy, and tolerable levels of risk.

Though they restrict their definition to human interactions with large carnivores, they provide no argument, and there is no substantive reason, why it could not be applied to interactions with all wildlife.

In emphasizing behavioral co-adaptations between humans and wildlife, Carter and Linnell (2016) help to overcome the artificial separation of material and social approaches, and

to understand human-wildlife interactions relationally. Relational approaches to human-wildlife interactions, in part, recognize that human and wildlife behavior is not fixed but changes as the result of interspecies interactions. For example, it is well documented that wildlife across the globe are adapting to human-dominated landscapes by becoming more nocturnal (Gaynor, et al. 2018), and by shifting their movement patterns (Broekhuis, et al. 2018) and feeding habits (Smith, et al. 2017; Valeix, et al. 2012). It is equally clear that these adaptations can produce cascading effects throughout ecosystems (Shamoon, et al. 2018; Woodroffe, et al. 2005a). Additionally, some wildlife have demonstrated the ability to learn new feeding behaviors from individuals of the same species who had significant interactions with humans (Donaldson, et al. 2012). In some cases, these adaptive, learned behaviors correspond to changing political and ecological circumstances (Boomgaard 2001). For example, Rangarajan (2013) documents two historical periods in which Asiatic lions (*Panthera leo leo*) in Gujarat, which rarely act aggressively toward humans, killed dozens of people. One period was following a drought between 1901-1904, and the second was between 1987-1988, when the practice of baiting lions with buffalo calves or goats to make them viewable for tourists was stopped. By stopping a practice that had habituated lions to the presence of tourist vehicles, policy-makers inadvertently changed the lions' behavior. These diverse lines of ecological and historical research suggest that human-wildlife interactions cannot be understood separately from the mutual influences that they have on each other's behaviors. In other words, humans and wildlife are as they are because of their interactions with each other.

The relationality of humans and nonhumans is a key focus of multispecies ethnography, a rapidly growing field within anthropology and cognate disciplines. Multispecies ethnography focuses both on how humans and nonhumans shape each other through their interactions, and

how political, economic, and ecological systems relate to those interactions (see below). Pooley, et al. (2017) suggest that multispecies ethnography is ideally suited to provide new perspectives on human-wildlife interactions because of its emphasis on the mutual influences they have on each other. Likewise, Parathian, et al. (2018) suggest that multispecies ethnography allows for ethnography and ethology to complement each other in a way that shows how human interactions with wildlife shape and create environments. In this dissertation, I build on their suggestions and look at human-wildlife interactions through the lenses of multispecies ethnography and Marxist scholarship. As I explain in the next section, this theoretical combination allows me to situate my exploration of the relationality of humans and wildlife within a broader historical and political economic analysis of conservation in central India.

2. Multispecies Ethnography and Marxism

Multispecies ethnography "centers on how a multitude of organisms' livelihoods shape and are shaped by political, economic, and cultural forces" (Kirksey and Helmreich 2010:545). The term 'multispecies' refers both to a movement beyond the assumption of human exceptionalism and a recognition that 'human nature' is an interspecies relationship (Tsing 2012a; Tsing 2015). Interspecies relationships, in this sense, are understood as encounters between two notably different entities that change those entities going forward (Barua 2015; Faier and Rofel 2014; Wilson 2017). In the same way that relational approaches understand human and wildlife behavior as the result of their interactions with each other, multispecies ethnographers see the nature of humans and nonhumans as emerging from their relationships with each other (Govindrajan 2018; Ogden, et al. 2013; Van Dooren, et al. 2016). This relational perspective implies that history is driven by interspecies relationships, not human action alone (Sundberg 2011; Tsing, et al. 2017). For example, Chapter 2 of this dissertation explores how the

history of colonial forestry in India is not driven only by British colonists seeking to plunder India's natural resources. The relationships between soils, trees, and shifting cultivators directed the speed and location at which colonial administrators appropriated forests and the extent to which they could monopolize those forests. These histories were driven by the interactions between biotic and abiotic entities, both of which multispecies ethnographers see as being constituted through relationships (Tsing 2013a). These two tenets, that humans and nonhumans co-constitute each other through their relationships and that history is a product of these relationships, form the basis of multispecies ethnography.

Multispecies ethnography has emerged from the intersections of several diverse strands of scholarship. Semiotic understandings that organisms' different biological characteristics lead them to perceive the world differently have been crucial to understanding how humans are not the only organisms that sense and purposefully act in their environments (Sagan 2010; von Uexküll 2010 [1934]). Actor-Network Theory has helped to rethink the associations of differently acting organisms in their environments as a form of sociality (Callon 1986; Latour 2005). Feminist studies of science and technology point to how these emergent associations remake the associated entities, whether they be humans or not (Haraway 2008; Haraway 2016). The concept of niche construction, which understands how organisms' ability to modify their environments changes evolutionary pressures affecting other organisms (Kendal, et al. 2011; Laland, et al. 2016; Odling-Smee, et al. 2013), has been useful for understanding organisms' environments as products of their interactions with other entities (Fuentes 2010). To be clear, the relational perspective of multispecies ethnography is not new; many people across the world understand their interactions with nonhumans in relational terms (West 2016). While multispecies ethnography has yet to make significant engagements with indigenous worldviews

(Sundberg 2014), it does not, as some ontological anthropology does (e.g. de Castro 2015), treat indigenous worldviews as stable, homogenous wholes, reminiscent of a bounded view of culture (Govindrajan 2018; Todd 2016). Multispecies ethnography is part of a larger movement in academia to do away with anthropocentric tendencies that have plagued much of the social sciences and humanities. Similar approaches include more-than-human geographies (Whatmore 2006), posthumanism (Sundberg 2011), new materialism (Coole and Frost 2010), and vital matter (Bennett 2009), among others. These different names are more reflective of disciplinary particularities than they are substantive differences. In this dissertation, I draw on scholarship falling under all these labels, while only using the term multispecies ethnography for the sake of simplicity.

One notable contribution of multispecies ethnography thus far has been a revision of conventional Marxist analyses to better understand how nonhumans relate to capitalism. Much of this revision stems from Donna Haraway's (2008) chapter on 'Value-Added Dogs and Lively Capital,' where she outlines the contours of nonhuman labor and encounter value. She posits encounter value as a third value-forming relationship, alongside conventional categories of use-value and exchange-value, to describe how value is generated through relationships between humans and nonhumans. She uses pet insurance to demonstrate the existence of encounter value, in that pets are generally insured for more than their market value, which suggests that the encounters between pets and pet-owners generate value in addition to the exchange-value of the pet. Multispecies ethnographers have drawn on Haraway's notion of encounter value to describe how nonhumans help generate value in the exotic pet trade (Collard and Dempsey 2013), in wildlife tourism (Barua 2016), and through mushroom commodity chains (Tsing 2013b). In showing that nonhumans are embedded in value-generating relationships, Haraway also

recognizes their ability to do labor, a category that Marx used to denote purposeful manipulation of physical matter, and which he stamped as exclusively human (Marx 2011 [1867]:Ch. 7). By understanding the different ways that the nonhumans do labor, multispecies ethnographers have attended to the multiple, uncompensated activities of nonhumans, like animals in factory farms, that contribute to production (Barua 2017; Beldo 2017; Blanchette 2015).

In revising these Marxist categories, multispecies ethnographers are challenging some of the central tenets of Marxist theory, while remaining consistent with his historical epistemology. Marx reserved labor as an exclusively human activity because, he argued, it has historically developed more in accordance with the social form of production than with bodily needs (Burkett 1999:28-29). In other words, an animal "produces only under the dominion of immediate physical need, whilst man produces even when he is free from physical need and only truly produces in freedom therefrom" (Marx 1978[1844]:76). The relational perspective of multispecies ethnography troubles this distinction, both by seeing nonhumans as imminently social beings (Tsing 2013a) and by seeing 'human nature' as the result of interspecies relationships (Johnson 2017). But this revision of the boundaries between human and nonhuman labor is consistent with Marx's historical epistemology, which acknowledges the mutual articulations of history and theory (Hall 2003). In the *Grundrisse*, Marx used the term 'labor' as an example of how abstract categories, despite their validity across time, are products "of historic relations, and possess their full validity only for and within these relations" (Marx 1978 [1939]:241). Without arguing that we are in a different epoch than Marx, it is quite clear that the relations between humans and nonhumans are different now than they were during Marx's time. I do not think that it is a coincidence that the categories of nonhuman labor, encounter value, or even multispecies ethnography in general, have emerged during a period when corporations,

NGOs, and governments are putting tremendous energy into 'saving nature by selling it' (Dempsey and Suarez 2016; McAfee 1999). That is, these revised categories have developed in relation to biodiversity and ecosystem processes becoming further integrated as commodities in the capitalist system. Thus, while multispecies ethnography's experiments with new analytic categories challenge conventional Marxist understandings, they are consistent with the historical epistemology upon which his analyses were built.

Where multispecies ethnography helps attune Marxism to the relationality of humans and nonhumans, Marxism allows multispecies ethnographers to understand how that relationality is embedded within larger political economic systems. Part of Marx's political project was to show that the seemingly fair and objective rule of capitalism necessarily leads to exploitation (Perelman 2000). According to Marx, capital accumulation entails the surplus value generated by the work of wage laborers being appropriated by their employers, who control everything the laborers would need to otherwise produce for themselves (Marx 2011 [1867]). That is, the wages that laborers earn from their employers are less than the value of what they produce through their work, yet they have no option but to work under these conditions because all other means of production are controlled by their employers (Marx and Engels 1998 [1848]). Feminist and ecosocialist scholars have also pointed out that this system of exploitation rests on other forms of domination that transform the bodies of humans and nonhumans into work machines (Federici 2004; Shukin 2009) and remake ecosystems to serve the needs of capital accumulation (Burkett 1999; Foster 2000). Another part of Marx's project was to understand capitalism as a historically contingent mode of production, rather than as a system of natural relationships. Understanding this historical contingency necessitates analyzing the violent forms of dispossession that established the conditions in which employers owned all means of production and workers were

left with no option but to sell their labor power (Luxemburg 1951 [1913]). These dispossessions often involved separating people from the natural resources that they relied on, as those resources came under the control of capitalists (Thompson 1975). Through such analyses of inequality, Marxist scholarship provides a framework with which multispecies ethnographers can understand how the relationality of humans and nonhumans shapes and is shaped by these larger political economic systems (Margulies and Bersaglio 2018).

Many Marxist-oriented scholars have critiqued conservation for either establishing or reinforcing capitalist systems of exploitation (Büscher, et al. 2012; Igoe and Brockington 2007). For example, these scholars see the purchase of large tracts of land to create protected areas as an act of dispossession that separates people from natural resources that they rely on (Corson and MacDonald 2012; Fairhead, et al. 2012; Rai 2012). They also see ecotourism and payments for ecosystem services as attempts to commodify biodiversity and ecosystems in order to expand opportunities for capital accumulation (Büscher and Dressler 2012; Duffy 2008; Kosoy and Corbera 2010). As Maan Barua (2017) points out, these programs often rely on the exploitation of nonhuman labor to generate value for conservation.

The point of this dissertation, however, is not just to show how conservation can reproduce capitalism through the exploitation of humans and nonhumans. To do so would be to accept that the world operates under the rules of capitalism as outlined by Marx, and treat his arguments as universal rather than historically situated. Rather, I aim to show that human-nonhuman relationships influence capitalism. To do this, I use human-wildlife interactions as a case study to show how they influence buffer zone conservation in central India, which, as I demonstrate later on, exhibits capitalist tendencies.

In the next section, I outline the ethnographic and historical context of human-wildlife interactions in central India. But first, I want to make a brief note about this dissertation's methodology, which follows from the intersection of multispecies ethnography and Marxism. A methodology "sets the framework for combining modes of inquiry and methods, and forms a set of organizing principles, following the logic underlying a particular area of study" (Pahl-Wostl, et al. 2013:37). That is, while each chapter includes a discussion of the different methods I used to collect the data presented in that chapter, here I want to briefly outline the organizing principles that guided how I combined these methods. These principles are noticing, emergence, and contingency. Anna Tsing (2010; 2015) uses the term noticing to refer to observation and fieldwork that attends to the unexpected ways that human and nonhuman lives come together (Van Dooren, et al. 2016). She posits noticing as a way of understanding how political economies come together through multispecies assemblages, rather than in accordance with capitalist teleology. Noticing has been crucial for my fieldwork, which has been guided to a large degree by what it did not anticipate (Strathern 1999:Ch. 1). For example, it was Dr. Amita Baviskar who first reminded me that plants exist. Up until I met with her, plants had hardly gained any of my attention, and now they are crucial to my arguments in Chapters 2 and 4. It was only by noticing plants and their relations to other nonhumans that I started to understand how political economies emerge through multispecies assemblages, rather than despite them. Noticing helps to orient this dissertation to how different multispecies relationships drive history in multiple directions simultaneously. With respect to this multidirectionality of history, noticing also aligns with the principles of emergence and contingency. Emergence refers to the new forms and processes that arise from the interactions of constituent parts of a system (York and Clark 2007). To acknowledging emergence is to understand that knowledge of a system's parts are

inadequate for understanding that system as a whole. Because the interactions between parts of a system can give rise to new forms, emergence directs analysis to the relationships between parts, rather than the parts themselves. A focus on emergence guided the mixed-methods approaches of Chapters 3 and 5 by allowing me to combine ethnographic observation with statistical reduction techniques, without resorting to reductionistic explanations of the world (Levins and Lewontin 1985; York and Mancus 2009). Contingency refers to an understanding that historical circumstances shape the present (Gould 2003; York and Mancus 2009). As I explained above, contingency is central to Marx's historical epistemology, which understands analytic frameworks as contingent on their historical circumstances. It is also central to the relational approach of multispecies ethnography and the dialectical thinking of Marx and Engels (Engels 2016 [1883]; Levins and Lewontin 1985), which understand how the present is conditioned by the past. Noticing, emergence, and contingency are consistent with the theoretical approaches of multispecies ethnography and Marxism, and together provide a framework with which I combine different methods throughout this dissertation.

With that methodological note out of the way, I now turn to a description of the ethnographic and historical contexts of Melghat and Tadoba-Andhari tiger reserves, both to introduce them as field sites and to highlight how their comparison is suitable for understanding how human-wildlife interactions restructure conservation.

C. Humans and Wildlife in Melghat and Tadoba-Andhari

1. Physical Geographies

The bus rides that took me to Melghat and Tadoba-Andhari revealed that while they had similar flora and fauna, their geology and hydrology were quite different. The bus to Melghat begins by heading north from the twin cities of Achalpur and Paratwada, which are situated in

the northern Deccan plateau, near the Maharashtra-Madhya Pradesh border (Figure 1.1). Over the next 30 kilometers, the bus climbs nearly 800 meters up the Gawilgarh ridge, across narrow switchbacks with increasingly steep drop-offs. The Gawilgarh ridge forms the southwestern end of the Satpura mountain range, which formed as the Deccan plateau to the south slipped beneath multiple fault segments and pushed up the land immediately to the north (Bhattacharjee, et al. 2016). The entire area sits upon one of the Earth's largest flood basalt deposits, the Deccan Traps, which was formed by rapid volcanic eruption around the Cretacious/Tertiary boundary (Duncan and Pyle 1988). These basalts helped form the patchwork of red and black soils found across the region (Bhattacharyya, et al. 2005, see Chapter 2).

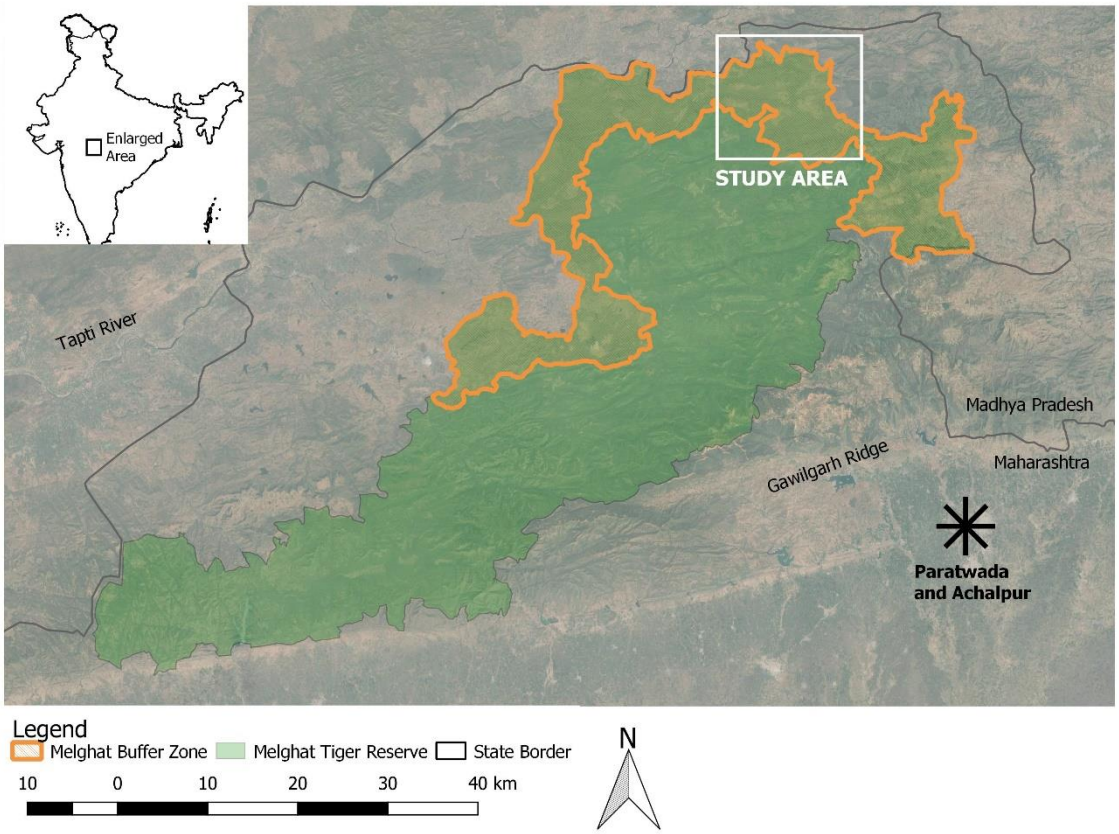

Figure 1.1: *Melghat Tiger Reserve*

From the Gawilgarh ridge, the bus descends into the undulating hills and valleys of Melghat, and it becomes clear how the region got its name. Meaning 'the meeting of the hills,' Melghat's landscape has been carved by the numerous monsoon-fed tributaries that flow north to the Tapti River, which forms its northern boundary. The monsoon, which is quickly becoming shorter and more intense (Deshpande, et al. 2016), brings the vast majority of Melghat's 100-225cm of annual rainfall between mid-June and late September (Government of Maharashtra 2015b:40), and often floods rivers and roads. It also brings down temperatures from their 40˚C (104˚F) peak in May and greens Melghat's cracked and parched landscape.

As the bus descends, it falls under the shadow of Melghat's tropical dry deciduous forests. The most prominent tree is teak (*Tectona grandis*), a tropical hardwood with large leaves and small white flowers that was grown commercially in the area by the British and Indian governments. Alongside teak, khair (*Senegalia catechu*), mahua (*Madhuca longifolia*), rosewood (*Dalbergia sissoo*), and tiwas (*Ougeinia oojeinensis*) grow on the slopes and valleys, interspersed by patches of bamboo (*Dendrocalamus strictus*) and other tall grasses. From the bus, it is not unusual to see groups of rhesus macaques (*Macaca mulatta*) or langur monkeys (*Semnopithecus entellus*) sitting along the road, waiting for bits of food to be thrown out the window. Occasionally, bus passengers will also spot chital (spotted deer, *Axis axis*), sambar (*Rusa unicolor*), gaur (Indian bison, *Bos gaurus*), and peacocks (*Pavo cristatus*) in the nearby forests. Less seen from the roads are animals like forest owlets (*Athene blewitti*), wild boar (*Sus scrofa*), common kraits (*Bungarus caeruleus*), and spectacled cobras (*Naja naja*). Tourist vehicles sometimes pass by the buses, packed with visitors hoping to glimpse some of Melghat's more elusive animals like tigers (*Panthera tigris*), leopards (*Panthera pardus*), sloth bears (*Melursus ursinus*), wild dogs (dhole, *Cuon alpinus*), and striped hyena (*Hyaena hyaena*).

The bus to Tadoba-Andhari begins by heading north through the coal fields of Chandrapur, in eastern Maharashtra (Figure 1.2). Unlike those going to Melghat, these roads involve almost no elevation change. The region lies across a suture zone separating the Deccan Traps from the Bastar Craton. Mukhopadhyay, et al. (2010) divide the area's geological development into seven time periods, including periods of deglaciation and inundation nearly 300 mya, and tectonic events including the breakup of the Gondwana supercontinent and India's separation from Antarctica and Australia. As the bus nears Tadoba-Andhari, this Gondwana basin gives way to an underlying Proterozoic formation, which is the result of a basin inversion nearly 1 billion years ago (Ghosh and Saha 2003). These rocks consist mostly of silica and include a variety of different sandstones (Chaudhuri, et al. 1999).

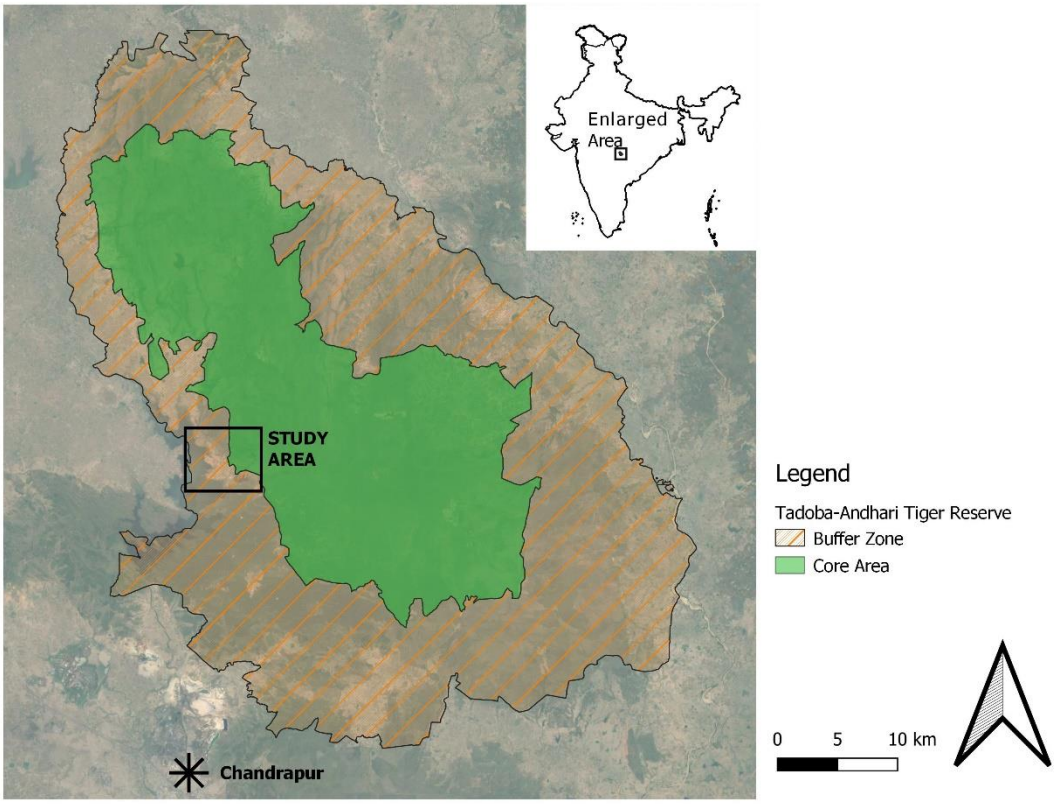

Figure 1.2: *Tadoba-Andhari Tiger Reserve*

Beyond Chandrapur's coal fields, the bus continues through the level forests surrounding Tadoba-Andhari and traces the outline of the Erai Dam Reservoir. This reservoir is the largest body of water in the area, though several smaller lakes, like Tadoba and Kolsa lakes, also dot the landscape. The landscape is not defined by tributaries to the extent that Melghat's is, but several small streams do flow into the Erai River to the north and the Andhari River to the south, which drain the area. The monsoon brings an average of 175 cm of rain each year, and cools the area from its peak high temperatures in May, which can reach 48˚C (118˚F) (Nagendra, et al. 2006). While the Erai Reservoir maintains some amount of groundwater throughout the year, the greater semi-arid landscape is increasingly vulnerable to the effects of climate change, which will make crop production increasingly difficult (Shukla, et al. 2017).

As it makes its way around Erai Reservoir, the bus passes through tropical dry deciduous forests similar to those of Melghat. Teak is again one of the more prominent tree species, and in addition to mahua it is accompanied by Indian frankincense (salai, *Boswellia serrata*), axlewood (dhawra, *Anogeissus latifolia*), and saaj (*Terminalia elliptica*). Like Melghat, these trees are interspersed by bamboos and other grasses that provide for a similar assemblage of wildlife. Animals are seen less frequently along the roads to Tadoba-Andhari than those to Melghat, as these are more heavily trafficked, but they include herbivores like sambar, chital, and gaur, in addition to nilgai (Blue buck, *Boselaphus tragocamelus*). The same carnivores found in Melghat are also found in Tadoba-Andhari, including tigers, leopards, sloth bears, wild dogs, and hyaenas (Government of Maharashtra 2016), although the density of tigers is much higher here than in Melghat (Jhala, et al. 2015).

In sum, while Melghat and Tadoba-Andhari have similar flora and fauna, their geological origins and hydrological formations are quite different. I now turn to the ethnographic context of this dissertation, emphasizing how the different political and economic settings of Melghat and Tadoba-Andhari make them ideal for comparison.

2. Ethnographic Context

As the bus leaves Paratwada and begins toward the northern Melghat buffer zone, it is rarely more than a third full. It picks up a few more people as it leaves town and approaches the Gawilgarh ridge, but the first hour and a half is largely a quiet ride up through the forest. The bus stops for a chai break in Semadoh, a larger village situated in the valley of the Sipna River. Semadoh is one of the few villages in Melghat with tourism facilities, and many roadside stalls serve snacks and meals to the tourists passing through. The tourism facility is situated on the opposite side of the river from the rest of the village, nestled in the rows of trees arranged as they were planted when Melghat was a commercial forest reserve. Semadoh is situated at a juncture, with the main road going toward Harisal and the larger town of Dharni beyond the western boundary of the reserve. However, the bus to the northern buffer zone turns away from this main road and on to a rocky dirt path. The bus is usually full at this point, and is especially packed on Thursdays, when the northern buffer zone has its weekly farmers market. This is the only bus that goes north to the buffer zone, and on Thursdays farmers fill it with bags of their produce.

After another two hours across bumpy forest roads, the bus makes its first stop in the northern buffer zone, at the area's largest village. Most of the passengers get off here and people waiting for the bus help others unload their produce. This village hosts the Thursday market, while also housing several Forest Department offices, a residential school for children belonging to Scheduled Tribes, and a Primary Health Center, which is the only health care facility in the

region. It is also where the *Gram sabha* meets about every month. *Gram sabhas*, or village assemblies, are open meetings of the *Gram panchayat*, an elected board of five local individuals, headed by the *Sarpanch*, who govern village affairs. During the *Gram sabha*, the members of the *Gram panchayat* discuss village governance, economics, and development issues, while also taking input and hearing about other issues from those in attendance. The *Gram panchayat* is also responsible for representing these constituents to district- and state-level government officials.

On a good day, when the rains have not washed out the road, the bus continues to the next few villages. On bad days, everyone gets off here and walks to their final destination. Villages are separated by stretches of forest, and from above, appear as patches of farmland dotting the larger forest landscape. Typically, the houses in villages are arranged along one or two roads and are surrounded by farmland. Most people in Melghat are farmers, growing some combination of rice, corn, soy, and sorghum. Aside from farming, there is a very limited number of wage labor jobs, typically offered by different government agencies, that often involve digging water retention ponds or repairing and constructing roads or houses. Most people live in houses made of teak frames and woven bamboo walls covered in a daubed mixture of dried mud and cow dung, which also covers the floor. In recent years, the government has been promoting brick houses to reduce people's use of forest resources, though these bricks are often locally made from mud found on the banks of rivers. Families typically keep their cows, water buffaloes, and goats tied to posts just outside of their houses. The bullocks are used to pull farm plows, and when not working in fields, livestock are often grazed in the forest.

The bus lets me off at my destination in front of the main row of houses. On this end of the village, most people identify as *Lohar*, a Scheduled Caste. Scheduled Caste (SC) is the

official designation for those who are most marginalized by the Hindu caste system, formerly referred to as Untouchables, and now sometimes called *Dalits*, a term popularized by B.R. Ambedkar the *Dalit* leader who oversaw the drafting of the Indian Constitution. In Melghat, *Lohar* people supplement their farming with their traditional occupation of blacksmithing, as well as carpentry, and wood carving work. After the group of *Lohar* houses, which make up about 20% of the village's population, the rest of the houses are generally occupied by people who identify as *Korku*, a Scheduled Tribe. *Korku* people make up most of Melghat's population. However, a small number of people in Melghat also identify as Gond and Gawli, a Scheduled Tribe and an 'Other Backward Class,' respectively. Scheduled Tribe (ST), like SC, is an official designation that signifies historical marginality. However, Scheduled Tribes are often considered to be so culturally distinct that they do not fit neatly into the Hindu caste system. They are sometimes referred to as *adivasis*, meaning 'original inhabitants,' akin to indigenous peoples elsewhere. People belonging to 'Other Backward Classes' (OBC) are usually designated from the *shudra* caste, ranked lowest of the four classical categories in the Hindu caste system but are still above SCs (Jaffrelot 2000). Government services, public universities and colleges, and elected offices have reserved seats for people belonging to SC, ST, and OBC groups in proportion to their presence in the population. Unlike the United States Constitution, which assumes equality among citizens and (ideally) punishes those who do not treat everyone equally, the Indian Constitution recognizes that inequality exists and puts in place a series of measures to create more equality (Moodie 2015). The reservations for SCs, STs, and OBCs are one of these measures.

After getting off the bus, I walk down the road and beyond the primary school complex to the NGO campus where I have stayed in Melghat every time I have visited since 2010. This

NGO is based in Pune, a large city in western Maharashtra, and has been working in Melghat since 1997 to curb high rates of childhood mortality and malnutrition. They began by organizing groups of volunteers from Pune to visit Melghat during the monsoon season, when children were most likely to fall sick. In this program, which continues today, volunteers monitor children's health in 28 villages and get medical care if a child needs it. As the program grew, the NGO realized that children's health was related to a host of other social, political, and environmental factors, and three volunteers began living in Melghat permanently. They built the campus complex, instituted education programs, helped build solar-powered water pumps, and began training a group of local youth to design and run other programs, with the idea that all such programs should eventually pass to the leadership of people who lived in Melghat.

These three individuals largely only visit Melghat now, and most programs are operated under local leadership. Some of these local leaders have become more political in recent years, organizing rallies and running for positions in local *Gram panchayats*. The rallies largely aim to bring more wage labor jobs to people in the northern Melghat buffer zone, and those who have been elected to local office have been focused on stopping practices of bribery and corruption among government officials and increasing people's access to government-sponsored development programs. In doing so, these elected leaders have been working to more fully implement the Panchayat (Extension to Scheduled Areas) Act of 1996, which gives increased powers to *Gram sabhas* in districts with large populations of Scheduled Tribes to manage inter- and intra-village affairs and manage natural resources. People describe their work as an *andolan*, or social movement, and Chapter 5 of this dissertation largely focuses on how this *andolan* relates to buffer zone conservation in Melghat.

Riding the bus to Tadoba-Andhari is quite a different experience. Though buses travel more frequently than those in Melghat, they are often packed full from the start. Generally, there are few tourists on the bus, but farmers, government workers, and students often use the bus to commute between Tadoba-Andhari and Chandrapur. As the bus enters the forested area, it passes by several villages, each advertising different wildlife tourism experiences. Some are privately run, others are administered by ecodevelopment committees, which are local government bodies aimed at promoting alternative livelihoods to reduce people's use of forest resources (see Chapter 4). These tourism experiences include safaris, souvenir shops, homestays, hotels, and a butterfly garden.

Upon reaching the buffer zone, which takes about 50 minutes total, some key differences between Tadoba-Andhari and Melghat become clear. Here, villages are not interspersed among forests, but rather line the forested border of the core zone. Villages and farmlands are situated between the protected area to the east and the Erai Reservoir to the west, with one main road connecting them. The distance from the forest to the reservoir ranges between 0.25 and 2 kilometers. The villages themselves look very different than those in Melghat. Houses are generally made of brick and concrete, and arranged in grids. Many people have signs outside of their homes advertising tourist homestays. Among these houses are shops and hotels catering to wildlife tourists. Larger tourism resorts line the main road between villages. Throughout the villages, many buildings have signs indicating that they were built with funds from the ecodevelopment committees or some other government program.

Most people in these villages identify as members of either the Gond or Pardhan Scheduled Tribes, though there are a few people who identify as Scheduled Castes or as Muslims. The people identifying as Scheduled Castes often also identify as Buddhists, being

descendants of followers of Ambedkar, who converted himself and hundreds of thousands of fellow Scheduled Caste members to Buddhism in Nagpur in 1956. People in the Tadoba-Andhari buffer zone typically earn wages either through employment in the tourism industry or through farm labor, though others also collect bamboo from the forest and weave it into mats that they then sell. Many Maruti Suzuki Gypsy jeeps line the roads, which are privately owned by local drivers who are then hired to take tourists into the park.

While in Tadoba-Andhari, I lived in a homestay that a local man owns and rents to a conservation NGO based in Nagpur. This NGO mainly focuses on mitigating human-wildlife conflict. They are working to organize village-level response teams, so that if someone is attacked by an animal, a group of people who know what to do will be close by. They have also hired local people to patrol the tiger reserve for signs of wildlife and conduct surveys in the different villages. These surveys often track how material goods from ecodevelopment or some other alternative livelihood program are distributed and used.

It is worth mentioning here that I had a falling out with this NGO that cut my time in Tadoba-Andhari short. We had agreed that the NGO would help me with fieldwork logistics, including housing, in return for me conducting an independent evaluation of their efforts to form village-level response teams. This NGO requires that volunteers working with them sign a waiver giving them full control of any data collected. I had informed them that I was fine giving them the data collected for the evaluation, but that my IRB agreement with the University of Georgia required me to maintain control of data collected for my dissertation. We agreed that I would sign the waiver now and then revise it before I started collecting data for my dissertation. However, after I completed the evaluation and submitted it to them, me trying to revise the waiver became an issue, as it seemed the people from the NGO did not understand why I needed

to change it. Eventually, after many awkward calls and conversations, they agreed to revise it, but things remained quite tense. Though I was able to collect the data that I present in Chapter 3 and 4, it became increasingly clear that our arrangement was no longer tenable, and I discontinued working with them. I made up for lost time by doing the archival research that now forms the basis for Chapter 2. But because of this disagreement, Tadoba-Andhari features as a secondary field site to Melghat in this dissertation. I compare my experiences in Tadoba-Andhari to those in Melghat in Chapters 3 and 4, while Chapter 2 and 5 deal with exclusively with Melghat.

I now turn to a review of the histories of these different settings, tracing their interactions with larger regional powers through the colonial era and then outlining their position within the larger history of wildlife conservation in independent India.

3. Political Ecological Histories of Central India, Pre-independence

In this sub-section, I provide a broad overview of the regional political ecological histories within which Melghat and Tadoba-Andhari are embedded. First, I chronicle political, economic, and ecological transformations in central India from the migration of shifting cultivators to the forested hill regions beginning in 2,000 BCE through the British colonial era. Because Chapter 2 presents a detailed analysis of British colonial forestry in Melghat, I only lay out the broad changes introduced during that era here. Second, I detail the different conservation histories and current issues facing Melghat and Tadoba-Andhari, again providing a broad overview as Chapter 4 goes into these processes in more detail. Through these histories, I argue that while Melghat and Tadoba-Andhari have occupied similar positions at the periphery of larger regional political ecological histories, the particularities of their differing human-nonhuman relations make them ideal for comparative analysis.

Long-term political, economic, and ecological processes led to the establishment of shifting cultivators in the central Indian highlands. Before 2,000 BCE shifting cultivation of grains and cereals was likely the main type of agriculture practiced across the Gangetic plain (Fuller 2006). However, between 2,000 and 700 BCE, the area experienced increased rainfall, population booms, and the rise of settled agriculture. The rainfall covered the Deccan plateau with thick vegetation and sal (*Shorea robusta*) forests, and the increasing power of settled agriculturalists pushed shifting cultivators further into the hill regions (Dhavalikar 1984; Kingwell-Banham and Fuller 2012). Agriculture continued to expand across South Asia under the Maurya Empire (300-200 BCE), which maintained extensive inter- and intra-regional trade networks between its discontinuous territories (Gadgil and Guha 2013 [1992]:74; Sinopoli 2006). There is evidence that by the early centuries CE, people in the central Indian highlands were trading forest resources for grains, salt, metal tools, and cloth from the west coast (Morrison 2007; Stiles 1993). These trade networks led to the establishment of feudal lords in the central highlands, who paid tribute to the Gupta Empire (300-500 CE) in exchange for land titles (Saha 1996).

While trade decreased after the fall of the Gupta Empire, the rise of the Mughal Empire (1526-1857 CE) resulted in an increased political economic connectivity across South Asia. This was largely due to the Mughals' expansion of agricultural and taxation systems. Mughal political rhetoric employed a 'garden of empire' metaphor in which the emperor cultivates good governance and weeds out those who threaten it (Pandian 2001). This rhetoric was reflected in Mughal imperial hunts, which brought the emperor and his armies to peripheral forested regions of the empire. These armies were accompanied by woodcutters and ploughmen, and the emperor granted feudal lordships to those who brought land under cultivation (Rangarajan 1996b). This

expansion of agriculture was also supported by advances in agricultural sciences, like new irrigation systems, and management techniques, like hierarchical land divisions and new units of measurement (Kumari 2012). Through these processes, the majority of northern India was brought under agricultural production and significant areas of central India were deforested in favor of farming (Habib 1999). The new agricultural fields were then taxed, allowing the Mughals to mobilize surplus over larger areas than past political regimes (Gadgil and Guha 2013 [1992]:93). Each village brought under Mughal control was assessed and assigned a revenue collector, who collected a tax equal to between one-third and one-half of a farmer's total produce (Habib 1999:Ch. 6). In these ways, agricultural expansion and taxation resulted in significant land use change that consolidated Mughal rule across a large extent of South Asia.

The political and economic relations, as well as the rough terrain of the hills, allowed shifting cultivators to persist in central India as settled agriculture expanded elsewhere. At the time, settled agriculture in hills was not as productive as that in the plains regions, and many chieftains in forested regions, despite still interacting with the Mughals, were relatively autonomous (Singh 1995). Though considered primitive by the Mughals, many people living in forested areas maintained economic and political ties to settled agriculturalists in plains regions. The Gond kingdoms, in particular, who controlled large areas of forests and rice-fields in and around what is now Chandrapur, married and traded forest produce and resources with agriculturalists (Bhukya 2013a), as well as served in Mughal armies (Singh 1995). These political and economic relations were mutually beneficial to the Gond kingdoms and the Mughal Empire, but also served to maintain the distinction between the two groups (Guha 1999).

The Mughal Empire declined as the Maratha Empire (1674-1818 CE) arose in the west and the British East India Company (rule in India: 1757-1858 CE) established control in the east.

The Marathas, under Raghojee Bhonsla, conquered the Gond kingdoms between 1737 and 1751, and their repeated attacks drove Gond people further in the forested areas (Prasad 1999). The Maratha rulers also replaced many Gond landlords with their own revenue collectors, effectively cutting Gond rule over their lands (Bhukya 2013a). About fifty years after the Marathas defeated the Gonds, the armies of the British East India Company defeated the Marathas. A key event in their doing so was Sir Arthur Wellesley's 1803 capture of the Maratha-held Gawilgarh Fort, a stronghold at the top of the Gawilgarh ridge in what is now Melghat (Bennell 1987). After this battle, the area that now includes Melghat and Tadoba-Andhari fell under the control of the Nizam of Hyderabad, who pledged fealty to the East India Company.

The British East India Company established a new, if uneven, political, economic, and ecological regime in South Asia (Gadgil and Guha 2013 [1992]; Rangarajan 1998). There was significant regional variation in the degree to which the Company controlled different territories (Rangarajan 1996b). Like with the Nizam of Hyderabad, the Company often conquered regional rulers only to return power to them in exchange for tribute. While it exercised various forms of political control, few of South Asia's farms and forests escaped the move toward a more standardized fiscal and political regime as the Company worked to integrate the region into the British Empire's global network (Rangarajan 1996a). The early 1800s saw many different regional governors assessing their stocks of teak in order to harvest them more efficiently (Prakash 2009). Indian teak harvested by the Company was crucial to the success of the Royal Navy during the Napoleonic Wars, and demand for it grew after the British began building railways across South Asia in 1853 (Gadgil and Guha 2013 [1992]).

As the Company extended its control into central India, Gond landlords began carrying out raids on agricultural crops. Bhukya (2013b) suggests that these raids were one way that the

remaining Gond elites tried to maintain political and economic power, as the raids brought them income and reduced British revenues. However, most Gond landlords surrendered to the Company in 1819, after the Company demonstrated its military dominance by defeating one of the last escaped Maratha rulers (Prasad 1999). To some success, the Company then tried to appease the remaining Gond landlords through treaties that recognized their proprietary rights over land in exchange for tribute (Bhukya 2013b). Though when the larger Indian Rebellion broke out in 1857, the remaining Gond raids were put down with military force.

After the 1857 rebellion was defeated, the East India Company's rule was replaced by that of the British Crown, which directly controlled some areas of South Asia and ruled through different forms of suzerainty in others. This political transition led to the implementation of new forest policies. The Imperial Forest Department was created in 1864 because colonial administrators were worried that ongoing deforestation was leading to increases in soil erosion and drought across India (Skaria 1998). Dietrich Brandis was appointed the first Inspector General of Forests for this department, and set about to manage India's forests along the lines of German scientific forestry (Rajan 1998). Through scientific forestry, timber from South Asia was commodified and integrated into the global economy of the British Empire. This happened through a combination of statistical and silvicultural practices. Statistical practices related to naming, classifying, counting, measuring, and valuing forests, represented forests in ways that were amenable to optimizing timber yields (Agrawal 2005). New silvicultural practices that changed forest composition, species diversity, and people's mode of subsistence through practices like fire management, monoculture plantations, and restrictions on cultivation in and around forests (Skaria 1998). Together, these new statistical and silvicultural practices served to

simplify forests in a way that made them manageable (Scott 1998), and extended British rule into areas that past regimes had failed to govern directly (Sivaramakrishnan 1999).

The rise in scientific forestry was accompanied by new forms of governing people who lived in forests. Around 1860, the British began to rely less on the military as a means of controlling people, and refocused efforts to 'civilize' them. The British categorized a variety of people who lived in hills and forests across India first as 'Depressed Classes' and then as 'Scheduled Castes.' These terms were used to label people who the British thought required significant socio-economic upliftment to make them more like the peasants of the plains (Bose, et al. 2012). The British signed further treaties with the Gond rulers, who were considered 'Depressed,' honored them with pensions, and sought to expose them to caste-Hindu society and English education as a way of subordinating them to British rule (Bhukya 2013b).

This 'civilizing' mission was accompanied by the introduction of private property, which the British administered in two main ways. Under the *zamindari* system, a landlord (or *zamindar*) paid tribute to the British, who then recognized large areas of land as the landlord's private property. The people who lived on this land paid taxes to the landlord, not the British. This system was used in the Central Provinces, of which Chandrapur was a part. In Berar, which included Melghat, the British administered taxes directly from people under the *ryotwari* system. In this system, the British recognized individuals' (*ryots*) private property rights and then collected taxes from them directly (Satya 1998).

The imposition of private property rights was also advanced by a series of forest legislation. The Indian Forest Act of 1865 established the state's claims to all the forests it required, except where existing rights already existed. Colonial anthropologists and other officials were crucial in documenting these rights, identifying people in the forests and hills as

primitive *adivasis* in need of private property rights and 'civilization' (Bhukya 2008). As the British began debating more extensive forest legislation, the issue of whether *adivasis'* land claims should be treated as rights or privileges took center stage, tied as it was to the extent to which the British could annex all forest lands (Gadgil and Guha 2013 [1992]). The ensuing Indian Forest Act of 1878 was based on the premise that the British Government had the sole authority to grant people rights, and itself had the right to take up unused land for its own benefit. The Forest Acts of 1878 and 1927 divided India's forests into three categories: reserved forests, in which the Forest Department assumed all rights; protected forests, in which people's rights were recorded, but not settled; and village forests, in which people had rights to forests. Aside from regions within what is now Uttarakhand (Agrawal 2005), this third category was never implemented (Bose, et al. 2012; Gadgil and Guha 2013 [1992]).

The forests of Melghat and Tadoba-Andhari soon fell under these categories. James Mulheran began the first survey of Melghat in 1860 (Mulheran 1865), and in 1866, the first state forest sectioned off 525 sq. mi. for scientific forestry. Over the next decades, more area was added to the reserve and by 1928 nearly three-quarters of Melghat's entire 1,558 sq. mi. area was classified as reserved forest (Crofton 1928). Again, Chapter 2 provides a detailed account of the rise of scientific forestry in Melghat, so I do not go in-depth here. Parts of what are now Tadoba-Andhari were designated Reserved Forests in 1879, however, they were largely closed in 1905 to become a shooting block for sport hunters (Government of Maharashtra 2015c). In 1935, a 45 sq. mi. area around Tadoba Lake was declared a game sanctuary (Nagendra, et al. 2006), and in 1942 the area was reclassified as a game reserve (Government of Maharashtra 2015c).

Sports hunting, aside from being an elite leisure activity, was part of a larger political project by the British to legitimate their rule in South Asia. Pandian (2001) argues that British

tiger hunts demonstrated the firm, paternal care that the British offered their subjects. The elimination of man-eaters, cattle-lifters, and other 'vermin and dangerous beasts' was sponsored by a system of bounties that showed how the British rewarded those who protected people and their livelihoods (Rangarajan 2012). The eradication of wildlife also advanced efforts to expand agriculture across South Asia, as it eliminated crop-raiders and other species that the British believed were harmful to farming (Sivaramakrishnan 1999).

Though financially successful, British forest policy had disastrous effects on South Asia's environment. By 1947, the Imperial Forest Department owned and managed 99,000 sq. mi. of land in South Asia and had seen growing profits throughout its tenure (Gadgil and Guha 2013 [1992]). Many of these forests, however, were simplified monocrops, as the British tried to eliminate bamboos and other plants in favor of only growing valuable tree species (Prakash 2009). Colonialism acted like a pincer on wildlife, eliminating habitat in the plains through the expansion of agriculture and hunting animals where they remained in forests (Rangarajan 2001). Towards the end of the colonial period, sports hunters were noting their "rapidly decreasing stock of tigers" (Corbett 2005 [1944]:224). Asiatic lions (*Panthera leo leo*) became confined to one forest in Gujarat, while Asiatic cheetahs (*Acinonyx jubatus venaticus*) were hunted to the extent that they became extinct in India soon after independence.

4. Wildlife Conservation in Independent India

India achieved independence in 1947, and for some time forest policy remained similar to what it was under the British. Scientific forestry continued in government-owned forests, though now for commercial purposes rather than industrial needs (Guha 1983a). The Indian Constitution made a new distinction between Scheduled Tribes and Scheduled Castes and provided these groups with government reservations, though the role of social science in determining tribal or

caste membership based on ‘cultural distinctiveness’ remained the same (Jenkins 2004; Kapila 2008; Moodie 2015).

Ecological degradation also continued, though accompanied by an emerging group of prominent conservationists. Salim Ali was a natural historian and ornithologist who catalogued the distribution and ecology of over 1,000 bird species in India and was instrumental in setting up the Keoladeo bird sanctuary in Rajasthan. E.P Gee, a British expatriate who stayed on after independence, was one of the first to argue that the Forest Department should be involved in wildlife conservation and not just commercial forestry. M. Krishnan, who chronicled the lives of animals and environmental change for a popular audience and advocated for strict conservation, was particularly influential on the thinking of Indira Gandhi (Rangarajan 2001).

As Prime Minister, Indira Gandhi passed far-reaching wildlife legislation and set up a national-level tiger conservation initiative called Project Tiger. She was passionate about wildlife conservation, partly due to the influence of M. Krishnan’s writings (Rangarajan 2009). In June 1972, she gave a speech at the UN Conference on the Human Environment in Stockholm citing poverty and need as the greatest polluters and condemning industrialized nations for their exploitation of the environment. Three months later, her government passed the Wildlife (Protection) Act (WPA), which banned all hunting of several hundred species and established a legal framework for setting up a system of national parks and sanctuaries across India. Though designed to protect, rather than exploit, wildlife habitat, this act resembled earlier British forest legislation in how it distinguished different areas based on rights. It distinguished between National Parks and Sanctuaries based on the degree to which people had rights over those areas. In Sanctuaries, rights were only granted to people already living there and to their descendants; no new land rights could be accrued after the declaration of a Sanctuary. To create a National

Park, all land rights to an area first had to become vested in the State Government, and once the National Park was declared, no one could accrue rights to the area for any purpose.

This legislation set up the legal framework for Project Tiger, which, at the time, was the largest national effort to protect a single species in the entire world. Three years earlier, the IUCN had held its Tenth General Assembly in New Delhi and decided to put the Bengal tiger (*Panthera tigris tigris*) on the endangered species list. At the time, a group of Indian foresters and the World Wildlife Fund had separately been trying to change public opinion of tigers from the 'dangerous beasts' of the British period to iconic species in peril. With an initial fund of 40 million rupees, Project Tiger aimed to establish national parks and sanctuaries in tiger habitat and coordinate conservation efforts through a national body, the Project Tiger Directorate (Rangarajan 2001). It was founded on two largely incorrect tenets common to the Yellowstone model of conservation: (1) that large areas of forest are untouched wildernesses, and (2) that human land-use invariably causes ecological destruction (Guha 1989; Saberwal, et al. 2000). Melghat Tiger Reserve was one of the first eight reserves set up under Project Tiger.

It was not long before Project Tiger's exclusionary paradigm began to show signs of strain. Many national parks, including Melghat's Gugamal National Park, had been set up without the state governments first assuming all land rights, as required by the WPA. This meant that a large number of people remained inside national parks, without any legal rights to the land or forest resources. With employment in the commercial forestry sector cut off and no alternative provided by the government, people had little recourse but to increase the extent to which they depended on forest resources.[1] However, the resulting debate over how to resolve these dilemmas did not overlay neatly with the 'tribal vs. tiger' narrative often portrayed in literature

[1] See Chapter 4 for a more detailed discussion of this change in livelihoods.

(e.g. Rastogi, et al. 2012). Rangarajan (2003) describes four main viewpoints on how to resolve the issue. First, pragmatic conservationists, like elephant conservationist Raman Sukumar, focused on the process through which conservation outcomes were meant to be achieved. Second, people like herpetologist Rom Whitaker focused on implementing constructive work projects, in which people could use their traditional skills to make a living within the changing political economic structures and demonstrate sustainable long-term use of natural resources. Third, a group of city-based researchers, like ecologist Madhav Gadgil and botanist V.C. Vartak, were often shielded from the more devastating effects of ecological degradation, but critiqued the process of modernization and took up cases of government denial of local rights and environmental destruction by industry. Fourth, rural activists engaged in some efforts to secure direct participation of resource users in resource management.

These different perspectives materialized in different ways across India. Joint Forest Management and Ecodevelopment, though designed by state and central governments and implemented in partnership with NGOs and international organizations, brought key terms like 'participation' and 'community' into the discourse of wildlife conservation (Sundar 2000; Sundar and Jeffrey 1999). Joint Forest Management sought to include people living in and around degraded forests with less than 40% canopy cover in their management (Nayak and Berkes 2008), while Ecodevelopment aimed to reduce people's dependence on forests in National Parks by developing alternative livelihood strategies (Baviskar 2003; Singh and Sharma 2004).[2] At the same time, the Forest (Conservation) Act of 1980 mandated Central Government approval for any denotification of protected areas larger than 10 hectares. The number of

[2] See Chapter 4 for a historical overview of ecodevelopment in India.

protected areas in India also continued to rise, which included the consolidation of Tadoba National Park and Andhari Wildlife Sanctuary into Tadoba-Andhari Tiger Reserve in 1995.

In 2006, two pieces of legislation dramatically shifted the terms of debate for wildlife conservation in India. One was an amendment to the WPA, which reorganized Project Tiger. This amendment created two new designations for tiger reserves that were overlaid on top of the National Parks and Sanctuaries of the original WPA. The core area of tiger reserves was declared Critical Tiger Habitat and managed along exclusionary lines. This area was surrounded by a buffer zone, which was meant specifically to promote human-wildlife coexistence.[3] The second piece of legislation was the Forest Rights Act (FRA).[4] This legislation was specifically aimed at addressing historical injustices committed against people living in forests, and allowed people to apply for individual and communal rights to forest land that they already occupied regardless of whether that land was in a protected area or not. This legislation came on the heels of the 1996 Panchayat (Extension to Scheduled Areas) Act, which gave increased powers of self-governance to Scheduled Tribes. Conservationists were divided on how best to proceed, given the contradictory nature of these two pieces of legislation. Some thought that the FRA was the last nail in the tiger's coffin (Sahgal and Scarlott 2010), while others circulated letters to the Ministry of Environment, urging it to end delayed implementation of the FRA (Rai, et al. 2016). I will return to a discussion of the FRA in the conclusion of this dissertation.

It is within this historical context that buffer zone conservation in India aims to promote human-wildlife coexistence in the buffer zones of protected areas. As I explore in Chapter 4, wildlife legislation in India largely adopts a material approach to human-wildlife coexistence and

[3] Again, see Chapter 4 for more on the history of human-wildlife coexistence in India.
[4] The full name of this legislation is The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

focuses on reducing the extent to which humans and wildlife rely on the same resources. This material approach stems from earlier programs like ecodevelopment, which sought to establish alternative livelihood strategies for people living in and around protected areas that did not rely on the use of forest resources. This material approach also aligns with the exclusionary paradigm of core areas, as it reinforces the notion that any human use of natural resources is necessarily destructive.

While a material approach to coexistence has its limits, again which I explore in Chapter 4, promoting coexistence in buffer zones is especially important in central India because it helps conservationists think about how to enhance the functional connectivity between protected areas. Landscape genetics research has confirmed that animals from Melghat and Tadoba-Andhari travel across human-dominated landscapes to interact with other populations in other protected areas (Dutta, et al. 2015; Dutta, et al. 2013; Joshi, et al. 2013; Sharma, et al. 2013). Conserving these metapopulation dynamics necessitates finding ways for animals to safely traverse human land uses (Dutta, et al. 2016; Seidensticker 2016). With this goal in mind, successfully promoting human-wildlife coexistence in protected area buffer zones could provide a model for safeguarding larger landscape-scale processes.

As I argue in this dissertation, efforts to promote coexistence both shape and are shaped by human-wildlife interactions. That is, conservation is not the subject acting on humans and wildlife objects. It exists in mutually influential relationships with the human-wildlife interactions it seeks to manage. As I will show, understanding this relationality allows for conservationists to ask new questions and pursue different avenues toward crafting more sustainable multispecies landscapes.

D. Dissertation Outline

I make my argument across four chapters. Each chapter builds on the last, though I have written them so that they can stand on their own. To be sure, these chapters are all fragments, and even when put together do not capture the full experience of human-wildlife interactions in central India.

Chapter 2 establishes one way in which human-nonhuman relations shape history. In this chapter, I draw on archival material that documents the appropriation of Melghat's forests under colonial forestry. With these archival materials, I argue that the relationality between soils, trees, and shifting cultivators shaped the location and speed at which Melghat's forests were appropriated and how those appropriated spaces then related to the larger landscape. This chapter explores how nonhuman labor necessitates a rethinking of the Marxist concept of metabolism and shows that processes like primitive accumulation and accumulation by dispossession do not only reconfigure that metabolism but are in fact shaped by it.

Chapter 3 moves to the present and shows how the spatial and temporal aspects of people's economic activity in Melghat and Tadoba-Andhari are shaped by people's interactions with wildlife. I combine geospatial analysis of people's movement across the landscape with ethnographic content to show that people's economic activity is shaped by their understanding of where and when they are at risk of encountering wildlife. I argue that people's economic activity in Melghat and Tadoba-Andhari is, in part, shaped by the different experiences they have with wildlife under varying levels of risk. This chapter builds on the concepts of landscapes of fear and dialectical biology to offer a needed corrective to ecological analyses that portray humans as risks to wildlife without understanding the full relationality of how humans and wildlife mutually influence each other.

Chapter 4 then shows how these different local economies that have emerged from human-wildlife interactions influence the implementation of buffer zone conservation. I show that buffer zone conservation in India aims to promote human-wildlife coexistence through a state capitalist model of market-based conservation. I then argue that this model has largely succeeded in Tadoba-Andhari but struggled in Melghat because the different ways that nonhumans have shaped those local economies affects how they articulate with other economic forms. This chapter draws on old debates over the articulation of modes of production to advance understandings of nonhumans in neoliberal natures beyond a functionalist framework.

Chapter 5 aims to understand how the people in Melghat think conservation should change to better promote human-wildlife coexistence. Through a combination of ethnography and Q Methodology, I show both how people in Melghat are working to change their relationships with state organizations and the political economies that emerged from human-wildlife interactions, and how their efforts result in alternative avenues for conservation. This chapter advances a relational understanding of moral economies to understand the processes through which people legitimize and delegitimize certain forms of conservation.

Chapter 6 then concludes the dissertation by summarizing the argument and explores directions for further research and practice.

CHAPTER 2

THE INS AND OUTS OF CAPITALISM: METABOLISM AND COLONIAL FORESTRY IN CENTRAL INDIA

A. Introduction

Landscapes, Elaine Gan, et al. (2017:G1) write, are haunted by histories of past multispecies encounters. In many of these histories, scholars focus on how the appropriation of landscapes under the capitalist ecological regime (Moore 2011a) degrade and simplify multispecies assemblages (e.g. Flaherty 2013; Zarrilli 2001). This focus is most clear in analyses of capitalism's appropriation of non-capitalist spaces outside of it. Such analyses typically describe the destructive social and ecological outcomes of primitive accumulation and accumulation by dispossession, which denote the initial and ongoing violent processes that reduce people to wage laborers and privatize control over the means of production and surplus value (Glassman 2006; Hall 2012; Harvey 2003; Marx 2011 [1867]). In these analyses, capitalism's appropriation of non-capitalist spaces entails breaking apart multispecies relationships and simplifying landscapes to meet the needs of capital accumulation.

These histories of appropriation envision capitalism as the sole driving force of history and characterize whatever is outside of capitalism as passive. Drawing on Rosa Luxemburg's (1951 [1913]) argument that appropriation of non-capitalist space is necessary to capitalism, David Harvey suggests that there are two ways in which capitalism relates to its outside: capitalism either finds and appropriates some pre-existing outside or actively manufactures it

(Harvey 2003:141). In both options, capitalism's outside has no choice but to serve the needs of capital. Most research that uses Harvey's concept of accumulation by dispossession has focused on the first option and emphasize capitalism's appropriation of a pre-existing outside (e.g. Fairhead, et al. 2012; Kelly 2011; Peluso and Lund 2011). These studies typically emphasize "how the accumulation of capital works through ecosystemic processes, re-shaping them and disturbing them as it goes" (Harvey 2005:67). While the focus on capitalism as the sole driving force of history is consistent with Marx's project of exposing the exploitation inherent in capitalism (Perelman 2000:30), in both of Harvey's accounts of how capitalism relates to its outside, the outside does nothing but wait for capitalism to either find or manufacture it, before being appropriated by it.

My purpose in this chapter is to tell a landscape history of multispecies encounters without the "crippling assumption" that capitalism is the only force of history (Tsing 2015:5). To do so, I focus on Marx's concept of metabolism, which denotes the material relationality of humans and 'nature.' Metabolism is often used to analyze the contemporary global environmental crisis, in that capitalism creates a rift in metabolic relationships (see below, Foster 1999; Foster 2000; Moore 2011a). Such analyses reinforce the notion that capitalism drives history and add metabolism to the list of things that passively await destruction. Contrary to this notion, I answer Schneider and McMichael's (2010) call to reconceptualize metabolism dialectically. They suggest that "Marx's notion of the dialectic relationship between humans and nature through labor lays the groundwork for this type of engagement, but the 'nature' side of the dialectic remains under-theorised as in much social science" (Schneider and McMichael 2010:470). To address this lacuna, I draw on multispecies ethnography to theorize metabolism as the material relationality between different species and their abiotic environment. I argue that

metabolism is a force of history that operates in relation to capitalism, demonstrating that it shapes the spatial and temporal dimensions of capitalism's appropriation of non-capitalist spaces. I use the establishment of colonial forestry in central India as a case study of capitalism appropriating its outside. I show how the colonial appropriation of forests was shaped by the pre-existing material relationships between trees, soils, and shifting cultivators. These relationships directed the speed and location at which appropriation occurred and established a gradient between the capitalist and non-capitalist elements in the landscape. Using this case study, I argue that capitalism not only appropriates its outside, but is shaped by it.

This chapter proceeds in four parts. First, I show how looking at metabolism from the perspective of multispecies ethnography necessitates breaking down 'nature' as an analytic category and turning attention to particular multispecies relationships. Second, I set the context of my analysis in central India's history of capitalist appropriation via colonial forestry. Third, I draw on archival material to demonstrate how the material relationships between trees, soils, and shifting cultivators shaped the process of colonial forestry's appropriation of central Indian forests. Finally, I conclude with a discussion of the implications of this analysis for understanding metabolism, contra capitalism, as a force of history and for imagining landscapes as products of multispecies relationships.

B. Metabolism and Multispecies Ethnography

In this section, I describe the Marxist concept of metabolism as the material relationality between humans and 'nature,' and argue that theories of metabolic rift imply intact, yet historically inert, metabolic relationships outside of capitalism. I then draw on multispecies ethnography to understand labor as an activity performed both by humans and nonhumans, which necessitates abandoning 'nature' as an analytic category and considering metabolism as a

material relationship between particular species and their abiotic environment. It is this understanding of metabolism that, I will then argue, is a force of history that shapes capitalist appropriation of non-capitalist spaces.

The Marxist concept of metabolism refers to the "process whereby human beings appropriate the means to fulfill their needs and return other use-values to nature" (Smith 2008 [1984]:54). The fulfillment of needs and return to nature of other use-values happens through the labor process, which Marx described as:

> a process in which both man and Nature participate, and in which man of his own accord starts, regulates, and controls the material re-actions [or, metabolism][5] between himself and Nature…By thus acting on the external world and changing it, he at the same time changes his own nature…[The labor process] is the necessary condition for effecting exchange of matter between man and Nature. (Marx 2011 [1867]:197-205)

In this rendering, labor involves both humans and nature, but is only performed by humans acting on their external world. In this sense, metabolism can be understood as the material relationality between humans and 'nature' enacted through labor that is exclusively human. Both humans and 'nature' are as they are because of their mutual metabolic relationships.

Over the past two decades, a number of scholars have drawn on the concept of 'metabolic rift' to understand the relationships between ecology and capitalism (Foster 1999; Foster 2000; Foster, et al. 2010; Moore 2000; Moore 2011a; Schneider and McMichael 2010). Simply put, 'metabolic rift' describes how the material relationality between humans and 'nature' is disrupted and redirected toward increased material throughput under the capitalist ecological regime. John Bellamy Foster initially outlined the concept using Marx's analysis of industrial agriculture's separation of town and county, which "disturbs the circulation of matter between

[5] *Stoffwechsel* is variously translated as 'material re-actions,' 'material exchanges,' or 'metabolism' (see https://climateandcapitalism.com/2018/05/01/marx-and-metabolism-lost-in-translation/)

man and the soil…[and] violates the conditions necessary to lasting fertility of the soil (Marx 2011 [1867]:554-555). Since then, others have conceptualized metabolic rifts as occurring progressively throughout the history of capitalism (Moore 2000; Schneider and McMichael 2010). Marx suggested that capitalism's appropriation of its outside also entailed a similar disruption of metabolic relationships, writing that primitive accumulation not only divorces individuals from the objective conditions of their labor, but also frees the "*objective conditions of labour*—land and soil, raw material, necessaries of life, instruments of labour, money, or all of these—from their *previous state of attachment* to the individuals now separated from them" (Marx 1978 [1939]:267, emphasis in original). Thus, the concept of metabolic rift clarifies that the separation of laborers from the means of production, which occurs via capitalism's appropriation of its outside, also entails the disruption of the metabolic processes through which humans and 'nature' defined each other.

The concept of metabolic rift implies two things: (1) that there are no metabolic rifts outside of capitalism, and (2) that metabolism is passive in relation to capitalism. Rosa Luxemburg's (1951 [1913]) work on 'natural economies,' upon which scholars of metabolic rift draw (e.g. Moore 2000:138), serves as an example of both points. She describes natural economies as self-contained closed-systems based on internal demand for their own products and non-economic means of reproducing social formations (Bradby 1980). Importantly, natural economies are not capitalist because "both means of production and labour power are bound in one form or another" (Luxemburg 1951 [1913]:369). That they are bound also implies that there is no rift in the metabolic relationships between humans and 'nature' in natural economies. Indeed, Moore (2000) draws on Luxemburg to argue that capitalism's historical expansion into non-capitalism spaces has just as much to do with the need to appropriate undegraded

ecosystems as it does the need to appropriate non-capitalist economic systems. This characterization of ecosystems being undegraded before appropriation by capitalism, coupled with the unity of labor power and means of production, implies that metabolic rifts do not exist outside capitalism. The rest of Luxemburg's exposition on natural economies describes how they are passive in the face of capitalist appropriation. Uprisings and rebellions feature in her case studies on British colonization of India and French colonization of Algeria only to demonstrate their inadequacy to quell capitalism's appropriation of natural economies. Thus, Luxemburg's account of natural economies suggests both that metabolic relationships are intact outside capitalism and that they were historically inert in the face of capitalist appropriation.

I now turn to multispecies ethnography to revise this characterization of metabolism outside of capitalism. As I mentioned in the introduction, the term 'multispecies' refers to a movement beyond assumptions of human exceptionalism (Tsing 2015:162), which has implications for how anthropologists and others think about how history unfolds. Marxist analyses are no exception. Donna Haraway (2008:46) notes that despite having significant insights about "the metabolism between humans beings and the rest of the world enacted in living labor," Marx "was finally unable to escape from the humanist teleology of that labor" under the goad of human exceptionalism. In other words, Marx's view of metabolism, as described above, emphasizes humans "acting on the external world and changing it" (Marx 2011 [1867]:198), rather than the external world acting on humans. Despite the relationality inherent in the concept of metabolism, Marx prioritized humans as historical actors and not 'nature.'

Rather than emphasize the role of 'nature' as a corrective (cf. Taşdemir Yaşın 2017), multispecies ethnography abandons 'nature' as an analytic category and instead focuses on what emerges from particular inter-species relationships (Govindrajan 2018; Van Dooren, et al. 2016).

In this view, the unique physical properties and ecological relationships of nonhumans, both biotic and abiotic, make them integral to and constitutive of history (Sundberg 2011). For example, Lien (2017) shows how sea lice influence domestication by necessitating that salmon farmers also domesticate wrasse, which protect the salmon by eating the sea lice. In another example, Tsing (2015:171) argues that by colonizing disturbed landscapes, pines and fungi make history through their mutual influences on each other. These examples support Schneider and McMichael's (2010) call for social science to define 'natural processes' in more than abstract terms. In these examples, 'nature' is not a helpful category because it turns the diversity of life into a monolith and stifles an understanding of how the interactions between different species shape each other and the course of history.

In this view, labor is something performed by humans and nonhumans alike, rather than an exclusively human activity (Barua 2017; Barua in press; Battistoni 2017; Beldo 2017; Blanchette 2015; Wadiwel 2018). Nonhuman labor is perhaps most clear in chimpanzee tool-use (Fay and Carroll 1994), but is also exemplified by trees taking in carbon dioxide and expelling oxygen, animals foraging for food, and soils filtering water, just to name a few. This nonhuman labor affects the kinds of labor that humans do, because human labor power "derives not only from…processes of household provision of food, shelter, and education, but also the taking in and expelling of air, water, and food, the periodicity of sleep and waking, and the many other ways in which bodies interchange with the environment" (Guthman 2011:237).[6] In this multispecies rendering, the labor process through which metabolism is enacted is no longer an exclusively human activity. Acknowledging human and nonhuman labor suggests that

[6] In these renderings, labor remains a biophysical process, and this is the way that I use the term throughout this chapter. However, it is important to note the works of other scholars, who have expanded our understanding of the affective and emotional aspects of labor (see Govindrajan 2018; Singh 2013)

metabolism does not only refer to the material exchanges that produce the human subject, it refers to the material relationality of humans and nonhumans, and how each make themselves and each other through material exchanges enacted by their labor activities.

The recognition that humans and nonhumans co-constitute each other through labor leads to different questions about the relationship between metabolism and capitalism's appropriation of its outside. Foremost, it suggests that capitalism is not the only force shaping such appropriation. Rather than stable metabolic relationships simply being torn apart as capitalism expands into its outside, multispecies ethnography presents the possibility that metabolic relationships also shape capitalism. Whether capitalism assimilates a pre-existing outside or produces it anew is no longer a question of how capitalism works in isolation. It is a question of how capitalism and its outside shape each other through their encounters. This is the question that drives this chapter.

I have described how the Marxist concept of metabolism is enacted through labor, and that the recognition that nonhumans do labor leads to new questions about metabolism and capitalism's appropriation of its outside. Next, I outline the historical context of my case study, the rise of colonial forestry in India, which represents one instance of capitalism appropriating its outside.

C. Colonial Forestry in India

The British colonial period was a social and ecological watershed in the history of South Asia (Chandran 1998; Gadgil and Guha 2013 [1992]; Guha and Gadgil 1989). Ecologically, the colonial period witnessed large-scale deforestation and associated cascading effects across multiple ecosystems. For instance, though some parts of South Asia saw more significant deforestation than others during the Mughal period (see Trautmann 2015), it dramatically

expanded under the British occupation, driven by the demands of ship and railway construction (Gadgil and Guha 2013 [1992]; Guha 1999). Between 1700 and 1850, deforestation changed the South Asian monsoon, decreasing precipitation in western India by 20% because deforested landscapes increased surface wind speeds and reduced moisture convergence (Takata, et al. 2009). The worry that deforestation was linked to drought and soil erosion was the main reason why the British administrators initially set up the colonial Forest Department (Skaria 1998). They hoped that scientific forest management, modeled after continental forestry's emphasis on minimum diversity, sustained yield, and balanced forest budgets, would help them avoid over-exploiting India's forests, while reaping the maximum benefits (Rajan 1998). To accomplish this, the Forest Department devised new bureaucratic structures and property relations, privatizing and enclosing forests through eminent domain (Sivaramakrishnan 1995), and securing its commercial monopoly via the Forest Acts of 1865 and 1878. Along with the ecological degradation of India, these changes to bureaucratic structures and property relations constituted major shifts in how people related to forests (Rangarajan 1996b; Rangarajan 1998).

These ecological and bureaucratic changes entailed broad social changes. Adivasis and shifting cultivators were stigmatized as colonial administrators sought to make India, and especially its forested regions, legible to their management (Scott 1998; Sivaramakrishnan 1999). Shifting cultivation and many of the those who practiced it in forested regions were labeled 'primitive' and became targets of British 'civilization' efforts that entailed sedentarization, privatization of property, and taxation, among others (Bhukya 2013a). Colonial anthropologists and missionaries were crucial to these efforts (e.g. Hislop 1866; Russell 1916). Racial taxonomies and descriptions of 'exotic' customs, together with missionary efforts at salvation, bolstered colonial efforts to turn adivasis into modern state subjects (Bhukya 2008). In

central India, shifting cultivation, being integral to many adivasi social and cultural institutions (Prasad 2012), became a key indicator of primitiveness that colonial administrators, seeing it as a 'pernicious practice,' sought to eradicate (Jewitt 1995). These efforts were fundamentally pacificatory, aimed at bringing patterns of settlement and production under British control (Sivaramakrishnan 1999). The stigmatization of shifting cultivation and adivasi distinctiveness became widespread during the colonial era and largely remains today (Moodie 2015).

However, this stigmatization only went so far as it complemented capital accumulation: where it interfered with colonial forestry, shifting cultivation was abolished, and where it benefitted colonial forestry, shifting cultivation persisted. For example, the subservience of stigmatization to capital accumulation is clearly seen in how colonial efforts to 'civilize' Baiga adivasis in central India quickly gave way to the needs of capital accumulation under colonial forestry. Regarding colonial policy towards Baiga people, Verrier Elwin noted that "The fact that 'the marketable value of forest produce rose in something like geometrical proportions' during those years probably accounts for a shifting of emphasis from …[a] policy of benevolent improvement for their own sake to a frank and simple desire to better the Provincial budget." (Elwin 1939:113). He went on to explain the colonial logic of allowing shifting cultivation to persist near colonial forest reserves, writing, "The forest officers did not want to prohibit bewar-cutting[7] altogether, for fear that they would lose the valuable assistance of Baiga labour" (Elwin 1939:116). Because of this fear, the Forest Department set aside one particular area in which they allowed Baiga people to practice shifting cultivation, while prohibiting it elsewhere. This pattern will repeat itself in the case study below, which, together with Elwin's account of the encounter between Baiga people and colonial forestry, suggests that the stigmatization of the

[7] Bewar was a form of shifting cultivation practiced by Baiga people

Adivasi practice of shifting cultivation could be suspended so as to not interfere with capital accumulation during the colonial era.

The colonial Forest Department was fundamentally a commercial enterprise (Gadgil and Guha 2013 [1992]), and colonial forestry serves as an exemplar of capitalism's appropriation of its outside. Shifting cultivation, which Perrings (1985) gives as an example of a natural economy, did not entail wage labor or the private control of means of production and surplus value. The Forest Acts and 1865 and 1878 gave the Forest Department a commercial monopoly over areas that it declared State Forests. This meant that land and forests were privatized and any surplus value that came from their use went to the Forest Department. When people entered these areas, they did so as wage laborers, employed by the Forest Department to cut timber (Guha 1983a). As Verrier Elwin's account suggested, there was some level of dependency of capitalism on non-capitalist spaces, as the latter kept a supply of laborers for the former nearby. I will explore these dynamics below.

I have outlined the context of colonial forestry in India as an example of capitalism's appropriation of its outside, and how it relates to ecology, adivasis, and shifting cultivation. Now, I turn to my case study of the introduction of colonial forestry in Melghat, a hilly region in central India. In doing so, I demonstrate that the metabolic relationships between teak, soils, and shifting cultivators shaped the spread of capitalism and helped to define the spatial and temporal dimensions of colonial forestry. I argue that these metabolic relationships are forces of history that shape and are shaped by capitalism.

D. Metabolism and Colonial Forestry in Melghat

In this section, I demonstrate how metabolic relationships shape capitalist appropriation of its outside through a case study of colonial forestry in Melghat, a region in the central Indian

highlands. First, I introduce Melghat's soils, trees, and shifting cultivators, three actors that I argue are bound by metabolic relationships. Second, I show how these metabolic relationships influenced the initial spread of capitalism, in the form of colonial forestry, in Melghat. The spatial extent of colonial State Forests largely conformed to the distribution of 'valuable' trees species across different soil types, and the appropriation of these areas for forestry happened at a pace commensurate with the rate at which soils under shifting cultivation became depleted and cultivators shifted plots. Third, I argue that colonial forestry produced a metabolic rift that depleted soils and caused some shifting cultivators to leave Melghat. This threatened colonial forestry's only available source of labor, necessitating that colonial administrators establish a gradient-like relationships between capitalist and non-capitalist elements across the landscape. Through this case study, I argue that history does not unfold according to the logic of capital accumulation alone and that metabolism is not only a process that is ruptured by capitalism, but is one that shapes it as well.

1. Melghat: Soils, Trees, and Shifting Cultivators

As I mentioned in the first chapter, Melghat is a hilly region at the southwest edge of the Satpura mountain range, bounded by the Tapti River in the north and the Gawilgarh Hills to the south. In this first sub-section, I introduce Melghat by focusing on three actors: soils, trees, and shifting cultivators. I argue that these three actors existed in metabolic relationship to one another prior to and during the introduction of colonial forestry in Melghat. Here, I use secondary sources to introduce these three actors and their relationships, and in the following sub-sections I will correlate these sources with the accounts of Melghat found in colonial archival documents.

The distinction between red and black soils is particularly important in the case study below because the colonial administrators conformed State Forests to the distribution of 'valuable' tree species, which in Melghat grew best on red soils. While the archival records do not specify exactly what soils these are, two types of soils called Alfisols and Mollisols tend to be red and black, respectively, and are both found in the Satpura range. Their presence is a product of the fact that much of the Satpura range, including Melghat, lies on the Deccan Traps, one of Earth's largest (500,000 sq. km.) flood basalt deposits, which was formed by rapid volcanic eruption around the Cretaceous/Tertiary boundary (Duncan and Pyle 1988). Geologists often differentiate Deccan Traps basalts based on the extent to which they are contaminated with different elements picked up as magma passed through the continental crust (Sano, et al. 2001), and the Melghat region has at least three different basalt types layered on top of each other (Peng, et al. 1998; Sheth, et al. 2004). These basalts help shape the distribution of soil types across the Satpura range through a chain of interactions. The basalts supply zeolites, porous minerals that stabilize smectite, which helps retain moisture and soil organic carbon that together form moderately acidic Mollisols (Bhattacharyya, et al. 2006), a black soil with a clay loam texture (Bhattacharyya, et al. 2005). In the Satpura range, these Mollisols are spatially associated with moderately acidic Alfisols (Pal, et al. 2014), a red soil with a silty to sandy clay loam texture (Bhattacharyya, et al. 2005). These Alfisols persist at higher-than-usual elevations because of the zeolites supplied by the basalts (Bhattacharyya, et al. 1999). Contemporary soil research suggests that, in the Satpura range, Mollisols tend to have higher soil organic carbon than Alfisols, because of their clay type and because Mollisols are often under more extensive forest cover than Alfisols (Bhattacharyya, et al. 2005). Again, there are limits to the accuracy with which I can reconstruct a historic landscape from archival documents. However, the

colonial administrators made a clear distinction between red and black soils in Melghat, and the Satpura range, including Melghat, contains red Alfisols and black Mollisols that are products of long-term geological processes. It is a good bet that these are the soils that colonial administrators were referring to.

The colonial administrators were keen to include red soils within State Forests because teak (*Tectona grandis*) grew on red, but not black soil. Teak naturally occurs predominantly in soils of volcanic origin, such as basalt (Kaosa-ard 1989), and is found across Melghat. It grows best in soils with pH values between 6.5-7.5, which overlaps with the pH range of Alfisols in the Satpura range, but not that of Mollisols (Bhattacharyya, et al. 2005). Teak also prefers moist, well-drained sandy loam, and tends to grow better in valleys than hilltops due to the increased moisture content (Tewari 1992:77-78). In moderately- to well-drained slopes, and particularly in dry deciduous areas like Melghat, teak is often accompanied by bamboo (*Dendrocalamus strictus*), which inhibits the growth of teak seedling competitors and prefers the moderate shade provided by teak (Tewari 1992:72). Teak's preference for the mildly acidic, moist, well-drained, sandy loam often found in valleys agrees with colonial records of teak's distribution in Melghat and the characteristics of Alfisols found in the Satpura range. It also agrees with the 1974 Melghat working plan, which describes how the best forests grow "in the valleys and on the lower gentle slopes" where the soil is a slightly acidic sandy clay loam, in contrast to the shallow dry soils found on the plateaus (Joshi 1974:3). Because of its soil preference and its association with bamboo, teak is an important actor in the case study below.

Shifting cultivators are the third main actor in the case study below. In the late 1860s and early 1870s, the time when the first British surveyors and missionaries arrived in Melghat and administrators began designing State Forest reserves, most shifting cultivators in Melghat were

Korku people, though there were some Gond and Gawli people practicing it as well (Mulheran 1865). These labels denote adivasi groups, and would eventually become legal terms in British and Indian law to designate different Scheduled Tribes (see discussion in Moodie 2015:Ch. 2). The initial survey of Melghat ignored linguistic and cultural differences between Korku and Gond people (Nagaraja 1999), suggesting that they were so similar that a description of one could substitute as a description of the other (Mulheran 1865:10). However, this similarity came with the caveat that Korku people in particular "periodically move from one place to another…[and] the new land occupied is, in the majority of cases strictly fallow, and, therefore, more productive than that given up as unfit for further cultivation" (Mulheran 1865:12).

The same survey described people in Melghat using a form of shifting cultivation called dhya cultivation. People used dhya cultivation to grow rice and chickpeas, which they exported from Melghat to the plains, as well as sorghum and other grains. Archival records suggest that people often moved plots every 1-4 years, and that the fallow period was often more than 8 years.[8] In his notes, Scottish missionary Stephen Hislop described dhya cultivation as follows:

> A piece of ground on a moderate slope is selected, clothed with trees, brushwood, and grass; the trees are cut down in November, the brushwood and grass are set fire to in May, the charred ground is left covered with ashes; in the beginning of June quantities of seed are placed at the upper end of the slope; the rains descending wash the seed over and into the prepared ground; no ploughing or any other operation is resorted to. There springs up a plentiful crop. (Hislop 1866:vi)

Hislop further qualified that this system is a "great cause of wastage and destruction of forests" and occurs precisely where "the finest timber trees like to grow" (Hislop 1866:vi). These two

[8] Letter No. 207 of 1872 from the Officiating Deputy Conservator of Forests, Berar to the 2nd Assistant Resident Hyderabad. Dated 29th February 1872.

characterizations are important because they exemplified the rationale for colonial administrators to separate shifting cultivation from areas that grew good timber.

Because systems of shifting cultivation vary across the globe and because the stigmatization has only recently begun to fade, broad generalizations about their relationship to soils and vegetation are difficult to make (Conklin 1961; Mertz, et al. 2009; Mukul and Herbohn 2016). In 1957, the UN Food and Agriculture Organization claimed that "Shifting cultivation is not only a backward type of agricultural practice. It is also a backward stage of culture" (FAO Staff 1957). Such racist views of cultural evolution continue to persist and are sometimes accompanied with the notion that shifting cultivation has become unsustainable because population growth and 'non-traditional' forms of shifting cultivation have shortened fallow periods and increased deforestation (Gupta 2000; Rasul and Thapa 2003). The length of fallow period is often treated as the prime indicator of shifting cultivation's sustainability, in that long fallow periods allow soil quality and floral and faunal biodiversity to regenerate to pre-disturbance levels, while short fallow periods do not (Bruun, et al. 2006; Mertz 2002; Raman 2001; Raman, et al. 1998; Thomaz 2013). Because adequately long fallow periods can both maintain high levels of biodiversity and provide food to humans, some conservationists now promote it as a 'biodiversity-friendly' form of agriculture (Padoch and Pinedo-Vasquez 2010). Despite variations across different types of shifting cultivation, what is clear is that, compared to tree plantations and sedentary agriculture of the kind promoted by the colonial Forest Department, shifting cultivation likely retained more aboveground biomass and soil organic carbon (Bruun, et al. 2009). In particular, soil erosion increases when teak plantations replace shifting cultivation plots in hilly environments because the resulting lack of understory (1) promotes the formation of an impermeable crust that accelerates overland water flows, and (2)

leads to raindrops having more kinetic energy because they are falling directly from the canopy rather than being dispersed (Ribolzi, et al. 2017).

Through this brief review, I argue that soils, trees, and shifting cultivators existed in metabolic relationships with each other before and during the introduction of colonial forestry in Melghat. Variations in soil moisture, nutrients, and acidity, among others, affected what trees could grow where and how long shifting cultivators could remain in one plot. Shifting cultivators contributed to temporary increases in soil organic carbon by cutting and burning foliage, and the fallow periods allowed underbrush to regrow and reduce soil erosion. And trees and their associates influenced soil organic carbon through decomposing leaf litter, which contributed to shifting cultivators being able to return to a plot after several years. Surely these are not the only material exchanges that occurred between soils, trees, and shifting cultivators, and I do not mean to imply that these relationships were ecologically sustainable, as there is not enough evidence to suggest that. However, I do argue that the physical properties of soils, trees, and shifting cultivators in Melghat were the result of their material exchanges with each other, and that therefore, they exist in metabolic relationships with each other.

2. Metabolism and the Initial Appropriation of Melghat's Forests

Having established the metabolic relationships between soils, trees, and shifting cultivators, I will now explore the first part of my case study, in which I argue that these metabolic relationships directed the location and speed at which capitalism appropriated non-capitalist spaces. I show that the distinction between red and black soils, and the implications of that distinction for the distribution of teak trees in Melghat, shaped where colonial administrators focused their efforts to establish forestry reserves. This led to areas with red soil gradually becoming spaces of capitalism, and areas with black soil becoming spaces of a hybrid economic

system that included some capitalist elements and some non-capitalist elements. The separation between the two spaces happened at a rate commensurate with the rotation period of shifting cultivation, as colonial administrators would appropriate shifting cultivation plots into State Forest reserves as shifting cultivators moved to new plots.

My case study deals largely with the period between April 1870 and December 1872, when colonial administrators were beginning to demarcate what areas of Melghat should be included as part of a State Forest reserve. Most of the forest at this point was not a plantation, but was the product of metabolic relationships between soils, trees, and shifting cultivators, among others. At this time, Melghat was a taluk of Ellichpur District, which was in the East Berar Division assigned to the Hyderabad Residency (Lyall 1870:246). The archival material that I use as evidence largely consists of letters between colonial administrators working at these different levels of government.

Before the British surveyed Melghat, the shifting cultivators living there were distinctly outside of capitalism. I mentioned above that Perrings (1985) used shifting cultivation as an example of a natural economy, a category that Luxemburg (1951 [1913]) used in contrast to capitalism. Archival material also supports the notion that people in Melghat were not part of capitalist social relations. Reflecting on the economic relations in Melghat before the British arrived, the Commissioner of East Berar listed people's rights as follows:

> 1st – The right to cultivate anywhere they pleased, cultivation by "dhya" included.
> 2nd – The right to cut, export, and sell Forest produce, Teak being specially subject to a seignorage [*sic*] to the Rajahs within whose limits it was cut.
> 3rd – The right to graze their cattle anywhere, subject to payment of seignorage [*sic*] to the Rajahs.[9]

[9] Letter No. 2217 of 1872 from Commissioner of East Berar to the 1st Assistant Resident, Hyderabad. Dated 8 August 1872, pg. 3.

Though they did pay a percentage to local Rajas, it appears that people generally had access to any lands or trees they wished to use for any purpose. There was no wage labor, no privately held means of production, and no private appropriation of surplus, three key indicators of capitalism. This suggests that before the British arrived, the economic system bore little resemblance to capitalism.

After the British completed their first surveys of Melghat in the mid-1860s, colonial administrators quickly bought the rights of local Rajas to collect taxes and transit dues,[10] and began planning how best to appropriate the area as a State Forest. The Forest Department focused its efforts on demarcating areas with 'valuable' forests,[11] which meant forests that contained certain tree species, primarily teak, tewas, and sheshum[12]. State Forests were purposefully designed to match the distribution of these species. On April 15th, 1870, G.W. Strettell, the Officiating Deputy Conservator of Forests, Berar, proposed expanding the area of Melghat initially selected to become a State Forest into two more areas (see Figure 2.1). He suggested extending the reserve westward where "Teak (*Tectona grandis*), Tewas (*Dalbergia dojerimensis*) and bamboos exist in great abundance," and to an area "between the Gurgur and Doolar rivers; where undoubtedly…is to be found in large abundance the best teak (*Tectona grandis*), tewas (*Dalbergia dojerimensis*), sheshum (*Dalbergia latefolia*), bamboos and the more valuable varieties of the non-reserved timber."[13] His proposed expansions show that State Forests were designed to include areas where these 'valuable' species grew well, and exclude areas where they did not grow well. Apart from the two areas he proposed including in the State

[10] Letter No. 87 from Colonel R.E, Officiating Secretary to the Government of India, Public Works Department to The Resident at Hyderabad. Dated 7th January 1870, pg. 1.
[11] *Ibid.* pg. 2.
[12] This species is commonly known as sheesham or shisham now, but I use the older spelling to maintain consistency with quotations from the archival documents.
[13] Letter No. 64 of 1870/71 from G.W. Strettell, Officiating Conservator of Forests, Berar to The 1st Assistant Resident Hyderabad. Dated 15th April 1870, pg. 2-4.

Forest, Strettell could not "recommend any more land to the west be set apart as State Forest, for even the one or two sites…containing a few Teak trees, and tolerably wooded, has [*sic*] since been cleared for cultivation, land in these parts being greedily sought after, the soil being of the richest black loam."[14] Strettell's proposed extensions to State Forests in Melghat indicate that the Forest Department was chiefly interested in land that was suitable for 'valuable' species like teak, tewas, and sheshum, and that the boundaries of the reserves would largely conform to the distribution of those species.

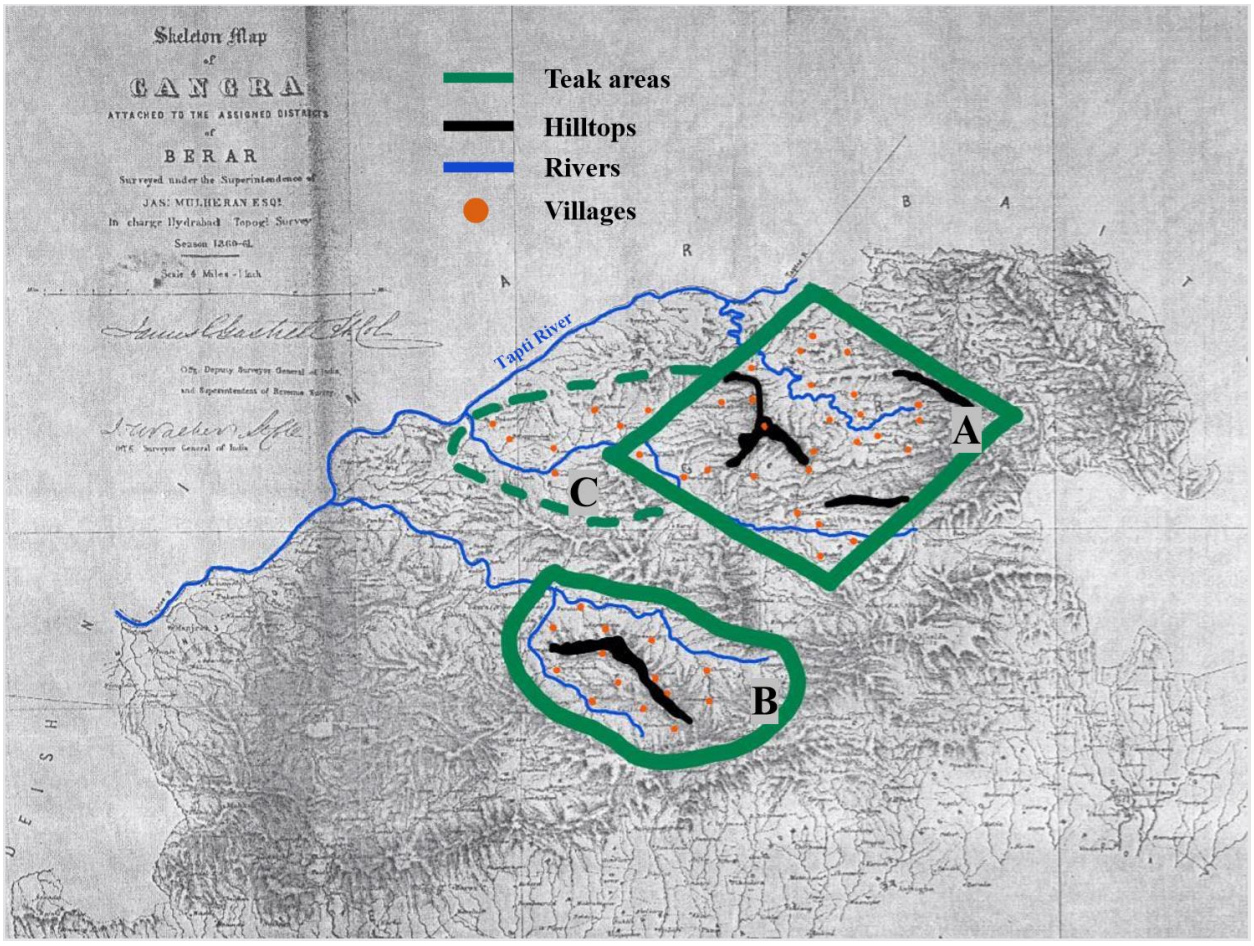

Figure 2.1: *A modified version of an 1865 map of Melghat from the first statistical survey. No maps of the State Forest reserves in Melghat were available. The teak areas are approximations, based on descriptions found in archival materials, of the best teak producing regions in Melghat. Region A formed part of the Bairagarh reserve, which was*

[14] *Ibid.* pg. 9.

established in 1866 and was the only State Forest in Melghat during the time period considered in this chapter. Region B would be added as part of the Gugamal reserve in the 1880s. Region C is the area Strettell proposed be added to the Bairagarh reserve. The hilltops within those teak producing areas are marked in black to indicate their soil type. All other soils, especially those around rivers, are assumed to be red soils, where teak grows best. The villages identified are only those named villages in the 1865 survey that fall within the teak areas.

The distribution of these 'valuable' trees largely corresponded to different soils found across Melghat. Strettell had commented that areas with the 'richest black loam' contained only a few teak trees and did not need to be included in the State Forest. This association between black soil and lack of teak was echoed in a comment by the Deputy Commissioner of Ellichpur on April 19th, 1870: "Throughout the Mailghat, in the most unexpected places rich black soil is found, not only in the valleys between the ridges but on the tops of the hills themselves. In many instances this soil is under cultivation, but whether owing to it having been cleared for this purpose or the soil not suiting teak, I noticed as a general rule that little of that kind of wood grew in such places."[15] Both sources suggest that teak was rarely found on black soils. However, teak did grow on the red soils found throughout the rest of Melghat. Strettell's successor, A.J. Drysdale, noted that Melghat's soil is "particularly a teak one, and consists for the most part of a red ferruginous loam."[16] While it is uncertain whether these red and black soils correspond to Alfisols and Mollisols, respectively, the colonial administrators described both red and black soils as loamy, and teak as growing predominantly on red soil. Both Alfisols and Mollisols in the Satpura range are loamy, and teak's acidity tolerance overlaps with the acidity of Alfisols in the Satpuras, but not that of Mollisols (Bhattacharyya, et al. 2005). It seems likely that these are the

[15] Letter No. 35 of 1870/71 from Officiating Deputy Commissioner, Ellichpur District to The Commissioner East Berar Division. Dated 19 April 1870, pg. 2.

[16] Letter No. 207 of 1872 from the Officiating Deputy Conservator of Forests, Berar to the 2nd Assistant Resident Hyderabad. Dated 29th February 1872, pg. 8.

soils they describe as red and black loams. But regardless of whether they are, teak trees were predominantly found on red and not black soils.

Partly because of how these different soils were distributed across Melghat's topography, teak trees were only found in certain areas. According to Drysdale, "Teak and well grown timber in general are as a rule only found in valleys and on the sides of hills."[17] Similarly, the Officiating Deputy Commissioner, Ellichpur noted that trees in Melghat, and particularly teak, are rather small, "except on the banks of streams."[18] The area that Strettell proposed to include in the State Forest encompassed ravines in which teak trees numbered "5 to 20 per acre," and on the slopes of these ravines grew "a fine forest of straight young teak."[19] In his proposal to expand State Forests in Melghat, Strettell quoted an earlier survey of Melghat that suggested that bamboo accounted for the presence of teak on hillsides. That report described how "clumps of bamboos are plentiful on this side of the hill, which no doubt have tended to retain the soil on the sides of it in this place, and thereby induced the production of a better class of timber than is to be seen elsewhere."[20] As described above, bamboo grows well in the shade of teak and inhibits the growth of teak competitors, and teak prefers valleys because of the increased moisture content of the soil (Tewari 1992:77-78). Because these different sources largely agree with each other, it seems reasonable to assume that teak tended to grow in red soils on valleys and on slopes, and not in patches of black soil.

Conversely, the only valuable tree on plateaus and hilltops seems to have been tewas. Drysdale described plateaus as areas "on which no wood is produced except tewas and the less

[17] Letter No. 250 of 1872 from A.J. Drysdale, Officiating Deputy Conservator of Forests, Berar to The Forester Peeli. N.d., pg. 3.
[18] Letter No. 35 of 1870/71 from Officiating Deputy Commissioner, Ellichpur District to The Commissioner East Berar Division. Dated 19 April 1870, pg. 2.
[19] Letter No. 64 of 1870/71 from G.W. Strettell, Officiating Conservator of Forests, Berar to The 1st Assistant Resident Hyderabad. Dated 15th April 1870, pg. 6-7.
[20] *Ibid.* pg. 7.

valuable kinds of unreserved trees," and as "better grain than timber producing areas."[21] Additionally, he noted that there was no difficulty at finding soils on which neither teak nor sheshum grew, but that "it is almost impossible to find any extent of waste land that does not contain tewas in some form."[22] Thus, the general pattern of tree and soil distribution seems to be that teak was predominantly found on red soils in valleys and on hillsides and not on black soils and hilltops. Tewas, on the other hand, seems to have been found across Melghat, regardless of soil or elevation.

In conforming their appropriation efforts with this general distribution of 'valuable' tree species, the colonial administrators developed rules to move shifting cultivators, who often lived in the same areas. In Strettell's proposal to expand State Forests in Melghat, he noted that "cultivated areas are so interlaced with the more valuable parts of the reserves that it would be impracticable to separate them from the forests."[23] This 'interlacing' meant that the expanded State Forest would necessarily include at least 80 inhabited villages. To manage these villages in accordance with the goals of colonial forestry, Strettell included in his proposal ten rules that he thought the Forest Department should apply to people living in State Forests. Among these rules were bans on dhya cultivation and on cutting teak, tewas, and sheshum, as well as stipulations that people (1) forfeit land rights to the Forest Department if they "abandon" their fields, and (2) must apply to the Deputy Conservator if they want to establish new fields, who will grant such permission if he sees "no objection from a forest point of view."[24]

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[21] Letter No. 250 of 1872 from A.J. Drysdale, Officiating Deputy Conservator of Forests, Berar to The Forester Peeli. N.d., pg. 3.
[22] Letter No. 250 of 1872 from A.J. Drysdale, Officiating Deputy Conservator of Forests, Berar to The Forester Peeli. N.d., pg. 3.
[23] Letter No. 64 of 1870/71 from G.W. Strettell, Officiating Conservator of Forests, Berar to The 1st Assistant Resident Hyderabad. Dated 15th April 1870, pg. 11.
[24] *Ibid.* pg. 12-15.

These rules, when coupled with the temporal relationships between shifting cultivation and soils, gradually moved people away from areas that were important to the Forest Department. The colonial administrators were aware that shifting cultivators moved plots almost every year. The same week that Strettell made his proposal, the Deputy Commissioner, Ellichpur District described shifting cultivation as causing "the most reckless destruction of wood…for the sake of the use of the ground for one year. Much of the ground poor for cultivation is heavily wooded. This in many instances is being cleared in order that it might be sown with some wretched crop for one year and then abandoned."[25] Considering that shifting cultivators moved almost every year, the ban on shifting cultivation and the requirement that any new plots be approved by the Deputy Conservator meant that the Forest Department could appropriate the areas they desired for State Forests at a pace commensurate with the rate at which people moved their fields. When people wanted to start new plots, two things happened: (1) their old plot became property of the Forest Department, and (2) they were only permitted to start a new plot in an area approved by the Forest Department. These rules, coupled with the need for people to shift cultivation plots, meant that the Forest Department could prioritize their forestry efforts according to the distribution of 'valuable' species, while limiting shifting cultivators to areas without 'valuable' species.

Correspondence dating from two years after Strettell's proposal confirms that the Forest Department used these rules to advance their appropriation of forests at the expense of shifting cultivators. When A.O. Hume, Secretary to the Government of India, questioned the logic of

[25] Letter No. 35 of 1870/71 from Officiating Deputy Commissioner, Ellichpur District to The Commissioner East Berar Division. Dated 19 April 1870, pg. 3-4.

including 80 villages within a State Forest,[26] Drysdale replied that under the current rules, forestry and shifting cultivation benefited, rather than hindered each other. He explained that:

> The villagers are permitted to take up fresh land for cultivation anywhere within the Reserve on obtaining the sanction of the Forest Dept, and it seldom happens that this is not accorded, as there is so much shallow culturable waste land scattered throughout the forests, which is particularly suited to the intermittent system of cultivation practiced by the Korkoos, and which is generally of little or no use for the production of timber.
>
> These privileges to which the people have now become accustomed do not as far as my experience goes militate in the least degree with our Forest Conservancy arrangement.
>
> On the other hand, their present system of cultivation is rather an assistance to us than a drawback, for we are enabled to establish plantations on such of their deserted fields as are suitable for the production of timber at just about one-half the expenditure that would have to be incurred had we to take up fresh land and clear it ourselves, instead of having this done for us gratis by the Koorkoos.[27]

In arguing that colonial forestry and shifting cultivations did not interfere with each other, Drysdale argued that the distribution of 'valuable' trees allowed both to persist in different spaces. As quoted above, Drysdale had noted that "Teak and well grown timber are as a rule only found in valleys and on the side of hills." He described this distribution of 'valuable' trees to suggest that "it should be our object therefore gradually to resume all land of this nature at present under cultivation, and to restrict cultivation as much as possible to the plateaus and terraces."[28] Drysdale suggested that Strettell's rules created a system in which shifting cultivation was gradually restricted to plateaus and terraces, where there was often black soil and few 'valuable' trees, allowing colonial administrators to appropriate teak, which was often found in the red soils of the valleys and hillsides.

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[26] Letter No. 474 of 1871, from A.O. Hume, Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce to The Resident at Hyderabad. Dated 19 October 1871.

[27] Letter No. 207 of 1872 from A.J. Drysdale, Officiating Deputy Conservator of Forests, Berar to the 2nd Assistant Resident, Hyderabad. Dated, Camp Pili, 29 February, 1872, pg. 7

[28] *Ibid*. pg. 3

While the valleys and hillsides, with their 'valuable' trees, were gradually appropriated under the capitalist system of forestry, a hybrid system combining capitalist and non-capitalist elements developed on the hilltops. These areas were still included in the State Forest, which, in Berar, meant that the land was owned by the Forest Department. Shifting cultivators were required to apply to the Forest Department to establish new plots, but it is unclear if this involved paying rent. Strettell and his superior had suggested leasing land annually to shifting cultivators,[29] but later correspondence does not mention rent when listing the rules for people living in the State Forests.[30] This later correspondence does indicate, however, that the Forest Department privately held timber from teak, sheshum, and tewas, as well as the land on which they grew. These were completely alienated from shifting cultivators and existed under capitalism, including the tewas that grew on the hilltops. This state ownership of tewas and the land on which it grew represents the capitalist element of the hybrid system that developed in hilltops. The non-capitalist elements of this hybrid system existed where tewas did not. The Forest Department did not interfere with fields that were already cultivated, people collected minor forest produce and cut grass and non-'valuable' tree species freely and for any purpose, and cattle grazing was allowed anywhere upon payment of a tax.[31] Though these economic activities existed in relation to capitalism, they did not include wage labor or the private appropriation of surplus value, and only some means of production were privatized, while others were not. Thus, the hybrid economic system that emerged in the hilltops included capitalist elements related to timber and land control, and non-capitalist elements related to all other

[29] Letter No. 64 of 1870/71 from G.W. Strettell, Officiating Conservator of Forests, Berar to The 1st Assistant Resident Hyderabad. Dated 15th April 1870, pg. 13; Letter No. 35 of 1870/71 from Officiating Deputy Commissioner, Ellichpur District to The Commissioner East Berar Division. Dated 19 April 1870, pg. 7.
[30] Letter No. 207 of 1872 from the Officiating Deputy Conservator of Forests, Berar to the 2nd Assistant Resident Hyderabad. Dated 29th February 1872, pg. 6-7; Letter No. 2217 of 1872, from Allardyce, Officiating Commissioner of East Berar to the 1st Assistant Resident Hyderabad. Dated 8 August 1872, pg. 5.
[31] *Ibid.*

economic activities. This hybrid system contrasted with the purely capitalist social relations that emerged largely in the valleys and hillsides, in which 'valuable' trees and the land on which they grew were exclusively held by the Forest Department.

Both the spatial configuration of State Forests and the speed at which colonial administrators could create them were largely shaped by the metabolic relationships between soils, trees, and shifting cultivators. The boundaries of Melghat's State Forests conformed to the distribution of 'valuable' tree species, especially teak, which was largely dependent on the distribution of different soil types in Melghat. Teak was typically associated with red soils in valleys and on hillsides. These areas gradually became spaces of capitalism as colonial administrators appropriated them for State Forests and forced shifting cultivators to move out. The speed at which they were forced out was commensurate with the temporal relationships between shifting cultivation and soils. People moved plots as soil nutrients depleted, and colonial administrators took this as an opportunity to restrict shifting cultivators to hilltops with black soil and few 'valuable' trees. In this way, metabolic relationships that pre-dated capitalism shaped the direction and speed of capitalism's appropriation of its outside, creating a pattern whereby red soils in valleys and hillsides with teak became spaces of capitalism, and black soils on hilltops with no 'valuable' trees became spaces of a hybrid economic system.

3. Metabolic Rift and How Capitalism Relates to its Outside

I have argued that the initial appropriation of Melghat's landscape for colonial forestry, which was shaped by metabolic relationships, led to a distinction between spaces of capitalism and spaces of a hybrid economic system. I will now show that, through the processes that led to this distinction, a metabolic rift emerged that threatened the viability of both colonial forestry and shifting cultivation. The black soils of hybrid spaces soon became depleted, and being

unable to move their plots to elsewhere in the State Forest, shifting cultivators began to leave the State Forest. This threatened colonial forestry because shifting cultivators were their only source of labor. Because the departure of shifting cultivators would have meant the end of colonial forestry in Melghat, colonial administrators redefined the relationship between capitalist and hybrid spaces in a way that created a gradient, rather than a sharp distinction, between them.

As colonial forestry became further established in Melghat, the administrators became increasingly dependent on shifting cultivators to work as laborers within the forestry system. While I have not found a clear description of the labor system of colonial forestry in Melghat for this period, disparate accounts do allow me to reconstruct its broad outlines. In 1870, the only full-time employees of the Forest Department in Berar were a deputy conservator, an assistant conservator, and a European forester.[32] A year later, the department added 5 *daroghahs* (superintendents), 3 *jamadars*, who liaised between the laborers and administrators, and 45 watchers, who patrollers forested areas looking for wildfires and people violating State Forest regulations.[33] Other than these full-time employees, the Forest Department hired shifting cultivators for work on a daily basis at a rate of 5 anna per day.[34] They were employed for a variety of tasks, including extinguishing wildfires, demarcating boundaries, thinning forests, planting timber species, cutting trees, and transporting timber to the plains.[35] Annual reports on forest operations in Berar suggest that shifting cultivators typically worked for the Forest

[32] Saunders, Charles B. (1870) Administration Report by The Resident at Hyderabad; including A Report on the Administration of the Hyderabad Assigned Districts; for the year 1869-1870. Pg. 86. Hyderabad: Residency Press.

[33] Saunders, Charles B. (1871) Administration Report by The Resident at Hyderabad; including A Report on the Administration of the Hyderabad Assigned Districts; for the year 1870-1871. Pg. 105. Hyderabad: Residency Press.

[34] Lyall, A.C., ed. (1870) Gazetteer for the Haidarabad Assigned Districts, Commonly called Berar, 1870. Bombay: Education Society's Press, Byculla. pg. 262; An anna is a former currency used during the British Raj. One anna was equal to 1/16 of a rupee.

[35] The Resident at Hyderabad (1873) Administration Report by The Resident of Hyderabad for the year 1872-1873. Pg. 93. Hyderabad: The Residency Press.

Department "when called upon to do so,"[36] but that administrators sometimes had to "pressure" shifting cultivators "to introduce them to labor."[37] In 1872, the Forest Department organized a corps of 40 Gond people, who were employed year-round in Melghat and earned 10 annas per day. When administrators required more laborers, they increased the corps by employing "the friends and relations of the permanent [corps members]."[38] Reports describe Korku shifting cultivators as being especially important for transporting cut timber from the hills to the cart tracks, as "no other class of men can compete with them at rough work of this sort."[39] For this reason, several administrators suggested that forestry and the wood trade would inevitably benefit shifting cultivators by providing steady employment.

Despite valleys and hillsides being the focus of colonial forestry and shifting cultivators being restricted to the hilltops, both areas were, for administrative purposes, included in State Forests. This administrative overlap was questioned by representatives of the Government of India but defended by regional-level administrators. In May 1871, the Commissioner of East Berar responded to a letter from the Government of India that asked why villages had not been administratively separated from State Forests, as was typical in the rest of Berar.[40] He responded:

> Although the boundaries of the State Reserves do overlap and include portions of villages, I see no necessity whatsoever for our going to the extent of demarcating the village boundaries. The Reserves themselves are being demarcated by a broad fire path which the people know that they are debarred from crossing. I would therefore treat the Mailghat exceptionally and leave matters as they are.[41]

[36] *Ibid.* pg. 88.
[37] *Ibid.* pg. 93.
[38] *Ibid.* pg. 93.
[39] *Ibid.* pg. 90.
[40] Letter No. 917 of 1871 from Commissioner of East Berar to The First Assistant Resident, Hyderabad. Dated 10 May 1871.
[41] *Ibid.* pg. 7-8.

He later added that demarcating village boundaries would further restrict cultivation and provoke the ire of shifting cultivators. Defending the flexibility of the current system of overlap, he wrote:

> There is no necessity whatever to restrict cultivation within the reserve, mainly for the reason that the patches which are or may hereafter be cultivated are of no use to the Forest Department. Moreover there is such an infinitude of patches that if any particular one did seem likely ever to be of use the Conservator has only to appropriate it after the crop is out and the cultivator would next year (as he probably would under any circumstances) go off to another.
>
> While therefore there is no necessity to restrict cultivation, there is every reason against our restricting it, for we should not only disgust the Korkoos, which we are particularly anxious not to do, but we should lose the little revenue which their cultivation brings in.[42]

This suggests that the Commissioner of East Berar believed that the administrative overlap between State Forests and cultivated areas did not interfere with either activity, and indeed was beneficial to both. A.O. Hume, Secretary to the Government of India, was not convinced. He insisted that "forest lands in the Mailghat should be marked off and strictly preserved, and that no cultivation should be permitted without the sanction of the forest officer concerned… any arrangement which included so large a number as 81 villages with their cultivated plots attached within the forest reserve must in the end prove a failure."[43]

The regional administrators once again objected to the Government of India's orders, refocusing their argument on how implementing those orders would threaten the viability of colonial forestry by harming its only available source of labor, shifting cultivators. Drysdale replied that he had discussed the Government's proposals with people in Melghat and that "what

[42] Letter No. 1074 of 1871 from Commissioner of East Berar to the First Assistant Resident Hyderabad. Dated 29 May 1871, pg. 4-5.
[43] Letter No. 474 of 1871, from A.O. Hume, Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce to The Resident at Hyderabad. Dated 19 October 1871, pg. 3-4.

they particularly object to in them is any limit being made to the area within which they are to cultivate, as well as that within which they are to graze their cattle and supply their wants with reference to timber firewood, grass, and other forest produce."[44] He closed his letter by stressing that any implementation of the Government's order would threaten colonial forestry by forcing shifting cultivators to leave the area:

> The Koorkoos are just recovering the effects of the curtailment of such of their former privileges as the introduction of Forest Conservancy rendered necessary, and are only now becoming accustomed to the Rules and working of the Forest Department. I would consequently strongly deprecate the enforcement of any more restrictions at present. Indeed such could hardly fail to lead to the general depopulation of the Reserve, and the disastrous effect that this would have on the Forest Department can scarcely be overrated; for we are entirely dependent on the hill people for labour.[45]

Drysdale's response emphasized how the success of colonial forestry depended on keeping shifting cultivators in State Forests, and how implementing the Government's orders would force them to leave. Captain MacKenzie, the Officiating Deputy Commissioner of Ellichpur District agreed with Drysdale, writing that "to attempt to limit these people to certain fixed lands would be to them intolerable. They would simply fly the country and cripple the working of your department entirely."[46] His belief that the current system benefitted shifting cultivators was so strong that even when three hundred of them complained to him about the restrictions on cultivation that were already in place, he responded by saying that the workings of the Forest Department would "ensure to them and their children constant and increasing employment… [that would] renumerate them quite as well as they ever were renumerated by their wood cutting

[44] Letter No. 207 of 1872 from the Officiating Deputy Conservator of Forests, Berar to the 2nd Assistant Resident Hyderabad. Dated 29 February 1872, pg. 8.
[45] *Ibid*. pg. 10
[46] Letter No. 366 of 1872, from MacKenzie, Officiating Deputy Commissioner, Ellichpur District to The Deputy Conservator of Forests, Berar. Dated 19 February 1872, pg. 7

in former times."[47] Thus, despite already hearing complaints from shifting cultivators, the regional-level administrators believed that the overlap between State Forests and villages was mutually beneficial. They believed that it allowed shifting cultivators the flexibility to move their plots and the opportunity to work as laborers in State Forests, thereby ensuring the stability of both systems. They argued that Hume's order to formally separating the two would restrict shifting cultivators' flexibility and bring harm to both colonial forestry and shifting cultivation by causing the cultivators to leave the area.

It turned out that the regional-level administrators were wrong, and that the system they had believed was mutually beneficial for forestry and shifting cultivation had actually driven shifting cultivators to leave Melghat. On March 18th, 1872, MacKenzie was informed that "55 cultivating families have emigrated from the Mailghat to the Central Provinces"[48] and he immediately ordered an inquiry into why they had left. Captain Laughton, Assistant Commissioner, Mailghat, reported back to him that while only nine of the families that left had lived in the State Forest, they had done so specifically because "their villages are situated within the reserved forests and the soil is too poor."[49] MacKenzie asked for a follow-up report on these nine families, as he was worried their departure could imply that there was "some cause at work that unchecked would in time drive away many others also."[50] Drysdale, who worked on that follow-up report with Laughton, reported that "the chief reason ascribed was the difficulty experienced in procuring fresh fields, in consequence of existing restrictions regarding the felling

[47] Letter No. 569 of 1872 from Captain K.I.L. MacKenzie, Officiating Deputy Commissioner Ellichpur District to The Assistant Commissioner In Charge Mailghat. Dated Ellichpur 18 March 1872, pg. 4.
[48] *Ibid.* pg. 2.
[49] Letter No. 130 of 1872, from Captain D.W. Laughton, Assistant Commissioner Mailghat to The Deputy Commissioner Ellichpur District. Dated 6 April 1872, pg. 2.
[50] Letter No. 785 of 1872, from Captain MacKenzie, Officiating Deputy Commissioner, Ellichpur, to The Assistant Commissioner, Mailghat. Dated 9 April 1872, pg. 2.

of tewas."[51] As noted above, tewas, in contrast to teak and sheshum, grew on both red and black soils. Colonial administrators said it "springs up almost as a weed in any land allowed to be fallow."[52] Because the rules for people living in State Forests barred cultivation from any lands that included teak, sheshum, or tewas, there seems to have been very little room for shifting cultivators to start new plots when soils became depleted.

This soil depletion, I argue, suggests that colonial forestry was causing a metabolic rift in Melghat. Soil depletion has been used as an indicator of metabolic rifts since that theory was first articulated. Foster (1999; 2000) drew on Marx's account of how the separation of town and county under capitalist agriculture "prevents the return to the soil of its elements consumed by man in the form of food and clothing; it therefore violates the conditions necessary to lasting fertility of the soil" (Marx 2011 [1867]:554). In Melghat, soils under shifting cultivation regained their fertility during the fallow period. To allow enough time for this to happen, shifting cultivators would have had to have access to an adequate amount of space within which to rotate their plots, so that they did not have to return to an old plot before it had regained its fertility. Colonial administrators had restricted shifting cultivators to black soils on hilltops with no teak, sheshum, or tewas, despite tewas being ubiquitous across Melghat. It appears that such restrictions did not permit shifting cultivators in some areas enough space to rotate crops, which meant that old plots had not regained their fertility when shifting cultivators returned to them. This, I argue, constitutes a metabolic rift in the relationship between shifting cultivators and soils. When confronted with this rift, it seems that some shifting cultivators decided to leave.

[51] Letter No. 377 of 1871-72, from A.J. Drysdale, Officiating Deputy Conservator of Forests, Berar, to Captain MacKenzie, Deputy Commissioner, Ellichpur. Dated 16 April 1872, pg. 1-2.

[52] Letter No. 2217 of 1872, from Allardyce, Officiating Commissioner of East Berar to the 1st Assistant Resident Hyderabad. Dated 8 August 1872, pg. 11.

The number of people leaving the State Forest soon grew, and the regional administrators were tasked with writing new regulations for people living in State Forests that would not force them to leave. One month after Laughton and Drysdale determined that soil depletion had caused people to leave the State Forest, Major Allardyce, Officiating Commissioner of East Berar, wrote that one of the Melghat Rajahs "assured me that 10 to 20 villages in the Reserve had become deserted. His statement is shown to correct for Captain Laughton reports the desertion of 23."[53] When Hume, the Secretary to the Government of India, heard that so many people had left the State Forest, he was sure to reiterate that "it was for this very reason that the Government of India directed the demarcation of small blocks instead of one large Reserve."[54] He then requested that a committee be formed to report on "the question of guarding the rights of the people from any undue pressure caused by the operations of the Forest Department" and to reconsider why demarcating village boundaries and dividing the State Forest into smaller blocks "may not be a proper course to pursue in order to obviate the dissatisfaction now said to be felt among the Koorkoos of Mailghat."[55]

The committee that formed included Allardyce, MacKenzie, Drysdale, and Laughton. They proposed a list of new rules for people living within State Forests that they hoped would induce "the wild and original race which inhabits the Mailghat…to cling to their ancient hills and valleys as much as possible…and at the same time to get them to aid us in our endeavors to protect and conserve the Forests by showing them that it is for their own interest to do so."[56] The following list paraphrases the rules that they proposed:

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[53] Letter No. 1252 of 1872, from Major J. Allardyce, Officiating Commissioner East Berar to the 2nd Assistant Resident, Hyderabad. Dated 15 May 1872, pg. 5-6.
[54] Letter No. 899, from A.O. Hume, Secretary to the Government of India, Department of Agriculture, Revenue and Commerce to The Resident at Haidarabad. Dated 31 July 1872, pg. 2.
[55] *Ibid.* pg. 3-4.
[56] Letter No. 2217 of 1872 from Commissioner of East Berar to the 1st Assistant Resident, Hyderabad. Dated 8 August 1872, pg. 6.

1. All trees except teak, tewas, and sheshum may be felled free of charge for home consumption
2. Teak may be obtained from unreserved forests for free, and from reserved forests upon payment and application to Forest authorities
3. Cattle may be grazed and grass may be cut for free, except in specially closed tracts
4. People living in closed blocks may graze their cattle freely in those blocks, except in areas reserved for special purposes, which will be clearly marked. No cattle from villages outside closed blocks will be allowed in, and no cattle from outside the Reserve will be allowed inside it.
5. No land not already in a cultivated village may be taken up for cultivation without permission of the Forest Officer.
6. In cultivated villages, cultivators may take up any land anywhere for cultivation, except land on which teak or sheshum is growing.
7. Tewas may be cut on cultivated land or land proposed to be cultivated, but may only be used for home consumption, not export.
8. People living in the reserve may collect minor forest produce – fruits, gums, etc. – for free, except in specially Reserved areas.[57]

These rules, the committee believed, would protect the Government's "rights and objects…as to the Forests" and "satisfy all reasonable wants on the part of the inhabitants."[58] However, the committee still objected to Hume's order about separating villages from State Forests. Citing the need for cultivators to shift plots, the committee argued:

> we cannot mark off into blocks either the Forest land, or the land the people would care to cultivate. If all the latter were to be marked off the work would be endless, indeed it may be said it would be impossible to do it and if restrictions are placed, with too harsh a hand, upon the fancies of the people in the matter of cultivation, they would probably emigrate, a point above all things to be avoided.[59]

Their insistence on maintaining the overlap between State Forests and villages seems to have won out. On December 11th, 1872, Hume replied to the committee that the Governor General in

[57] *Ibid.* pg. 8-12.
[58] *Ibid.* pg. 12.
[59] *Ibid.* pg. 7-8.

Council had approved their proposed rules and requested that the committee send a follow-up report one year later to report on how the rules were working out.[60]

The metabolic rift that emerged from the distinction between capitalist and hybrid spaces posed such a threat to colonial forestry and shifting cultivation that colonial administrators had to redefine the relationships between capitalist and hybrid spaces. The new rules they establish moved tewas into a liminal space between capitalism and hybrid economic systems, existing in the former when exported and the latter when used for cultivation and home purposes. As such, the Forest Department maintained exclusive rights to the exchange-value of tewas, while shifting cultivators benefited from use-values. People also moved between capitalist and hybrid spaces, being shifting cultivators near their hilltop villages and working as wage laborers in the plantations at the valleys. The new rules, established by the committee in response to a metabolic rift, produced a gradient between capitalist and hybrid spaces, in that the two were distinct but the exact boundaries between them were blurred.

Ultimately, this gradient was a product of the encounter between capitalism and pre-existing metabolic relationships outside of it. Capitalist appropriation of its outside was shaped by the metabolic relationships between soils, trees, and shifting cultivators, resulting in a distinction between a capitalist system existing in the valleys and slopes, and a hybrid economic system existing at the hilltops. This distinction produced a metabolic rift that threatened both systems and necessitated that the relationship between capitalist space and hybrid space be redefined. The specific spatial configuration of these economic systems in Melghat cannot be explained without reference to both capitalism and the metabolic relationships it encountered

[60] Letter No. 1438, from A.O. Hume, Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to The Resident at Haidarabad. Dated 11 December 1872, pg. 1-2.

there. Because of this, I argue that metabolism, along with and in relation to capitalism, is a force of history.

E. Discussion

Having argued that the Melghat landscape was a product of the encounter between two forces of history, metabolism and capitalism, I want to focus this discussion on the implications of multispecies ethnography for Marxist theory, while also acknowledging some limitations of my argument.

In this chapter, I have built upon multispecies ethnographers' understanding of nonhuman labor to think about the Marxist concept of metabolism as the material relationality between different species and their abiotic environments (Barua 2017; Haraway 2008). The recognition that nonhumans do labor gestures towards the understanding that humans and nonhumans are co-constituted by historically contingent material relationships (Swanson, et al. 2017). Because 'nature,' as an analytic concept, is too abstract to describe these relationships (Schneider and McMichael 2010), I have argued for thinking about metabolism as a process that occurs between specific biotic and abiotic entities.

This view of metabolism is one example of how multispecies ethnography can offer new perspectives on Marxist debates. First, as I have focused on here, multispecies ethnography offers new perspectives on how Marxist scholars think about the interaction between capitalism and its outside. I have argued that Marxist scholars often theorize capitalism's outside, and the metabolic relationships that exist there, as passively awaiting appropriation into the capitalist system (e.g. Foster 2000; Harvey 2003; Moore 2011a). This characterization bears some resemblance to Althusserian debates on articulation of modes of production and the extent to which non-capitalist modes of production persist in relation to capitalism (see Foster-Carter

1978; Wolpe 1980). Both debates conceptualized non-capitalist space as persisting because it is functional to capitalism. Theorizing metabolism as a force of history offers the possibility that capitalism's outside can do things apart from being functional to capital. In my case study, I showed how the colonial administrators redefined the relationship between capitalist and hybrid economic systems in order to secure their labor supply. Allowing shifting cultivation to persist was surely functional to capital because it reduced the costs of capitalists having to reproduce their workforce (see Hall 2012:1196). However, the need to redefine this relationship suggests the influence of metabolic relationships on capitalism. In this case, the fact that shifting cultivators were the only source of available labor meant that colonial administrators were limited in what they could appropriate by the metabolic relationships of which shifting cultivators were a part. These limits suggest that, so long as capital cannot reproduce its own workforce, it is constrained in how it can redirect metabolic relationships away from the needs of laborers towards increased material throughput (cf. Federici 2004). In other words, capitalism's outside can be functional to capitalism, but it also shapes the way in which it is appropriated by capital.

Second, the multispecies view of metabolism that I have adopted here has implications for how Marxist scholars think about the geography of capitalism. In arguing that metabolism is a force of history, I have focused heavily on how metabolism shapes the spatial and temporal dimensions of capitalism's appropriation of its outside. Well-established geographic theories of uneven development (Smith 2008 [1984]) and spatial fix (Harvey 1982) understand these dimensions through Marx's account of the logic of capital accumulation. Focusing on the logic of capital tends to reinforce the notion that capitalism is the only force of history. My aim here is not to challenge these accounts of capitalism's spatial and temporal dimensions, but to show

what happens when they encounter metabolic relationships outside of capitalism. In the case study above, colonial administrators focused their efforts on appropriating the most valuable forests, in accord with the logic of capitalism. However, the resulting gradient from the predominantly capitalist space of the valleys and slopes to the hybrid economic space of the hilltops cannot be explained by the logic of capital accumulation alone. It can only be explained with reference to the metabolic relationships between trees, soils, and shifting cultivators that pre-dated capitalism in this region. Melghat's specific landscape was a product of the encounter between capitalism and metabolism, and I suggest that Marxist scholarship could benefit from more attention to how encounters such as these shape the geography of capitalism.

I want to acknowledge the limitations of using colonial sources for reconstructing the landscape history of Melghat. The Subaltern Studies school was acutely aware that colonized peoples are rarely subjects of their own history (Guha 1983b; Guha and Spivak 1988; Spivak 2010). Most of the primary sources I have used here represent what Ranajit Guha (1988) calls secondary discourse. These are official discourses seeking to understand some action by colonized people that already occurred so that they can ensure it does not happen again. These secondary discourses work to negate the meanings that colonized people attributed to their action. For example, the letters I have used here allow me to understand what the colonial administrators thought when shifting cultivators left Melghat, but do not offer a space for shifting cultivators to explain why they left in their own words. Ultimately, recovering subaltern consciousness through these sources is impossible, and it was not my aim to do so. But by understanding how the colonial administrators reacted to the actions of colonized people, it is possible to argue that the colonized had some effect on the colonizers, and by extension that capitalism is affected by its encounter with its outside.

One other limitation of this chapter is that I have used the colonial designation of 'valuable' trees uncritically and have not investigated where that value comes from. Multispecies ethnographers have put significant effort into understanding how nonhumans produce value (Barua 2016; Barua 2017; Collard 2014; Collard and Dempsey 2013; Collard and Dempsey 2017; Kay and Kenney-Lazar 2017; Kenney-Lazar and Kay 2017; Tsing 2013b). I have omitted their work here for space and clarity, but I take it up in the fourth chapter, giving more attention to how nonhumans are embedded in specific economies.

Writing landscape histories about past multispecies encounters is important because it helps "to radically imagine worlds that are possible because they are already here" (Gan, et al. 2017:G12). My account of Melghat's landscape history served both to introduce some of the historical factors that shaped the contemporary context of human-wildlife encounters in central India, and to emphasize the theoretical issue of nonhumans as political and historical actors. This emphasis runs throughout this dissertation, as I show how encounters between humans and nonhumans shape people's economic activity, affect the implementation of conservation programs, and contribute to moral economies.

CHAPTER 3

LANDSCAPES OF FEAR:

RISK OF HUMAN-WILDLIFE ENCOUNTERS SHAPES ECONOMIC ACTIVITY

A. Introduction

I had just returned from a day of interviews and was heading to the bathroom to freshen up. I put my toiletry bag on top of the toilet tank and then unpacked and organized my notebooks and papers at my table. I then returned to the bathroom to wash my feet, and as I turned on the faucet, a dark-green, tennis ball-sized frog jumped up from the floor as the water hit its back. This bathroom was tiled up to head height so that the whole room could double as a shower, which resulted in some water remaining on the floor. The frog had apparently been cooling off in that water. Though a bit startled, I was more puzzled about how to get the frog out.

As I looked down at the frog, wondering if a broom would be useful for pushing the frog out, I heard a thump to my right. I looked up, and rearing its head from within my toiletry bag was a small black snake with white stripes. I quickly backed out of the bathroom and called for Bishram. I had come across this snake before, if not the same individual then one of the same species. To be clear, I am not sure if it was a venomous common krait (*Bungarus caeruleus*) or the krait's nonvenomous mimic the wolf snake (*Lycodon aulicus*). But when Bishram and I had seen it before, we had treated it as if it was a common krait.

Common kraits are one of the 'Big Four' snakes in India, who are responsible for the greatest number of medically significant snake bites in India. One of the major components of

common krait venom is a presynaptic acetylcholine receptor blocker called β-bungarotoxin, which causes paralysis by blocking neuromuscular transmissions from passing beyond the presynaptic membrane (Silva, et al. 2016). People who are bitten by common kraits develop a variety of symptoms, which tend to progress from drooping eyelids, weakening eye muscles, abdominal pain, and facial weakness during the first 2-4 hours to difficulty swallowing, lower limb weakness, and respiratory paralysis after 4-6 hours. Common kraits are nocturnal and mostly bite people who accidentally roll onto the snake while sleeping on the floor. However, because envenomation rarely results in pain or symptoms at the location of the bite, most people who are bitten do not wake up until they begin experiencing later symptoms (Bawaskar and Bawaskar 2004). While available antivenom can effectively clear venom from the system, it cannot prevent or reverse neuromuscular paralysis, meaning that people who are bitten often require assisted ventilation in addition to antivenom (Anil, et al. 2010).

I had researched all this information after the first time Bishram and I had encountered what we thought was a common krait, and it all flashed through my head as I backed away from the bathroom. The snake seemed to disappear into my toiletry bag, which, like the snake was black, and I lost sight of it before Bishram reached me. After he came, he used a bamboo stick to carefully lift the bag onto the floor and poke through it. But we found no snake. In fact, we could not find the snake anywhere in the bathroom, in the toilet, or out the window. As we pondered what had happened, it was clear something did not add up. I had heard a thump, which suggested that the snake had fallen, but there was nowhere for it to fall from – no rafters or ledges in the bathroom at all.

It was not until the next day that we realized where the snake had gone. It was after dinner when Bishram called me back to the bathroom to show me the snake resting at the top of

the tile that lined the bathroom wall, over seven feet up. Another man, Tiwarilal, joined us with the bamboo stick and started poking the snake, which soon revealed its secret. The snake moved down between the tile and the concrete wall, where, unknown to us, there was a small gap. Eventually, Tiwarilal got the snake out by pouring water down the gap to make it come up, and then lifting it with the stick and taking it outside to leave it away from the buildings.

I tell this story for two reasons. The first reason is to emphasize how the encounter with the snake changed the way I moved through and experienced the landscape during my fieldwork. Having encountered snakes before, I had always been cautious about where I stepped, especially when walking at night or off the main road. However, until this encounter, I had never considered that I should look up when looking out for snakes. From then on, I always looked up in the trees as well as down at the ground when walking in the forest, and always checked the rafters as well as the floor corners when entering a room. Together with the anxiety I was experiencing as a side effect of my anti-malarial medication, the encounter with the snake changed how I experienced and moved through the landscape.

One way that wildlife ecologists understand the effects of multispecies encounters on how wildlife experience and move through the landscape is through a paradigm called landscapes of fear. The term landscapes of fear describes how an animal perceives spatial variation in predation risk across the landscape, and either moves or behaves in ways to mitigate that perceived risk (Gaynor, et al. 2019; Laundré, et al. 2010). For example, elk avoid aspen forests when they perceive a high risk of attack from wolves, and spend less time eating and more time watching for predators in areas associated with the presence of wolves (Fortin, et al. 2005; Laundré, et al. 2001). Many conservationists have used this paradigm to understand how wildlife respond to humans, showing that species like cheetahs, deer, and mongooses adjust their

movement and behavior according to perceived risks from humans (Broekhuis, et al. 2018; Lone, et al. 2014; Valeix, et al. 2012). Some conservationists have suggested that low levels of anthropogenic risk, in which humans do not pose a serious risk of mortality to wildlife but nevertheless influence wildlife movement and behavior, could promote human-wildlife coexistence by offsetting the spatial and temporal dimensions of humans' and wildlife's movement across the landscape (Oriol-Cotterill, et al. 2015). However, while it is well-established that wildlife respond to human activity, few researchers have explored how humans adjust the spatial and temporal dimensions of their movement in response to risks from wildlife. Because human-wildlife coexistence depends on both humans and wildlife co-adapting to each other's presence in the landscape (Carter and Linnell 2016), understanding how each responds to the other in shared multispecies landscapes is crucial to promoting coexistence.

The second reason that I tell the story about the snake encounter is to emphasize how differently the snake and I experienced our surroundings. Biologist Jakob von Uexküll used the term *umwelt* to refer a species' perceptual life-world (von Uexküll 2010 [1934]). That is, each species experiences and makes meaning out its environment differently according to its specific biological characteristics. For instance, von Uexküll describes how ticks, which are blind and deaf, detect prey by smelling the butyric acid emitted by mammals. Ticks tend to drop from leaves when the smell butyric acid and uses their sense of temperature to know whether or not they have fallen onto their prey or not. Snakes do not hear like humans, but can sense vibrations through the ground, which they use in combination with olfactory and visual cues to experience their worlds (Friedel, et al. 2008; Shivik and Clark 1997; Young and Morain 2002). With this perceptual apparatus, the common krait that I encountered may not have associated the bathroom with risk, but with desire for the frog. Sensing the frog's smell and the ground vibrations

generated by its movement, the snake was drawn to the bathroom. The bathroom had a different meaning within my perceptual life-world, in that I associated it as a hygienic place in which to recuperate. Thus, the differing meanings that we attached to the bathroom drew myself and the snake there. Our encounter created new meanings that I attached to the bathroom and to high-up places, and may have also done so for the snake.

This chapter is about how people's encounters with wildlife shape how they move in and experience the landscape. In it, I compare people's encounters with wildlife in the buffer zones of Tadoba-Andhari and Melghat tiger reserves. The risk of violent encounters with wildlife is much higher in Tadoba-Andhari than it is in Melghat. Between 2005 and 2011, tigers (*Panthera tigris*) in Tadoba-Andhari attacked 103 people and leopards (*Panthera pardus*) attacked 29 (Dhanwatey, et al. 2013). More recently, in late 2018 a 60 sq. km. area adjacent to Tadoba-Andhari became the site of a massive tiger hunt, as the Maharashtra Forest Department used drones, remote cameras, and teams of sharpshooters on elephants to find a female tiger that had been implicated in the deaths of thirteen people. The tiger, known as T-1 or Avni, was eventually drawn out when officials sprayed Calvin Klein's Obsession cologne, which attracts tigers because it contains a compound derived from civet scent glands, and shot her in the nearby bushes (also see Margulies 2019).[61] In contrast, the only similar violent human-wildlife encounter in Melghat happened in 2010, when a sloth bear (*Melursus ursinus*) killed four people in a village in eastern Melghat.[62] Additionally, in both buffer zones, animals like wild boar (*Sus scrofa*) and a variety of monkeys and ungulates raid people's fields and damage crops (Bayani, et al. 2016; Government of Maharashtra 2015a; Government of Maharashtra 2016). Building on

[61] Kumar, Hari, and Jeffrey Gettleman (2018) Man-Eating Tiger Is Shot Dead in India. *The New York Times*, 3 November 2018. Accessed 3 April 2019. https://www.nytimes.com/2018/11/03/world/asia/india-tiger-dead.html

[62] More, Vaidehi (2010) Sloth bear that killed 4. *The Times of India*, 8 August 2010. Accessed 21 February 2019. https://timesofindia.indiatimes.com/city/nagpur/Sloth-bear-that-killed-4/articleshow/6273582.cms.

multispecies ethnographers' engagements with dialectical biology (Fuentes 2010; Levins and Lewontin 1985), I argue that human-wildlife encounters influence how people move through and experience the landscape, and shape the spatial and temporal dimensions of their economic activity. These human-wildlife encounters, I argue, occur at the intersection of human and nonhuman life-worlds. Both pursue certain desires across the landscape, but where these desires spatially co-occur, landscapes of desire can turn to landscapes of fear. This tension between fear and desire, I argue, helps shape the ecology and economy of different species within the landscape.

This chapter is divided into four sections. First, I review the concept of landscapes of fear and how conservationists have adapted it to understand human-wildlife interactions. I argue that the inherent relationality of the landscapes of fear concept has been missing from its applications to human-wildlife interactions, and that recovering this relationality is crucial for understanding whether landscapes of fear promote human-wildlife coexistence. Second, I outline the methods I used to collect and analyze data, which included a mix of geospatial and ethnographic techniques. Third, I present the results of resource selection functions that shows how people's use of the landscape throughout the day is related to where they think they are likely to encounter wildlife, and supplement this model with ethnographic accounts of people's encounters with wildlife. Last, I end with a discussion of how local economies emerge from the mutual ecologies of humans and wildlife.

B. Landscapes of Fear and Human-Wildlife Coexistence

In this section, I outline the concept of landscapes of fear and argue that its inherent relationality aligns it well with relational understandings of organisms in their environments and multispecies ethnography. However, this relationality has largely been omitted when ecologists

have applied the concept to understand how wildlife respond to risks from humans. I argue that inverting this relationship, and exploring how humans respond to risks from wildlife, can help recover a relational perspective of human-wildlife interactions and understand how landscapes of fear contribute to human-wildlife coexistence.

'Landscapes of fear' refers to an animal's perception of spatial variation in predation risk (Gaynor, et al. 2019). The concept builds on behavioral and community ecology. Behavioral ecology suggests that individuals face trade-offs between time spent foraging and time spent watching for predators (Brown, et al. 1999), and community ecology suggests that the outcomes of these trade-offs have implications for the structure and distribution of habitats (Ogden, et al. 1973). The concept was first used by Laundré, et al. (2001), who showed that the presence of reintroduced wolves in Yellowstone National Park led female elk and bison to allocate more time to watching for predators and less time to eating. Subsequent research showed that the presence of wolves changed how and where elk moved (Fortin, et al. 2005), what elk ate (Hernández and Laundré 2005), and that these wolf-induced changes to elk behavior had implications for the structure and configuration of Yellowstone's forests and rivers (Beschta and Ripple 2019; Ripple and Beschta 2012). The concept of landscapes of fear has since been used to describe diverse predator-prey systems like lynx and roe deer in the Swiss Alps (Gehr, et al. 2018), fur seals and white sharks off the coast of southwestern Africa (Hammerschlag, et al. 2017), and coral reef fishes and algae off Australia (Madin, et al. 2011).

Through its foundations in community ecology, research on landscapes of fear aligns with relational understandings of the mutual influences of organism and environment on each other (Levins and Lewontin 1985; Lewontin and Levins 2007). The perceived risk of predation can induce stress in prey species that changes their physiology (Clinchy, et al. 2013;

Hammerschlag, et al. 2017). In response to perceived predation risk, prey species may change their diet (Creel and Christianson 2009) or social behavior (Creel and Winnie Jr 2005; Hasenjager and Dugatkin 2017), which can in turn change the structure of vegetation or distribution of other animal species at lower trophic levels (Schmitz, et al. 2004; Suraci, et al. 2016; Teckentrup, et al. 2018). These changed landscapes then circle back and influence the hunting behavior of predators (Kauffman, et al. 2007). This framework is relational in that neither predator, prey nor landscape can be fully understood without reference to their mutual relationships.

Partly because of its inherent relationality, landscapes of fear has found its way into the multispecies ethnography literature (Forssman and Root-Bernstein 2018). In the same way that community ecologists understand organisms and environments as products of their mutual interactions, multispecies ethnographers understand ecologies and economies as products of the mutual influences between humans and nonhumans (Tsing, et al. 2017). For example, Fuentes (2010) shows how temple tourism economies emerge from the interactions between human perceptions and land use and macaque social behavior and pathogen physiology. Forssman and Root-Bernstein (2018) engage with the landscape of fear concept to show how deer hunters modify the landscape and entice deer into certain areas. In these modified landscapes, hunters use their ethno-ethological knowledge to anticipate where deer will be and move accordingly to approach undetected. In this example, the humans and deer were shaped by their interactions with each other, and these mutual influences produced 'landscapes of anticipation.'

By focusing on an animal's perception of and response to risk across the landscape, the landscapes of fear concept also aligns with von Uexküll's (2010 [1934]) notion of *umwelt*. This notion describes how each species has a unique perception of its environment given the

biological distinctions between species' sensory systems (Manning, et al. 2004). That is, the concept of *umwelt* suggests that each species has a distinct, subjective point of view on the world, and acts in accordance with that subjective viewpoint (Sagan 2010; Tønnessen 2009). From the different subjective perspectives of different species, the same physical entity will have different meanings attached to it. For instance, some humans may associate domesticated plant species as opportunities for income, with many going so far as to destroy wild plant species in order to grow domesticated ones. However, to an elephant (*Elephas maximus*) the differences between wild and domestic plants are associated with differences in nutrients like protein, calcium, and sodium. According to this perspective, it is understandable why crop-raiding by elephants in India tends to peak just after the monsoon, when crop species are most abundant (Sukumar 1990). Crops are desirable to both species, but for different reasons. When these life-worlds intersect, however, desire can turn to fear.

However, the relationality that is key to the landscapes of fear concept has been conspicuously absent when that concept is applied to human-wildlife interactions. These studies tend to characterize humans as 'super predators' that induce antipredator responses in carnivores and herbivores alike (Ciuti, et al. 2012; Clinchy, et al. 2016; Smith, et al. 2017). For example, Valeix, et al. (2012) show that lions generally avoid cattle enclosures in Botswana, and move more quickly when near such enclosures than they do otherwise. Broekhuis, et al. (2018) show that cheetahs avoid human settlements but often frequently stop in livestock-disturbed areas that attract wild herbivores. This view of humans as super predators has been extended to the realm of wildlife management, in that some managers now attempt to induce a fear response in ungulates that changes their habitat use (Cromsigt, et al. 2013). While this view is important for understanding the role of humans in different animals life-worlds, the literature is currently

confined to a unidirectional understanding of human-wildlife interactions. That is, it emphasizes how wildlife perceived and respond to humans, but does not account for how humans respond to nonhumans or feedbacks between the two.

This characterization of humans as 'super predators' contrasts with much of the human-wildlife conflict literature, which focuses on how humans experience and adapt to risks from wildlife (Inskip, et al. 2013). This literature shows how wildlife attacks, crop-raiding, and livestock depredation pose risks to human life, well-being, and livelihoods (Karanth and Kudalkar 2017; Madden 2004; Ogra 2008; Woodroffe, et al. 2005b). Conservationists have developed a diverse portfolio of initiatives to mitigate these risks, including compensation and insurance programs (Dickman, et al. 2011), building fences to protect livestock (Woodroffe, et al. 2014), and promoting alternative livelihood strategies that minimize people's interactions with wildlife (Nyhus 2016). While this literature presents an inverse relationship to human-wildlife interactions than that used in the landscapes of fear literature: humans change their behavior based on perceived risks from wildlife, but these changes do not feedback and affect wildlife aside from perhaps excluding them from certain areas.

The emerging emphasis on the role of behavioral co-adaptations to promote human-wildlife coexistence provides one remedy the one-sidedness of both human-wildlife conflict and landscapes of fear approaches to human-wildlife interactions. Recently, Carter and Linnell (2016:577) suggested that a key component of human-wildlife coexistence is the ability of humans and wildlife to "change their behavior, learn from experience, and pursue their own interests with respect to each." There is a growing body of literature demonstrating that wildlife change the spatial and temporal dimensions of their behavior in response to humans in ways that could facilitate coexistence (Athreya, et al. 2013; Carter, et al. 2012; Gaynor, et al. 2018;

Kolipaka, et al. 2018). While the human-wildlife conflict literature has explored some ways in which humans adjust to risks from wildlife, it has largely ignored discussions of spatial and temporal adjustments that people make to their activity. Here, I adopt the notion that wildlife pose risks to humans from the human-wildlife conflict literature, and embed it within a landscapes of fear approach to understand how humans adjust their movements across the landscape in response to risks from wildlife. When coupled with literature on how wildlife respond to perceived risks from humans, I suggest that this approach can advance a relational understanding of human-wildlife interactions within the landscapes of fear framework. By understanding how humans and wildlife each respond to perceived risks from each other, this approach can offer insights into how behavioral co-adaptations can or cannot promote human-wildlife coexistence.

C. Methods

Building on the landscapes of fear literature, I compared how people in two villages respond to different levels of risk from wildlife at different times of day. Because wildlife temporally offset their activity to avoid humans at fine spatial scales (Carter, et al. 2012), and because predation risk varies by time of day (Kohl, et al. 2018), I restricted my analysis to a fine temporal scale of 24 hours. My purpose was not to perfectly model people's movement throughout the day, but to understand how their movement related to a key set of variables that represented the tension between landscapes of fear and landscapes of desire. These three variables were spatialized by respondents drawing on a map of the surrounding landscape. Landscapes of desire – spatial variation in what people wanted to fulfill through their interaction with the landscape – were represented by people drawing where they go for different economic activities. Landscapes of fear – spatial variation in what people experience risks from wildlife –

were represented by people drawing where they think animals are and by marking areas that they specifically avoid going in the landscape. Together, these three variables represented landscapes of desire and landscapes of fear. The other two variables were roads and rivers, which were important to include because they often structure people's movement across the landscape.

1. Site Selection

To understand how risks from wildlife relate to how people move across the landscape to fulfill certain desires, I selected two villages in which wildlife pose different levels of risk to humans. In the buffer zone of Melghat Tiger Reserve, I selected one village in which people reported crop raiding, but few other human-wildlife interactions aside from an occasional sighting of a carnivore. In the buffer zone of Tadoba-Andhari Tiger Reserve, I selected one village in which people reported frequent sightings of tigers and sloth bears, in addition to frequent crop raiding. Sadly, I later learned that one person from this village had been killed by a tiger seven months before I started working there. If risks from wildlife influence how people move across the landscape as they pursue certain desires, these two sites should differ in how people's movement relates to variables describing the landscape of fear.

According to the 2011 census, the village in Melghat had 92 households and 472 individuals, of which 47% were female, and the village in Tadoba-Andhari had 56 households and 234 individuals, of which 48% were female (Government of India 2011a; Government of India 2011b). People in both villages largely identified as different Scheduled Castes and Tribes (see Results). In the village in Melghat, people primarily worked as farmers on their own land, while in the village in Tadoba-Andhari, people primarily worked as wage laborers either on other people's farms or in tourism resorts. In both villages, people frequently enter the forest to collect forest resources like timber, bamboo, and firewood. The two villages have different spatial

layouts (Figure 3.1). The village in Melghat consists of one main row of houses, surrounded by about 2 sq. km. of farmland, which is then surrounded by forests. Other nearby villages have similar layouts and are connected to each other by a network of roads. The village in Tadoba-Andhari is situated in a strip of farmland separating the forest from the Erai Dam Reservoir. The houses in the village are separated into two clusters, and a main road runs through the strip of farmland, connecting this village to others in the north and south.

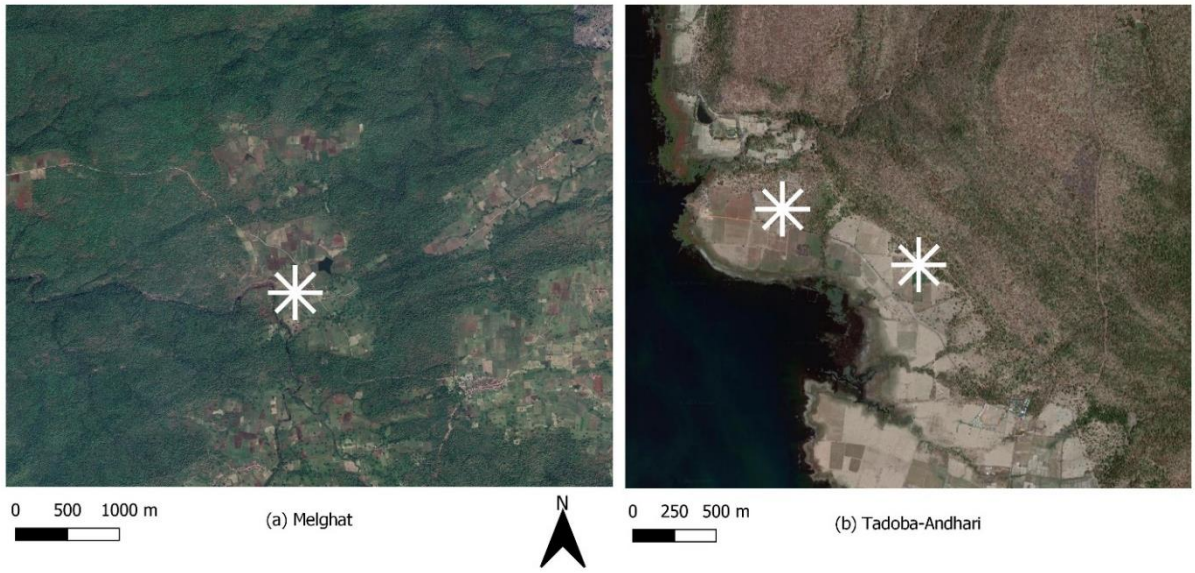

Figure 3.1: *The two study villages in (a) Melghat and (b) Tadoba-Andhari. The stars indicate clusters of respondent's houses. Note that while the houses in Tadoba-Andhari are split between two locations, they are considered part of the same village.*

1. Sampling

Because a representative random sample of houses or individuals would result in a sample size too low for statistical analysis, I sampled one individual from every house in both villages and tried to ensure that the gender ratio of those sampled was similar to the ratio of the entire village. With research assistants from the same or nearby villages, I collected data in the

morning and in the evening, when most people were at home. If no one was present at a house we approached, we skipped that house and returned to it the next time we visited to try again.

2. Digital Sketch Maps

To understand how people understood the spatial distribution of risks from wildlife and desires across the landscape at different times of day, we conducted semi-structured interviews with an accompanying digital sketch mapping exercise. Digital sketch maps have been widely used in disaster management and criminology to understand that how people spatialize different risks (Brennan, et al. 2016; Curtis 2012; Doran and Lees 2005; O'Neill, et al. 2015). Using a Microsoft Surface Pro with a touch screen, I showed people a recent Google Earth image of their village and explained the image to them, highlighting where different villages and landscape features were. I then asked them the following questions:

1. In the morning, what are the three or four most dangerous animals in this area?
2. Please mark on the map where you think these animals are in the morning.
3. In the morning, have you ever encountered any of the animals you listed?
4. This time of year, what do you normally do in the morning?
5. Please mark on the map where you go for these activities.
6. How many people are normally with you for these activities?
7. Are there places on this map that you do not go in the morning? If so, please mark them on the map.
8. Why do you not go to these areas?

Each question was followed by more open-ended discussion about the topic, and people were asked to draw directly onto the touch screen using a stylus pen. I then repeated the same questions, but changing the time from morning to day, evening, and night. In all, each person created four maps corresponding to these different times of day (see Figure 3.2). When people needed help drawing the maps, we discussed where they were talking about with reference to specific landscape features, and I drew on the map accordingly. At the end of the interviews, I

collected demographic information, including age, gender, income, caste, job, and highest level of education. With each person's permission, I also audio recorded every interview.

Figure 3.2: *Example of a map created by a resident of the Tadoba-Andhari village. The names of animals listed in blue were those that this person listed as being dangerous this time of day, and the blue shape (underneath the green shape) shows where this person thought those animals were. The orange dot shows that this person stays at her/his home at this time of day, and the green shape shows where this person actively avoids, which, in this case, was because of those same animals.*

3. GPS

I distributed GPS devices to understand people's movement across the landscape, a method that has been growing in popularity within tourism research (Bielański, et al. 2018; Stamberger, et al. 2018). At the end of every mapping exercise, I asked people if they would be willing to carry one Garmin eTrex10 GPS unit with them for 24 hours. I chose the Garmin eTrex10 because it is accurate to about 3 meters (Oderwald and Boucher 2003), and because it has an extended battery life that is ideal for collecting GPS data throughout the day (cf. Stamberger, et al. 2018). If the person agreed, I gave them the device and instructed them to keep

it with them at all times. The devices were set to record one GPS location every minute, which included date, time, elevation, and latitude and longitude coordinates.

4. Data Analysis

I hired two people fluent in both Hindi and Marathi to transcribe the audio, with one person transcribing audio from Melghat and the other transcribing audio from Tadoba-Andhari. I asked the transcribers to keep word forms, commentaries, and syntax as close to the original speech as possible, and to highlight when different languages were being used and when speakers were using an expression specific to the language they were speaking in (McLellan, et al. 2003). I georeferenced every map and digitized people's sketches in the WGS 84 coordinate system using QGIS 3.4 (QGIS Development Team 2018). I digitized their sketches into three layers, one for areas where they think animals are present, one for areas they avoid, and one for areas where they go. For any area in which people's sketches overlapped regarding the same question, I used the union and dissolve tools to assign a value to that area equal to the number of people whose sketches overlapped there. I then rasterized these overlaps to create a heatmap of areas that people used, avoided, and thought that animals were present. Additionally, I digitized and rasterized roads and water bodies in the two study areas.

I analyzed the relationship between the digital sketch maps and the GPS points using a use/availability resource selection function (Manly, et al. 2007) in R statistical software (R Core Team 2018). Many ecologists have used resource selection functions to describe landscapes of fear through the distribution of GPS locations across land cover classes and corresponding levels of risk (e.g. Avgar, et al. 2015; Hebblewhite, et al. 2005). I created subsets of the GPS points by time of day into morning (6-10am), day (10am-5pm), evening (5-10pm), and night (10pm-6am), and ran the same analysis on each subset. Using the existing GPS points, I created a minimum

convex polygon to estimate the range across which people travelled for that time of day. I populated that area with 1,000 random points to estimate the land that is available for people to use, and then overlapped the use and available points to understand how they were distributed over the different sketches people had drawn. I then created a binomial generalized linear model to understand how people's sketches of where they go, where they do not go, where they think wildlife are, as well as the presence of roads and water bodies, relate to the locations of the GPS points. Because I was interested in comparing the different variables across times of day and between Melghat and Tadoba-Andhari, and not interested in coming up with the 'best' model of people's movements, I did not apply any model selection technique, like Akaike Information Criteria or Bayesian Information Criteria, to the output (cf. Hebblewhite, et al. 2005). I then used the coefficients from the model output to create a predictive landscape of people's movements. I validated this landscape using a *k*-fold partition design (Boyce, et al. 2002). To do this, I randomly removed 20% of the GPS points to create cross-validation points, divided the predictive landscape into 20 bins, and calculated a Spearman-rank correlation between the area-adjusted frequency cross-validation points within the different bins.

D. Results

In the Melghat village, I interviewed 60 people, 37 women and 23 men.[63] Of those, 32 women and all the men chose to carry a GPS device. People's reported age ranged from 18-67, with a mean of about 36 years old, their reported education level ranged from no education to 12th standard, with a mean of 4th standard, and their reported income ranged from Rs. 5,000-

[63] This sampled gender ratio does not match that of the Melghat village population's gender ratio. There are two possible reasons for this discrepancy. First, it is possible that at the times I administered the survey (late morning and early evening) more women were at home than men. Second, both research assistants that I worked with in the Melghat village were women, which may have biased who was more likely to talk with them.

42,500 rupees per year, with a mean of about Rs. 16,000. 48 people identified as Korku, 10 as Lohar, 2 as Gond, and 1 as simply *Adivasi.* In the Tadoba-Andhari village, I interviewed 43 people, 21 women and 22 men. Of those 8 women and 16 men chose to carry a GPS device. People's reported age ranged from 21-65, with a mean of about 43 years old, their reported education level ranged from no education to 12th standard, with a mean of 4th standard, and their reported income ranged from Rs. 15,000-60,000 per year, with a mean of Rs. 23,112.[64] 13 people identified as Pardhan and 10 identified as Gond, while others identified as Kunbi, Gawdi, Mahar, or simply OBC (Other Backward Class) or ST (Scheduled Tribe). Two people identified as Muslim.

Across the two sites, people identified seven animals as dangerous (see Table 3.1). Regardless of the time of day, the most frequently mentioned animals in Tadoba-Andhari were tigers, sloth bears, wild boar, and leopards, in that order. Some people there also mentioned snakes in the evening and night, and wild dogs (dhole, *Cuon alpinus*) during the day and evening. Though most people did not refer to a specific species of snake, one person said that they were typically spectacled cobras (*Naja naja*) and Russell's vipers (*Daboia russelii*). In Melghat, the animals that people mentioned being present varied more by time of day. Monkeys, which some people further identified as langurs (*Semnopithecus entellus*), were the most frequently mentioned animal for the morning, but were mentioned with declining frequency throughout the day. Snakes were frequently mentioned as being present in the morning, day, and evening, but less so at night. In the evening and night, wild boars were the most frequently mentioned animal, though they were less frequently mentioned as being present during the

[64] One person reported an annual income of Rs. 200,000, but I considered this an outlier and left it out of the reported range and mean.

morning and day. Tigers were the least frequently mentioned animal at all times of day in Melghat.

Table 3.1: *Comparison of rates at which people mentioned certain animals being present at different time of days in the Melghat and Tadoba-Andhari villages.*

	Melghat		Tadoba-Andhari	
Time of Day	Animal	% of people who said it was present (N=60)	Animal	% of people who said it was present (N=43)
Morning	Monkey	45.00	Tiger	79.07
	Snake	20.00	Sloth bear	46.51
	Wild boar	10.00	Wild boar	20.93
	Wild dog	10.00	Leopard	9.30
	Sloth bear	8.33		
	Tiger	5.00		
Day	Snake	20.00	Tiger	53.49
	Monkey	16.67	Sloth bear	37.21
	Sloth bear	10.00	Wild boar	25.58
	Wild boar	5.00	Leopard	6.98
	Wild dog	5.00	Wild dog	2.33
	Tiger	5.00		
Evening	Wild boar	18.33	Tiger	74.42
	Snake	13.33	Sloth bear	46.51
	Wild dog	11.67	Wild boar	32.56
	Monkey	8.33	Leopard	13.95
	Sloth bear	6.67	Snake	4.65
	Tiger	1.67	Wild dog	2.33
Night	Wild boar	73.33	Tiger	79.07
	Sloth bear	15.00	Sloth bear	62.79
	Wild dog	8.33	Wild boar	34.88
	Snake	5.00	Leopard	11.63
	Tiger	3.33	Snake	4.65

The results of all eight resource selection functions are shown in Table 3.2. Before going into specifics, it is worth mentioning a few generalities here. In Melghat, people's movement was always negatively associated both landscapes of fear variables: the areas that they said they avoided and areas they associated with the presence of animals. In Tadoba-Andhari, people's

movement was always negatively associated with areas that they said they avoided, but always positively correlated with where they thought animals were, though the coefficients were rather small. Everyone's movement was positively associated with the landscapes of desire variable, where they said they go at all times of day, except for Melghat during the day, when areas people said they go were not significantly related to their movement. Aside from this variable, as well as two in the Tadoba-Andhari morning model and several variables in both night models, all variables were statistically significant beyond the $p < 0.001$ level. All models performed well at predicting people's movements ($p < 0.05$), except the Tadoba-Andhari morning model, which was only significant at the $p < 0.10$ level. The Melghat night model failed to produce a predictive landscape, which I will discuss more in the limitations section.

Table 3.2: *Comparison of the resource selection functions for Melghat and Tadoba-Andhari at different times of days. Note, the function for Melghat during the day does not include any information for the Avoid variable, as no one in Melghat said there is anywhere they avoid during the day. Also, the function failed for Melghat during the night. See the limitations section for more details.*

		Melghat				Tadoba-Andhari			
		Estimate	Std. Error	Z value	Pr(>|z|)	Estimate	Std. Error	Z value	Pr(>|z|)
Morning	Intercept	1.86089	0.04432	41.991	$< 2^{-16}$	0.63269	0.06767	9.35	$<2^{-16}$
	AnimalPresence	-3.5612	0.29848	-11.931	$< 2^{-16}$	0.0385	0.05651	0.681	0.496
	Avoid	-4.70077	0.38438	-12.229	$< 2^{-16}$	-0.32149	0.02978	-10.796	$<2^{-16}$
	Go	0.68036	0.08231	8.266	$< 2^{-16}$	1.47987	0.09007	16.431	$<2^{-16}$
	Rivers	-1.10036	0.18469	-5.958	2.55^{-9}	-176.14071	2562.52431	-0.069	0.945
	Roads	5.34131	0.28718	18.599	$< 2^{-16}$	4.43981	0.33468	13.266	$<2^{-16}$
		Spearman's Rank Correlation ρ: 0.952381 p-value: 0.001141				Spearman's rank correlation ρ: 0.9 p-value: 0.0833			
		Estimate	Std. Error	Z value	Pr(>|z|)	Estimate	Std. Error	Z value	Pr(>|z|)
Day	Intercept	2.31052	0.03974	58.145	$< 2^{-16}$	1.67568	0.06291	26.636	$<2^{-16}$
	AnimalPresence	-0.72498	0.11463	-6.325	2.54^{-10}	0.17713	0.03548	4.993	5.96^{-7}
	Avoid	-	-	-	-	-0.43047	0.02789	-15.436	$<2^{-16}$
	Go	-0.08621	0.10945	-0.788	0.431	0.57303	0.04826	11.875	$<2^{-16}$
	Rivers	0.98159	0.24329	4.035	5.47^{-5}	-6.16602	0.62387	-9.9	$<2^{-16}$

	Roads	5.38221	0.31174	17.265	$< 2^{-16}$	5.02545	0.44192	11.372	$<2^{-16}$
		Spearman's Rank Correlation ρ: 1 p-value: 0.01667				Spearman's Rank Correlation ρ: 0.8809524 p-value: 0.007242			
		Estimate	Std. Error	Z value	Pr(>|z|)	Estimate	Std. Error	Z value	Pr(>|z|)
Evening	Intercept	2.60492	0.05731	45.456	$<2^{-16}$	34.68999	1.97902	17.529	$<2^{-16}$
	AnimalPresence	-1.14753	0.14282	-8.035	9.39^{-16}	0.20285	0.02278	8.904	$<2e^{-16}$
	Avoid	-2.25157	0.07859	-28.648	$<2^{-16}$	-1.99067	0.11716	-16.991	$<2e^{-16}$
	Go	2.03578	0.21187	9.609	$<2^{-16}$	3.86015	0.24793	15.57	$<2e^{-16}$
	Rivers	1.53424	0.25624	5.987	2.13^{-16}	-36.39827	2.41179	-15.092	$<2e^{-16}$
	Roads	5.78552	0.42277	13.685	$<2^{-16}$	2.63825	0.36457	7.237	4.60^{-13}
		Spearman's Rank Correlation ρ: 0.8928571 p-value: 0.0123				Spearman's Rank Correlation ρ: 0.8928571 p-value: 0.0123			
		Estimate	Std. Error	Z value	Pr(>|z|)	Estimate	Std. Error	Z value	Pr(>|z|)
Night	Intercept	-164.4	19400.4	-0.008	0.993	117.22427	21.61184	5.424	5.83^{-8}
	AnimalPresence	-	-	-	-	0.07973	0.09507	0.839	0.4017
	Avoid	-	-	-	-	-6.32182	1.19935	-5.271	1.36^{-7}
	Go	203.4	23365.8	0.009	0.993	0.78995	0.44614	1.771	0.0766
	Rivers	-	-	-	-	-	-	-	-
	Roads	-250.3	30845.7	-0.008	0.994	0.74017	0.5314	1.393	0.1637
		Spearman's Rank Correlation: Failed p-value: NA				Spearman's Rank Correlation ρ: 0.6214286 p-value: 0.01557			

I will now present more specific results from Melghat and Tadoba-Andhari at different times of day, linking the resource selection functions to data from the interviews. I will compare Melghat and Tadoba-Andhari in the morning first, then during the day, evening, and night.

1. Morning

In the Melghat village, people's movement was negatively associated with where they thought animals were (β = -3.5612), where they said they avoid (β = -4.70077), and with rivers (β = -1.10036), and positively associated with where they said they go (β = 0.68036) and with roads (β = 5.34131). The majority of the landscape showed about a 50% chance of people using

it, though there were patches of forest that people said they avoid, which have a lower probability of people using them (Figure 3.3).

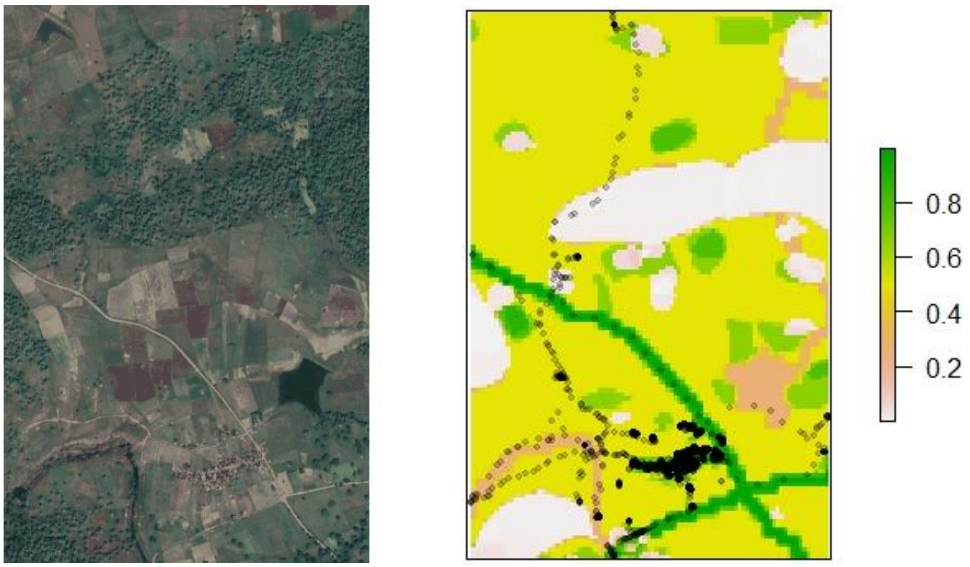

Figure 3.3: *A satellite image of the Melghat village and the predictive landscape for people's movement in the morning, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

While there were gendered differences in people's economic activity during the morning, these differences did not translate into significantly different encounters with wildlife. Twenty-seven women said that their mornings consisted of some combination of relieving themselves, collecting water, cooking, cleaning, and doing other household chores, while the other ten said they went to the farms. There did not appear to be caste-based reasons for these differences. There was only one woman who said that she grazed cattle in the morning, and she was one of only two women who said that they had encountered wild dogs in the morning. Both women said that their encounters with wild dogs happened in the forested area to the northeast of the village. Other women said that they avoid this part of the forest because of the presence of wild dogs, but

did not say that they had encountered them there. Thus, differences in where women carry out their economic activities in the morning may be more strongly linked to their experience of wildlife in the landscape than differences in what economic activities they are doing. Eighteen men said that they go to their farms in the morning, and the rest said that they either herd cattle or do chores. Of those that said they graze cattle or other livestock in the morning, none reported any wildlife encounters that varied from what other people reported, and whether a man said that he grazes livestock in the morning did not vary according to his caste. While rivers were negatively associated with people's movement in general, five people carrying GPS devices did go to the nearby river in the morning, likely for a combination of bathing and washing clothes. Four of these people were men. For the most part, people used established footpaths and roads, though some people did cut across farms as shortcuts.

The interviews revealed that there were key differences between how people interacted with wildlife in farmlands and forests. In farmlands, people actively sought out monkeys to drive them away from their crops, though doing so also inadvertently brought people into contact with snakes. Monkeys and snakes were the animals that people most frequently mentioned as being present in the morning (see Table 1). People generally only referred to these animals by their generic names *bandar* (monkey) and *saap* (snake), though some clarified that the monkeys were langurs (*Semnopithecus entellus*), and others mentioned specific snake species like rat snakes (*Ptyas mucosa*), spectacled cobras, and common kraits. While many people said that monkeys pose no direct risk to people, they said that monkeys were dangerous because, as one woman put it, "They eat sorghum or corn or whatever crop we have. They cause a lot of damage." To prevent crop damage from monkeys, many people said that they purposefully "go to the farm to drive out the monkeys if they are there." Because people actively sought out monkeys in their

fields, within the village's farmland there was frequent overlap between where people said they went and where they said animals were present. This overlap is indicated on the predictive landscape model, which shows some areas of pale pink inside areas of green. People often said that they go to their farms in groups of 2-6, and that while the monkeys "quickly run away" when found in farms, they "are there almost everyday."

In contrast to farmland, people said that they generally try to avoid wildlife in forests. The few people who mentioned the presence of predators in the morning often either had farms near the forest boundary or took their animals for grazing in the forest. Most of these encounters were sightings from afar and involved few direct interactions. Two men said they had encountered predators while grazing cattle in the forest. One said he "encountered a tiger once eating a cow's calf," and the other reported seeing a bear. Wild dogs were more frequently reported near people's farms and were said to eat goats. One woman said that she had once encountered a wild dog in the forest between her village and the neighboring village, and that she "threw a stone at it, and it ran away into the forest." Generally, when people identified an area with wild dogs, they also identified that as an area that they avoided in the morning. These areas were all forests immediately adjacent to the village farmland, and except for one person, everyone who carried a GPS unit avoided these areas. Most people said that there was no area that they avoided in the morning, and that even the forests were safe to go to, though a few did specifically say that they avoid forested areas because of the presence of animals like wild dogs, snakes, and wild boar.

In the Tadoba-Andhari village, people's movement was negatively associated with areas they said they avoid (β = -0.32149), and positively associated with where they said they go (β = 1.47987) and with roads (β = 4.43981). People's movement was not significantly related to

where they thought animals were or with rivers. The predictive landscape model (Figure 3.4), which was only significant at the $p < 0.10$ level, shows that people are not likely to go into the forest at all, and especially not the forest immediately adjacent to the two groups of houses. The model predicted that people are most likely to be found on roads, in fields, or in their villages.

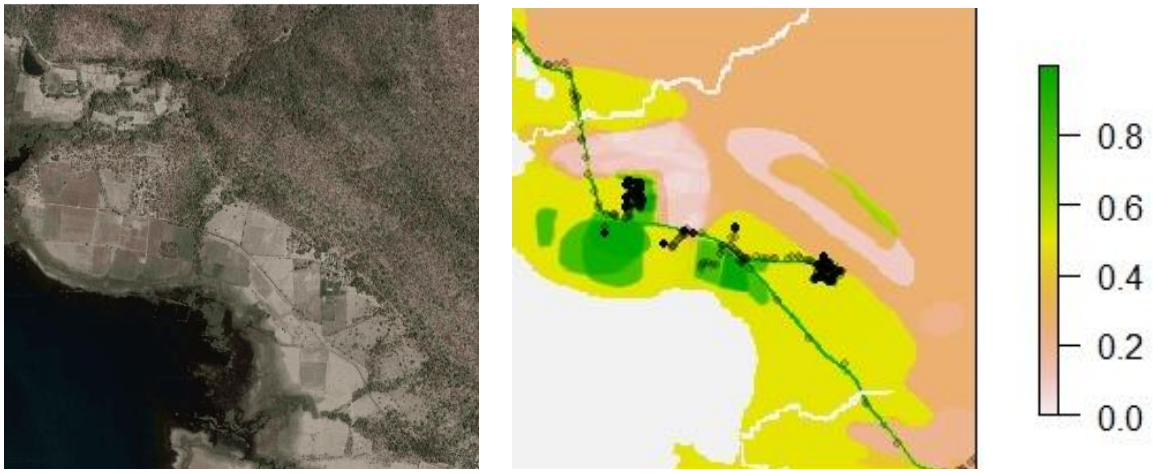

Figure 3.4: *A satellite image of the Tadoba-Andhari village and the predictive landscape for people's movement in the morning, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

The gendered differences in people's morning economic activities were starker in Tadoba-Andhari than they were in Melghat. Fourteen women said that they do household chores in the morning, while seven said they work as laborers in other people's farms, and the rest said that they either collect wood from the forest, tend livestock, or work at rural child care centers (*anganwadis*). Economic activity was more varied for men, who reported doing diverse activities including working as farm laborers, working in tourism resorts, tending cattle, and going to the forest to collect bamboo, and weaving bamboo mats. None of these activities were listed significantly more or less frequently than the others. Men's economic activity in the morning tended to take them further away from the village than women, resulting in gendered movement

patterns across the landscape in the morning. However, these economic activities did not align with caste differences.

Despite people's movements varying by gender, those differences did not necessarily translate into different encounters with wildlife. Both men and women reported having encounters with similar wildlife species in the morning. Both groups of houses in this village are immediately next to forests, and these were the areas that the model predicted people were least likely to travel to in the morning. Many said that they saw or heard animals at these places where the village meets the forest. This village's primary school is next to the forest, and the teacher said that the presence of animals can deter parents from sending their children to school. The teacher said, "Sometimes, while bringing back the primary school children, one can see them [tigers and bears]. So the children say, 'There are tigers!' and that's why their parents don't send them there. They were behind the school the last time. The wall goes right along the jungle." Between the two groups of houses, there is a small stretch of forest with a stream running toward the dam reservoir. That forest borders the western group of houses, and people living along it often said they hear animals in the morning. One woman who lives next to this stretch of forest made a special point of emphasizing the sounds she heard from tigers as they passed by. She said that, in the morning, tigers "go from behind the house to the fields and to the water. People are scared of them, they make those sounds. I mean, roughly, from behind the house, that's where they go from, making sounds. The sound, that's what. Over the last 2 or 3 days, it's been going via our house. I haven't seen it myself, but the sound and all. At like 7:00am, they go roaring, they go making sounds like 'aauuww aauuww.'" Others described the sounds that tigers make as screams. Another woman said that in the morning, "there is no one at home. I have to stay with these small kids. It had come here once in the summer. We were eating," she gestured behind her

house, “and it came here and screamed. It must have been 9 or 10 o’clock. We immediately shut the door.”

Despite many people saying that the forest was a dangerous place in the morning, some people’s work necessitated that they go there. One woman said that she grazes her goats at the forest boundary immediately outside the village. Several people mentioned losing goats to leopards in this way. While no one took a GPS unit into the forest, both men and women said that they go into the forest in the morning to collect bamboo, which they use to make woven mats, despite the commonly held assumption that “the entire jungle is where one will get scared.” People said that they often travel in groups of 5-25 when they go to the forest to collect bamboo. But, they said, it was important for them to go in the morning because the temperature is not at its peak yet and because, as one man said, “If one goes in the afternoon, then a forester will catch you. That’s why we go in the morning at 8 o’clock.” One person said that he encountered a tiger while returning home in the morning from the night shift at one of the tourism resorts. “I was coming back from my duty, I had night duty, and on the way back, there was a call from a monkey. So I turned and saw a tiger coming toward me on the road. I didn’t budge though. I stood there. If I had run…” He did not finish that thought, but just ended by saying, “I did nothing. I stood there.” Thus, people’s work, as well as the proximity of their houses to the forest, mean that their morning activities frequently overlap with the movement of tigers.

While some people’s work brought them into contact with wildlife, others actively avoided areas because of them. Many people said that they avoided the small stretch of forest between the two groups of houses, and one woman said that she does not start work until later because of the presence of wildlife. She said, “We don’t feel like going at 8 or 9 o’clock. So, 10

to 12 of us women go at 11 o'clock. We just go like that. Because of fear, we don't go in the morning." Another woman said that she goes through that stretch of forest once or twice a week in the morning, when she hears of some available work, but because she always, "feels scared [that] there might be a tiger," she waits until a vehicle comes around to pick her up. A man said that avoids that area because tigers "live in that area." Aside from the forest, the other place that many people said they avoided in the morning was a small temple about 300 meters into the forest. This temple is close to a stream that flows into the Erai reservoir and has a small pool by it that people said retains ground water even during the summer and attracts animals to it. Many people said that tigers and bears can frequently be found there, and ten people listed it as a place that they actively avoid. As one woman put it, "Going there is highly dangerous. Nobody wants to go there because there are lots of tigers. Anytime, everyday there is a tiger." One woman who grazes goats in the morning specifically said, "We do not take them there [near the temple]. We leave the goats to graze near the village," and another said that "We get scared [near the temple]. We don't go there." Other places that people avoided because they were scared of encountering wildlife included a stretch of forest behind one of the tourism resorts.

2. Day

In the Melghat village, people's movement was negatively associated with where they thought animals were (β = -0.72498), and positively associated with rivers (β = 0.98159) and roads (β = 5.38221). Where people said they went was not significantly related to where they actually went, and, importantly, no one said there was any area that they avoided during the day time. Most of the predictive landscape model showed a 50% chance that people would use the landscape, with a few areas with lower probability, where people said animals might be present

(Figure 3.5). Most often, people had little to say about interactions with wildlife during the day, with a few exceptions.

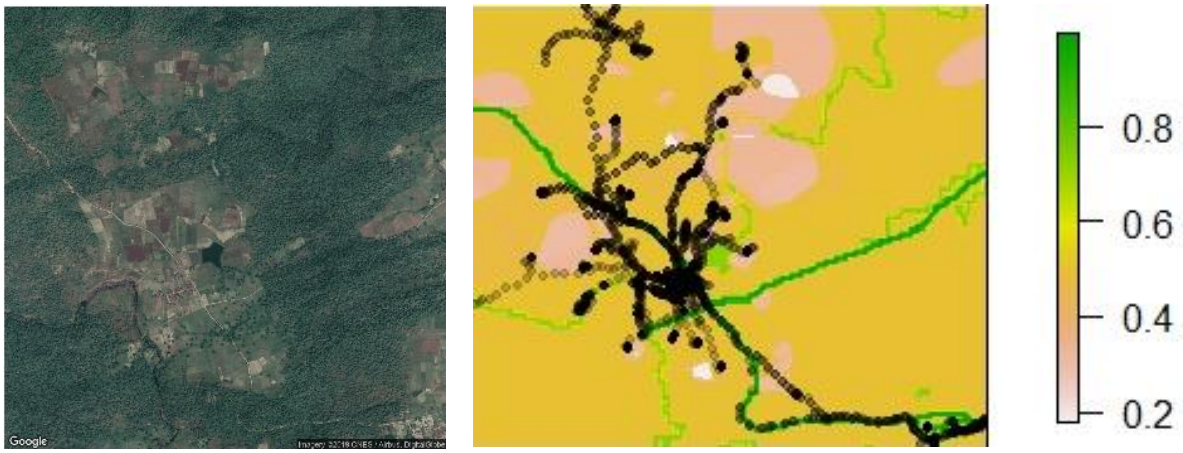

Figure 3.5: *A satellite image of the Melghat village and the predictive landscape for people's movement during the day, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

Regardless of gender, most people said that they farmed during the day, though there were some gendered differences in other economic activities. Aside from those women who said they farm during the day, a few said that they stay home and work around the house, while two women said that they do both activities. None of these differences corresponded with caste identities. The same woman who said she grazed cattle in the forest during the morning also said that she does so during the day, though she said that she encountered wild animals during the day while doing so. Most men also said that they farm during the day. However, there were five men, all of whom identified as Korku, who said that they graze livestock during the day, and one who said that they cut wood from the forest. Grazing take people several kilometers into the forest, but for the most part, these men did not report encounters with wildlife that were different from those men who worked in their farms, except that none of the those who grazed livestock during

the day reported any encounters with snakes. There was one Gond man who said that he did construction work during the day and that because of this he does not venture out into the farms or forests.

The GPS locations show people moving in forests both adjacent to and away from the village's farmland, sometimes following the river. The predictive landscape for the Melghat village during the day shows little difference between forest and farmlands. There are no large patches in which the model predicts no one will move. During this time, people also traveled to the larger village in the east for the weekly Thursday farmer's market. The GPS locations show that both used the road and cut through the forest to get there. In general, people traveled where they wanted during the day time, with some sticking to roads and rivers, while others ranged more widely off path.

Snakes were the most frequently mentioned animal for the day time. Most of the people who mentioned snakes reported seeing them while working in their farms. One woman mentioned, "When I dig the soil in my farm to plant seeds, sometimes snakes come out of the ground." Another recounted how she had encountered a cobra in her farm. She said it was, "Sometime last year, when I was picking the beans. It was daytime, and there it was, a real cobra. It had its fangs raised, hissing. Then it took a swipe. I got shit scared and took off. But I got caught up in the bean crop and fell. The snake was there, and I was here on the ground, a meter away. It was hissing and showing its raised fangs. It must have gotten angry because someone must have pulled the bean plant where it was hiding." Aside from encounters with snakes in their farms, a few people mentioned the presence of tigers, bears, wild dogs, and wild boar in the forest, though few said that they had had any encounters with them there. Most people said things along the lines of "wild animals don't come during the daytime."

In the Tadoba-Andhari village, people's movement was negatively associated with where they said they avoided (β = -0.43047) and with rivers (β = -6.16602), and was positively associated with where they thought animals were (β = 0.17713), where they said they go (β = 0.57303), and with roads (β = 5.02545). People encountered wildlife less frequently during the day, and this was the time when the fewest people said wildlife were present. However, the predictive landscape model for the day looks much like it did for the morning, with more than a 50% probability that people will use different areas of the farmland, but a less than 20% chance that they will go to the forest (Figure 3.6). One person did go into the forest just north of the western groups of houses, but did not do so for very long.

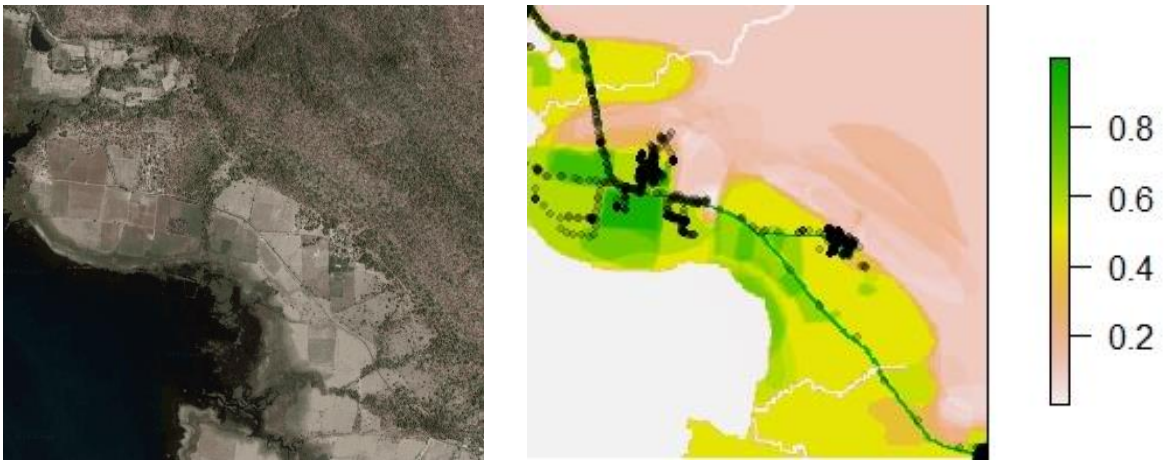

Figure 3.6: *A satellite image of the Tadoba-Andhari village and the predictive landscape for people's movement during the day, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

The main gendered difference in economic activity took place within the clusters of houses. Thirteen men said that they stayed within the clusters of houses during the day working to weave bamboo mats. All twelve of the women who said they stay within the clusters of houses during the day said that they did so to rest. This was the main gendered difference in people's

economic activity during the day, but it did not lead to men and women to go to different parts of the landscape. A few more women than men said that they do farm labor during the day, but not in numbers that suggest gender was the key variable in this difference. Other than that, men and women reported going to the forest to collect bamboo or graze livestock, and one woman said she works at a tourism resort during the day. These differences did not align by caste.

Some people reported infrequent encounters with wildlife during the day, especially during the summer months, but these encounters did affect how people used the landscape. One woman said a leopard had approached her from behind while she was grazing goats near a mahua tree (*Madhuca longifolia*), but that it ran away when she turned toward it. She explicitly said that because of this encounter, she no longer goes near that tree "because I get scared that [the leopard] is there." Another person mentioned how she had been napping outside in the summer with her dogs when a tiger approached her. She was able to move away, but the tiger ended up killing one of her dogs. Several people mentioned that they had encountered wild boar while picking cotton and that the boar would often run towards them. Because of that, many people said that they pick cotton in groups of 5 or 6. Many people mentioned the stretch of forest between the two clusters of houses as a place that they avoid because they fear encountering animals there. One woman said, "Nobody goes there, [because] we feel scared!" Another man said that he does not go there because he had previously seen tigers and sloth bears there. The temple was another place people mentioned that they do not go because of the fear of wildlife, with one man saying "We don't go near [the temple] because that's where the tiger stays."

The people who said they go to the forest for bamboo in the morning generally said that they return in the early afternoon. Most of these people said that they spend their afternoons making woven bamboo mats to sell. I observed many people doing this while administering the

surveys. People split the bamboo stalks lengthwise into quarters with an axe. Once it has begun to split, the bamboo can largely be pulled apart with the occasional help of the axe. The split stalks are then tightly woven together into a mat about six feet high and length equal to that of the stalks. Many people used these mats as fences surrounding their houses, often with vine plants growing up them. The majority of GPS points collected during the day were located in the two groups of houses, and it is likely that many of these people were weaving mats.

3. Evening

In the Melghat village, people's movement was negatively associated with where they thought animals were (β = -1.14753), and places they said they avoid (β = -2.25157), and was positively associated with where they said they go (β = 2.03578), with rivers (β = 1.53424), and with roads (β = 5.78552). The predictive landscape model begins to show a lower probability that people will use forests as compared to farms in the evening, though the probability that they will use farms remains similar to what it was during the morning and day time (Figure 3.7).

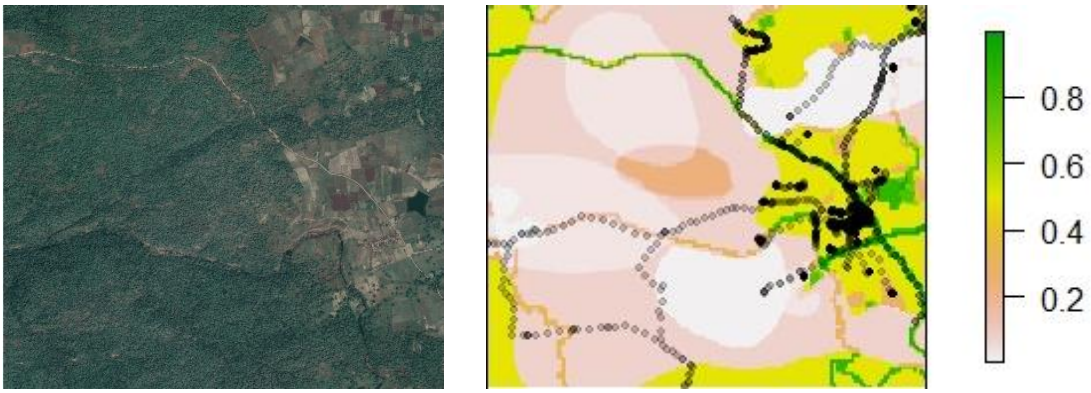

Figure 3.7: *A satellite image of the Melghat village and the predictive landscape for people's movement in the evening, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

There were clear gendered differences in people's economic activity during the evening, but these differences took place within the people's homes and did not translate into significant differences in how people moved across the landscape or interacted with wildlife. Twenty-four women said that they do household chores, like cleaning and cooking, in the evening, six said that they work in their farms, three said they guard their farms, and the remaining women said that they rest. As with other times of day, women's economic activity did not vary by caste during the evening. However, at about 5:00pm, one woman carried a GPS device several kilometers down the river and through the forest before looping back to the village an hour and a half later. Half of the men said that they rest in the evening, either watching TV or chatting with friends, while the others said that they farm, guard their crops, or do chores. None of these activities varied by caste affiliation. Most of the GPS locations in the evening were at people's homes, regardless of their gender. Thus, while most women said that they do household chores and most men said that they rested in the evening, these differences all took place within or near people houses and did not affect how they moved or interacted with wildlife.

Most animals that people mentioned being present in the evening were those that they saw on their way back to their homes. The evening was the time when people most frequently said wild dogs were present, which many said they saw in the forests from the roads or farmland. A few people said that they avoid forested areas in the evening because of the presence of predators like wild dogs and sloth bears. The most frequently mentioned animal in the evening was wild boar. People said that wild boar start to enter people's farms in the evening in groups of 5-6. However, only one person said that they go to guard their crops against wild boar in the evening. Most people who guard their crops said that they did so at night, and that the evening was when they went home to rest or eat. Aside from encountering them on their way home,

people did say that they also encounter snakes in their houses during the evening. One person said that they almost stepped on a krait in the evening, and another said they found and killed a small cobra in their home. A woman specified that the construction of their houses allowed snakes to enter in the evening, saying "We don't have a permanently built house. Ours is like a shack. That's why we find snakes sometimes in our backyard."

In the Tadoba-Andhari village, people's movement was negatively associated with where they said they avoided (β = -1.99067) and with rivers (β = -36.39827), and was positively associated with where they thought animals were (β = 0.20285), where they said they go (β = 3.86015), and with roads (β = 2.63825). While the model predicted people's movements well, it gave low probabilities to people using any portion of the landscape (Figure 3.8). This is because 18 people said that they do not go out of their homes in the evening, meaning that the entire area, including villages, farmlands, and forests, had strong negative values associated with it. People's houses, while clustered together, were counted separately and therefore did not have an additive effect on the model and were each valued separately. While the predictive landscape looks empty, there are small patches under people's GPS locations that show small probabilities of people using that area. This lines up well with what people said about their movements during the evening.

There were minor gendered differences in people's livelihood activity during the evening, and like during the day, these differences did not take people to different parts of the landscape. Twelve women and fifteen men said that they rest in the evenings. Eight women said they do chores and four men said they work on their bamboo crafting. All these activities take place within the boundaries of the clusters of houses and there were no patterns between people's caste and what they said they did during the evening. There were only two men who said that they

leave the houses in the evening. One said he worked a night shift at a resort and the other said he guarded his fields from crop raiding animals.

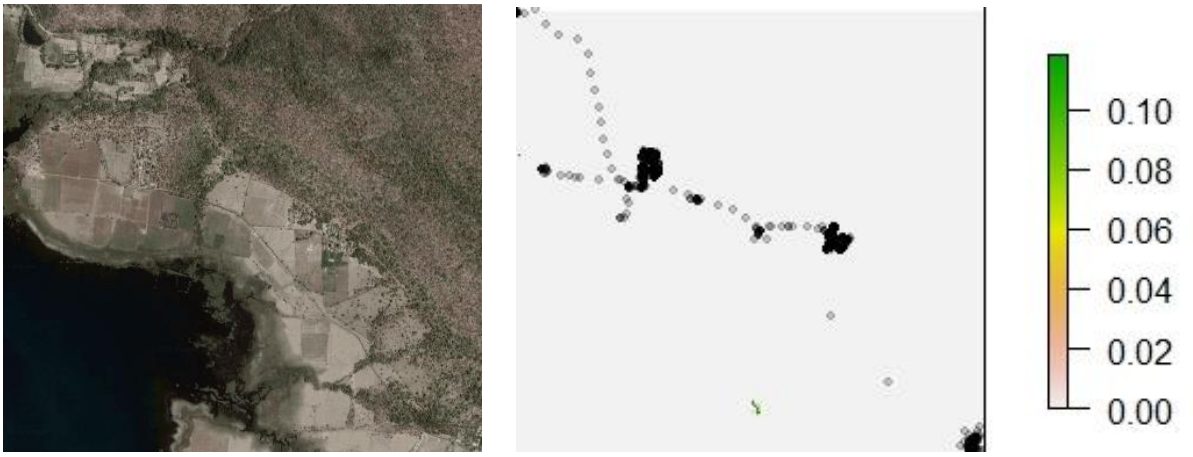

Figure 3.8: *A satellite image of the Tadoba-Andhari village and the predictive landscape for people's movement in the evening, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

Of the people who stayed within the boundaries of the village in the evening, almost all said that they do not leave because of the presence of wildlife. Additionally, eighteen of those said they do not leave their homes for this reason. All the GPS locations show people returning to their houses during this time. When I asked one man to identify a specific area that he avoids in the evening, he replied, chuckling, "Tell me one thing: in the evening, anywhere you go there is something scary, right? So which place exactly should I tell?" Another woman echoed his sentiment, saying "even here on the road, one is scared to go. We feel scared to go anywhere in the evening. The tigers keep roaming around, making their rounds." Many others voiced similar sentiments like, in the evening, "we don't go anywhere, [because] there is fear," or "We don't go anywhere. There is fear everywhere in the evening." One person mentioned that should a cow get loose after 5:00pm it would inevitably get attacked. One woman, who lived in a house next to the forest, again emphasized that the sounds that tigers and other animals make remind her that

they are nearby. She said, “Behind the house, nobody goes there. I mean even the other villagers don’t go there. It stays in your mind…If you look out far, one can see peacocks and other animals. Those sambar and chital scream, the peacocks scream. And we know why they are doing it. That’s how we feel…The tigers go roaring, doing that ‘auw auw.’ They make those big sounds, and we stay quietly in our house.” Another said that she avoids using a footpath near her house because “that’s the place where the tiger comes from daily.” One man also identified the stretch of forest between the two clusters of houses as being a place that “Nobody goes…[because] the tigers live there.” Another man said that he does not go to the backside of his house, because there are tigers there in the evening.” In other words, during the evening, people specifically avoided going to some places because of the fear of wildlife.

People also specified how sloth bears come close to the village in the evening, especially in the winter when the jujube fruit (*Ziziphus jujuba*) ripens. Several people repeated the refrain, “When the jujubes ripen, the bears come.” One woman said that they often come in groups, “In the winter seasons, anytime you can see one, three or four, five. You can see that many, everyday.” She went on to say how some people treat the presence of bears as an event. “A bunch of us look at them, look at them from afar, when they come here. At that time, just to see them, we throw a lot of jujubes here. And then all of us see them together. And if we think anything is about to happen, then for our protection we stand separately.” Often, she said, the bears come to within a few feet of her house, and when they do, she gets scared.

4. Night

The nighttime model for the Melghat village was the only model not to result in a predictive landscape. There was a wide discrepancy between places people said that they go and the corresponding GPS locations. 27 people, nearly half of all those interviewed in Melghat, said

that they go to their farms during the night to guard their crops from wildlife. However, all GPS locations were in people's houses (see Figure 3.9). I will elaborate on this discrepancy more in the Discussion section, and will restrict this section to outlining people's experiences with wildlife at night.

Figure 3.9: *A satellite image of the Melghat village and the points recorded by people's GPS devices at night, both clipped by the extent of people's movement. The model failed to predict where people would go, and hence the predictive landscape does not appear.*

People's economic activity at night was restricted either to guarding their farms or sleeping in their homes. A higher proportion of men guarded farms than women did. Eighteen of the thirty-seven women said that they guard their fields at night. All five of the women who identified as Lohar said that they guard their farms at night, but it is not clear if this pattern has some basis in caste or if it is just a random occurrence. Fourteen of the twenty-three men said that they guard their farms at night, and the rest said that they slept in their houses. There were no clear caste differences between those who guarded their fields and those who did not.

73% of people said that wild boar were present at night, by far the most mentioned of any animal in the Melghat village at any time of day. About half of the people I interviewed said that they go to their farms with 1-5 other people at night specifically to ward off animals like boar.

As one woman put it, at night "we stand on the *machan*. The pigs come to eat the crops. They come to eat sorghum or corn. That is why we have to scare them away, otherwise they will flatten the whole farm. They have already eaten a lot from my farm. They ate a lot of corn." *Machans* are raised platforms that people build in their farms that they sleep on during the night and scare off animals. However, the view from the *machan* does not allow people to easily distinguish different species below. As one man said, "Once I heard the hustle and bustle of some animal destroying my corn crops, so I threw stones at it and it ran away and never came back. I could not see what animal it was." Even among those who guard their crops, many said that the only way they knew that animals had come through their farms is by seeing new damage the next morning. Several people mentioned something similar to what one woman said, that "I haven't seen any, but I know that the wild boar come to my farm and eat the crops and run away into the forest." While pigs were by far the most frequently implicated animal, some people who said they stayed out on *machans* also reported the presence of predators. One woman said that she scared wild dogs out of her farm once by making noise until they ran off, and another speculated that bears may also come to the fields, though she had never encountered them. The same woman said that she heard a tiger roar at night once, but that that was an isolated incident that happened over a year ago.

Many of the people who said that they stay in their houses at night also said that their farms are not near the forest edge. One woman said "My farm is right in the middle of the village, there are no forests around. So, I have never encountered any dangerous animals." However, some people who stayed home also specified that they have other family members who guard crops at night but not them. When people who stayed home at night mentioned the presence of an animal, they were most often guessing or repeating something they had heard

from someone else. Nobody said that they go into the forest for any reason at night, but only one person said that this was because of wildlife. Most said that they did not go to the forest because they had no reason to go there.

In the Tadoba-Andhari village, the only variable significantly related to people's movement was where they said they avoided (β = -6.32182). The predictive landscape (Figure 3.10) suggested incredibly small probabilities that people would use the landscape, with slightly higher probabilities in the areas around their houses. All GPS locations were either in houses or resorts, though one man briefly left the village for six minutes, and another spent the night in a farm, likely in a *machan*.

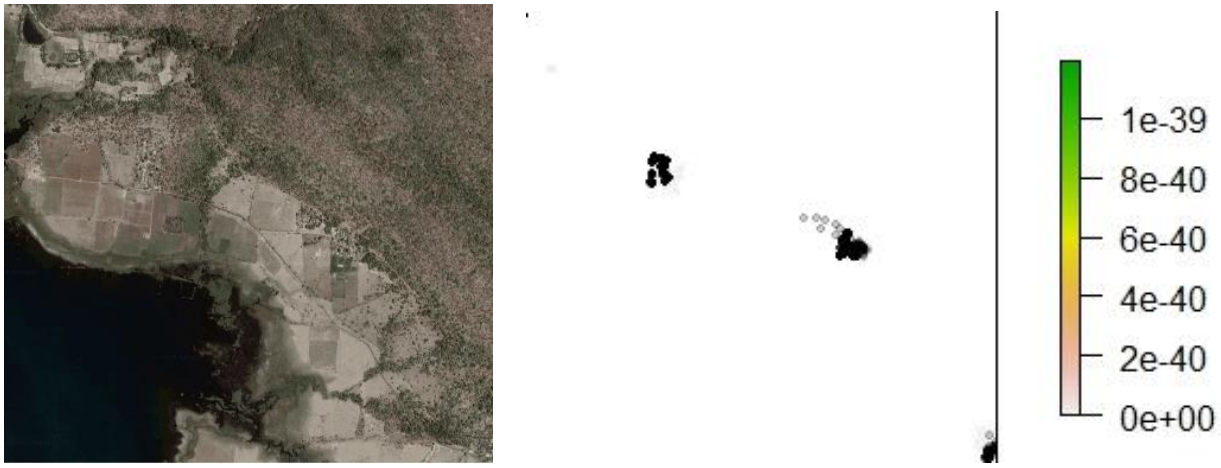

Figure 3.10: *A satellite image of the Tadoba-Andhari village and the predictive landscape for people's movement in the evening, both clipped by the extent of people's movement. The color bar indicates the probability of someone using that portion of the landscape.*

In accordance with the predictive landscape, people said that the risks at night in the Tadoba-Andhari village were much like they were in evening, only heightened to a greater extent. Again, 18 people said that they avoid going anywhere during the night. People often repeated phrases like, "We don't go anywhere at night because we are scared," or "No one goes

out due to fear of animals." One person went so far as to say, "At night, I am scared even at home." Many people repeated things they had said for the evening, like tigers "come screaming behind the house," or "bears come to the jujube tree." One woman specified why people stay indoors, saying "It's too dark in the night and I won't be able to see anything that comes nearby. One can't tell when the attack will come at night, so everyone is inside." If people did say that they had to go out at night, they always said it was in groups and in a vehicle. People who work the night shift at resorts are sure to leave for work before it gets dark. As one person said, "If they go at 5 in the evening, there is no reason to fear; it is still day. If anyone goes at night, then 1-2 people go along." There were no gendered differences in people's activity during the night. Everyone said that they sleep in their houses, except for two men, one of whom works at a resort and the other of whom said he guards his crops.

E. Discussion

Human-wildlife interactions in the two villages were very different, and shaped people's use of the landscape accordingly. People in the Melghat village actively sought out encounters with crop-raiding animals in the morning and at night. During the day and evening, their interactions with wildlife were largely incidental, and people generally pursued their desires as they wished. People in the Tadoba-Andhari village actively avoided wildlife as much as possible, despite often using the same areas they thought wildlife might be. For people in this village, predators were a constant risk that shaped where and when they moved through the landscape. In the morning and daytime, people largely kept away from the forest unless going to collect bamboo. In the evening and night, they largely avoided going outside at all.

There were some gendered differences in people's economic activity that took them to different places in the landscape, but these different activities did not appear to be associated

with different kinds of wildlife encounters. In Melghat, a higher proportion of men than that of women said that they go to their farms in the mornings and at night. There were few differences in the economic activities of men and women during the day, and while there were gendered differences in the evening, these differences did not translate into different movement patterns because they all took place within or near people's houses. In Tadoba-Andhari, there were also some gendered differences in economic activity, but these only translated into gendered movement patterns in the morning, when men's activity tended to take them further from the village than women. Through the rest of the day and night, the differences between men's and women's economic activity did not correspond to different movement patterns, as they carried out their different economic activities within the village.

Wildlife encounters did not vary much by different livelihood activities. The only meaningful difference between livelihood activities in this regard were the differences between people in Melghat who worked at home and those who did not. The people who stayed at home were less likely to say that they had encountered wildlife during the time they were at home than those whose economic activities took them away from the house. The same did not hold true in Tadoba-Andhari, where there were no differences between wildlife encounters and whether or not someone left their house to pursue some economic activity. In both villages, when someone was outside the cluster of houses, their economic activity did not seem to be related to whether or not they encountered wildlife.

In general, fear seemed to play a stronger role in shaping people's economic activity in Tadoba-Andhari than it did in Melghat. In Tadoba-Andhari, people were very specific about what areas they associated with dangerous wildlife, from the temple in the forest, to the forests immediately adjacent to their homes. These fears often meant that some people could not pursue

their desires, from children not going to school to people not guarding their crops. A separate study that included this same village found that farmers lose around 50% of their crops to animals. While not everyone in this village owns the farmlands they work on, the presence of dangerous carnivores prevents people from guarding against such raids. The predictive landscape models for Tadoba-Andhari showed clear distinctions between farmlands and forests during the morning and daytime, indicating that people are less likely to go into the forests during those times because of the risk from wildlife. That is, people were able to assess spatial variation in risk from wildlife quite easily in Tadoba-Andhari. In Melghat, people were able to pinpoint some areas that they avoided because of wildlife, but to a much smaller degree than people in Tadoba-Andhari. The predictive landscape models for Melghat generally showed little difference between farmlands and forests in terms of risk during the morning and daytime. Tellingly, most people were confused by the question about areas that they avoid and just said they avoid certain places because they have no reason to go there.[65] This suggests that fear does not play a large role in structuring people's movements in Melghat, while the opposite is true in Tadoba-Andhari.

The landscape in Melghat is perhaps better described as a 'landscape of anticipation', in which people anticipate the habits of wildlife and move accordingly to encounter them. Forssman and Root-Bernstein (2018) describe landscapes of anticipation as those in which humans modulate their activities and movements in the landscape according to how they anticipate wildlife will move and behave. Importantly, these anticipations have a disciplinary effect; they exert power over and through individuals and their bodies (Dean 2010:29; Foucault 1977). While people in Melghat are never sure if animals will come to their farms and raid crops, they check their farms most mornings under the assumption that wildlife could be there. Though

[65] When people gave answers like this, they were excluded from the GIS layer of places that people avoid because this sort of response does not indicate avoidance.

not amounting to surveillance, the knowledge of animal behavior coupled with the uncertainty of their exact location disciplines people to assume and anticipate that animals will be in their farms every morning, and people move accordingly to drive them away. Aside from checking their fields, however, people in Melghat are, for the most part, able to pursue their desired activities across the landscape unencumbered by wildlife. People are generally able to go to the forest to graze livestock and cut wood, or go to their farms, whenever they please. Thus, while wildlife play some role in structuring people's economic activity in Melghat, the degree to which they do so is not nearly as great as it is in Tadoba-Andhari.

This analysis shows how people's fear and anticipation of wildlife are spatialized. While conservationists have shown that the risk of wildlife to humans can have a spatial component (Karanth, et al. 2012a; Miller, et al. 2016a), explorations of the fear and/or anticipation that people feel towards wildlife have largely neglected spatial variations (e.g. Frank, et al. 2015; Johansson, et al. 2012; Kaltenborn, et al. 2006). The distinction between risk and fear/anticipation is important here, as most of the conservation literature that assesses risk does so independently of people's ideas about risky places. Risk, as used in conservation literature, generally refers to a spatialization of the likelihood that humans and wildlife will encounter each other in the landscape. Fear and anticipation, as I use them here, refer to how people experience the landscape given imperfect knowledge of those risks. That is, the spatialized risk that is measured in many studies may not necessarily correspond to the spatialized fear/anticipation that people experience. Studies of urban crime and gendered violence distinguish between risk and fear in terms of absolute and relative space (Koskela and Pain 2000; Valentine 1989). In an absolute sense, there may be spaces that are more risky to go to. But in a relative sense, those spaces exist in relation to a confluence of political, economic, social, and environmental

factors.[66] The same can be said about humans and wildlife. There may be places where the risk of encountering wildlife is higher than others. But the fear/anticipation that people experience within a landscape is the product of prior encounters with wildlife and shared understandings with others. These encounters and understandings are what shape people's movement and use of the landscape, not objective measures of risk. Therefore, greater attention to how people spatialize fear/anticipation may advance efforts to turn landscapes of fear into landscapes of coexistence.

There are many factors that could account for some of these different human-wildlife interactions. First, the density of predators in the two areas is quite different. The density of tigers in Tadoba-Andhari Tiger Reserve is 5.28 per 100 sq. km (Government of Maharashtra 2015c). In Melghat Tiger Reserve, the tiger density is averages to about 0.23 tigers per 100 sq. km. (Government of Maharashtra 2015b). These different densities mean that any stretch of area in Tadoba-Andhari is likely to have more tigers than any comparable area of forest in Melghat. Thus, encounters with large predators like tigers are much less frequent in Melghat than they are in Tadoba-Andhari. Second, people are exposed to different kinds of risk from wildlife in the two sites. Most of the risk in Melghat came from crop-raiding animals, which people actively seek to encounter and drive out of their farms. Animals like monkeys and wild boar pose serious risks to people's livelihoods, but no one said that they pose risks to people's lives. In Tadoba-Andhari, most of the risk from wildlife was to people's lives. While crop-raiding does happen there (Bayani, et al. 2016), the risk to people's lives seems to be too great for people to want to guard their fields at night. Third, the spatial arrangement of the villages also likely contributes differences in how people interact with wildlife. In Tadoba-Andhari, people's houses are

[66] For more on the difference between absolute and relative space, see Smith (2008 [1984]:116)
"We do not live, act, and work 'in' space so much as by living, acting, and working we produce space."

immediately adjacent to forested areas, and people reported being scared even in their houses because they knew wildlife traveled close by. In Melghat, people's houses are surrounded by farmland on all sides. Most reports of predators in Melghat came from people who have farms near the forest edge or graze cattle in the forest, while people who stay at home or have farms away from the forest edge did not report many predators present.

Perhaps more important than these factors, however, is the fact that human *umwelts* intersect with nonhuman *umwelts* in very different ways between the two sites. In the Melghat village, people's farms were the most prominent site of human-wildlife interactions, and held different meanings for different species, depending on their subjective perspective. Following their keen sense of smell, wild boar likely desire going into farms because of the abundance of energy rich foods, including both crops and soil-dwelling insects (Schley and Roper 2003). In contrast to boar, monkeys see better than they smell (Wheeler, et al. 2011). This helps them distinguish between different parts of crop species, of which they eat certain parts, but discard others (Naughton-Treves, et al. 1998). Snakes tend to frequent people's farms not because they eat crops, but because prey species like mice do. To them, crops are not so much a food as they are a hide out and a lure. Farms are all desirable for these species, but for different reasons. Based on their different sensory systems, these species respond to farms in different ways, though all are attracted to them for different reasons. Being one area of overlap between different life-worlds, farms become sites of multispecies encounters.

In the Tadoba-Andhari village, many of these *umwelts* intersected in the same way, but farms were not the only place in which they did so. The forests immediately adjacent to the clusters of houses were places where many people said they encountered wildlife. These places have small footpaths that people use to enter the forest, but those same paths are also used by

tigers and bears. Bears use them to reach the jujube fruits that grow on trees just outside the village, while tigers seem to use them to access the nearby reservoir. For humans, tigers, and bears, these footpaths are a means of reaching some desired part of the landscape. However, for humans, and likely for other animals as well, those footpaths also produce fear because their overlap with different animals' *umwelts* makes them likely sites of encounter.

In shaping people's movement across the landscape, I argue that human-wildlife interactions also shape the spatial and temporal dimensions of their economic activities. In Melghat, human-wildlife interactions extend the temporal dimensions of people's economic activity, as well as the quantity of crops they have to eat or sell at the market. Farming does not only happen during the day when people plow, seed, and harvest crops, it also happens at night, when people guard their fields from animals. This means that for many people in Melghat farming is a 24-hour activity, and must be done in groups, so people can take turns sleeping in *machans* or watching their fields. If they do not do this, animals like monkeys and wild boar will eat their crops, reducing the amount of food people can harvest, eat, and/or sell. In Tadoba-Andhari, interactions with wildlife also affect the temporal dimensions of people's economic activity. People generally do not go outside in the evening or at night because they are afraid of predatory wildlife. The only work available at that time is wage labor at tourism resorts. Additionally, people tend to move in groups while traveling across the landscape, so that they are better prepared to deal to intimidate wildlife with their noise and numbers should they encounter them. Thus, though people's interactions with wildlife are different in both landscapes, those interactions have strong implications for when people can do what economic activities.

1. Limitations and Future Directions

There were several limitations to this research, which I address here and suggest future directions for research that could overcome these limitations. First, the resource selection functions and the resulting predictive landscape models did not model people's movements perfectly and may have included inaccuracies. Part of this comes from the fact that my aim was not to account for every variable that may influence people's movement, but to test whether people's movements were associated with several key indicators of a landscape of fear. The point of the modeling was to understand if people adjusted their movements based on where they thought wildlife were, in order to understand how well the landscapes of fear concept described their experiences with wildlife. The predictive landscapes may have been more accurate if my purpose was to understand all variables associated with people's movement. To do this, future research could include land cover, elevation, distance to edges, and interactions between the different variables in the resource selection function.

Second, the digital sketch maps may have introduced inaccuracies into the model because people are not perfect at drawing on a map or at identifying the extents of all areas they use, avoid, and think wildlife are. While people were actually fairly good at identifying these areas, future research could benefit from using multiple methods to understand the spatial extents of these areas and how people experience them. For instance, video landscape walks, in which a person walks through the landscape with a GoPro or other video recording device, can help pinpoint the exact places people go and how they experience those places (Wilhoit and Kisselburgh 2016). However, these may be inadequate for understanding places that people avoid or feel danger, as it is unethical to ask someone to go somewhere that they fear.

Third, the generalizability of this research is limited by its fine spatial and temporal scale. Only recording people's movement for 24 hours hinders any understanding of how people's movements vary across weeks, months, or seasons. For instance, part of the GPS recording in the Melghat village happened on a Thursday, when there is a weekly farmers market in the neighboring village that most people go to. Additionally, seasonality affects when people go to guard their fields, and seemed especially important to people's interactions with sloth bears in Tadoba-Andhari, which they mainly reported being present in the winter. In other words, the fine scale of this study may not have captured a representative sample of people's movement, and may have led to an arbitrarily small estimate of range people typically travel across. However, my understanding of these dynamics was limited by the battery life of the GPS devices, which become unreliable after 24 hours. This could be remedied by longer-term team research, in which it would be possible to replace people's GPS devices or change the batteries every day, and track people's movement over a greater period of time.

Finally, I am unable to guarantee that people always took the GPS devices with them. For instance, it is impossible to say if someone stayed at their home all day or if they just forgot to take the device with them. This is one possible reason why the GPS devices did not record anyone in the Melghat village going to their farms at night. GPS watches may be an improvement over using the Garmin eTrex 10, as they are more easily left on a person's wrist. However, some people may be uncomfortable taking the GPS device to certain places or at all because it doubles as an instrument of surveillance. As technologies for tracking people and animals become more sophisticated, issues of surveillance are becoming more prevalent in conservation (Sandbrook, et al. 2018). Many people in Tadoba-Andhari said that they did not want to take the GPS devices because they were worried that the data would get back to the

Forest Department and link them to illegal activity in the forest. This worry about surveillance is another possible reason why no one took a GPS device into the forest in Tadoba-Andhari, despite many people saying that they go there to collect bamboo. As I mentioned in the introductory chapter, my time in Tadoba-Andhari was cut short by a disagreement with the NGO I was partnering with. Because of that, I did not have the time to build relationships with people in Tadoba-Andhari like I had in Melghat, and many people, quite understandably, may not have trusted me. While spending more time building rapport with people may have led more people to agree to carry a GPS device, all research must prioritize people's wishes above the collection of data and accept the methodological limitations that come with that ethical imperative.

2. Conclusions

In this chapter, I have argued that human-wildlife interactions shape people's movement across the landscape, and by extension, the spatial and temporal dimensions of their economic activity in two villages in the buffer zones of Melghat and Tadoba-Andhari tiger reserves. In Melghat, people actively sought out wildlife like monkeys and wildlife boars to mitigate the risks they pose to agricultural crops. In Tadoba-Andhari, people actively avoided wildlife like tigers and sloth bears by limiting the spatial and temporal dimensions of their use of the landscape. If behavioral co-adaptations between people and wildlife are key to creating coexistence (Carter and Linnell 2016), more research like this will be crucial to understand the mutual influences that people and wildlife have upon each other, beyond simplistic notions of anthropogenic risk in wildlife studies and mitigation measures in conservation literature. By coupling research like this with explorations of wildlife adaptation to humans, conservationists can move towards a more relational understanding of how landscapes of fear relate to human-wildlife coexistence. Having explored how interactions with wildlife shape people's economic activity, the next chapter turns

to a historical analysis of how these economies shape the implementation of conservation initiatives seeking to promote human-wildlife coexistence.

CHAPTER 4

ARTICULATING COEXISTENCE:

NONHUMANS AND STATE CAPITALIST CONSERVATION

A. Introduction

It was around 8:00pm, while I was washing clothes in my bathroom, that a friend hurriedly entered and told me that a tiger was near the village. He urged me to stop what I was doing and come with him to see it. I hesitated initially, both because I was worried about my safety and because I was not sure that my presence would help the situation. However, my friend insisted that we could be useful because the tiger had chased some people and they may be injured. With reservations, I followed him out.

We joined another man, Rujul, and the three of us got on his motorcycle and drove a few hundred feet outside the village, which was in Tadoba-Andhari Tiger Reserve's buffer zone. A small group of men had gathered there, shining the headlights of their motorcycles and Suzuki Gypsy four-wheeler across a stretch of farmland in search of the tiger. As we stood there, rumors circulated that the tiger had chased two men, who had been able to escape unharmed on their motorcycle. This was supposed to have happened just a few meters from where we were. From the fields, we heard chital (spotted deer) barking, indicating that a predator was likely nearby. But the headlights found nothing, and after about ten minutes, we returned to the village.

I sat with Rujul for some time afterward discussing the incident. He said that eight years ago, a similar incident had occurred in which a tiger was spotted close to the village. At that

time, people had tried to get the tiger to leave by throwing rocks and shouting at it. Aside from such rare encounters, he said people had never given much thought to tigers. Rujul told me this story to highlight how much had changed in eight years. He said that people had gone searching for the tiger tonight either because they wanted to make sure that everyone was safe or because they wanted to see the tiger. The rapid growth of the wildlife tourism industry around Tadoba-Andhari Tiger Reserve, he explained, had led people to realize how much money they could make from tourists coming to see tigers. Because of that realization, he said, people began to like tigers. To him, the income from tourism was the main reason why people no longer threw rocks and yelled when tigers came near the village.

At face value, this seems like a successful example of market-based conservation promoting human-wildlife coexistence. Advocates of market-based wildlife conservation strategies, such as wildlife premium mechanisms (Dinerstein, et al. 2012) and wildlife tourism (Romanach, et al. 2007), suggest that people's tolerance of wildlife and support for conservation will increase if the presence of wildlife can generate value for local economies. In India, as wildlife tourists become more willing to pay higher fees for quality tourism experiences (Karanth, et al. 2012b), some conservationists hope that the "shared profit motive between landowners and tourism entrepreneurs" will promote human-wildlife coexistence by encouraging people to adopt livelihoods that benefit from the presence of wildlife (Karanth and Karanth 2012). This view of market-based wildlife conservation suggests that when the presence of wildlife generates value for local economies, people's livelihoods will improve, they will be more tolerant of wildlife, and habitats will expand as people convert farmlands to forests (Karanth and Karanth 2012).

Generating value from the presence of wildlife is foundational to conservation in India's protected area buffer zones. As I detail below, buffer zones in India are meant to promote human-wildlife coexistence by minimizing the extent to which humans and wildlife rely on the same natural resources. Wildlife tourism and markets play a central role in these efforts, as they are meant to act as a substitute for people's use of natural resources, while also increasing people's support of wildlife and conservation.

Much empirical and critical research on market-based wildlife conservation emphasizes how wildlife function as commodities whose exchange contributes to economic growth and market expansion. Economic research on wildlife tourism tends to focus on the extent to which commodified wildlife bring income to communities and conservation (Banerjee 2012; Sandbrook 2010; Sinha, et al. 2012). Critical scholarship, while often critiquing the ideological underpinnings and social and ecological effects of the commodification of wildlife and nature, often does little to challenge the assumption that market-based conservation easily commodifies wildlife and expands capitalism (Büscher and Dressler 2012; Büscher, et al. 2012; Igoe and Brockington 2007; Igoe, et al. 2010). And while some empirical work shows that market-based conservation does not operate as a pure market because of its articulation with specific contexts (McElwee, et al. 2014; Roth and Dressler 2012; Shapiro-Garza 2013), the role of wildlife in this articulation is largely unexplored. That is, most researchers, critical and otherwise, have taken for granted the assumption that wildlife function as commodities in market-based conservation, neglecting the possibility that wildlife may affect conservation in other ways.

In this chapter, I challenge the assumption that under market-based conservation wildlife only function as commodities. Rather than being functional to market-based conservation, I argue that wildlife help shape the extent to which it can be implemented in different contexts. To

make this argument, I compare the buffer zones of Melghat and Tadoba-Andhari tiger reserves. In both buffer zones, human-wildlife coexistence is meant to be promoted through a national-level market-based conservation strategy. In Melghat, this strategy has struggled to gain a foothold, while in Tadoba-Andhari it has expanded rapidly over the past decade. To help explain these differences, I show that wildlife set different conditions under which the local economies of both areas grew, and that these differences influenced the extent to which market-based wildlife conservation could be implemented in the two areas. In other words, it is not just that Tadoba-Andhari's higher density of wildlife led to market-based conservation being more successful there than in Melghat. Wildlife density is not necessarily positively associated with market-based wildlife conservation opportunities (Maciejewski and Kerley 2014). Rather, I suggest that wildlife differentially shape local economies in ways that affect how they articulate with market-based conservation. In making my argument, I draw together old debates about the articulation of modes of production with more recent multispecies scholarship on the role of nonhumans in neoliberal natures. I show that by shaping local economies wildlife affect how market-based conservation articulates with those economies.

This chapter is divided into five sections. First, I review debates between functional and historical understandings of the articulation of modes of production, arguing that the neoliberal natures literature tends to reflect functional understandings when considering the role of nonhumans in economic systems. Contrary to this tendency, I suggest that by drawing on more historical approaches to the articulation of modes of production, multispecies ethnographers can better understand the contingencies through which nonhumans come to shape and be shaped by economic systems. Second, I trace the genealogy of buffer zone conservation in India, showing how it builds on past ecodevelopment projects to promote human-wildlife coexistence through a

state capitalist model of market-based conservation. Third, I show how nonhumans like crops, teak, and crop-eating animals shaped the historical emergence of contemporary economic systems in Melghat, which limit the implementation of state capitalist conservation. Fourth, I show that tigers and bamboo, by each playing two economic roles simultaneously, have enabled the rapid rise of state capitalist conservation in Tadoba-Andhari. Last, I end with a discussion of how relations between humans and nonhumans can enable or hinder the implementation of market-based conservation.

B. Functional and Historical Perspectives on Nonhumans and Economies

In this section, I draw together older debates about the articulation of modes of production with more recent attention to the role of nonhumans in economic systems. While correcting for conventional Marxism's lack of attention to the role of nonhumans in economic systems, the neoliberal natures literature tends to treat those roles as functional to the reproduction of capitalism. In doing so, their arguments bear resemblance to perspectives on the articulation of modes of production that sought to understand how dominant modes of production structure their subordinate economic components. In contrast, I argue that drawing on historical perspectives to the articulation of modes of production will help multispecies ethnographers to better understand the contingencies through which nonhumans come to shape and be shaped by economic systems.

Debates over the articulation of modes of production largely centered on the extent to which the reproduction of one mode of production was related to that of another mode of production (Foster-Carter 1978; Wolpe 1980).[67] Functional approaches to the articulation of

[67] Here, I define a mode of production as an abstraction of the relationships between productive forces and relations of production on the one hand, and ideology, law, and coercion on the other. For different perspectives on what constitutes a mode of production, see Althusser (2014), Cohen (2000), and Donham (1999).

modes of production typically assume that "in all forms of society there is one specific kind of production which predominates over the rest, whose relations thus assign rank and influence to the others" (Marx 1978 [1939]:242). For example, capitalism is a mode of production in which a combination of laws, coercion, and ideologies reinforce a relationship between wage laborers and their employers. That relationship enables employers, who privately control all means of production, to appropriate the surplus value generated by wage laborers. Rosa Luxemburg provides an example of how capitalism dominates worker cooperatives, a non-capitalist form in which wage laborers and employers are the same people. She argues that capitalism forces cooperative workers to "play the role of capitalist entrepreneurs toward themselves" (Luxemburg 1986 [1900]:45). That is, to be viable within the larger capitalist system, cooperative workers must extend their working days and cut or hire themselves. In this example, capitalism dominates cooperatives by making them play by its rules.

Assuming that one mode of production is dominant, functional approaches focus on understanding how elements of subordinate modes of production help reproduce the dominant mode (Althusser, et al. 2015 [1965]). For example, Claude Meillassoux (1975) argued that non-capitalist elements of migrant labor persisted under capitalism in South Africa because they kept wages low and profits high. This suggests that migrant labor, the subordinate mode of production, persisted because it performed a function for capitalism, the dominant mode of production.[68] While functional approaches often lack clarity on how to differentiate subordinate modes of production from the dominant mode (Banaji 1977; Wolpe 1980), they are distinguished by their emphasis on how different economic systems interlock and reproduce each other.

[68] This is consistent with Cohen's (2000) understanding of functional explanation, which differs from functionalism in the anthropological sense (also see Donham 1999).

Historical approaches to the articulation of modes of production tend to emphasize the process through which modes of production came to articulate with one another. In this approach, the relationships between modes of production are analyzed as outcomes of "the struggle of agents organised under differentiated relations and forces of production" (Wolpe 1980:40). For example, Post (2012 [1978]) argues that the protests and ensuing emancipation of Jamaican laborers changed how their subsistence production articulated with other modes of production. While laborers' subsistence production had previously complemented slave plantations, the protests led it to eventually come into contradictory articulation with global capitalism after emancipation. This kind of analysis prioritizes historical contingency over functionality in explaining how modes of production came to articulate with one another (Donham 1999; Williams 1977b:Ch. 8). While some modes of production may dominate others, whether and how they do so is a question to be investigated rather than a pre-given assumption. Though not requiring an analysis of change through time, the historical approach to the articulation of modes of production aims to understand why things turned out as they did in particular places at particular times through "an appreciation of each social moment as a fragile interaction of possibilities given by a set of structural alternatives" (Donham 1999:142). Historical approaches are thus distinguished by their emphasis on the contingencies through which modes of production come to articulate with one another (Foster-Carter 1978).

These debates are fifty years old, but it was necessary to briefly review them here in order to show that the neoliberal natures literature (Heynen and Robbins 2005) tends to reflect functional approaches when considering the economic roles of nonhumans. These functional approaches are apparent in recent explorations of how the differential physical properties of nonhumans enable their enrollment in value generating interspecies relations under capitalism

(Barua 2017; Haraway 2008; Kallis and Swyngedouw 2018; Kay and Kenney-Lazar 2017; Kenney-Lazar and Kay 2017). Efforts to show how capitalism produces hierarchies of nonhumans based on their ability to generate value reflects Marx's notion that dominant modes of production assign ranks and status to their constituent economic parts (Collard and Dempsey 2013; Collard and Dempsey 2017). Explorations of how value is generated as nonhumans move from non-capitalist modes of production to capitalism reflect the understanding that elements of one mode of production function to reproduce another mode (Collard 2014; Tsing 2013b). To be sure, these analyses do a lot to correct for conventional Marxism's lack of attention to the exploitation of nonhumans under capitalism. Showing that nonhumans contribute to the generation of value necessitates understanding how their structural position within modes of production functions to reproduce capitalism. In this sense, frameworks that reflect functional approaches to the articulation of modes of production have been useful for showing the exploitation of nonhumans under capitalism.

In this chapter, however, my aim is not to highlight exploitation, but to show how nonhumans have shapes the articulation of different modes of production. In advancing historical approaches to this question, I draw on Tim Ingold's (2000:Ch. 5) notion of production as a process of establishing the conditions for growth. For instance, farmers do not actually produce crops, they help establish the conditions under which crops grow. Likewise, plants help establish the conditions under which humans grow and develop, either as grassy fields on which people play sports, or forests that help to regulate levels of atmospheric greenhouse gases. The case studies in this chapter compare how nonhumans have established different conditions of growth in Melghat and Tadoba-Andhari, and in doing so, affected the implementation of market-based conservation in the two buffer zones. In the buffer zone of Melghat Tiger Reserve, I show how

crop production established the conditions under which other nonhumans were enrolled in local economies, and in which systems of bribery and independent family enterprises came to reproduce each other. Market-based conservation has struggled to gain a foothold there because the reproduction of these local economic systems is not conducive to the reproduction of capitalism. In the buffer zone of Tadoba-Andhari Tiger Reserve, I show how tigers and bamboo established contradictory conditions that make some economic activities more dangerous. Market-based conservation resolved this contradiction by establishing wage labor and has since been able to reproduce itself. Through this comparison, I demonstrate how questioning, rather than assuming, the dominance of one mode of production, opens the possibility that nonhumans not only function to reproduce modes of production, but that they also shape the way modes of production articulate (cf. Hribal 2007). My aim in presenting these case studies is to open up multispecies ethnography to the possibility that nonhumans are not only defined by economic systems, but that economic systems are also defined by nonhumans.

C. Coexistence as State Capitalist Conservation

Before exploring my two case studies, however, I first trace the genealogy of buffer zone conservation in India. I show how it builds on past ecodevelopment projects to promote human-wildlife coexistence through a state capitalist model of market-based conservation. This model operates under the assumption that promoting human-wildlife coexistence is a problem of resource allocation, and works to minimize the extent to which humans and wildlife rely on the same natural resources. To do this, buffer zone policy repurposes past ecodevelopment initiatives in order to offset restrictions on people's use of natural resources with increased opportunities in wildlife tourism and other markets. These policies provide a framework for a state capitalist mode of production for buffer zones, defined as the state employing wage labor and

appropriating surplus value but having the potential to distribute that surplus for public benefit (Gibson-Graham 2006:67). I first outline that mode of production here, and then go on to show how nonhumans shape its articulation with local economies in the buffer zones of Melghat and Tadoba-Andhari tiger reserves.

1. Buffer Zone Conservation and the Emergence of Ecodevelopment in India

Buffer zone conservation came to international prominence through UNESCO's Man and the Biosphere Programme (MAB). Launched in 1971 and still in existence, MAB seeks to coordinate research on human-environment interactions and promote the conservation of natural areas and their genetic resources (Batisse 1971; Dyer and Holland 1988). Biosphere reserves have been a key component of this program since 1974 (Batisse 1982). They are designed to better human societies in regions undergoing environmental degradation and to preserve the genetic diversity of plants and animals by protecting a representative sample of terrestrial ecosystems (Dyer and Holland 1991). To achieve these goals, biosphere reserves were designed as a set of three concentric circles. The innermost circle was designated a core zone, in which any activity that endangered conservation would be strictly prohibited, including significant human settlements. The core zone was surrounded by a delineated buffer zone, in which only activities that are compatible with the protection of the core zone would be permitted. This buffer zone was then surrounded by an undelineated transition zone, in which researchers, managers, and the local people would cooperate to ensure appropriate planning and sustainable resource management in harmony with the purpose of the biosphere reserve (Batisse 1986). Thus, in biosphere reserves, buffer zones were meant to cushion the effects of strictly protected core zones and sustainable development on each other.

In India, buffer zone conservation emerged in tandem with ecodevelopment, though they were considered distinct conservation strategies until 2006. India's first national system of protected areas, Project Tiger, was launched in 1973 but the initial reserves did not include buffer zones. In 1983, a task force organized by the Indian Board of Wildlife suggested that the "enforcement of restrictions in wildlife reserves triggers antagonism" among those who lived in or near protected areas (IBWL 1983). To ameliorate this antagonism, the task force recommended that each reserve adopt a "core-buffer-multiple use surrounds structure," very similar to the three concentric circles of UNESCO Biosphere reserves. This structure would require people living in or around protected areas "to forgo all use of forests within the core and considerably curtail the use in buffer zones" (Indurkar and Gogate 1991:857). The multiple-use surrounds area, the outermost concentric circle, would "be subjected to rapid multilateral eco-development capable of enhancing the agricultural, pastoral and forest productivity of the area and to provide supplemental alternative resources" (IBWL 1983:718). Buffer zones were not initially envisioned as areas for ecodevelopment, as managers worried that extending ecodevelopment to villages in the core and buffer zones would incentivize them to stay there rather than relocate (Indurkar and Gogate 1991). Rather, buffer zones were meant to "prevent excessive spill-over of wild animal populations into the multiple use areas so as to minimise damage to crops and livestock" (IBWL 1983:718). That is, just as in Biosphere reserves, buffer zones in India were meant to cushion the effects of strictly protected core zones and sustainable development on each other and were not originally designated as areas for ecodevelopment.

Ecodevelopment in multiple-use areas proliferated quickly in the 1990s. Before that, only a few NGOs had implemented ecodevelopment activities around one or two protected areas (Singh and Sharma 2004). But in 1991, the Government of India began funding ecodevelopment

projects around some of its Project Tiger reserves. In 1995, ecodevelopment projects around Great Himalayan National Park in Himachal Pradesh and Kalakad-Mundanthurai Tiger Reserve in Tamil Nadu received international funding from the World Bank's Forestry Research, Extension, and Education grant (Saberwal, et al. 2000; Singh and Sharma 2004). In 1996, the World Bank and Global Environmental Facility worked with state and central governments in India to provide USD 67 million to start ecodevelopment projects around seven protected areas in India, as sum that was roughly 133% of what the Government of India had spent on all tiger reserves between 1973 and 2003 (Narain, et al. 2005:6).

As ecodevelopment expanded, it changed from its original conceptualization in ways that increased the role of both state organizations and markets in village-level conservation and development. First, the focus of ecodevelopment shifted from promoting livelihoods that were "compatible with the needs of local people and wildlife" (IBWL 1983:718) to safeguarding protected areas from "unsustainable or otherwise unacceptable pressures resulting from the needs and activities of people living in and around such areas" (Singh and Sharma 2004:290). This shift in focus led to more market-oriented ecodevelopment activities being implemented than had originally been proposed. The 1983 task force had suggested ecodevelopment activities that would increase agricultural, pastoral, and forest productivity, like soil conservation, afforestation, dry farming, micro-irrigation, pasture development, improved husbandry, and energy alternatives. The ecodevelopment projects that were implemented tended to focus on establishing livelihood activities that reduced people's use of forest resources and increased their participation in markets. Some of these alternative market opportunities included bee-keeping, tailoring, repair shops, jobs in tourism (either as guides or resort staff), tree nurseries, souvenir shops, small businesses, bottle washing, dairying, handicrafts, cookstove and well-water pump

distribution, and road, transportation and well development (Gubbi, et al. 2009; Saberwal, et al. 2000; Shahabuddin 2010). These activities all depended either on buying outside inputs or selling to outside buyers. This change in the focus and content of ecodevelopment activities relied on increasing people's participation in markets rather than enhancing the productivity of their agricultural and pastoral endeavors.

The second change to ecodevelopment was the creation of ecodevelopment committees, which allowed representatives of state organizations to influence the planning and management of village-level activities. The 1983 task force had suggested that the implementation of ecodevelopment should be centralized and run through a new cell of the Central Wildlife Organisation. However, funding from the World Bank was contingent on ecodevelopment being participatory. To meet this requirement, ecodevelopment committees were added to the project and tasked with (1) planning specific village-level ecodevelopment activities, (2) liaising with the Forest Department, and (3) managing new village-legal trust funds into which local people would donate a small percentage of their earnings to ecodevelopment projects (Singh and Sharma 2004). Ecodevelopment committees were separate from Gram Panchayats, the elected government councils that typically manage village affairs (World Bank 1996:26), though many of the same individuals served in both bodies (Mahanty 2002). The two organizations often had overlapping but distinct areas of jurisdiction, and while the Forest Department has no formal role in Gram Panchayats, each ecodevelopment committee includes one member of the Forest Department. In this way, ecodevelopment committees became parallel village-level organizations to Gram Panchayats that allowed forest departments to have more influence over village activities and required local people to contribute money to state ecodevelopment projects. This allowed state organizations to have more control over the largely market-oriented

ecodevelopment activities. Together the shift in focus and change in organizational structure increased the involvement of state organizations and markets in village-level conservation and development activities (Baviskar 2003).

In this form, ecodevelopment achieved varying levels of success across India. The World Bank rated the project outcome as 'moderately satisfactory,' citing more efficient, equitable and sustainable use of resources, but also a lack of strong institutional arrangements and management (Rees 2007). However, a number of site-specific assessments highlight more significant shortcomings. Baviskar (2003) argues that ecodevelopment in Great Himalayan National Park treated people as passive recipients rather than active partners in conservation, and that Forest Department staff were trapped within larger bureaucracies that prevented them from innovating in ways that accounted for social complexity. Mahanty (2002) shows that ecodevelopment in Nagarhole fell short of its goals because it was focused too much on delivering pre-determined outcomes rather than on restructuring the relationships between state bureaucracies, tribal rights groups, and local governmental organizations. Additionally, Arjunan, et al. (2006) and Gubbi, et al. (2009) argue that benefits from ecodevelopment in Kalakad-Mundanthurai and Periyar tiger reserves, respectively, have not improved people's attitudes toward conservation and development, which was the original reason the 1983 task force had suggested ecodevelopment. In sum, while most of these studies recognize ecodevelopment as a serious effort to address conflicts between conservation and local communities, for the most part they suggest that ecodevelopment fell short of achieving this goal (Shahabuddin 2010).

One reason for ecodevelopment's shortcomings was that it relied on, rather than challenged, state and market interventions. Those in the Indian Institute of Public Administration who helped design ecodevelopment meant it as a short-term stop-gap measure, and recognized

that "over the medium and long-term more fundamental changes will have to be made if biodiversity is to stand a chance of surviving" (Singh and Sharma 2004:292). However, by focusing on short-term proximate solutions to conservation and development problems, ecodevelopment reinforced the institutional and legal structures that led to those problems in the first place (Read 2016). In other words, ecodevelopment's emphasis on state and market interventions meant that it was just as much about keeping "the state in business" as it was about conserving wildlife (Baviskar 2003:295).

2. Promoting Human-wildlife Coexistence through Ecodevelopment in Buffer Zones

In 2005, wildlife conservation in India went through a critical juncture. On January 22nd of that year, *The Indian Express* published a news story claiming that, except for two sightings by tourists, no tigers or pugmarks had been seen in Sariska Tiger Reserve, Rajasthan, over the previous six months.[69] Scientists and managers soon confirmed that all tigers from Sariska had been extirpated by poachers (Shahabuddin 2010). In the aftermath, wildlife conservation in India was largely restructured. As part of that restructuring, the increased roles of state organizations and markets in ecodevelopment evolved into a fully-fledged state capitalist model of market-based conservation aimed at promoting human-wildlife coexistence in buffer zones.

The notion of promoting human-wildlife coexistence emerged from a report written by the Tiger Task Force, which had been appointed to investigate the causes of the extirpation in Sariska and to suggest ways of preventing it from happening in other reserves (Narain, et al. 2005). In their report, the Tiger Task Force outlined five interrelated factors that had led to the extirpation. First, a breakdown in management led to confusion about which government officials were responsible for carrying out certain duties. Second, this breakdown eased the

[69] Mazoomdaar, Jay. *Have you seen a tiger in Sariska since June? If yes, you're the only one.* The Indian Express, January 22nd, 2005

access of commercial poachers to Sariska. Third, these poachers, in many cases, were supported by local people, who lived in the reserve with no notified rights and minimal government services. Fourth, due to the management breakdown, local cattle grazing went unchecked in the area and degraded tiger habitat. Fifth, extensive mining operations immediately south of Sariska isolated its tiger population from others, making it functionally extinct (Narain, et al. 2005:16-18). After listing these causes, the Tiger Task Force then posed the questions, "How do we protect the tiger? How do we regenerate these lands? How must we manage the competing, but equally vital, needs of human livelihood? We don't have the option to choose one over the other: the poverty of one will destroy the other. It is quite literally about coexistence" (Narain, et al. 2005:22).

Part of the Tiger Task Force's plan for promoting coexistence involved restructuring the relationship between buffer zones and ecodevelopment. Ecodevelopment, the Tiger Task Force argued, had focused too much on state organizations and markets. It suggested that ecodevelopment had operated under the assumption that all human use of forests was destructive and wrongly tried to substitute people's use of forest resources with increased market opportunities. It also argued the focus on state organizations was misguided and that ecodevelopment committees do "not work with the existing mechanisms of development in the village" (Narain, et al. 2005:130). As alternatives to states and markets, the Tiger Task Force, in agreement with the original 1983 task force, suggested that ecodevelopment should focus on securing the forest-grazing-agriculture economy by improving the productivity of forests and grazing lands and investing in water facilities. The Tiger Task Force also acknowledged that people will inevitably continue to live in buffer zones and multiple-use areas, and that the sustainability of their doing so hinged on them being involved in developing management

strategies and on their livelihoods being linked to protected areas (Narain, et al. 2005:116). To this latter point, the Tiger Task Force recommended reserving forest protection and management jobs for local people and making sure they benefitted from wildlife tourism. In all, these changes meant that ecodevelopment should change in three broad ways: (1) it should focus on people living in both buffer zones and multiple-use areas, instead of only the latter, (2) it should help create livelihoods opportunities that actively engage with and compliment forest protection, rather than separate people from forests, and (3) it should be reorganized to give local people more influence in forest management and ecodevelopment activities.

In 2006, after the Tiger Task Force submitted its report, the Government of India passed an amendment to the Wildlife (Protection) Act that took many of the Task Force's recommendations seriously. First, it restructured tiger reserves to promote ecodevelopment in buffer zones. This was done by re-zoning tiger reserves from three concentric circles to two: an inviolate core area, called Critical Tiger Habitat, which included national parks and sanctuaries, and a buffer zone, whose purpose was to promote "co-existence between wildlife and human activity with due recognition of the livelihood, developmental, social and cultural rights of local people" (Government of India 2006). Whereas buffer zones had been designed to cushion the effects of strictly protected core zones and sustainable development on each other, they were now designated to "provide for management focus [*sic*] and measures for addressing conflicts of men and wild animals and to emphasise on co-existence in forest areas outside the National Parks, sanctuaries or tiger reserve [*sic*]" (Government of India 2006). Ecodevelopment was a clear part of the coexistence strategy. The amendment mandated the creation of Tiger Conservation Foundations for each tiger reserve to "facilitate and support their management for conservation of tiger and biodiversity and, to take initiative in eco-development by involvement

of people in such development process [*sic*]" (Government of India 2006). Because the 2006 amendment also called for removing people from the core areas of tiger reserves, there was an inherent implication that all ecodevelopment activities would be implemented in the buffer zones designed for coexistence. Second, the 2006 amendment also acted on the Tiger Task Force's recommendation to link people's livelihoods to protected areas. The new Tiger Conservation Foundations, which were mandated to facilitate and support ecodevelopment, were given a specific set of objectives. These included, among others, promoting "ecotourism with the involvement of local stakeholder communities" and augmenting financial resources including "recycling of entry and such other fees received in a tiger reserve, to foster stake-holder development and eco-tourism" (Government of India 2006). Both changes, implementing ecodevelopment in buffer zones and creating economic opportunities linked to forest protection, were in line with the Tiger Task Force's recommendations.

However, the 2006 amendment did not act on at least two of the Tiger Task Force's recommendations. First, the amendment did not provide a mechanism to strengthen forest-grazing-agricultural economies. This meant that ecodevelopment remained focused on substituting people's use of forest resources with market opportunities, which now included an emphasis on wildlife tourism. Second, rather than fitting ecodevelopment into existing village structure, the amendment doubled down on implementing it through state organizations. The amendment restructured the Project Tiger Directorate into the National Tiger Conservation Authority (NTCA). Part of the NCTA's mandate is to "facilitate and support the tiger reserve management in the State for biodiversity conservation initiatives through eco-development and people's participation" (Government of India 2006). The amendment also mandated the new Tiger Conservation Foundations to "take initiatives in eco-development" that supported

conservation, giving them powers to create and facilitate development activities and manage associated financial resources. Thus, in contrast with the Tiger Task Force's suggestions, the 2006 amendment increased, rather than decreased, the roles of state organizations and markets in ecodevelopment.

Because of its selective changes to buffer zone conservation and ecodevelopment, I argue that the 2006 amendment establishes the legal framework for promoting human-wildlife coexistence through a state capitalist model of market-based conservation. As a mode of production, state capitalism involves the state employing wage labor and appropriating surplus value, but with the potential to distribute that surplus for public benefit (Gibson-Graham 2006:67). The Tiger Conservation Foundations, which were tasked with recycling tourists' entry fees from tiger reserves to foster ecodevelopment and more wildlife tourism, are state organizations that both appropriate surplus value and have the potential to distribute it. However, because ecodevelopment focuses on creating market opportunities, Tiger Conservation Foundations tend to distribute surplus value in a way that expands markets and employs wage labor. Even when ecodevelopment programs result in people controlling some means of production, like self-owned repair shops or other small businesses, the consequence is that people become dependent on connections to outside markets (Levins and Lewontin 1985:Ch. 9). This gives states and outside actors more power in determining the economic opportunities available to people living in buffer zones.

The concept of 'coexistence' is employed in this legislation in a way that naturalizes these state capitalist relations. In the introductory chapter, I outlined how literature on 'coexistence' generally uses the term in two ways, a social sense and a material sense. A social approach sees human-wildlife conflict arising from changing political economic systems and

debates between people about wildlife. Coexistence, in this sense, can be achieved by collaborative wildlife management that creates partnerships between local people and wildlife managers. A material approach sees human-wildlife conflict arising from interspecies competition for limited resources. Coexistence, in this sense, can be achieve by providing people with alternative livelihoods that reduce the extent to which humans and wildlife rely on the same resources. As discourses, the social sense of 'coexistence' has very different effects than that of the material sense. The Tiger Task Force's report employed the term 'coexistence' in a social sense (see Chapter 1), generally using it in reference to balancing "the livelihood needs of people with the imperatives of conservation" (Narain, et al. 2005:100). In this social sense, 'coexistence' refers to the need to overcome the historical inequalities produced by some conservation practices and find a better fit between the needs of conservation and people's livelihoods. However, the 2006 amendment used 'coexistence' in a material sense. That amendment uses the term in reference to "addressing conflicts of men and wild animals," and "promoting co-existence between wildlife and human activity." This usage, coupled with the 2006 amendment's focus on substituting market opportunities for people's use of forests and making core areas inviolate, suggests a view that sees human and wildlife subsistence needs as inherently incompatible and that promoting coexistence between wildlife and humans activity means separating the two. Such a view aligns with evolutionary arguments that human-wildlife conflict results from interspecies competition over limited resources (e.g. Nyhus 2016), rather than being something that is historically contingent (Margulies and Karanth 2018). In this material sense, 'coexistence' works as an ideology that naturalizes conflicts between humans and wildlife, as well as state organizations' role in mediating those conflicts (Margulies 2018). That is, as it is employed in the 2006 amendment, 'coexistence' does ideological work to narrate the

world in a particular way and set the conditions for how people experience it (West 2016). In their implementation of state capitalist conservation, the NTCA, Tiger Conservation Foundations, and state forest departments help materialize this ideology (cf. Althusser 2014 [1995]) that coexistence in buffer zones can only be achieved by minimizing the extent to which humans and wildlife rely on the same resources. The way that this is done is through linking local livelihoods with outside markets through ecodevelopment.

To be clear, I do not argue that all state wildlife conservation in India follows a state capitalist model. The 2006 amendment to the WPA designated core areas to be managed in accordance with nationalist values, not capitalist exchange-values. Cederlöf and Sivaramakrishnan (2005:6) use the term ecological nationalism to refer to "a condition where both cosmopolitan and nativist versions of nature devotion converge and express themselves as a form of nation-pride in order to become part of processes legitimizing and consolidating a nation." Tiger conservation is an important convergence of these cosmopolitan and nativist views of nature for the Indian state. The same year that Indira Gandhi began Project Tiger, the national animal of India changed from the lion to the tiger, despite the fact that tigers exist elsewhere and Asiatic lions are only found in India. That this symbolic change happened in tandem with large-scale institutional support for tiger conservation meant that tigers became a symbol of national pride, and their successful conservation worked to legitimize the nation-state. This helps explain why the extirpation of Sariska's tigers was such a large political juncture: it threatened the legitimacy of the state's largest wildlife conservation program, and thus chipped away at the legitimacy of the state overall.

This sense of ecological nationalism that was attached to tiger conservation also helps explain why the state did not pursue some of the Tiger Task Force's recommendations. To

strengthen the agriculture-grazing-forest economy or to fit ecodevelopment within institutions designed for village's self-governance would be mean breaking down the hegemonic idea that the state is best suited to advance conservation and development. In contrast, the 2006 amendment expanded the role of the state in both core areas and buffer zones, in a way the reemphasized the state's central role in tiger conservation. That amendment consolidated what had been the core and buffer zones into inviolate Critical Tiger Habitats and renewed the focus on relocating people from these areas. The 2006 amendment also reframed what had been multiple-use areas into buffer zones, where it doubled-down on the role of state organizations in facilitating coexistence. That is, while core zones were set apart from the state capitalist model for buffer zones, tigers in both areas were valued first along the lines of the state's sense of ecological nationalism to bolster its claims to legitimacy. Only in buffer zones was this nationalist value then translated to advance capital accumulation.

In sum, the 2006 amendment envisioned promoting human-wildlife coexistence in buffer zones through a state capitalist model of market-based conservation that both expanded markets and bolstered the state's claims to legitimacy. This relied on using state organizations to promote ecodevelopment activities that link people's livelihoods to markets, while appropriating surplus from wildlife tourism to reproduce wage labor relations. It makes ideological claims about the relationships between people, wildlife, and state organizations, and this ideology is materialized in specific institutional practices that are backed by state power. However, this is an abstract model for conservation that exists only in legislation. I now turn to two case studies that explore how this model was implemented, and what role nonhumans played in articulating local economies and state capitalism.

D. Reproducing Independent Family Enterprises in Melghat

In late September 2016, towards the end of the monsoon season, a friend was driving me through a small stretch of forest separating two villages in the Melghat Tiger Reserve buffer zone. On the side of the road, we saw a group of four or five men shoveling soil from the ground into a trailer attached to the end of a tractor. I did not think much of it at the time, and we kept driving toward our destination. The next day, we returned to the same village and passed by the spot where the men had been digging. This time, a forest department truck and two officers were there measuring the hole that the men had created the previous day. I asked my friend what they were doing, and he said that the men from yesterday had illegally collected soil to make mudbricks that they would then use to construct a house. I asked what would happen if the Forest Department could trace the bricks to the person whose house was under construction. He said nothing would happen, because that particular person is renowned for having a short temper and would fight the forest officers if they tried to stop construction of his house.

Other people in Melghat do not have the same reputation, and things go differently when they are confronted by Forest Department staff. As one person described it, the forest officers go out once every few days to patrol for people cutting wood in the forest. If they find someone, rather than arresting or fining that person, they usually take a bribe either in the form of a chicken or money to buy a chicken, which costs about Rs. 500. People in Melghat use the English word ‘corruption’ largely to refer to institutionalized bribery and abuse of government position for personal gain (cf. Jauregui 2014). To be clear, I never witnessed a forest officer, or any other person, accept or give a bribe, nor do I know the frequency with which bribery happens. However, people in Melghat characterize most forest officers in a very particular way. To them, forest officers do not do their jobs, they just harass people for money.

In this first case study, I show how nonhumans shaped the historical emergence of economic relationships in Melghat that limit the implementation of state capitalist conservation. I argue that crops shaped the independent family enterprises that emerged after Melghat was designated a tiger reserve and set the conditions under which other nonhumans were enrolled in local economies. While these independent family enterprises were incompatible with buffer zone conservation, state organizations' attempt to resolve this incompatibility inadvertently further entrenched it. Within this contradiction, bribery allowed independent family enterprises to maintain access to forest resources, while also appropriating some surplus from farmers. By reproducing each other, independent family enterprises and bribery limited the extent to which state capitalist conservation has been implemented in Melghat.

Between 1973 and 1985, as a large area of Melghat was redesignated from a state forest reserve to a protected area, thousands of people in Melghat transitioned from doing wage labor to working in small-scale independent family enterprises. Prior to 1973, most people worked primarily as wage laborers in the state forest reserves, and farmed for subsidiary needs (Sarwate 1965). However, with the creation of Melghat Tiger Reserve's core area, Gugamal National Park, in 1973 and its buffer zone, the Melghat sanctuary, in 1985, wage labor opportunities for 61 villages were cut off, and people began farming in family units as their primary livelihood strategy (Indurkar and Gogate 1991; Narain, et al. 2005:110). While they gained land rights during the transition, the amount of land titled to them was the amount people used when farming was a subsidiary, not a primary, means of making a living. In other words, the reterritorialization of Melghat to fit the core-buffer-multiple use structure meant that people had to find a way of earning a living on farm plots that were meant only for subsidiary purposes.

In the independent family enterprises that emerged after the creation of the tiger reserve, family members typically perform a variety of unpaid labor activities, including housework, farm labor, family care, and self-provisioning (Gibson-Graham 2006). Currently, these activities are largely divided by gender. In the survey described in Chapter 3, most women said that their mornings consisted of some combination of relieving themselves in the forest, collecting water, bathing, cleaning the house, cooking, taking care of children, and then going out to the farms. They typically stay on the farms – either plowing, planting seeds, or harvesting crops, depending on the season – until the late afternoon, when they come back to do more housework, before sleeping either inside or on *machans*, raised platforms in their fields. Typically, men said that they only farm or graze livestock throughout the day, and they were more likely than women to say that they relax in the evenings and guard crops at night. Aside from farming and crop guarding, both men and women collect forest produce and cut wood, as well as fish in the nearby rivers.

The major political economic changes in Melghat during this time period were not centered in the northern buffer zone area. The growth of tourism industries have mainly been concentrated in areas immediately to the south of the reserve, where two historical forts are situated on the clifftops and offer scenic views of the Deccan plateau below, and to the west, to cater to visitors coming from Madhya Pradesh. Smaller state and private ecotourism resorts have been developed along Maharashtra State Highway 6, which runs east and west through the core area. Beginning in 1999, the state Forest Department began collaborating with local conservation NGOs to relocate villages from Melghat's core area. Most of the villages that relocated moved to beyond the southern boundary of the reserve (Sekar 2016). None were moved to the northern area near the study site. From Highway 6, the northern buffer zone is, to this day, only connected

by winding roads through the forest, many of them unpaved. It is only through recent organized protest (see Chapter 5) that a state transportation bus now reaches this area once a day. Monsoon rains often wash out these roads, and it was only in 2015 that villages in the study area gain access to somewhat reliable electricity. In all, the northern buffer zone remained isolated from many of the development initiatives and political economic changes going on elsewhere in the Melghat region, and more recent economic changes, within the last five to ten years, can mostly be attributed to the social movement described in the next chapter.

These independent family enterprises have largely been shaped by the requirements of crop species, which set the conditions under which other nonhumans are enrolled in local economies. People largely subsist by cultivating crops like rice, corn, soybeans, and sorghum, among others. The centrality of these species to people's livelihoods largely defines how other nonhumans relate to independent family enterprises. The crops require bullocks to pull plows, which in turn require large areas for grazing. Cattle produce dung, which fertilizes crops. Plows require wood from the forest, which is also used for cattle pens, houses, and *machans*, raised platforms in which people protect their crops from animals. In setting the conditions under which nonhumans are enrolled in independent family enterprises, crops structure much of people's economic activity. As shown in the previous chapter, people in Melghat spend the bulk of their time farming, either plowing and cultivating crops during the day, or guarding them at night. Many other economic activities, like cutting wood or tending livestock, ultimately feed back into the production of crops. In these ways, crop species set the conditions under which other nonhumans, like cattle, dung, and trees were enrolled in independent family enterprises and thus shaped the emergence of those enterprises after the creation of the tiger reserve.

Crops do not enroll nonhumans in independent family enterprises equally. Teak was a privileged species before and after the transition from wage labor to independent family enterprises. Because it is highly resistant to rot, insects, fungi, and mildew, wood from teak trees is an ideal construction material (Vyas, et al. 2018). Its durability made it a focal species of scientific forestry (see Chapter 2) and gave it substantial use-value in the emergent independent family enterprises in Melghat. People still use it to construct houses, bed frames, and tools, including farm plows, and the need to cut it influences the spatial and temporal dimensions of people's economic activity (see Chapter 3). In the transition to independent family enterprises, teak became a privileged species, while crop-eating animals became threats. Animals like wild boars, macaques, and langurs seek out crops for their nutritional content (Hill 2018). Reports from across India suggest that animals like these can eat anywhere from INR 200 to 1,000,000 worth of crops per year (Karanth and Kudalkar 2017).[70] In Melghat, people describe how "wild animals come and eat up our crops, destroy our farms," and "come at night and eat corn and jowar crops and run away into the forest." Because of the risks from these animals, people say that they spend their nights in *machans* "to protect crops from being eaten by wild animals" (see Chapter 3). The centrality of crops to independent family enterprises means that these animals, which had been unimportant to people's work as wage laborers, became threats to the new livelihood strategies. In this way, the increased importance of crops created a hierarchy of how nonhumans related to independent family enterprises that is reflected in people's daily economic activity.

Thus, the independent family enterprises that arose after wage labor was stopped in Melghat were shaped by the physical properties and growth requirements of crop species. Crops

[70] USD 2.71 to 13,549

were surely functional to independent family enterprises, but they also shaped the form that independent family enterprises assumed by enrolling nonhumans in different ways. Independent family enterprises were not destined to form after wage labor was restricted. They emerged from the multispecies relationships between humans, crops, cattle, teak, and other nonhumans.

The independent family enterprises that emerged in relation to nonhumans soon became incompatible with buffer zone conservation in Melghat. In order to grow enough crops to make independent family enterprises viable, people had to illegally expand their farmland beyond the small amount of land originally titled to them and into the forest. Both the Forest Department and many people living in Melghat see such 'encroachment' as harmful to forests and wildlife. The current Tiger Conservation Plan for the Melghat Buffer Zone lists "encroachments for agricultural purposes on wildlife habitats and forest lands by local people" as the primary threat to wildlife in the buffer zone (Government of Maharashtra 2015a:13). While conducting surveys in Melghat, many people mentioned to me how such 'encroachments' were necessary for their livelihoods but detrimental to forests and wildlife. One woman said that, "since the forest has been cleared, there are no animals…there isn't even forest around our farm anymore. Our farm is surrounded by other farms." Another explained that she agreed with the Forest Department that 'encroachment' was harmful, but that "our only problem is we need more farmland." One man echoed these sentiments but emphasized how the negative effects of encroachment only became a problem after the creation of the tiger reserve. He said, "Encroachment is wrong. I have realized that now…[but] since the [tiger] project has come, people have lost their employment. So, wherever there is forest area, there is still encroachment, and wherever there is teak harvesting, there is less encroachment." Teak harvesting, which employs wage labor, still occurs in the forests just outside Melghat Tiger Reserve. By attributing a rise in 'encroachment' to

restrictions on wage labor, this man suggested that the creation of the tiger reserve also created the incompatibility between local livelihoods and buffer zone conservation.

State organizations have made several attempts to address this incompatibility, but, by their own description, these attempts have largely failed. Though 'encroachment' is illegal, the state government has on several occasions given people titles to 'encroached' lands (Government of Maharashtra 2015a:14). However, as indicated in the Melghat Buffer Zone's Tiger Conservation Plan, the Forest Department suggests that doing so has led "All the encroachers [to] have [a] strong belief that one day the Govt. would distribute the encroached forest land to them" (Government of Maharashtra 2015a:14). In 1994, the state government, perceiving the incompatibility of including 61 villages in a buffer zone, reclassified 526.60 sq. km. of the buffer zone as a multiple-use area. This would have given 39 villages the ability to collect non-timber forest produce for commercial use. In central India, some of the major non-timber forest products include tendu leaves (*Diospyros melanoxylon*; used to wrap *beedi* cigarettes), mahua flowers (used to distill alcohol), and bamboo (Lele, et al. 2010). These are either sold to wrap *beedi* cigarettes, distilBut after an environmental group sued, arguing that such collection would destroy the forest, the Government of Maharashtra banned commercial extraction of forest resources in the multiple-use area (Narain, et al. 2005:110). The Tiger Task Force indicated that this ban "pushed the people in the 39 villages to extract forest produce illegally or by bribing forest guards" (Narain, et al. 2005:110). Thus, according to reports by different state organizations, attempts to resolve the incompatibility between independent family enterprises and buffer zone conservation have led people to believe that they will receive titles to 'encroached' lands and have strengthened the ties between 'encroachment' and bribery.

Thus, independent family enterprises exist in a state of contradiction. Centered around crop production, independent family enterprises must expand into forests to be viable. Though doing so is illegal, efforts to address the incompatibility of independent family enterprises and buffer zone conservation through retrospective legalization have inadvertently entrenched these enterprises as the main livelihood opportunity available to people. As I will now show, within this contradiction, systems of bribery have arisen that allow people to maintain access to forest resources, and the mutual reproduction of independent family enterprises and bribery limits the implementation of state capitalist conservation.

Bribery operates as a pseudo-gift economy. In gift economies, people give things to one another seemingly out of generosity, but in doing so create obligations that must be reciprocated (Mauss 1967). This misrecognition between the generous act of giving and the binding obligations that result is the defining feature of gift economies (Bourdieu 1977). In this system, individuals control surplus by building social capital: the more one can demonstrate that access to their gift-giving networks will result in wider benefits for others, the more favorable gifts they will receive from others (Bell 1991). Bribery, as I use it here, bears certain similarities to gift exchange, but also significant differences. The person accepting or demanding the bribe may see it as an immediate reciprocal exchange. For example, a police officer might accept money in exchange for not arresting someone or further fining someone. However, the difference between gifts and bribes is that where gifts entail a misrecognition that giving creates binding social obligations and bribes entail a clear recognition that giving involves no further obligation of either party (Smart 1993). That is, in bribery, individuals leverage their position to appropriate surplus for private gain, rather than build social capital to bring in more surplus from gift-giving networks.

Bribery is often characterized as a type of corruption, which is a major political issue in contemporary India. Though a traveling concept (Muir and Gupta 2018), corruption often, but not always (Jauregui 2014), signifies an abuse of public office for private gain (Gupta 1995). In India, the term 'corruption' has been used in reference to activities like government agencies giving better marketing opportunities to rich farmers in exchange for bribes (Jeffrey 2002), hawkers paying officials to get back their confiscated property (Anjaria 2011), and government officials collaborating with the mafia (Witsoe 2011). The term 'corruption' has gained widespread attention in public discourse through the passage of the 2005 Right to Information Act and the 2011 protests in support of an ombudsman bill to address corruption in public administration (Sengupta 2014; Sharma 2018). State forest departments are also often cited as corrupt institutions, in which bribery and embezzlement commonly shape people's access to certain forest resources (Fleischman 2016; Robbins 2000).

In Melghat, while forest officers are not the only people associated with corruption, they do have a specific reputation for harassing people to give bribes. Again, I did not directly observe bribery taking place. However, I had numerous conversations with people who reported having given bribes or having successfully avoided giving bribes. For instance, a wood worker told me that a forest officer would harass him for a bribe, rather than arrest him, if the officer caught him working with wood from the forest. Another person explained how it was only younger, more educated people in Melghat who knew that it was possible to lodge complaints when officials tried to take bribes, while others just assumed that they had to pay bribes to officers. As I indicated at the beginning of this case study, people describe forest officers as patrolling every few days for people cutting wood from the forest and accepting bribes equal to the price of a chicken in exchange for allowing them to continue cutting wood. Aside from forest

officers, people in Melghat have accused teachers of taking money meant for scholarships or school supplies, and other government bureaucrats for embezzling money meant to pay the few people who are still hired for seasonal labor. A leader of a social movement working, in part, against corruption (see Chapter 5) suggested that Melghat's roads, water infrastructure, and electrical facilities are in a state of disrepair because corrupt local government employees do not carry out their official duties to the extent that he thinks they should.

One man's encounter with Forest Department staff illustrates how bribery is reproduced through the contradiction between independent family enterprises and buffer zone conservation. This man lives in a house that is situated on top of a hill. That hill is surrounded by farmland on all sides and has around twenty trees growing on it. According to this man, almost twenty years ago, he was approached by a Forest Department Range Officer and his deputy. They accused him of encroaching on the forest by living on a hill that had trees on it. Instead of paying a bribe, as the man thought the two officers expected, he protested, saying that his family had lived in this house for generations. In response, the Range Officer and his deputy destroyed the man's plow and arrested him. The legal documents that this man had showed that he had been indicted for encroaching on two square kilometers of forest land, which is equal to about half of that village's entire area of farmland. The man said he had been sent to jail and to court several times since then, and has paid numerous bribes, which did nothing to resolve the issue.

This man's encounter with Forest Department staff demonstrates several points. It shows how the contradiction between independent family enterprises and buffer zone conservation, embodied in the issue of 'encroachment' reproduces bribery. This issue provides a frame through which bribery can thrive in spaces where it otherwise might not, because what counts as 'encroachment' tends to be defined by the Forest Department staff at hand. This meant that, even

where encroachment may not have happened, people can still get accused of it, and are pressured to give bribes. Instances in which people refuse to give bribes demonstrate the coercive nature of bribes, as the same people asking for them are also backed by state power. When someone refuses to give a bribe, a government official can always fall back on their formal role as an arm of the state and enforce legal regulations. However, doing so is less desirable for both parties, as the person asking for a bribe does not receive it, and the person asked to give a bribe risks going to jail.

By structuring incentives in this way, bribery allows independent family enterprises to maintain access to forest resources. To be viable, independent family enterprises must illegally expand their farmlands into forested areas. This illegality presents an opportunity for forest officers to privately benefit from their position by taking bribes from those they catch illegally felling trees. While people try to avoid giving bribes whenever possible, giving bribes allows people to expand their farmland and access other forest resources as necessary. The embezzlement of funds for development projects, like road construction, limits access to other markets and livelihood options, leaving independent family enterprises as one of the few available means of making a living. In these ways, bribery and embezzlement reproduce independent family enterprises, allowing them to be viable in a state of limbo, while also limiting other livelihood opportunities.

This mutual reproduction of bribery and independent family enterprises hinders the implementation of state capitalist conservation. As outlined in the 2006 amendment to the Wildlife Protection Act and as reflected in the Melghat Buffer Zone's Tiger Conservation Plan, state capitalist conservation aims to leverage the state's ability to redistribute surplus in order to increase market opportunities that will substitute for people's use of natural resources. When I

asked people about ecodevelopment committees or wildlife tourism, most said that the committees never meet and that there are no opportunities for wildlife tourism in the buffer zone. Several local forest department staff members seemed to believe that people in Melghat do not deserve ecodevelopment and that they are all going to be relocated anyway (see Chapter 5). In other words, the state capitalist conservation model described in the 2006 amendment has largely not been implemented in Melghat. Independent family enterprises, shaped by the requirements of crop species, depend on the use of forest resources and the expansion of farmland into forests to be viable. Bribery reproduces independent family enterprises while also stifling access to other livelihood options that state capitalist conservation might seek to establish. Bribes allow for some surplus to be appropriated from independent family enterprises, disincentivizing officials to work toward establishing alternative livelihood options for people that may threaten such appropriation. Thus, state capitalist conservation has no point at which to articulate with local economies and as a result has not been implemented in a significant way.

While surely bribery and independent family enterprises are functional to each other, their articulation is a product of multiple historical contingencies. The emergence of independent family enterprises was contingent on the physical properties and requirements of multiple nonhumans enrolled in hierarchical economic relationships. While crop species set the conditions under which nonhumans are enrolled in independent family enterprises, whether privileged like teak or marginalized like crop-eating animals, relationships with all these nonhumans shaped people's economic activity and the form that independent family enterprises took. Contingent on relationships with nonhumans, independent family enterprises became incompatible with buffer zone conservation because of their need to expand into forests. This incompatibility was inadvertently further entrenched by state organizations' efforts to address it. And, in this

contradiction, bribery became a means for people to maintain their access to natural resources, while also limiting other livelihood options, including state capitalist conservation. All these steps are contingencies in the historical process through which independent family enterprises and bribery came to reproduce each other and limit state capitalist conservation in Melghat.

In the next chapter, I return to the Melghat buffer zone to show how people are working to bring wage labor back to Melghat and stop bribery. But first, I turn to Tadoba-Andhari, where relationships between humans and nonhumans have led to the rapid proliferation of state capitalist conservation.

E. Tigers, Bamboo, and the Transition to State Capitalism in Tadoba-Andhari

I met Rujul the first time I got off the bus in the Tadoba-Andhari Buffer Zone. He works with an NGO based in Nagpur but lives in the buffer zone. He showed me to my room – a stuffy accommodation attached to two other rooms that the owner rents to tourists. I put down my things, and since it was around 4pm, Rujul drove me to get chai from the nearby state-operated wildlife tourism resort. On our way back, we drove slowly through town. In contrast to the Melghat Buffer Zone, most houses in this village were made of concrete. Many advertised tourist homestays, while others had Maruti Suzuki Gypsies in front of them, waiting to be filled with tourists. Rujul explained that although the Gypsies are expensive, the drivers, who are unionized, easily recover the costs after a few years of driving tourists. Two hotels were under construction in the village, both over three stories tall. Towards the main gate leading into the reserve, private wildlife tourism resorts lined the paved roads, along which workers were adding brick sidewalks. At least every quarter kilometer along the main road bordering the reserve, another tourism resort was either already hosting guests or under construction. The resorts were separated by a

mixed landscape of forests and farms, paved and unpaved roads, and traffic signs showing the outline of a tiger, warning drivers of wildlife crossings.

Rujul told me that about half the people in his village are employed in the tourism sector, while the other half work as farm laborers, who are employed to work on other people's land. Only two of the people I spoke with said that they actually own farmland. Neither of them had any formal education, they were not of the same caste, and did not report incomes that were significantly different from other people in the village. Most of the other people I spoke with said that they work on private farms when the owner announces that there is work available. The official Tiger Conservation Plan for the Tadoba-Andhari buffer zone describes a similar pattern, in that there are private farms, but that "the majority of people are agricultural labourers" (Government of Maharashtra 2016:19). This concentration of much of the land in the hands of few people likely stems from the fact that this area used to be organized under the British's *zamindari* system of land revenue, in which they granted landlords control of significant areas and taxed them, rather than granting land to individuals and taxing them directly (Satya 1998). While these landlord systems were largely abolished in independent India, land was not redistributed, leaving some people who owned most of the land and many others who owned little land (Banerjee and Iyer 2005). People who work in farms do things like plow fields, pick cotton or food crops, like soybeans, and weed the fields. Typically, farm owners will call five or six people per day to work in their fields. More women reported being farm laborers than men. As I mentioned in the previous chapter, men's economic activities tended to be more diverse than women, and they tended to be the ones who went into the forest to collect bamboo when they could not find work elsewhere.

Most of the people I spoke to said that they were wage laborers and would either work in other people's farms or in resorts, depending on the season and job availability. Resorts often hire people for construction, cleaning, watch duties, etc., but the availability of this work often declines in the monsoon season, when the core area of Tadoba-Andhari is closed to tourists. Aside from working as farm laborers or in some part of the wildlife tourism sector, the other way people earn income is through making and selling woven bamboo mats, which can be used as walls or fences around people's houses. To do this, people go into the forest in the morning, before it gets too hot, cut bamboo, bring it back to the village, split the stalks, and weave them together into rectangular mats, which they then sell. Whereas the wildlife tourism sector and farm labor involve people selling their labor power either to private companies, state enterprises and/or tourists, bamboo mat construction involves people selling products of their own making. These three ways of making a living form the bulk of the local economy in the Tadoba-Andhari Buffer Zone.

In this case study, I show the process through which state capitalist conservation and its articulation with other economic practices arose in the Tadoba-Andhari buffer zone and argue that this process was largely contingent on contradictory roles that bamboo and tigers play with regards to bamboo collectors. Bamboo provides use-values to collectors, while tigers threaten them. State capitalist conservation resolves this contradiction by generating value from the presence of tigers and removing bamboo from local economies. In shaping these local economies, the value relationships of tigers and bamboo have been instrumental in the rise of state capitalist conservation, which is steadily replacing bamboo collection and becoming the dominant mode of production in the buffer zone.

Conservation has a much longer history in Tadoba-Andhari than in Melghat. The majority of the area that is now the buffer zone was declared a reserved forest between 1889 and 1895 (Government of Maharashtra 2016). In 1905, these forests were opened as shooting blocks where game hunting was allowed with special permits. In 1935, the area around Tadoba Lake was declared a sanctuary for wild animals (Government of Maharashtra 2016; Nagendra, et al. 2006), and was used for hunting both by upper-class Indians and by foreign dignitaries.[71] In 1955, this same area was declared a National Park under the Madhya Pradesh National Parks Act, and in 1986, the forests to the south were notified as the Andhari Wildlife Sanctuary. The two protected areas were joined together as Tadoba-Andhari Tiger Reserve in 1995. Thus, while Tadoba-Andhari was declared a tiger reserve more recently than Melghat, the protection of wildlife habitat, first for hunting and then for conservation, has a much longer history in Tadoba-Andhari.

Before and after the time that the tiger reserve was established, the area went through several political economic changes. In 1983, the Erai reservoir was created to store water for the Chandrapur Super Thermal Power Station. That reservoir flooded a large part of the area to the west of what would become the buffer zone, but also opened opportunities for commercial fishing, which employs laborers on a contract basis (Government of Maharashtra 2016). Between 1989 and 2001, the western buffer zone became better connected to nearby local and regional markets, which led some people to sell illegally harvested resources from the park to middlemen, and caused more localized forest degradation in this area (Nagendra, et al. 2006). In 1992, the people living inside the park were barred from collecting minor forest produce (Ghate 2005), and in the late 1990s, the Forest Department began focusing on relocating these villages outside the

[71] Letter from Shri M.P. Dwivedi, Deputy Commissioner, Chanda to Shri Lakhpat Rai, IFS, Chief Conservator of Forests, Madhya Pradesh, Nagpur.

park (Ostrom and Nagendra 2006). Before the passage of the 2006 amendment to the WPA, there were no tourism facilities in the buffer zone and, according to the reserve managers, most ecodevelopment projects had failed (Government of Maharashtra 2016). Thus, prior to the establishment of state capitalist conservation, people's access to markets tended to increase in ways that were contrary to the goals of conservation.

The current Tiger Conservation Plan for the Tadoba-Andhari buffer zone outlines an agenda for state capitalist conservation very similar to that described in the 2006 amendment to the Wildlife Protection Act. One of its objectives is to implement "ecodevelopmental activities for reducing resources dependency [*sic*] of local people on surrounding forests," (Government of Maharashtra 2016:21) which reflects the ideology that coexistence can only be achieved by minimizing the extent to which humans and wildlife rely on the same resources. However, the Tiger Conservation Plan acknowledges that a major problem facing ecodevelopment is lack of funds. As per the 2006 amendment, the solution to this problem was to use money from the Tadoba-Andhari Tiger Conservation Foundation to fund ecodevelopment. The Tiger Conservation Foundation, in turn, would receive money from wildlife tourism entry fees. In this way, by using a state organization to increase market opportunities as a substitute for the use of natural resources, Tadoba-Andhari's Tiger Conservation Plan reflected the state capitalist conservation model of the 2006 amendment.

To implement this state capitalist model, the Tiger Conservation Plan lays out a plan to reorganize the reserve's administrative structure in a way that allows funds to be transferred from the Tiger Conservation Foundation to the ecodevelopment committees. It proposed constituting a federation of ecodevelopment committees that would coordinate with the executive committee of the Tiger Conservation Foundation. Ecodevelopment committees would then be "actively

involved in the decision making process related to development of [wildlife tourism] sites, infrastructure, fee structure etc. [*sic*]" (Government of Maharashtra 2016:29). In this way, the relationship between the Tiger Conservation Foundation and the ecodevelopment committees would become self-perpetuating: tourism revenue would go from the Tiger Conservation Foundation to ecodevelopment committees, which would further develop tourism infrastructure to attract more tourism revenue.

A senior official in the Maharashtra Forest Department explained to me how they set up the ecodevelopment committees and implemented the Tiger Conservation Plan. He said that ecodevelopment committees were set up between 2010 and 2012, as the area was transferred from the Forest Wing to the Wildlife Wing of the Forest Department. These committees are made up of members of the *Gram Panchayat* and beat guards, the lowest position in the Forest Department, tasked with monitoring small areas of forest, or beats. As tourism was increasing around that time, revenue began to flow from the Tiger Conservation Foundation to the ecodevelopment committees. Through the ecodevelopment committees, the Forest Department began focusing on reducing people's use of forest resources in two ways: distributing liquid petroleum gas (LPG) cookstoves and building toilets. People often gathered wood to burn for cooking or went into the forest to relieve themselves. Under ecodevelopment, each family was allotted funds for one LPG cylinder per month, along with a backup cylinder, and a distributor was hired to visit each village weekly to deliver new cylinders and remove old ones. This program worked in tandem with the central government's Ujjwala program to promote the use of natural gas across India. Ecodevelopment has also aligned with the national Swachh Bharat (Clean India) Mission to construct toilets in every house. Constructing toilets to reduce open defecation has been a key agenda item of Prime Minister Narendra Modi's government. Through

a combination of Swachh Bharat campaign and ecodevelopment, most households in the Tadoba-Andhari Buffer Zone now have toilets. Aside from cookstove distribution and toilet construction, the senior Forest Department official explained that the ecodevelopment committee largely set their own agendas. One village had set up a boating experience for tourists on the Irai reservoir. Others have constructed *Gram Panchayat* offices, roads, and developed tourist infrastructure. In pursuing these activities, the Forest Department offers advice and training, but people run their own facilities.

The success of state capitalist conservation hinged on its ability to resolve the contradictory roles of tigers and bamboos. Because it is both durable and somewhat flexible, bamboo is an ideal construction material for weaving together mats. The importance of bamboo to people's livelihoods became immediately apparent to me upon entering a village situated close to the forest. Outside almost every other house in the village, someone was sitting and either splitting bamboo stalks lengthwise with an axe or weaving together different pieces into a larger mat. Most houses had small fences around them, usually with door made of these mats. Additionally, large piles of bamboo were scattered across the village, waiting to be split and woven.

As I indicated in the previous chapter, the people who go to collect bamboo almost always do so in the morning and are almost always men. Bamboo collection complements people's other livelihood activities, like farming or working in resorts. People said that they collect bamboo and weave it into mats when they cannot find these wage labor opportunities, either because all the jobs are taken, or because they are not available, like in the monsoon when Tadoba-Andhari is closed to tourism. Many people said that they often travel up to two kilometers into the forest to collect bamboo and that they usually do so in groups of five to

twenty-five. These groups return before noon, and then spend their afternoons splitting and weaving the bamboo stalks, tasks that are almost done exclusively by men. More than half of the men I interviewed in the previous chapter said that they spend their afternoons working on bamboo mats. Once completed these mats are either used by the person who made them or sold to others.

However, the collection of bamboo from the forest puts these men at a double risk. On the one hand, they risk encounters with tigers and other dangerous animals in places where help is far away. Many people told me that they encounter tigers while collecting bamboo in the forest, sometimes as often as three or four times a month. Most often, people reported only seeing pugmarks while going into the forest. However, others reported that tigers would follow them while they were in the forest. One man said that when they do see tigers, it is often because tigers are following them through the jungle. He said "it's behind us. When we finished cutting bamboo and leave, the tiger often comes and digs at the ground where we were." There were also some specific places and times that bamboo collectors said they avoided in the jungle. Many people mentioned that they often avoided the Teli River, because they believed that tigers often came there to drink the water. While bamboo collectors only went to the forest in the morning, seasonality also affected their ability to do so. One man also said that "When the forest is green, we can't even go to the jungle in the morning because of the fear from tigers." Additionally, while making the digital sketch maps, many people identified the same areas when indicating where they go to collect bamboo and where tigers are. Several people also hinted at incident that happened the previous February, when one man was killed in the forest by a tiger. They did not describe much about what happened, but referenced the event to describe the kind of risk that going into the forest brings.

People do travel in groups specifically to intimidate any animals that they might come across. One man described how, when his group encountered a tiger while collecting bamboo, "All the people present came together and start making a racket to scare it away." This tactic seems to usually work, but one man said that his group had to strike a tigress with rocks to get it to leave when they came across it and three cubs in the forest. While the people I spoke to in the last chapter did not report significantly different wildlife encounters than those who farmed or stayed in the villages, most of the tiger attacks on people that have been reported in the Tadoba-Andhari landscape happen when people are collecting minor forest produce like bamboo (Dhanwatey, et al. 2013) and news stories about bamboo collectors being attacked by tigers are not uncommon.[72] Thus, tigers are a direct threat to those whose economies revolve around bamboo collection.

On the other hand, when men enter the forest to collect bamboo, they are also at risk of being caught by Forest Department personnel. One reason men said that they collect bamboo in the morning is so that they can get what they need before Forest Department staff begin their patrols. When people are caught, which has happened, people said that the Forest Officers either take them "right to jail" or that they "throw all [the bamboo] away." As I indicated in the last chapter, this worry about being caught by Forest Officers was one reason why many more people in Tadoba-Andhari chose not to take GPS units into the forest. They were worried that the data would be linked back to them and incriminate them in some illegal activity. Thus, bamboo collection, while central to many people's livelihoods, puts people at risk both from tigers and from Forest Officers.

[72] TNN (2017) "Tiger attack on bamboo feller inside TATR." *Times of India*, 13 November 2017. Accessed 10 October 2018. https://timesofindia.indiatimes.com/city/nagpur/tiger-attack-on-bamboo-feller-inside-tatr/articleshow/61619622.cms.

State capitalism conservation resolves these two contradictions of bamboo collection. Tigers are central to the production of value in wildlife tourism. Tadoba-Andhari's high density of wildlife, relatively easy terrain, and accessibility from Nagpur bring in thousands of tourists each year. Tigers are the main attraction in Tadoba-Andhari, but tourists also frequently see leopards (*Panthera pardus*), wild dogs (dholes, *Cuon alpinus*), gaur (Indian bison, *Bos gaurus*), nilgai (blue bull, *Boselaphus tragocamelus*), chital (spotted deer, *Axis axis*), among others. The habituation of these animals to vehicles allows them to become more viewable (Higham and Shelton 2011; Knight 2009). For example, Margulies and Bersaglio (2018) report on a tiger that used tourist jeeps as cover for stalking prey. People in Tadoba-Andhari made similar reports of animals being habituated to, or at least tolerant of, vehicles, and numerous videos posted online show tigers in Tadoba-Andhari showing little concern for tourist vehicles. One man described to me how, when driving home at night, he rounded a corner and found a tiger sitting in the middle of the road. He ended up waiting for over half an hour because the tiger would not move. I and another person had a similar encounter with a nilgai near the side of the road, which paid us little attention as we watched it for more than five minutes from our motorcycle. When viewed through the cultural lens of the tourist (Vasan 2018), encounters like these produce value. The specific bodily characteristics and habits of nonhumans help constitute value generating encounters (Barua 2016; Haraway 2008). It is through encounters such as these that tigers and other wildlife help produce value in wildlife tourism.

By performing these two economic roles, being threats to bamboo collectors and producing value in wildlife tourism, tigers helped shape the local economies of Tadoba-Andhari. Many people now see working for wages in wildlife tourism as preferable to collecting bamboo. As one woman put it, "there are those people who want to get employed to work in a resort. But

those who aren't able to, it is important for them to go into the jungle, no?" During another conversation, while someone was speaking of the risk of encountering tigers when going into the jungle, another woman chimed in and said "It is jungle. We need to fill our stomachs. There is no work. What to do?" That is, knowing the risk posed by wildlife, many people would prefer not to go into the jungle, where they are threatened by tigers, and instead work in wildlife tourism, where value is produced by them. Thus, by threatening one economic strategy and benefitting another, tigers helped accelerate the rise of wildlife tourism over bamboo collection in Tadoba-Andhari.

However, state capitalist conservation in Tadoba-Andhari is already starting to show signs of strain. Just after my fieldwork ended, Avinash Prabhune, a Right to Information (RTI) activist, filed a Public Interest Litigation (PIL)[73] against the Maharashtra State Forest Department, arguing that the number of tourist vehicles it allowed into Tadoba-Andhari Tiger Reserve was beyond the approved limit stated in the Tiger Conservation Plan. The National Tiger Conservation Authority (NTCA) admitted that an excessive number of VIP tourist vehicles had entered the park and pledged to put forth new guidelines for managing the number of tourists entering Tadoba-Andhari Tiger Reserve.[74] In response to the NTCA's move, two sarpanches (heads of Gram Panchayats), two resort owners, and the secretary of the Tadoba Gypsy Driver's Union submitted a petition stating that any curb to tourism would negatively affect their

[73] Public Interest Litigation (PIL) is a legal action that any individual or group can file to the Indian Supreme Court, state High Courts, or judicial magistrates when they feel that the public good is being undermined by some government action. The individuals or groups do not have to show personal harm, but rather argue a case for harm to the public interest.

[74] Pinjarkar, Vijay (2017) "NTCA admits Tadoba violated carrying capacity" *Times of India*, 8 December 2017. Accessed 10 October 2018. https://timesofindia.indiatimes.com/city/nagpur/ntca-admits-tadoba-violated-carrying-capacity/articleshow/61971585.cms.

livelihoods.[75] While the PIL is still going through the courts, regardless of its outcome, the negative reaction from this group in Tadoba-Andhari demonstrates how central wildlife tourism has become to local economies in the buffer zone. If wildlife tourism is meant to substitute for everyone's use of natural resources, as both the Forest Department and many people living in Tadoba-Andhari seem to want it to, it must continue to grow, which necessitates more tourist encounters with wildlife. If the bamboo blossoms within the next few years, more people will likely come to depend on tourism, which, if it is able to accommodate them, will further exacerbate pressures on wildlife to produce encounter value.

State capitalist conservation has arisen rapidly in the Tadoba-Andhari buffer zone. This is in no small part due to its ability to resolve the contradiction that tigers and bamboo pose for bamboo collectors. In this way, tigers and bamboo are not so much functional to different economic systems as much as they shape those economic systems and their articulation with each other.

F. The Histories and Possible Futures of Coexistence

In this chapter, I have argued that a historical approach to the articulation of modes of production can illuminate how nonhumans shape the implementation of market-based conservation. State organizations in India aim to promote human-wildlife coexistence in protected area buffer zones through a state capitalist model of market-based conservation. In the buffer zone of Melghat Tiger Reserve, this model has struggled to gain traction, in part, because nonhumans shaped independent family enterprises in a way that brought them into contradiction with buffer zone conservation. This contradiction was resolved, in part, by systems of bribery,

[75] Pinjarkar, Vijay (2018) "Don't hit our livelihood: Tadoba guides, resort owners in HC." *Times of India*, 18 August 2018. Accessed 10 October 2018. https://timesofindia.indiatimes.com/city/nagpur/dont-hit-our-livelihood-tadoba-guides-resort-owners-in-hc/articleshow/65445532.cms.

which stifled the implementation of conservation. In the buffer zone of Tadoba-Andhari Tiger Reserve, tigers simultaneously threaten bamboo collection and help produce value in wildlife tourism. These dual roles have drawn people away from bamboo collection and toward state capitalist wildlife tourism, which could become one of the only opportunities to earn a livelihood, should the bamboo blossom and cut off all bamboo collection.

In arguing that nonhumans shape the articulation of modes of production, my aim is to demonstrate that the economic roles of nonhumans are not only defined by dominant modes of production but are active in the relationships that lead some modes of production to being dominant over others. The neoliberal natures literature often focuses on the restructuring of nature under the capitalist ecological regime (Heynen and Robbins 2005). This literature does a good job of highlighting how nonhumans are exploited under capitalism and enrolled in hierarchies according to how their bodily characteristics and habits relate to the production value (Collard and Dempsey 2017; Kay and Kenney-Lazar 2017). However, it reproduces the tendency of functionalist approaches to the articulation of modes of production to understand the restructuring of the world to serve a dominant mode of production. The neoliberal natures literature does little to understand the role of nonhumans in giving rise to capitalism as the dominant mode of production. Here, I contrast Melghat and Tadoba-Andhari to show how the implementation of state capitalist conservation is contingent on specific multispecies relationships. In doing so, I suggest that nonhumans have a role in shaping how different economic systems arise and interact. In Melghat, state capitalism was stifled by the relationship between bribery and independent family enterprises, the latter of which was particularly influenced by the needs of crop species. In Tadoba-Andhari, state capitalism has expanded quickly, in part because tigers play such different roles in bamboo collection than in wildlife

tourism. In other words, far from only being hierarchicalized by modes of production, nonhumans help produce the hierarchies between modes of production that determine which is dominant among others.

I do not, however, want to suggest that functional and historical perspectives to the articulation of modes of production are mutually exclusive. Showing the process through which modes of production come to articulate with one another does not dismiss the possibility that a dominant mode of production structures elements of other modes of production in order to reproduce itself. Indeed, tigers in Tadoba-Andhari do help reproduce state capitalism by producing value that is then appropriated by state capitalist organizations. But, as I have argued, they also helped give rise to state capitalism in Tadoba-Andhari in the first place. In other words, functional and historical perspectives approach the same issue from different angles. Functional perspectives are ideal for understanding the systems of exploitation produced by the articulation of modes of production, and historical perspectives are ideal for understanding how modes of production came to be articulated. The former highlights exploitation, while the second highlights contingency. Both are necessary to fully understand the relationships between economic and ecological systems.

This chapter highlights limits to market-based conservation, as well as limits to critiques of it. Market-based wildlife conservation begins with the assumption that wildlife are disconnected from local economies if they do not generate value for local economies. This assumption, which has been at the center of critiques of market-based conservation (Büscher, et al. 2012), negates the historical interdependence and diversity of economic and ecological systems. By understanding economic and ecological systems as products of multispecies relationships, market-based wildlife conservation looks less like an effort to achieve a win-win

for wildlife and people's incomes, and more like a rupturing of the historical metabolism through which humans and nonhumans have defined each other (see Chapter 2). However, critiques of market-based conservation are also limited by their focus on this assumption. Market-based conservation rarely operates in isolation according to its own assumptions (e.g. McElwee, et al. 2014). By focusing on the ideologies and assumptions of market-based conservation, critiques often miss out on the other forces that shape market-based conservation during its implementation. That is, the practice of market-based conservation is rarely a perfect mirror of the theory of market-based conservation. By not understanding the non-market forces that reshape market-based conservation, critiques reinforce the notion that capitalism bends everything to its will and miss out on the relationships that shape and have shaped capitalism historically (cf. Bradby 1980).

Rujul may have been right that income from wildlife tourism has made people in Tadoba-Andhari more tolerant of tigers. But this does not mean that market-based wildlife conservation can 'scale up' and restructure every economy so that wildlife produce value. Many conservationists are increasingly concerned with finding ways to 'scale up' their initiatives (e.g. Edgar, et al. 2016; Shwartz, et al. 2017; Steenweg, et al. 2017). To 'scale up' an initiative typically means to expand it without changing it (Tsing 2012b). However, as Anna Tsing notes, a scalable project necessarily excludes any friction-causing biological or cultural diversity from its scalable designs (Tsing 2012b; Tsing 2015). This friction does not mean that scalability is impossible, but that scalability itself is historically contingent. As I have shown, the ability of state capitalism to promote human-wildlife coexistence across India relies on its ability to make certain articulations with local economies. These articulations mean that the ability of market-based conservation to expand without changing its form – its scalability – is contingent on the

multispecies histories of the different places it aims to expand in. These histories load the dice in favor of different possible futures (Donham 1999:138), influencing what project do and do not become scalable, and the extent to which they can be implemented in different contexts.

If this chapter focused on how present circumstances are "found, given, and transmitted from the past" (Marx 1978 [1852]:595), then the next chapter explores how, given these circumstances, people in Melghat are making their own history and shaping the future of human-wildlife interactions.

CHAPTER 5

MORAL ECONOMIES OF COEXISTENCE[76]

F. Introduction

"What's the price of this?" I asked.

Sonam held up two fingers and mouthed, "Do." Two hundred rupees.

Escaping the afternoon sun with some likeminded individuals, I sat on the patio of Sonam's house, watching her husband, Tisumar, turn two chunks of teak into a rolling board and pin used to make *roti*. For the rolling board, he began by drawing outlines of the feet onto a disc-shaped chunk. Hitting a chisel with the backside of an axe blade, he chipped away large pieces from between those outlines, leaving the feet protruding from the board. He switched to a smaller chisel for finer detailing. After the board had taken the well-known flat round shape with three legs, he began smoothing out his work with a metal file.

Just before he finished, he abruptly stopped and placed the wood and tools against the inside of the patio's thigh-high wall. Tisumar reached for the piece of wood in my hands, which was to become the rolling pin, and placed it next to the others, out of sight from the main road. He got up, wandered into the front yard, and leaned from left to right with arms raised, stretching

[76] This chapter contains material that my colleagues and I previously published as:
Read DJ, Mawaskar R, and Habib B (2019) Translating Legitimacy: Perspectives on institutions for human-wildlife coexistence in central India. *Geoforum* 101:38-48. doi: 10.1016/j.geoforum.2019.02.027.
In accordance with the publishing agreement with Elsevier, I retain the right to publish this material as part of my dissertation.

his sides. A jeep drove by. After it passed, he leisurely returned to work, filed the rolling board some more, and passed it to his son to finish.

"Who was in that vehicle?" I asked.

"Forest officer" he replied.

"What would they do if they saw you?"

"Humph!" a laugh, grunted through his nose, was his only reply.

A little while later, another man, Dhaval, joined us, along with his son and a drunk guy from the village. Sonam spent considerable time pulling at the intoxicated man's arm, trying to drag him away from the house. But after some struggle, she gave up and offered us all tea. I hadn't spoken to Dhaval about my research yet, and as I explained that part of it was about understanding their ideas for improving wildlife conservation, he joked, "There shouldn't be any forest officers." I added that to the list of ideas I was compiling, which Dhaval then looked at. He read aloud another entry on the list, "Forest officers should follow the regulations better than they do."

Without looking up from his work, Tisumar replied, "Ha, we'd die," and returned to filing the rolling pin.

Tisumar and Dhaval's opinions about forest officers in no way represent those of everyone in Melghat. But their belief that conservation regulations are unacceptable, should not have to be followed, and are not legitimate, is widely shared. This gap between the institutionalized practices of enforcing conservation regulations and people's beliefs about the legitimacy of those practices poses problems both for people who are subject to conservation institutions that they do not accept and for conservationists attempting to promote human-wildlife coexistence. To address that gap, in this chapter, I explore how people's beliefs about

the legitimacy of conservation institutions in the Melghat Buffer Zone vary, and how they act on and express those beliefs. I do so to highlight both people's critiques of conservation and the ways they are working to change it. As one person put it, it is not conservation, per se, that people do not support, only the way that conservation is practiced on the ground. This sentiment corresponds with the disparity between studies that show strong support for wildlife and conservation from people living in or near Indian protected areas (Karanth and Nepal 2012; Macura, et al. 2011; Mir, et al. 2015), and those that document routinized noncompliance or resistance to conservation institutions (Ostrom and Nagendra 2006; Read 2016; Robbins, et al. 2009). Thus, by understanding how people act on their beliefs about conservation, I aim to explore avenues that could better align conservation practice with people's beliefs about what constitutes legitimate conservation institutions. Improving this alignment, I argue, will help promote human-wildlife coexistence in an equitable and effective way.

The literature on human-wildlife coexistence largely relies on a normative definition of legitimacy that is tied to good governance principles. Carter and Linnell (2016:575) argue that socially legitimate institutions are a key component of achieving human-wildlife coexistence. They suggest that legitimate institutions, like those that ensure bottom-up participation and democratic decision-making structures, can help align conservation with conflicting stakeholder priorities. By giving 'bottom-up participation' and 'democratic decision-making' as examples of legitimate institutions, Carter and Linnell argue for a 'good governance' approach to conservation (e.g. Armitage, et al. 2012; Lockwood 2010). Good governance approaches are centered around normative principles "that make claims about how governing or steering should happen and in what direction – that is, how governance actors should exercise their authorities" (Lockwood 2010:758). Much of the research on environmental governance is based around such

principles. For example, Agrawal, et al. (2008) list a number of principles that researchers should consider when investigating the changing governance of the world's forests, including "careful definition of user rights and responsibilities in forests, greater participation by those who use and depend on forests, downward and horizontal accountability of decision-makers, stronger enforcement of property rights, and investments in institutional capacities at local, regional, and national levels." Approaches like these are useful because they encourage comparative research and generalizable findings. However, because they emphasize generalizable findings, 'good governance' principles are necessarily defined independently of the study context, and do not reflect variations in what people mean by terms like 'bottom-up participation' or 'legitimacy' (Birnbaum 2016)[77]. That is, even while granting the assumption that a certain combination of factors in greater or lesser degrees will ensure legitimacy (e.g. Turner, et al. 2016), good governance approaches cannot say what legitimacy will actually look like in specific cases, because they adopt a case-independent definition of legitimacy.

I am not arguing that good governance approaches are inherently wrong or not useful – increasing participation and bottom-up decision-making structures may very well enhance the legitimacy of conservation practice. However, I suggest that because these approaches are limited in their ability to describe legitimacy in empirical cases, they can be complemented by research focusing on the lived experiences of actual individuals and groups. This latter approach is important because it abandons the managerial approach of good governance, which implies an adjustment of certain key variables associated with legitimacy, and emphasizes collaboration and

[77] Additionally, good governance principles also have the potential to reinforce racists imperial discourses that judge an 'Other' against an 'Us' (Jones 2013)

listening to the perspectives of those whose lives shape and are shaped by encounters with wildlife and conservation.

In this chapter, I build upon scholarship on moral economies to explore variation in how people act upon and express different beliefs about the legitimacy of conservation. In the next section, I outline a relational approach to moral economies that centers on emotions, claims, and consensus. Then, I use a mixed-methods approach to understand the legitimacy of conservation in the Melghat Buffer Zone. Using data from participant observation, I argue that emotions help people articulate new ways in which groups can relate to each other, and that the claims people make about the obligations between themselves and others further solidify these groups. Then, using data from a Q Methodology exercise (Zabala, et al. 2018), I argue that consensus on what constitutes legitimate conservation practice does not imply that everyone understands that consensus in the same way. I conclude by discussing how a focus on moral economies lead to alternative ways of achieving human-wildlife coexistence.

G. Moral Economies: Emotions, Claims, and Consensus

In this section, I outline E.P. Thompson's (1971) use of the term moral economies, focusing on the emphasis he placed on the roles of emotions, claims, and consensus. However, I argue that Thompson, and later James Scott (1976), used the term in a normative, rather than relational, way, in that they assume class interests are pre-determined by political economic relationships. Drawing on the work of Guha (2010 [1989], I outline a more relational understanding of the concept that I will employ throughout this chapter.

The term 'moral economy' is most closely associated with the works of E.P. Thompson (1971) and James Scott (1976), who both use it to describe how people's notions of what constitute legitimate economic practices translate into specific acts of protest and rebellion.

Thompson developed the term to describe food riots[78] in eighteenth century England – not to explain their occurrence, [79] but to understand the specific form that they took. He writes:

> It is of course true that riots were triggered off by soaring prices, by malpractices among dealers, or by hunger. But these grievances operated within a popular consensus as to what were legitimate and what were illegitimate practices in marketing, milling, baking, etc. This in its turn was grounded upon a consistent traditional view of social norms and obligations, of the proper economic functions of several parties within the community, which, taken together, can be said to constitute the moral economy of the poor. (Thompson 1971:79).

Food riots unfolded as protests against liberalized English economic policies that promoted *laissez-faire* agricultural principles over traditional paternalist regulations (Genovese 1973). These paternalist regulations included (1) limiting the price of grain in public markets, (2) giving priority to poorer individuals over larger dealers in purchasing grain, flour, and bread, and (3) prohibiting farmers from withholding stocks from markets, dealing with intermediaries, selling samples, and selling their output before it was harvested (Edelman 2012; Thompson 1971). According to Thompson, the riots were triggered by scarcity and high prices, but the crowds' demand for a return to paternalist regulations that protected their access to grain, flour, and bread in the marketplace reflected the larger moral economy within which the riots took place.

James Scott adapted Thompson's use of the term 'moral economy' to describe peasant rebellions in Southeast Asia and "the nature of exploitation in peasant society as its victims are likely to see it" (Scott 1976:4). Peasants, Scott argued, are risk-averse in that, rather than seeking

[78] In many places, Thompson says that 'riot' is a blunt and imprecise term for popular action (Thompson 1971:107; 1991:224).

[79] Pierce (2016:172) argues that Thompson and Scott employ a circular logic: explaining the occurrence of crowd action through the moral economy, while explaining the moral economy through the occurrence of crowd action. However, both Thompson and Scott are clear in saying that their analyses only pertain to how the crowd action unfolded, not what sparked it, and thus, Pierce's critique misses the mark.

to maximize income, they focus on maintaining a minimum level of subsistence. Economic practices are legitimate to peasants if they maintain these rights to subsistence and fall within certain norms of reciprocity between peasants and elites. Economic practices that do not reflect peasants' rights to subsistence and norms of reciprocity are, from the peasants' perspectives, exploitative.

Since Thompson and Scott popularized it, the term 'moral economy' has traveled and been applied to many diverse contexts. These include immigration policies (Fassin 2005), corruption (Pierce 2016; Shah 2010), colonialism (Bernal 1997), and witchcraft (Hickel 2014). Though Thompson and Scott used it to analyze conflict, Edelman (2012) notes that the term has also been used to explore social cohesion in the rise of scientific norms and rigor (Daston 1995), the persistence of corruption (de Sardan 1999), and heroin sharing (Bourgois and Schonberg 2009). The term is now so ubiquitous that it sometimes stands without definition (e.g. Chaudhuri 2013; Chhatre and Saberwal 2006). However, Edelman also notes that as the term has traveled, "[E.P.] Thompson's signal contribution to theories of moral economy has of late so often been obscured" (Edelman 2012:64; but see Orlove 1997). Part of my aim here is to address Edelman's concern by building upon Thompson's use of moral economy to outline a relational interpretation of the concept.

I highlight this relationality by focusing on three interrelated features of Thompson's use of 'moral economy': emotions, claims, and consensus. First, Thompson argued that beliefs about legitimate economic practices enveloped deep emotional outrage that overrode fear or deference to authority. He writes that moral economies are not only about people's beliefs, but how those beliefs are charged by "deep emotions stirred by dearth…and the outrage provoked by profiteering in life-threatening emergencies" (Thompson 1991:338). Second, Thompson

described the claims that the crowd made upon the authorities in times of crises, which often labeled certain economic practices as illegitimate. In the case of eighteenth-century food riots, these claims involved the crowd defining what the roles of marketers and millers should be by setting the price at which they sold grain. Third, in making these claims, Thompson describes how rioters were often supported by the wider consensus of the community that they were defending traditional rights or customs. This consensus fed back into people's emotions, in that it "was so strong that it overrode motives of fear or deference" to authorities that might have stopped people from rioting (Thompson 1971:78). Together, emotions, claims, and consensus make a moral economy.

In making a moral economy, emotions, claims, and consensus necessarily contribute to people's notions of what is legitimate. While Thompson did not define legitimacy, the way he related it to his use of 'moral' offers some clues about his meaning. He wrote that his use of 'moral economy' suggests "economy in its original meaning (oeconomy) as the due organisation of a household, in which each part is related to the whole and each member acknowledges her/his several duties and obligations" (Thompson 1991:271). Thompson rooted this economic view in Tudor policies of provision, which depended, in part, on reciprocal obligations and duties of governors and governed in times of dearth. In this context, economic practices were validated "with reference to moral imperatives (what obligations the state, or the landowners, or the dealers *ought* to obey)" (Thompson 1991:269, emphasis in original). 'Moral' took on a sense of obligation between the crown and the crowd, with the crowd's consensus pertaining to a "deeply-felt conviction that prices *ought*, in times of dearth, to be regulated, and that the profiteer put himself outside of society" (Thompson 1971:112, emphasis in original). By referencing the obligations that states, landowners, and dealers *ought* to obey, and a popular consensus on what

ought to be done, Thompson created a parallel with his definition of the moral economy as a popular consensus on what are legitimate and illegitimate economic practices. This parallel suggests that legitimate economic practices are those that *ought* to be, based on reciprocal obligations.

Thus, as I use it here, what is legitimate is what ought to be, and beliefs about legitimate economic practices are beliefs about what the economic obligations between different parties *ought to,* or *should*, be. In contrast to good governance approaches, this definition of legitimacy cannot be defined apart from the study context. For Thompson, legitimacy was tied to paternalist traditions. For Scott, legitimacy was tied to peasant subsistence and norms of reciprocity. In both cases, what is legitimate is what ought to be, but what ought to be is defined by the study context.

However, in using the term moral economies to describe models of what people think are legitimate economic practices, both Thompson and Scott tended to understand moral economies in normative, rather than relational, terms. For instance, Scott's (1976) uses the term 'moral economy' in an ahistorical way. All peasants, he argues, are risk-averse by nature of being peasants, and therefore their actions can be explained with a reference to fixed norms of reciprocity and rights of subsistence. Scott's view of peasants belies an essentializing tendency within Marxist scholarship that reifies class interests and assumes that "actors within the same class category…will act in similar ways even when differentially situated within flows of transactions" or relational settings (Emirbayer 1997:290). Elsewhere, Thompson goes to painstaking lengths to describe how people actively construct their class and class-consciousness (Thompson 1966; Thompson 1975). But in his work that explicitly deals with moral economies, he errs somewhat in the direction of class interests being given, as he ascribes a consensus on

what are legitimate economic practices to all the food rioters that is directly transmitted from the past.

In contrast, Ramachandra Guha presents a historically contingent and relational view of moral economies in *The Unquiet Woods* (2010 [1989]). Guha's account of peasant resistance in what is now the Himalayan state of Uttarakhand, shows the historical transformation of a moral idiom of protest known as *dhandak*. Before British rule, *dhandak*, which involved people either not cooperating with new rules and officials or fleeing to forested areas across political boundaries, was a type of protest against "oppression by subordinate officials and/or the introduction of new taxes and regulations." It was a customary form of protest used to reestablish and negotiate the obligations between ruler and ruled. However, as the British established a foothold in the Himalayas, and their form of rule began to look less and less like the paternalist style that Himalayan peasants were used to, *dhandak* changed to become a direct challenge to British authority, as people started to equate the "King Emperor with the very personification of evil, Ravan" (Guha 2010 [1989]:126). A further change came after independence, when the Chipko movement employed similar moral idioms in response to commercial forestry's perceived breach of "the informal code between the ruler and the ruled known as the 'moral economy' of the peasant" (Guha 2010 [1989]:174). That is, by showing how *dhandak* and the claims it involves changed with the historical trajectory of political rule in the Himalayas, Guha presents a relational approach to moral economies, in that they can only be understood with reference to shifting relationships and meanings.

In what follows, I do not track such networks of meaning across time. My aim is to advance a relational understanding of moral economies through three arguments regarding emotions, claims, and consensus. First, I argue that emotions help people imagine new ways of

aligning in different groups and of relating to each other. Second, I argue that making claims about legitimate economic practices is just as much about refining these group distinctions as they are about articulating what is and is not legitimate. Third, I use Q Methodology to argue that consensus does not imply shared understanding of why certain economic practices are legitimate. By differentiating emotions, claims, and consensus among people in the Melghat buffer zone, I highlight how these concepts play out within relational networks that reveal them less as categories defined by attributes and more as "historically shifting sets of relationships that are contingently stabilized" (Somers 1995:136).

H. Moral Economies of Coexistence in the Northern Melghat Buffer Zone

The case study I present here largely focuses on the work of activists in the northern buffer zone of Melghat Tiger Reserve. In Chapter 1, I mentioned how a Pune-based NGO had been working in Melghat for over 20 years to curb rates of child malnutrition, and how their work grew to become a social movement led by people from Melghat. These activists describe their work as an *andolan*, or social movement, and focus on bringing more wage labor jobs to Melghat, stopping practices of corruption, and increasing people's access to government services. I focus on their work first before getting to conservation, because they have been influential in changing the relationship between local people in Melghat and the Forest Department.

One way that they have done that is by working to expand the powers and transparency of the *Gram sabha*. As I mentioned in Chapter 1, the *Gram sabha* is a corporate body of all adult members of a village. In Melghat, this body convenes at monthly meetings, led by the *Gram panchayat*, an elected board of five local individuals, headed by a *Sarpanch*, who govern village affairs. During these meetings, the *Gram sabha* discusses village governance, economics, and

development issues, while also taking input and hearing about other issues from those in attendance. The *Gram panchayat* is also responsible for representing these constituents to district- and state-level government officials. Activists have been trying to strengthen the *Gram sabha* by working to implement the Provisions of the Panchayats (Extension to Scheduled Areas) Act of 1996, or PESA, in Melghat. In districts where the majority of the population identify as Scheduled Tribes, PESA directs state legislatures to endow *Gram panchayats* and *Gram sabhas* with the power and authority to self-govern in "consonance with the customary law, social and religious practices and traditional management practices of community resources (Government of India 1996). Among other things, PESA empowers *Gram sabhas* to regulate intoxicants, manage minor forest produce, prevent land alienation, manage village markets, and control money lending (see Pal 2000). Though PESA has not been implemented uniformly across India (Kashwan 2016), is vague in terms of the *Gram sabha's* relationship to other government institutions (Sundar 2001), and has limited abilities to prevent land acquisition by the state (Lahiri-Dutt, et al. 2012; Sundar 2011), activists in Melghat see it as a step toward stopping corruption and bringing more work and development opportunities to their villages.

I begin with an incident that happened at the *Gram sabha* in September 2016.

1. Emotions: Stealing money and speaking falsely

The mood of the crowd changed noticeably when the local bureaucrat had walked out of earshot. For the first time that day, in what had been an otherwise orderly and routine meeting of the *Gram sabha*, a woman, Durga, addressed the entire group. In a clear, direct voice, she told the crowd that the bureaucrat who had just left had not paid her for contracted farm labor. Almost immediately, ongoing side conversations went silent, and many people began quietly but quickly shuffling away, uncomfortable with either the topic or the bluntness with which Durga

spoke of it. But those who remained moved much closer to the members of the *Gram panchayat* seated at the front of the group, and everyone began talking over each other. As Durga's voice got lost under the growing noise of the crowd, the other women seated around her began echoing her experience with their own. Soon their mutual offense at the bureaucrat's transgression propelled their voices above the others. The meeting became more and more disorderly, and I lost track of the conversation as people started mixing Hindi with Marathi and Korku. I asked a friend next to me what was going on and he explained that Durga, along with fifteen to twenty other women, were supposed to have received Rs. 1,440 each from the bureaucrat for eight days of work. The implication was that he had kept their payment for himself.

The fact that Durga spoke up so clearly and so publicly marks a sharp contrast to the way others in Melghat shy away from potential conflicts. While I was conducting surveys, many people repeated a common refrain about how *Adivasis* shy away from speaking out in public. Phrases like, "We *Adivasis* are really scared and don't speak out," and "We keep our mouths shut," were common. Their descriptions of themselves largely matched their actions. When I witnessed someone be slighted or insulted, most often that person would either ignore or walk away from their detractors, rather than responding to them. For example, on one occasion, a Korku friend of mine cringed when a Forest Department official bluntly accused Korku people of not deserving government services. But rather than engaging with the official he simply walked outside for fresh air. Another time, when confronted by two drunk people spouting incoherent insults, one of the people I was with walked into the house and closed the door, while the other simply sat quietly with me and averted eye contact with the two accusers. Though Durga had waited to bring up the issue with the *Gram sabha* until after the bureaucrat in question had left, her doing so in such a public and vocal way, with the support of other women, caught

others off-guard for how it departed significantly from the way that people typically deal with such unfair practices.

The emotion Durga expressed at the *Gram sabha,* whether it was anger, frustration, indignation, or something else, had a visible effect on how people grouped together. Some people left the meeting, while other moved in closer. Some raised their voices to overcome hers, while others raised their voices to support hers. These circulating emotions eventually led the *Gram sabha* to appoint someone to confront the official who had not distributed the money and get to the bottom of the matter. In these ways, Durga's emotions worked to cohere certain groups of people and to structure the interactions between them.

Figure 5.1: *The Gram sabha meeting*

In this section, I focus on how emotions help to imagine and align people in different groups. To do so, I draw on Raymond Williams' concept 'structures of feeling,' which denotes the affective elements of relationships that "do not have to await definition, classification, or

rationalization before they exert palpable pressures and set effective limits on experience and on action" (Williams 1977a:132). These affective elements are structures in the sense that they contain internally relating elements, but not in the sense that they have a regular form (Filmer 2003). Here, I resist labeling people's emotions in the way that Thompson (1971) described the crowd's "intense" and "profound" feelings of "fury," because it denies the variation and emergence of people's emotions. Instead, I focus on what people's emotions do. Sara Ahmed argues that "emotions *do things*, and they align individuals with communities…through the very intensity of their attachments" (2004:119, emphasis in original). Following Ahmed, I show how people's emotions help them align individuals into different groups, without needing to assign a label to those emotions. As I will show, much of the activists' work in Melghat is driven by shifting emotions and structures of feeling, and I argue that it is through those emotions that different groups of people begin to cohere and align against others.

The relationship between shifting emotions and how activists group people in relation to their work was apparent during a meeting between local NGO workers, trustees from Pune, and leaders of the local social movement. I sat with them as they discussed dealing with corruption in Melghat. The discussion began with Prahas, an activist and NGO worker, suggesting that they should help more people pursue higher education. Higher education, he argued, would help 'tribal people' question the corruption of 'outsiders.' These two terms were Prahas's, which he used to distinguish locals from the government workers who had been transferred to Melghat. Pramukh, an activist and member of the *Gram panchayat*, replied and offered a qualification. In his qualification, he partially revised how Prahas had grouped people. Instead of grouping people into 'tribal' and 'outsider' categories, Pramukh grouped people into 'those who are corrupt' and 'those who do something about corruption.' Each of his new categories was associated with a

distinct emotional state. When we described those who are corrupt, he used a slow, matter-of-fact, monotonous tone, and when he described those who do something about corruption, he used a quick, forceful, declarative tone. His qualification to Prahas began in the matter-of-fact tone, as he pointed out that both 'tribal people' and 'outsiders' can be corrupt. He said, "These injustices that happen, we understand how to deal with that. Even amongst ourselves, there are people who drink and who are corrupt." The pace of his speech then quickened, and he ended with a declarative statement, "But others have thrown them out – because this should *not* happen."

Prahas added "Such things would not have happened in the past."

"Such things would *not* have happened in the past," Pramukh forcefully agreed. "If the chief pressed it, the entire village would come under pressure. It is not so anymore, but I know that such things should not happen. This corruption is wrong." He then listed examples of corruption by both 'tribal people' and 'outsiders,' and accordingly his speech became slow and monotonous, "This *Patil* [police officer] is speaking falsely. This *Sarpanch* is speaking falsely. This post master is stealing money." His speech then quickened again as he concluded his point, "So, there is a discussion about it, and he is brought in front of the *Panchayat*, in front of the village, in front of the *Sabha*. And this happens very quickly. The fact that there is a procedure for this gets people to start thinking about it. We should interact with these outsiders, but not in a way that our people get ruled over."

Pramukh's emotions helped him establish an alternative way of grouping people. Through shifting his emotional state, he was able to distinguish between the corrupt and those who do something about corruption. This grouping was still ambiguous and not entirely different from Prahas's earlier classification. Indeed, Pramukh used Prahas's groups at the end by distinguishing 'our people' getting ruled over by 'outsiders.' But it was Pramukh's changing

emotions that established an alternative way of imagining how people align and interact with each other, despite those groups not being completely solidified. This ambiguity is central to the notion of structures of feeling, which describes the influence of emotions in "an embryonic phase before [they] can become fully articulate and defined" (Williams 1977a:131).

In the same way that Pramukh's emotions helped him articulate a different way of grouping people, the work of activists has helped to materialize different groups in Melghat. For example, working against 'money power' in *Gram sabha* elections has helped to align people against state and national political parties. A phrase that Pramukh and others use in English, 'money power' denotes how state and national political parties pay for people's votes in *Gram sabha* elections. Candidates in those elections are barred from having official party affiliations, but parties like the Bharatiya Janata Party, Indian National Congress, and Shiv Sena actively support some candidates over others by giving money to candidates and voters. In working to counter money power, Pramukh and others have been fundraising for their own election campaigns, while simultaneously working to be transparent in how they handle money. In early September 2017, Pramukh presented his village with the *Gram panchayat's* first official State Bank of India checkbook. This checkbook, he said, would be used for managing and distributing funds earned from *tendu* leaf collection,[80] a growing source of income in the area. Additionally, while fundraising for his own campaign to become *Sarpanch*, Pramukh was adamant about giving detailed receipts, with his name on them, to donors. Through these efforts, Pramukh worked to align people against larger political parties. Ultimately, his were successful, and he was elected *Sarpanch* by a narrow margin. Prahas, another activist working in the NGO, also decided to run for office in the neighboring *Gram sabha*.

[80] As stated in the previous chapter, tendu (*Diospyros melanoxylon*) is a native to India and Sri Lanka. Its leaves are used to wrap tobacco into *beedi* cigarettes, and people collect and sell tendu leaves for this purpose.

Through their anti-corruption work, activists have also realigned the relationship between people in Melghat and different levels of government bureaucracies. Much of their local activism aims to leverage district-level bureaucrats against the corruption and injustices committed by local bureaucrats. For instance, when teachers were not showing up to school, activists submitted a formal complaint to the district-level school administrators, resulting in a meeting between activists, teachers, and district administrators at the NGO campus. Similarly, one activist leader, who had helped organize a rally for guaranteed daily wage labor in the district Collector's office in Amravati, emphasized how he wanted more government development programs for water, electricity, and road infrastructure, thinking that a larger government presence in the area would decrease instances of corruption. These efforts worked to align people in Melghat with district-level bureaucrats and against corrupt local-level bureaucrats, a distinction that complicates the 'tribal people/outsider' binary.

These brief examples show that activists' emotions help them to articulate and materialize new group alignments. Though they still often categorize people into 'tribal' and 'outsider,' their emotions are helping them to imagine and cohere groups that do not fall squarely in line with those labels. J.K. Gibson-Graham (2006) argue that emotions can prime people for establishing new political economic relationships. While these new relationships are still emerging in Melghat, shifting and circulating emotions have been a crucial part of this process. The concept of structures of feeling is important because it directs attention to the moments when "new patterns of experience emerge, when people start to think differently, when new sensibilities arise, when habits swerve" (Sharma and Tygstrup 2015:4). Following this kind of analysis, I argue that emotions help produce the categories that people use to guide their action against corruption, despite those categories not yet being clearly defined.

Having explored the relationships between emotions and processes of change, I now want to turn to specific claims that activists make upon authorities that further refine different groups of people through an acknowledgement of their obligations to one another.

2. Claims: "We follow the law, so you'll have to too"

As Pramukh finished his report to the group, Nivant, an NGO trustee from Pune, abruptly shifted the focus of the conversation, "One, one – uh, there is one thing that I want to tell you all because I think that in terms of encroachment," his voice grew softer and deeper, "there is going to be a revolt against the government."

After a brief, telling pause, Prahas confirmed, "Yes, a big revolt."

Nivant continued, "And with that, what could happen is that people will say, 'These NGO folks, they are provoking the people, and they are telling people to encroach.'"

"No!" Pramukh interjected. "The politicians had revolted against the NGO. They say that the NGO used to be involved with *tendu* leaf collection, but that now it has slowly started to branch out, earning more money and getting foreign funds – that people are earning an income." He chuckled as he recited these accusations, but then grew louder and more direct. "And then we had a fight in front of the *Prant* Officer.[81] The fight got so intense that we started getting violent."

Nivant quietly answered Pramukh's frustration, "I have an intuition. I'll give you a solution." He paused. And then continued, "You should conduct a workshop on law obedience…and document it. Call the *Panchayat* committee or the government officials to inaugurate it. We will organize a workshop on obeying the laws. This means that we will discuss what the laws are, how they work, we'll tell people not to encroach and that there is no benefit to

[81] Prant Officers have various duties related to land revenue, including safeguarding government-held land, supervising land acquisitions, and succession of properties, etc.

encroachment. We know that, right? But announce it, so afterward you'll have proof showing that you aren't provoking the people against the government. It's a strategy. Do it to remain safe. And call the *Zilla Parishad* CO[82] for the workshop or call the Deputy CO – somebody from the government – and in front of them, give a lecture about law obedience. Teach what the law is, that the Government makes good laws. The laws are good. The laws are empowering tribal people."

"The laws are for our good," Prahas agreed.

"But now," Ranajit chimed in before being cut off, "some people from Hatru had beaten up a forest guard…"

Pramukh cut in, "Over here: complaints, violence. Over there: big drama, rallies. Anything that happens – like chasing and threatening an official – in all of this, the NGO's name gets associated."

"This is a warning. This is an indication to you that you need a strategy," Nivant said. "We don't really want to break laws. Do we really want to break laws?"

"No," everyone answered in unison.

"Do we want that?" Nivant asked again, rhetorically. "We are telling every person, official, or employee who isn't obeying the law to obey the law! We don't ask you to break the law. We have faith in the country's laws. They are good and they are for the people. That is the focus of our movement. Highlight it a little and document it. It should come in one or two newspapers: 'Law Obedience Workshop: Our NGO organized a law obedience workshop and the Deputy CO inaugurated it.' Do that, so if anything happens against the Government, we have no stake in it and neither do the people. Some third person will benefit from it. The whole point is

[82] A *Zilla Parishad* is an elected district-level council that is the top-tier of the *panchayat raj* (local self-government) system in India. They work with state governments to support rural development and governance processes.

that we obey the law. We obey the law. Take the government and forest officials by the hand. Go and tell them that they have the wrong impression. 'We aren't like that. We are people that abide by the law. We follow the law, so you'll have to too.'"

Nivant's strategy for activism involved several claims about different groups, all defined by how he thought they should relate to other groups. For example, he juxtaposed 'we' and 'anyone who is encroaching' to define how all NGO activists should relate to people breaking the law. He opposed 'you' and 'government officials and media outlets' to define how local activists should invite others to the law obedience workshop. He used 'we' again but opposed it to 'government and forest officials' to define how people in Melghat should set an example for others. In other words, his claims about how different groups should interact were part and parcel of the groups themselves. That is, rather than defining the groups beforehand and then discussing how they should relate, he defined groups by their relation to others.

In the last section, I argued that emotions help people to articulate new ways of aligning people into groups. In this section, I want to focus on how activists' claims about what constitute legitimate economic obligations work to further refine these groups in ways that overcome different local identities to give local laborers more power to negotiate with government officials. For Thompson, the groups that made particular claims about mutual economic obligations were predetermined. The 'poor' already existed independent of their claims, and because of their standing in relation to marketers and millers, they had specific ideas of what constituted legitimate economic obligations. Here, I argue that claims about what constitute legitimate economic obligations redefine groups in a way that seeks to balance the unequal social forces. In making this argument, I draw on Amita Baviskar's analysis of activists who worked to create an *adivasi* consciousness that transcended caste differences and focused on class

inequalities (Baviskar 2005:Ch. 8). She shows how outside activists successfully convinced *adivasis* that caste taboos distinguishing *Bhils* from *Bhilalas* put both at a disadvantage when dealing with non-*adivasi* traders and government officials. By joining together under the common identity of *Adivasi*, people were better able to resist attempts by the Forest Department to evict people from encroached forest land. This work shows how certain groups are not pre-determined as 'weaker' or 'stronger,' but that groups are made through negotiations over what constitute legitimate economic practices.

When activists use the term 'tribal people,' they generally use it to mean everyone who is local to Melghat, rather than in reference to Scheduled Tribes specifically. While most people from Melghat identify as Korkus, a Scheduled Tribe, there are others who identify as Gonds (ST), Lohars (SC), and Gawlis (OBC). When making claims to government officials, however, activists tend to use the label 'laborers' instead of 'tribal people.' Pramukh made this clear when he told us about a meeting he had with a divisional forest officer (DFO) after a worker's march he had organized. The DFO began by naming a specific tribe, but Pramukh gradually shifted the conversation to be about laborers. He recalled how, "The DFO said 'Korku people just don't understand. It's like this: they keep cutting the jungle. Even if they are given employment, they don't work properly.' I said, 'If you live in Melghat, learn the ways of Melghat. If you want to live in Melghat, Melghat is as it is. If we *adivasis* are worthless, don't work here. Leave this place.' So he said, 'What was our mistake? What was the mistake of our people? That you *adivasis* are like this?' 'Not that. We don't say such bad things about you. We know how good your forest guards are. We even know how good your ranger is. We know how good you are. If you were good, you wouldn't be saying such things. And your forest guards do their duty here. We have to wash their clothes, make their food. We have to do that. Ask them in front of us, I'll

tell you who made food and who didn't. Your compound that has been made—if you really were following the rules and not cutting the jungle, then you wouldn't have been able to make a compound of bamboo. If today you wanted to make the compound, you could've used nets or used wires. You have broken the rules. We were new to protecting the jungle, but who was the one who cut the jungle? It was you.' That's when he understood and didn't say anything. I told him to start employing people, and they did immediately. Our rally was for laborers, it was a strike for laborers."

In Pramukh's telling, the DFO repeated a refrain, often uttered by government officials, that Korku people are lazy and stupid. However, Pramukh was clear that his work was not for Korku people alone. He first used the term '*adivasis*' to describe who he was advocating for, but then ended by emphasizing that he worked on behalf of laborers.

Pramukh and the activists often prefer to make claims on behalf of laborers instead of *adivasis,* because that term betrays the caste differences in livelihood practices and access to government programs that persist in Melghat. While nearly everyone in Melghat farms, regardless of caste, Lohar people tend to supplement their farming with other crafting activities, such as making wood products or metal tools. The few Gond people in the area have relatively less farmland than others but do additional wage labor activities like building and road construction and working as school cooks. Similarly, because Scheduled Tribes are distinct groups from Scheduled Castes by law, some government programs apply to one but not the other, like a nearby residential government school that has declined admission to students who are members of Scheduled Castes and not Scheduled Tribes.

The caste differences in terms of access to government services were also clear in how one field assistant adjusted survey questions depending on the caste of the person we were

interviewing. The landscapes of fear survey (Chapter 3) included another section about the legitimacy of conservation. That section required the field assistant to read narrative descriptions of different perspectives about what should be done to enhance the legitimacy of conservation institutions, and people were supposed to evaluate what parts of those statements they agreed with and what parts they did not agree with.[83] The field assistant, who belonged to the Lohar Scheduled Caste, would read the narratives differently depending on the caste of the person she was talking to. If she were talking to someone from the Korku Scheduled Tribe, she would often follow a sentence like, 'The forest department should give people gas cylinders so that they will stop cutting trees,' with "This is all for the *Adivasi* people only." If she were talking to someone also from the Lohar Scheduled Tribe, she would often say that such programs were for *Adivasi* people, but instruct the person to "suppose that we were counted as *Adivasi* people." For her, '*Adivasi'* meant Korku, not Lohar, and it was associated with government services not available to Lohar people.

While *'Adivasi'* is often used synonymously with Scheduled Tribes, as opposed to Scheduled Castes, some Korku people were confused by the label. Immediately after Pramukh told the story of his meeting with the DFO, Sirak asked, "They call us *Adivasis*. What is this name, *Adivasi*? How did we come to be named *Adivasis*?" One NGO organizer from Pune answered that it had to do with staying in a place for a long time, to which Pramukh asked, "But haven't people been in Pune for a long time?" to which Sirak answered, "No, people started to settle in Pune in the 1300s." The conversation went on and some people brought up the fact that there are *Adivasis* in South Africa and America as well. The only satisfying answer seemed to be

[83] These narratives are produced in the next section as results from the Q Methodology exercise. The original research plan was then to take these narratives and ask people to evaluate them. However, many people found this too difficult and I have not included the results in this dissertation.

that *Adivasis* were people who had been living near the forest for a very long time, and are sometimes called *vanvasis*, or forest inhabitants, rather than *Adivasis*, or original inhabitants.

I make this digression into the confusion of over these labels to demonstrate that Pramukh's preference for speaking about laborers is not a given. People of different castes stand in different relations to government programs and officials. But by making claims about government officials' obligations to follow the law and provide wage labor employment, activists define their base as laborers instead of specific castes or *Adivasis*. It is not that everyone experiences inequality the same way and therefore have similar interests. Groups are actively defined by those making particular claims upon state officials as they negotiate what constitute legitimate economic obligations. By describing people as laborers, activists can claim to represent everyone in Melghat and gain more power in such negotiations.

While these claims define people as laborers, they do not do away with caste, gender, or age differences. Nor do their claims mean that everyone who is a laborer thinks about legitimate economic practices in the same way. In the next section, I show that while there are several courses of action that most people believe would help to enhance the legitimacy of conservation institutions, this consensus in no way means that people agree on why those actions would legitimize conservation.

3. Consensus and Conservation

I opened this chapter with a vignette about Tisumar and Dhaval evading Forest Officers, saying that there should not be any Forest Officers, and suggesting that if Forest Officers did their jobs better, people would die. Clearly, their views stand in stark contrast to those expressed by Nivant, Pramukh, and other activists, who believe that Forest Officers should follow the law. In this section, I want to bring this contrast into explicit conversation with the legitimacy of

institutions governing human-wildlife encounters, a subject I have only dealt with tangentially in this chapter so far. Human-wildlife encounters were tangential up till now because I wanted to focus on the larger moral economy in the Melghat buffer zone. Now, I turn to how that moral economy applies to wildlife conservation by exploring the degree of consensus about what legitimate conservation practices should be, focusing specifically on institutions governing human-wildlife encounters.

Thompson argued that there was a consensus among English food rioters as to what constituted legitimate economic practices because those rioters repeated specific activities in different places and at difference times. In his case study, this activity involved the English crowd setting the price of food. They did this by (1) taking grain or other produce from farmhouses and mills, selling it at fair prices at the market, and returning the money to the farmers and millers; (2) requesting that villagers and farmers buy corn at fair prices; and (3) soliciting food contributions from the wealthy. From these repeated actions, Thompson concludes that "there can be no doubt that the actions were approved by an overwhelming popular consensus. There is a deeply-felt conviction that prices *ought*, in times of dearth, to be regulated, and that the profiteer put himself outside of society" (Thompson 1971:112). Thus, from the consistent and repeated crowd action, Thompson infers a consensus of beliefs on what constitute legitimate economic practices.

Working as an anthropologist, I had the ability to talk to people about how they judge the legitimacy of conservation institutions, rather than infer their thoughts from their actions (Bennett 2016). My aim in talking to people about legitimacy was to put the normative good governance principles about what constitutes legitimate conservation practices that I described at the beginning of this chapter into context. Based on these normative good governance principles,

wildlife researchers and conservationists often make statements, implicitly or explicitly, about what should be done to increase the legitimacy of conservation. For example, conservationists might make statements about enhancing the accountability and transparency of governance processes (Jedd and Bixler 2015; Jepson 2005), about building trust amongst different stakeholders (Turner, et al. 2016; Young, et al. 2013), about increasing participation of key stakeholder groups (Armitage, et al. 2012; Reed 2008), or about ensuring that benefits accrue to all levels of participation (Karanth and Nepal 2012). These are all context-independent statements about what will increase the legitimacy of conservation practice. Here, I used Q Methodology to develop a list of these statements, along with others that people in Melghat suggested, and ask people to assess the extent to which they thought these ideas would enhance the legitimacy of conservation institutions in Melghat. I did this both to show areas of consensus but also different understandings of why these statements would enhance the legitimacy of conservation.

a) Q Methodology and its steps

Q Methodology is a pile-sorting method that explores different perspectives on a single topic based on similarities and differences in how much people agree or disagree with statements about that topic. It uses statistical factor analyses to find idealized models of how people arrange those statements from "most agree" to "most disagree," and then interprets those models qualitatively based on how the statements were arranged in relation to each other.

The purpose of Q Methodology is to understand variation between people's beliefs, not to understand how beliefs vary across people (Eden, et al. 2005). As such, Q Methodology does not test associations between people's responses and certain pre-determined categories and variables, as would a traditional survey. Rather, it informs the categories that researchers would explore

associations between by defining those categories based on shared perspectives on a certain topic (Robbins and Krueger 2000). For this reason, Q Methodology is growing in popularity amongst conservation researchers due to its ability to explore different perspectives in detail (e.g. Hermelingmeier and Nicholas 2017; Mattson, et al. 2006; Rastogi, et al. 2013; Rust 2016; Sandbrook, et al. 2013).

To explore different perspectives, Q Methodology follows a specific series of steps. The first step is to construct a list of statements that represent as many ideas about the research topic as possible. I constructed this list by reviewing government reports, NGO documents, academic articles, and popular websites, and by informally interviewing people in Melghat, and identifying normative statements about enhancing the legitimacy of conservation (Brown 1980). This chapter's opening vignette described Dhaval both reviewing and contributing to this list. Because legitimacy refers to what *should* be, I phrased all statements as 'should' statements, such as, "There should be more education programs about conservation and the forest regulations." From this list, I selected 36 statements that were clear, concise, and represented a wide variety of ideas on legitimacy. 36 statements allows a range of ideas to be represented, while still being feasible for participants to sort (cf. Rastogi, et al. 2013; Rust 2016). I reviewed this final list with several key informants in Melghat, and made slight changes when necessary to improve the clarity of the statements. I then randomly assigned the statements numbers 1-36 and wrote them on cards in Hindi.

The second step in Q Methodology is to select the participants. In Q Methodology, this is typically done purposively to capture as many different perspectives as possible, rather than randomly to represent the whole population (Dziopa and Ahern 2011). A local colleague helped me select respondents based on who he thought would have valuable and different perspectives n

conservation regulations. With his help, I interviewed members of the *Gram panchayat*, members of the ecodevelopment committee, social workers, police officers, and leaders in the local social movement[84]. All participants lived in the northern part of the Melghat Buffer Zone and were likely to have different understandings of the legitimacy of conservation institutions, as some are meant to develop them, some are working to change them, while all interact with them on a near daily basis. I limited the sample to literate individuals because sorting 36 statements would not be feasible if they had to be repeatedly read aloud.

The third step of Q Methodology is conducting the interviews. Each participant granted oral consent to participate after we explained the research. I then instructed participants to sort the statements into three piles based on how well they believe the statements answer the question "What should change so that more people will accept and follow the forest regulations?" which is an operationalized version of the question "What should be done to enhance the legitimacy of conservation institutions?" that good governance principles attempt to address. After they sorted the statements into three piles, I instructed participants to sort the statements into a grid shaped as a quasi-normal distribution, with "most agree" and "most disagree" at each end of the distribution (Figure 6.2). This restricts them to strongly agreeing or disagreeing with only a few statements, meaning that they must sort the rest of the statements into the middle of the distribution. Upon completion of the grid, I asked participants about any interesting placement of statements, additional statements they thought should be included, and the research topic more generally. I clarified statements for participants when they asked, taking care to introduce as little bias in our clarifications as possible. I conducted all interviews in Hindi, with the local colleague translating between Korku and Hindi when needed.

[84] I attempted to sample employees of the Forest Department, but they declined.

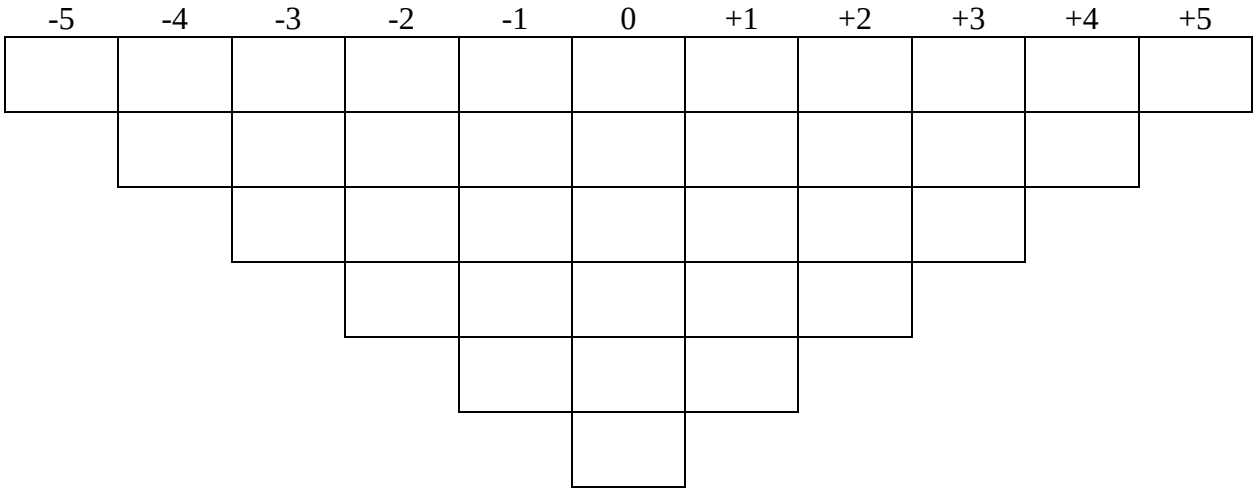

Figure 5.2: *Participants sorted statements into this grid. -5 indicates most strongly disagree, +5 indicates most strongly agree*

The last step of Q Methodology is to interpret how people sorted the statements. I entered data into PQMethod (Schmolck 2014), a software dedicated to Q Methodology. After intercorrelating how each participant sorted statements into the grid, I performed a by-person centroid factor analysis for seven factors (Brown 1980). This means that the software was limited to finding seven distinct factors, or perspectives, regardless of how much variation they represented. Then, following the Kaiser-Guttman criterion, I eliminated factors with eigenvalues below 1.00 (see Watts and Stenner 2012:105), which means that they do not capture enough variation to account for even one person's perspective. I then performed a varimax rotation on the remaining factors, meaning that, among the remaining factors, I maximized the differences between them to make them as distinct from each other as possible. Those participants who sorted the statement similarly were associated with the same factor, meaning that they had similar perspectives on the legitimacy of conservation institutions. I then created idealized models of these shared perspectives, called factor arrays, using weighted averaging. Weighted

averaging means that those participants whose grids had higher correlation with the factor had more influence on the averaging that produced the idealized model. I interpreted these factor arrays following the crib sheet method described by Watts and Stenner (2012), which begins to build a narrative of each perspective based on the statements that people ranked highest and lowest, and the statements they ranked higher and lower than those associated with other perspectives. I created a narrative description of each perspective and then re-interviewed participants who highly correlated with each factor, having them review the narrative and make changes as necessary.

b) Q Methodology Results

In total, 30 individuals – 4 women and 26 men – from 11 villages completed the pile-sorting. 29 identified themselves as Korku, and 1 identified as Lohar. The reported education level ranged from 3rd standard to college degree. The mean reported annual income was USD 431.42 per year[85]. 29 individuals reported earning income from farming, while some also included occupations like student, social worker, police officer, contract laborer, and mechanic. From these interviews, I argue that there are at least three distinct perspectives amongst people in Melghat about the legitimacy of conservation institutions, which together account for 40% of the variance. I have created narrative descriptions of the three perspectives, which I name: (1) Improving program outcomes, (2) Centrality of relationships, and (3) Knowledge as a prerequisite. Below are descriptions of each of these perspectives.

[85] Conversion to USD from Indian Rupees (INR) was done on 2 February, 2017.

Table 5.1: *Idealized Q-sort and z-scores for the three-factor solution. * marks a distinguishing statement (p < 0.01); † marks a consensus statement (p < 0.01); ‡ Rank refers to where the statement falls in that factor's idealized Q-sort, or factor array, (from -5, most disagree, to +5, most agree).*

Statement	Factor 1		Factor 2		Factor 3	
	z-score	Rank‡	z-score	Rank‡	z-score	Rank‡
1. Conservationists should spend money on upholding tribal peoples' land rights	1.204	3	0.140	0*	0.950	2
2. The forest department and Gram Sabha should manage the buffer zone together	-0.450	-1	1.951	5*	-0.164	0
3. People should be paid for improving habitat and populations of wildlife	0.695	2	-0.824	-2*	1.005	2
4. There should be other work so people depend less on the forest	0.086	0	0.735	1*	-0.447	-1
5. The government should offer more schemes to local people	0.883	2	-0.277	-1*	0.434	1
6. There should be more education programs about conservation and the forest regulations†	1.217	3	1.183	3	1.646	4
7. Money from tourism, hunting, or other wildlife activities should be given back to local communities	-0.324	0*	-0.976	-2	-1.206	-3
8. There should be training in how to us gas cylinders	0.015	0	0.146	0	1.153	3*
9. The government should buy unwanted livestock	-0.632	-1	-0.505	-2	1.363	3*
10. The ecodevelopment committee should meet more regularly	-0.841	-2	-0.226	-1	-0.901	-3
11. The forest regulations should be less strict	-1.038	-3*	-0.336	-1	0.040	0
12. There should be more schemes to improve farming and livestock practices	2.074	5	1.252	3*	2.286	5
13. Local people and forest officers who do not follow the regulations should be punished	-1.106	-4*	0.063	0	-0.041	0
14. People should be relocated from forest areas†	-1.960	-5	-2.122	-5	-1.622	-4
15. There should be more departments making and enforcing regulations†	-0.876	-2	-1.054	-3	-0.683	-2
16. The forest regulations should be more clear	-0.083	0	-0.446	-1	0.579	2
17. Tribals living in forests they protect should be left alone	0.398	1*	-1.648	-3	-1.210	-4
18. Government should focus on improving the current schemes, not making new ones	0.464	1	-0.151	-1	0.449	2
19. NGOs should help create forest regulations†	0.192	1	0.267	1	-0.173	-1
20. People should be paid to not use forest resources	-1.039	-3	-1.196	-3	0.169	1*
21. Forest officers should follow the regulations better than they do†	-0.509	-1	-0.146	0	-0.664	-2
22. People should be paid the full compensation when livestock are killed by wild animals	1.918	4	1.615	4	1.184	3
23. NGOs should help facilitate forest protection between communities and the forest department	0.711	2	0.903	2	-0.881	-2*
24. The Gram Sabha, not the forest department, should manage the forests in the buffer zone	-0.526	-1	0.786	2*	-0.172	0
25. There should be no forest officers	-0.520	-1	-1.750	-4*	-1.014	-3
26. If it can be confirmed that livestock was killed by a wild animal, the affected owner should be paid directly and promptly†	1.825	4	1.340	4	1.723	4
27. Nothing should change	-0.931	-2*	-1.749	-4*	-2.480	-5*
28. There should be clear boundaries and rules for managing, monitoring, and enforcing forest regulations	-1.835	-4*	1.229	3*	-0.212	-1*
29. Local people should create and enforce the forest rules†	0.604	2	0.411	1	0.007	0
30. The forest officers should be more accountable to local people	0.484	1*	-0.609	-2	-0.786	-2
31. There should be more opportunities for public debate about conservation	-1.034	-3*	-0.002	0	0.202	1
32. The government should give people gas cylinders and LPGs	-0.711	-2*	0.761	2*	0.126	1*
33. The forest department should hire more local people†	0.550	1	0.189	1	0.312	1
34. Local people's rights to subsistence and well-being should not be violated†	-0.296	0	-0.122	0	-0.584	-1
35. There should be better communication between forest officers and local people	1.241	3	0.827	2	0.028	0*
36. Local people and NGOs should be able to limit the powers of government bureaucracy	0.149	0	0.340	1	-0.416	-1
Percentage of Explained Variance	11		16		13	
Eigenvalue	3.3		4.8		3.8	
Number of people significantly associated	6		14		8	

(1) Improving program outcomes

Perspective 1 distinguishes itself by seeing legitimacy as intimately tied to the outcomes of conservation programs. Individuals associated with this perspective strongly believe that more people will accept and follow the forest regulations if the number of farming and livestock programs increases (12: +5)[86] and if compensation for depredation programs function as designed (22: +4, 26: +4). One individual emphasized that people from the village do not graze cattle in their assigned area because of the long distance. This person suggested that more people will follow the forest regulations if they can graze cattle in a fenced area closer to the village (Q16 interview). Aside from these specific programs, individuals associated with this perspective generally believe that the government should improve current programs (18: +1) and offer more programs to people (5: +2). To achieve such changes, these individuals emphasize the need to secure land rights for all people (1: +3, Q1 and Q16 interviews).

Individuals associated with perspective 1 generally believe that improving communication between forest officers and local people (35: +3), possibly facilitated by NGOs (23: +2) will enhance the legitimacy of conservation. While they believe that local people should help to create and enforce forest rules (29: +2), they also believe that increasing the role of government or local bodies, like the ecodevelopment committee or *Gram sabha*, may hinder the legitimacy of conservation regulations (10: -2, 2: -1, 24: -1, 15: -2). These individuals strongly believe that punishing those who do not follow rules (13: -4), or relocating people from the buffer area will not increase the legitimacy of conservation (14: -5). The regulations themselves

[86] The parentheses indicate the rank of each statement in the factor array and/or a particular interview. For example, "(12: +5)" means that statement 12 was ranked at +5 in the factor array. "(Q16 interview)" corresponds to participant 16, and indicates that a specific individual made a certain point.

do not need to be less strict (11: -3). As one individual stated, the regulations are good, but people will only accept them when the effectiveness and outcomes of conservation and livelihood programs improve (Q16 interview).

While Q Methodology does allow me to say whether or not people's perspectives statistically relate to their position in society (see Limitations), I can describe how people's perspectives vary across different positionalities. Of the four women, none of them were associated with this first perspective. A few social workers, some of the social movement leaders, and the police officer were associated with this perspective. All people strongly associated with this perspective were educated at or beyond 8th standard. People with this perspective were dissatisfied with the Forest Department's history of implementing its programs, with one person saying that "The Forest Department doesn't help with anything." Because of this, they were clear that they did not want any new programs to be created, because they have seen so many proposals come and go without any results. Rather, they prefer that the current programs be fixed so that people benefit from them. The most frequently mentioned benefit that people wanted was work. They talked about wanting land rights and wanting stall grazing, etc., but these were largely means to an end so that people would have viable work to do.

The installation and management of village solar panels is one example of this perspective playing out. Members of the NGO and leaders of the social movement have partnered with government and other non-government organizations to install solar panels throughout the northern Melghat buffer zone. The first large solar panel in the northern buffer zone was donated by Engineers Without Borders. It powers lights in people's homes and water pumps throughout the village, so people do not have to use hand pumps or go to the river. Everybody who has an electrical device connected to the solar panel contributes a small monthly

fee for its upkeep and maintenance. Solar panels like these have spread across the area, and many now power well pumps to help people irrigate their fields. Because they help increase the productivity of people's farms and give people better access to cleaner water, members of the social movement have been strong advocates of increasing people's access to these technologies. It remains to be seen whether this leads to more people following conservation regulations, but these solar panels fit with this perspective's emphasis on improving the outcomes of livelihood programs.

(2) Centrality of relationships

Perspective 2 distinguishes itself by its emphasis on the relationships between forest officers and local people. As one individual expressed, "If the relationship between both is better, then [local people] will follow the rules" (Q6 interview). Accordingly, individuals associated with this perspective emphasize how the forest department and *Gram sabha* should manage the buffer zone together (2: +5), rather than either by itself (24: +2). These individuals also believe that there should be clear boundaries and rules for managing, monitoring, and enforcing the forest regulations (28: +3), and that communication between forest officers and local people should improve (35: +2), which NGOs could help facilitate (23: +2). In tandem with increasing communication and improving relationships, these individuals believe that local people and NGOs should be able to limit the powers of government bureaucracies (36: +1).

Individuals associated with this perspective also stress the importance of education about the regulations (6: +3) and the compensation for depredation programs (22: +4, 26: +4), because of their implications for the relationships between local people and the forest department. One individual explained that local people do not know how compensation programs are supposed to function. As a result, they are scared to report a depredation because they do not know what

forest officers will ask, and if they do report depredation, they do not know how to deal with delayed or withheld payments (Q6 interview).

In general, these individuals believe that managerial solutions will not enhance the legitimacy of conservation regulations. They do not believe that there should be more departments making and enforcing regulations (15: -3), or that the government should buy unwanted livestock (9: -2), or that there should be more programs in general (5: -1). Other than compensation for depredation programs, they believe that payments to people will not lead to more acceptance and compliance of regulations (20: -3, 3: -2, 7: -2, 9: -2, 1: 0).

Fourteen people were associated with this second perspective, more than with any other. This includes two of the women, one of whom was a member of the *Gram panchayat*, and many of the social movement leaders and social workers. Everyone associated with this perspective was educated at or above the 7th standard. People highly associated with this perspective believe that the Forest Department has a good relationship people in positions of power, but that it does not support people who are poor. According to this perspective, these unequal relationships reinforce inequality. One person mentioned that the Forest Officers not only require people to front some of the money for government programs, but also solicit bribes from people caught using forest resources. Furthermore, the Forest Department programs are unequally implemented, where some people will get compensation for livestock losses, and others will not. People with this perspective tend to believe that the *Gram sabha* is a good venue for addressing these problems, because it provides an opportunity for an open forum. In other words, as one man put it, “There you can speak.” While people with this perspective would like for Forest Department staff to come to the *Gram sabha*, as of yet none have. People with this perspective

prioritize relationships as a necessary condition to getting other outcomes. As one person put it, "after there is a relationship, our development will come by itself."

One of the social movement leaders exemplified this perspective during a conversation with myself and a volunteer from the Pune-based NGO. We sat outside one evening eating dinner, and the volunteer started talking about how creating more tourism opportunities in this part of the buffer zone would increase people's incomes. He and I went back and forth a bit about who actually profits from wildlife tourism, and eventually the social movement leader chimed in. He said that incomes and tourism were not the key issues facing people in Melghat, but that what was important was finding ways for the Forest Department and the locals to do a better job of working together. He cited some successful examples of such collaboration, including the Forest Department helping people to build trenches on hills that would direct rain water toward the rivers and prevent erosion of people's farmland, and people working with the Forest Department to extinguish wildfires. He said that the goal of better implementing PESA would help to improve this relationship, and by extension, help people and the Forest Department to better collaborate on forest and wildlife management.

(3) Knowledge as a prerequisite

Perspective 3 distinguishes itself by focusing on the knowledge of people to understand and accept regulations. More so than other perspectives, these individuals emphasize the importance of education programs about conservation (6: +4) and the clarity of conservation regulations (16: +2). Similarly, they thought that training in the use of gas cylinders (8: +3) was more important than the government handing out gas cylinders (32: +1). Individuals associated with this perspective also believe that farming, livestock, and compensation for depredation programs should function as designed (12: +5, 26: +4, 9: +3, 22: +3), but highlighted the

limitations of people to understand these programs. As one individual put it, “In farming, there must be some or the other program for when there is damage due to animals and birds from the forest, and compensation should be given…but people don’t understand this information. Who should get compensation, who will do the compensation process. People don’t know about this” (Q24 interview).

Generally, these individuals do not feel strongly about relationships between local people, forest officers, or NGOs, or about regulatory mechanisms and procedures. They are generally ambivalent about NGOs and local people helping to create regulations (19: -1, 29: 0), and about improving communication between forest officers, local people, and NGOs (23: -2, 35: 0). Similarly, they do not feel strongly about limiting the power of bureaucracies (36: -1), or increasing the accountability of forest officers to local people (30: -2). They disagree that tribal people should be left alone (17: -4), and strongly believe that something should change to enhance the legitimacy of conservation (27: -5). In general, these individuals see educating people about conservation regulations and development issues as a prerequisite to legitimacy.

This perspective had the fewest people associated with it, only eight. Of the three perspectives, the people associated with this perspective showed the greatest range in education level, from 3rd standard to 12th. The other two women sampled were associated with this perspective, though few in people associated with government positions, the NGO, or the social movement were. Perhaps because of their positionality, people associated with this perspective emphasized that they do not know the regulations well, but they had clear examples of things that could be done to remedy that. One person suggested that there should be one point person, either in government or with the NGO, “so that if there is any scheme, it will reach the people.” Even when people become aware of certain government programs, it is often too late for them to

apply. For instance, one man described how, even when people tell the Forest Officer that their livestock was attacked by an animal, the compensation will not come on time because people do not understand how the process should work and the Forest Officers drag their feet. Because there is little guidance on how these programs are supposed to work, those associated with this perspective believe that people "don't get information and take wrong steps."

One way that this perspective plays out is through efforts by members of the social movement to organize and monitor tendu leaf collection in different villages. Some of these members have been meeting with different *Gram sabhas* around Melghat and teaching them how to manage tendu leaf collection and sales. They said that they are doing this because tendu leaf collection can significantly contribute to people's incomes, but that people do not understand how to organize the collection, management, and sale of tendu leaves. The checkbook that Pramukh had introduced his village to was part of his efforts to teach people in his village about money management and tendu leaf sales. However, efforts to organize and monitor tendu leaf collection have heightened tensions between some government officials and members of *Gram panchayats.* While meeting with one village's *Gram sabha* about tendu leaf collection, a sub-divisional officer[87] protested that he should oversee such matters. This agitated one member of the *Gram panchayat*, who yelled back, arguing that he also has authority in the matter, and that because he is from the village, it's his word that will be the final one.

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While these perspectives highlight differences in how people think about the legitimacy of conservation institutions, there were several points of consensus across them. Here, consensus means that people generally ranked statements in similar locations in the grid, regardless of the

[87] Districts are divided into sub-divisions and sub-divisional officers are the chief administrators of those areas, focusing on revenue and executive tasks.

perspective with which they were associated. Table 5.2 shows these consensus statements, in order of how strongly people agree with them. For example, people from all perspectives ranked statement 26, “If it can be confirmed that livestock was killed by a wild animal, the affected owner should be paid directly and promptly” at +4, and they ranked statement 33,” The forest department should hire more local people” at +1.

Table 5.2: *A subset of Table 5.1, showing consensus statements ($p<0.01$) with their z-scores and ranks across the three factors, listed from agreement to disagreement*

Statement	Factor 1		Factor 2		Factor 3	
	z-score	Rank	z-score	Rank	z-score	Rank
26. If it can be confirmed that livestock was killed by a wild animal, the affected owner should be paid directly and promptly	1.825	4	1.340	4	1.723	4
6. There should be more education programs about conservation and the forest regulations	1.217	3	1.183	3	1.646	4
33. The forest department should hire more local people	0.550	1	0.189	1	0.312	1
29. Local people should create and enforce the forest rules	0.604	2	0.411	1	0.007	0
19. NGOs should help create forest regulations	0.192	1	0.267	1	-0.173	-1
34. Local people’s rights to subsistence and well-being should not be violated	-0.296	0	-0.122	0	-0.584	-1
21. Forest officers should follow the regulations better than they do	-0.509	-1	-0.146	0	-0.664	-2
15. There should be more departments making and enforcing regulations	-0.876	-2	-1.054	-3	-0.683	-2
14. People should be relocated from forest areas	-1.960	-5	-2.122	-5	-1.622	-4

While Table 5.2 shows that there is some degree of consensus on what constitutes legitimate economic practices, when paired with the three different perspectives, it becomes clear that not everyone agrees with why those practices are legitimate or not. There is a consensus that compensation for livestock depredation should be direct and prompt, and that there should be more educational programs about conservation and forest regulations. Furthermore, there is consensus that people should not be relocated from forests and that there should not be more departments making and enforcing regulations. But despite nearly everyone ranking these statements similarly, they did so for different reasons. For some, compensation and education are about the relationships between them and forest officials, while for others they are related to the outcomes of conservation programs. For some, more departments making and enforcing

regulations relates to their knowledge of, and ability to understand, forest regulations, whereas for others it may relate to their relationships with government officers. Consensus about what constitute legitimate economic practices, in other words, does not mean that everyone judges legitimacy in the same way.

While there is certainly some degree of consensus in the Melghat Buffer Zone as to what constitutes legitimate economic practices, the consensus is not so strong that it means there are no areas of disagreement or no differences in how people understand and judge the legitimacy of conservation institutions. People can agree with an idea for multiple reasons and because of multiple, sometimes competing, interests (cf. Murphree 2005; Tsing 2005). This simple fact has significant implications for ascribing a moral economy to a specific group of people. Thompson described his use of 'moral economies' as including "ideal models or ideology…which assign economic roles and which endorses customary practices (an alternative "economics"), in a particular balance of class or social forces" (Thompson 1991:340). However, he gives little attention to divergences and discontinuities in how and why people assign the economic roles. His task was to highlight an alternative economics that challenged the hegemony of capitalist ideologies. But in doing so, he erred in ascribing an entire economic model to a class, which, though contextualized historically, reifies the structural approaches to Marxism that he so often argued against. Focusing how people work to overcome differences and discontinuities within their own 'community,' as I have tried to do here, better brings forth the contingencies, relationships, and processes through which moral economies emerge as alternative models of legitimate economic obligations, roles, and practices.

I. Legitimacy in Relation

My goal in this chapter has been to show how moral economies emerge from contingent shifting relationships, as people make their own history within the circumstances given to them (Marx 1978 [1852]). Far from being determined by people's position within relations of production, people actively produce moral economies as alternatives to the structures they do not believe are legitimate. Emotions and claims help to cohere different groups and beliefs about how those groups should relate to each other, though these relationships are contingent and constantly being re-established, and consensus is neither unanimous nor indicative of shared perspectives.

In that they are constantly being negotiated and re-established, moral economies are just as much about the present as they are the past or future. Thompson defined the moral economy of the poor based on their selected interpretation of past paternal practices (Sundar and Jeffrey 1999:18). And while this focus on the past has substantive meaning for where Thompson locates the basis of their moral economy, there is no formal theoretical reason why moral economies must be tied to the past. Indeed, Edelman (2012) notes that moral economies reflect both past traditions and utopian aspirations. These aspirations orient moral economies toward the future as people challenge existing political economic structures with alternative possibilities. However, viewing moral economies as either based on the past or looking toward the future gives the sense that they are a fixed set of beliefs. Rather, as I have shown here, moral economies are contingent and always changing. Emotions shift and cohere groups differently, claims about who is obligated to what economic roles are not given, and consensus does not imply shared understanding. Focusing on the past helps to contextualize certain beliefs and practices, and acknowledging the future-orientation of moral economies helps to understand them as visions of

an alternative political economics. However, focusing on the "here and now," as Gibson-Graham (2006:xxiv) put it, prompts questions about the ways that people cultivate different beliefs and claims within the constantly changing and uncertain present. Answering this prompt means attending to how moral economies emerge from the relational and contingent processes that bind people together in different ways.

Because of their relational and contingent nature, I suggest that moral economies are about both struggle and cohesion. In recent literature, the term moral economy has migrated from an analytic of class struggle, rebellion, and protest to one of Maussian social cohesion (Pierce 2016), a process that Edelman (2012) argues has obscured Thompson's signal contributions to theories of moral economy. In focusing on emotions, claims, and consensus, I have tried to highlight and build upon the foundational elements of Thompson's contributions. However, in showing that emotions and claims cohere different groups in opposition to others, I have shown how cohesion is part and parcel of struggle. By making claims about government obligations to laborers, activists expand their base beyond the limits imposed by terms like 'caste' and *'Adivasi.'* This does not mean that differences in how people judged legitimacy do not persist, but that activists tried to align groups along different axes in order to mount a struggle against existing political economic structures.

However, this struggle is not a rebellion or riot, as was the case in Thompson and Scott's examples. Rather, I argue that it was a form of engagement about the state's relationship to the law. Examining how Penan narrate dispossession in Malaysia, Brosius (2006:315-316) argues that "much of what we have come to designate resistance in our analyses may be something quite different. What we may in fact be observing are efforts at engagement/articulation: efforts born of frustration and desperation, to be sure, but efforts at engagement all the same." In trying to

implement the PESA Act, get government officials to follow the law, and secure daily wage labor employment for workers, activists in Melghat are not so much resisting the state as they are engaging with it to make it work for them. Activists are, to use Nandini Sundar's phrase, 'defending the law against the state' (Sundar 2011). In Melghat, people are defending the law against state officials who do not follow it themselves and who see people as threats to forests and wildlife. This is not so much an act of resistance against the state, but an engagement with how it relates to the law. In other words, the law is inseparable from people's engagement with the state, but it is also an important medium through which they express their social and political struggles (Peluso 2017; Thompson 1975:208).

My argument in this chapter is that legitimacy is fundamentally relational. I have demonstrated that by building on theories of moral economies, emphasizing the contingencies of emotions and the groups they cohere, the definition of specific groups through claims about legitimate economic practices, and the different perspectives on legitimacy that exist within consensus.

This analysis has significant implications for conservation efforts aimed at promoting human-wildlife coexistence, which have largely adopted a normative, rather than relational, approaches to legitimacy that are tied to good governance principles. By normative, I mean that good governance principles use pre-determined categories and standards to understand legitimacy (Bodansky 1999). This approach includes typologies of legitimacy that attempt to break down legitimacy into constituent *a priori* categories like consequential, procedural, structural, and/or personal legitimacy (e.g. Suchman 1995). Good governance approaches apply certain principles to each of these categories in order to measure legitimacy, like the process must be bottom-up or the outcomes must be equitably distributed. But even when good

governance principles are not directly applied to these categories, the categories themselves remain normative because they take a stance on where legitimacy comes from that is independent of the empirical reality being described. It is important to note that normative typologies of legitimacy often stem from, or are reminiscent of, Weberian ideal types (Weber 1958). However, there is an important distinction between Weber's ideal types and normative typologies of legitimacy. Although both use ideal types/typologies as abstractions from empirical circumstances to guide the development of theory, Weber did not use ideal types describe empirical reality (Keyes 2002). Normative typologies of legitimacy are often used to describe empirical realities, and in doing so, restrict variation in how and why people legitimize certain practices into pre-determined categories. While my argument does not negate that these categories may be useful for describing legitimacy and for drawing comparisons between sites it does bring forth that there are aspects of legitimacy that may be left out or distorted by normative approaches to legitimacy.

Rather, I suggest that initiatives for human-wildlife coexistence would be better served by understanding legitimacy relationally. A relational understanding of legitimacy does not pre-impose certain categories of legitimacy onto a given context. Rather, it recognizes that how and why people legitimize certain practices emerges from historically contingent, shifting relationships. This emergence must be described first with specific reference to the historical context, and only then can it be compared to other theories of where legitimacy comes from. This does not mean that normative and relational approaches are mutually exclusive. Downward accountability and democratic decision-making may well lead to legitimacy in specific contexts. But whether or not they do would be understood differently by the two approaches. Relational approaches would not understand these processes as legitimate because they check pre-

determined boxes about what is and is not legitimate. Rather, they would understand that these processes are legitimate because of how they relate to and emerge from the specific context at hand. Additionally, a relational approach understands that any change in relationships may result in changes in how people judge legitimacy. For example, promoting human-wildlife coexistence, by definition, means changing how people relate to each other and to nonhumans. However, by changing these relations, conservation may also change people's ideas about legitimacy. The push and pull between efforts to legitimize certain institutions and the basis on which people judge the legitimacy of those institutions is key to a relational approach to understanding legitimacy.

Additionally, no attempt to promote human-wildlife coexistence is likely to fit all the different ways that people judge legitimacy. As I argued using Q Methodology, consensus about what practices are legitimate does imply consensus about why those practices are legitimate. Because of this, regardless of the extent to which people agree on a certain course of action, promoting human-wildlife coexistence comes with the risk of privileging some perspectives and marginalizing others (cf. West 2005). This is especially true given that some feel the impacts of human-wildlife encounters differently than others (Barua, et al. 2013; Ogra 2008). Power and inequality always influence whose perspectives counts, and how those perspectives get translated (Gal 2015; Satsuka 2015; Tsing 2005). Thus, conservationists should be particularly aware of the trade-offs associated with how they frame and implement their initiatives to promote human-wildlife coexistence, so as to make explicit and to mitigate ways that they could unintentionally reinforce inequalities (Hirsch and Brosius 2013).

1. Limitations

The Q Methodology component of this study had several limitations. Purposive sampling, and the algebraic need for fewer participants than statements (Kampen and Tamas 2014), prevented me from generalizing the results to the larger population. Using forced distributions, though easier for people, also reduces the variance of the rankings, creating higher correlations than an unstructured sorting would have (Dziopa and Ahern 2011). The need for literate participants, as having me or a field assistant read each statement aloud repeatedly during the sorting process would be unfeasible, biases the sample, which also included few women. While these limitations do not threaten the validity of the perspectives I found, they, along with the fact that the three perspectives account only for 40% of the variance, mean that I may not have captured every distinct perspective. The lack of gender balance amongst the participants could also mean that substantially different perspectives were not captured, as experiences of human-wildlife encounters can vary by gender due to how people with differently gendered bodies are differently positioned in local economies (Ogra 2008). Additionally, the skewed gender ratio likely affected the full list of statements from which I selected 36 statements. This could mean that the full list of statements was not as saturated as it could be, and thus the 36 statements I presented to participants was not as diverse as possible. This could also mean that people who experience different kinds of hidden impacts of human-wildlife encounters, and statements about those experiences, were not included in the study (Barua, et al. 2013). These limitations reinforce the need for future research that remedies this shortcoming.

2. Conclusion

Ultimately, understanding legitimacy relationally in conservation necessitates thinking about the people who live near wildlife as partners to collaborate with, rather than as variables to

be managed. Only through collaboration will conservationists know if people judge legitimacy based on process, outcomes, relationships, or some completely different standard that is specific to their lived experiences. People in Melghat have highlighted how people should have regular opportunities for wage labor, how *Gram sabhas* should manage forest resources under the PESA Act, and how compensation should be readily available and fairly distributed to those who lose crops or livestock to wildlife. These options cut across the polemics that are so entrenched in conversations about conservation in India, and present an alternative vision for how people should relate to each other and to nonhumans. With conservation in India nearly paralyzed by 'tigers vs. tribals' and 'protectionist vs. inclusionary' polemic, there is a need to find new approaches that alter the terms and conditions of debate. Perhaps listening to people who frequently encounter wildlife in their daily lives and who are affected most by conservation initiatives would be a place to start.

CHAPTER 6

CONCLUSION:

THE PROMISES AND PITFALLS OF COEXISTENCE

A. Introduction

On February 13th, 2019, the Indian Supreme Court ruled in favor of a petition submitted by three conservation NGOs regarding the Forest Rights Act of 2006 (FRA). The FRA built on PESA[88] by establishing a framework for Scheduled Tribes and others who have traditionally lived in forests to submit applications to state governments, via *Gram sabhas*, to have their individual or community rights to forest land recognized, regardless of whether that land was in a protected area or not. The FRA has been controversial since it was passed. It has been variously been hailed for democratizing forest areas (Kumar and Kerr 2012) and for equitably protecting forests from extractive industries (Kashwan 2013), and been critiqued for being unsuitable to improve people's living conditions (Münster and Vishnudas 2012) and for being the 'decisive nail in the tiger's coffin' because it gives government control of protected areas to local people (Sahgal and Scarlott 2010). While implementation of the FRA has been delayed for many areas, civil society groups and activists have been successful at securing some people's land rights across India (Barnes, et al. 2016). The three conservation NGOs that petitioned the Supreme Court hoped to prevent fraudulent use of the FRA by people trying to acquire new forest land, rather than have claims to their current land-holdings recognized. These NGOs argued that

[88] Again, the full name of this act is the Panchayat (Extension to Scheduled Areas) Act, 1996

anyone who had applied for land right under the FRA and been rejected should be considered encroachers and be forcibly removed from forests.

While the Supreme Court initially ruled in favor of the NGOs' petition, their decision caused a major outcry across India. Other conservation groups circulated and signed petitions defending the FRA as a key tool for conservation, while tribal activists decried the central government's silence throughout the court case. By some estimates, the court's ruling meant that between one and two million people living in forested areas would be evicted from their homes in a matter of months. Many conservation and tribal groups noted that the poor implementation of the FRA meant that legitimate claims to land rights had been rejected for procedural inaccuracies and that the court's ruling did not account for procedural errors, but instead assumed that any rejected claim must mean that the applicant has no legitimate land rights. In response to pressure from several groups, the court stayed its decision on February 25th and ordered state governments to provide details on how and why people's applications were rejected.

I am not aware of any claims being filed under the FRA by people I worked with during my dissertation research, but the activists in the northern buffer zone of Melghat do see it as a long-term goal. As I detailed in the previous chapter, these activists are working to more fully implement PESA and to expand the powers and transparency of the *Gram sabha*. The *Gram sabha* is the main body that submits applications under the FRA to the government. The activists have discussed the possibility of filing FRA claims once they are satisfied with how the *Gram sabha* is functioning, but have not yet done so.

However, my research was supported by two of the organizations that filed the petition to the Supreme Court, which work primarily in Melghat and Tadoba-Andhari. I was unaware of

their involvement in the petition during my fieldwork. I had known that the organization in Melghat, which is different from the one associated with the activists discussed in Chapter 5, had been involved in the relocation of villages from Melghat's core zone, but my understanding was that their role was to ensure that the process happened along voluntary, rather than coercive, lines. I am opposed to any coercive relocation of people, but I do understand that there are some people who would prefer to move out of protected areas (cf. Ghate and Beazley 2007). It was my understanding that this NGO had helped to ensure that those who wanted to move out had access to resources and knowledge to make that process as equitable as possible (see Sekar 2016). The NGO in Tadoba-Andhari was the one that I had a falling out with. By the time we stopped working together, it had become clear that, although they were doing some good work to help people mitigate conflicts with wildlife, they were absolutely opposed to people subsisting off forest resources. My opposition to their stance made it even more necessary for me to stop working with them.

The FRA extends the possibilities of coexistence from protected area buffer zones into core areas. It stipulates that anyone who has recognized land rights in core areas cannot be resettled or have their rights affected for conservation purposes unless "the State Government has concluded that other reasonable options, such as, co-existence are not available [*sic*]" (Government of India 2007). In contrast to the 2006 amendment to the Wildlife Protection Act, this wording implies that coexistence is possible in the core areas of tiger reserves, and that it must be ruled out as an option before people can be resettled. However, in line with my argument in Chapter 4, this definition of coexistence is likely to be interpreted along material lines, with coexistence only being achieved when people and wildlife do not use the same resources. That is, while the FRA presents the legal possibility that people and wildlife could

coexist in core areas, the material definition of coexistence that is used in India makes it difficult to argue that coexistence is a 'reasonable option' in core areas.

In this conclusion, I argue that this material definition of coexistence focuses wildlife conservation on the wrong issues, and that a relational definition of coexistence may help to advance a more equitable and effective form of wildlife conservation in and beyond protected areas. First, I argue that the material definitions of coexistence are inadequate for advancing conservation because they ignore the demonstrated ability of wildlife to behaviorally adapt to changing landscapes and because they emphasize fine-scale changes at the expense of regional-scale processes. Then, I summarize how this dissertation has advanced a relational understanding of human-wildlife interactions. Finally, I outline how a relational definition of coexistence that acknowledges the co-construction of landscapes and the different ways of living that emerge from human-wildlife interactions can advance conservation beyond protected areas.

B. Pitfalls of a Material Definition of Coexistence

In Chapter 4, I traced the material definition of coexistence that is used in Indian legislation to ecodevelopment's focus on reducing people's use of forest resources. As I mentioned, this definition largely aligns with evolutionary explanations that suggest human-wildlife conflict arises from interspecies competition for limited resources (e.g. Nyhus 2016), and that coexistence can be achieved by reducing the extent to which humans and wildlife rely on the same resources. This material definition worked to reinforce the idea that people should participate more in market economies in order to reduce their use of forest resources.

Here, I suggest that there are at least two main drawbacks to a material definition of coexistence. First, it neglects the ability of humans and wildlife to adapt to each other. In Chapter 3, I showed how humans adjust their spatial and temporal use of the landscape according to

different risks from wildlife. This chapter complements numerous studies from India and across the globe to demonstrate how animals like big cats and bears adjust the spatial and temporal dimensions of their movement and foraging behavior when in close proximity to humans (Athreya, et al. 2016; Athreya, et al. 2013; Bargali and Ahmed 2018; Broekhuis, et al. 2018; Carter, et al. 2012; Klaassen and Broekhuis 2018; Kolipaka, et al. 2018; Odden, et al. 2014; Takahata, et al. 2014). Taken together, this growing body of literature on human-wildlife co-adaptations (Carter and Linnell 2016) presents evidence that human and wildlife resource-use is flexible, rather than fixed. Material definitions of coexistence account neither for this flexibility nor the fact that this flexibility may allow humans and wildlife to use the same resources at different times of day, thus allowing them to live in close proximity. Rather, as I showed, they are based in an erroneous protectionist ideology that suggests wildlife cannot survive near human habitation and thus require inviolate spaces (see Margulies and Bersaglio 2018).

However, as some conservationists have pointed out, these co-adaptations may allow humans and wildlife to co-occur in close proximity but not coexist, as they may increase the actually increase wildlife attacks on humans and livestock (Harihar, et al. 2013). For example, though I showed in Chapter 3 how people in the buffer zone of Tadoba-Andhari Tiger Reserve restrict their use of the landscape to avoid wildlife, they still frequently come into violent conflict with carnivores (Dhanwatey, et al. 2013). Furthermore, domestic animals are often a key source of food for carnivores living close to humans (Athreya, et al. 2016; Bargali and Ahmed 2018; Edgaonkar and Chellam 2002). While wildlife attacks on people and livestock offer clear examples of conflict occurring despite behavioral co-adaptations, it does not follow that reducing people's use of forest resources is the only solution. For example, the occurrence of livestock depredations does not necessarily imply that livestock herding must stop. Many livestock

husbandry techniques, like the use of bomas or guard dogs, have been shown to greatly reduce the chance that carnivores will prey on cattle (Ogada, et al. 2003; Woodroffe, et al. 2006). Additionally, wildlife alert systems, which monitor the movement of wildlife and alert people to their presence via text message, have been shown to greatly reduce the number of people who are killed by wildlife in southern India (Kumar and Raghunathan 2014; Singh and Kumar 2014). The success of these management strategies demonstrates that conflicts do not necessarily occur because humans and wildlife use the same resources, but that they stem, in part, from incongruencies in *how* they use the same resources. The emphasis on 'how' rather than 'what' resources people use brings the role of human-wildlife co-adaptations back to the fore, in that people can mitigate conflicts not by ceasing to use certain resources, but by changing how they use certain resources. Because the central role of these mutual adaptations of humans and wildlife (Carter and Linnell 2016) is missing from a material definition of coexistence, I argue that it focuses wildlife conservation on the wrong issue.

Second, a material definition of coexistence often results in a mismatch between scale at which conservation is practiced and the scale at which the target ecological processes occur. As implemented in India, the material definition of coexistence focuses on people's interactions with wildlife in and around protected areas. As described in Chapter 4, coexistence strategies often focus on very fine scales, often at the household or village level. This is clear in wildlife tourism, which aims to provide an alternative livelihood for farming households (Karanth and Karanth 2012). However, the effectiveness of protected areas at conserving wildlife populations is largely influenced by how they are situated within larger landscapes (DeFries, et al. 2007; DeFries, et al. 2010). For example, protected areas only conserve tiger populations effectively when tigers can move between them and breed with individuals in other populations

(Seidensticker 2016). Ensuring their ability to do this requires initiatives at the landscape scale to maintain habitat connectivity through mosaic landscapes (Dutta, et al. 2016; Sayer, et al. 2013). At the landscape scale, features like mines, roads, railways, and power plants are the largest barriers to habitat connectivity and animal movement (Dutta, et al. 2018). Importantly, ecodevelopment initiatives that aim to promote human-wildlife coexistence often increase people's reliance on these features. Wildlife tourism requires accessible roads and increased electrical input, and other market opportunities promoted under ecodevelopment also require better connectivity between buffer zones and cities. I am not aware of any study that directly examined the impact of coexistence strategies on forest cover. But wage labor and the presence of local markets, two factors promoted under coexistence strategies, are positively associated with deforestation in India (Davidar, et al. 2010). In other words, there is an open question as to whether material definitions of coexistence undermine landscape scale processes by focusing on fine scale interactions.

Related to this question is another question about ecological effects of materially defined coexistence strategies at distant locales. As part of Tadoba-Andhari's coexistence strategy, tourism resorts are being constructed throughout the western part of the buffer zone and are mainly built of sand-derived concrete. Sand mining has devastating effects on the health of rivers and their floodplains (Miller, et al. 2018; Sreebha and Padmalal 2011), and concrete production in general contributes 8.6% of all anthropogenic carbon dioxide emissions (Miller, et al. 2016b). That these factors are not considered in the buffer zone's coexistence strategy is another short coming of the fine-scale focus that comes from a material definition of coexistence. That is, such a definition may implicate coexistence in patterns of ecologically unequal exchange (Jorgenson

2012; Rice 2007) whereby the implementation of coexistence strategies around protected areas contributes to ecological degradation elsewhere.

By ignoring the ways that humans and wildlife co-adapt to each other and by creating a scalar mismatch between ecological processes and conservation action, material definitions of coexistence are limited in their ability to create sustainable multispecies landscapes. Overlapping resource use, in itself, does not lead to unsustainable human-wildlife interactions, and a focus on fine-scale resource use distracts from, and may bolster, factors threatening landscape-scale ecological processes. Furthermore, as I showed in Chapter 4, material definitions of coexistence can naturalize conflicts between humans and wildlife and thereby reinforce protectionist and capitalist ideologies of conservation. In the next section, I summarize the main arguments of this dissertation and how they emphasize a relational view of human-wildlife interactions.

C. Summary of Arguments about the Relationality of Humans and Wildlife

This dissertation focused on how the relationality of humans and wildlife shapes efforts to promote a material definition of human-wildlife coexistence in central India. Drawing on multispecies ethnography and Marxist political ecology, I used the term 'relational' to denote how humans and wildlife, rather than being fixed entities, change as a result of their relationships with each other, and that this relationality influences history and gives rise to emergent phenomena. While political ecologists have developed a large corpus that demonstrates how conservation has restructured people's relationships with nonhumans, they have tended to characterize conservation as an unchanging monolith that structures different contexts according to its own vision, but does not change itself (e.g. Carrier and West 2009; Igoe and Brockington 2007; Jalais 2010; Massé 2016; Moore 2011b; Neumann 1992; Rai, et al. 2019; Snijders 2012; West 2005; West 2006). In order to advance a more relational approach to the political ecology

of conservation, I drew on the growing intersection between multispecies ethnography and Marxism to understand how people's relationships with nonhumans structure conservation in central India.

In the first chapter, I introduced the buffer zones of Melghat and Tadoba-Andhari tiger reserves in Maharashtra, India. Both areas are governed by laws that aim to promote human-wildlife coexistence and have similar assemblages of wildlife. However, their political economies are somewhat different, as are people's interactions with wildlife. In Melghat, most people work as farmers and primarily encounter wildlife when trying to prevent animals from eating their crops. In Tadoba-Andhari, people either work as wage laborers in farms and tourism resorts or collect bamboo and sell woven mats, and frequently encounter large, dangerous animals like tigers, sloth bears and leopards. Comparing these two sites is ideal for understanding how people's relationships with wildlife affect conservation, because the conservation regulations and assemblages of wildlife are largely the same, but the political economies and human-wildlife interactions are quite different.

In Chapter 2, I showed how the material relationality between soils, trees, and shifting cultivators shaped how colonial administrators appropriated Melghat's forests for scientific forestry. Because certain trees only grew on certain soils, colonial administrators focused on appropriating some areas and restricting shifting cultivators to others. This created a pattern whereby the valleys and slopes became spaces of capitalism and the hilltops became spaces of a hybrid economic system. I then showed that this sharp spatial distinction created a metabolic rift that threatened both colonial forestry and shifting cultivation, resulting in the colonial administrators establishing more of a gradient between capitalist and hybrid spaces. This chapter

established how multispecies relationships act as a force of history in relation to capitalism, and that both have mutual influences on each other.

In Chapter 3, I explored how contemporary local economies in Melghat and Tadoba-Andhari emerge from the relationships between humans and wildlife. I showed that the spatial and temporal dimensions of people's economic activity is shaped the different kinds of risk posed by wildlife. In Melghat, wildlife primarily pose risks to people's crops, and because of that people often move with the explicit intention of encountering and driving out wildlife from their farms. In Tadoba-Andhari, wildlife primarily pose risk to people's lives, and because of that people often avoid going to certain places at certain times of day because they fear encountering wildlife. Because these interactions affect what kinds of economic activity people can do where and when, I argued that the different local economies of Melghat and Tadoba-Andhari are partly the result of the different relationships people have with wildlife in the two areas.

In Chapter 4, I demonstrated that the way wildlife have shaped local economies affects the implementation of coexistence strategies in both buffer zones. In Melghat, crops set the conditions under which local economies grew in contradiction to protected area regulations. Systems of bribery helped resolve that contradiction but stifled the implementation of coexistence strategies. In Tadoba-Andhari, coexistence strategies have been bolstered by the fact that tigers pose risks to bamboo collectors but generate value in tourism, driving people from the former to the latter. Through this comparison, I showed how the relationality between humans and wildlife influence the implementation of coexistence strategies.

Finally, in Chapter 5, I highlighted how an alternative vision for human-wildlife coexistence emerges from people's efforts to transformation their political economies and relationships with state organizations. I show that people's emotions and the claims that they

make about obligations between themselves and others help to articulate new ways in which groups relate to each other. I then use Q Methodology to show how people differently translate claims about what constitutes legitimate conservation practice. Through this exploration of moral economies, I argue that legitimacy is fundamentally relational, and that this relationality necessitates thinking about the people who live with wildlife as partners in conservation, rather than variables to be managed.

Ultimately, by demonstrating how the relationality of humans and wildlife shapes conservation, I aim to advance a relational definition of human-wildlife coexistence. While Carter and Linnell (2016) have contributed to such a relational definition by emphasizing the co-adaptations of humans and wildlife to each other, the other aspects of their definition of coexistence fall short of relational understandings. In Chapter 5, I critiqued their conceptualization of how legitimacy relates to human-wildlife coexistence, in that they offered a normative framework for understanding legitimacy through a set of principles, rather than relationships. My main argument in Chapter 5 was that legitimacy is relational, and that people's ideas of what makes an institution legitimate cannot be understood apart from how people relate to different groups and to the institution itself. Such an understanding advances a relational definition of coexistence by showing how people's ideas for managing their interactions with wildlife are contingent on those interactions. In the next section, I suggest directions for future research that can build on a relational understanding of human-wildlife coexistence to co-create just, multispecies landscapes.

D. Directions for Future Research on the Relationality of Humans and Wildlife

At the end of Chapter 2, I quoted Gan, et al. (2017:G12), who wrote that acknowledging how landscapes emerge from multispecies relationships helps "to radically imagine worlds that

are possible because they are already here." This understanding of the co-constitution of landscapes points to the limits of material approaches to human-wildlife interactions that emphasize resource and spatial separation (cf. López-Bao, et al. 2017), and aligns with efforts to promote landscapes that work for both humans and wildlife (Kremen and Merenlender 2018; Sayer, et al. 2013). Landscapes have always been multifunctional, but only recently have conservationists begun to seriously consider them as a viable option for achieving human-wildlife coexistence (Ceaușu, et al. 2019). Numerous large species have demonstrated their ability to persist in multifunctional landscapes (e.g. Athreya, et al. 2013), which suggests that more research on human-wildlife interactions outside the boundaries of protected areas, and even into urban spaces, is needed (see Soulsbury and White 2015). This research can be advanced by further explorations of how co-adaptations between humans and wildlife shape and are shaped by different landscape processes, and how these relationships are embedded within larger political and ecological processes.

Further research on how humans and wildlife share landscapes will necessitate collaborative research on how multifunctional landscapes can and cannot promote environmental justice. The literature on how conservation can reproduce multiple inequalities is vast, and both social and ecological scientists have called for further collaborations with activist groups and others working to create more just multispecies interactions (Redpath, et al. 2017; Sundberg 2014). These collaborations are important because people who share landscapes with wildlife often have unique perspectives on how best to manage their interactions with wildlife (Amit and Jacobson 2018; Rust 2016), and also because their perspectives often emerge from their interactions with those nonhumans (Allen, et al. 2018). This relationality between people's interactions with wildlife and their ideas for managing those interactions means that researchers

need to listen to and collaborate with those who share space with wildlife, as no blueprint approach can account for the infinite variations of human-wildlife interactions. In other words, just landscapes can only be created through just means. While such collaborations will always necessitate understandings of different trade-offs, translations, and incommensurabilities between different perspectives and forms of knowledge (Hirsch and Brosius 2013; McShane, et al. 2011), it is becoming clear that justice and conservation can be mutually reinforcing (Vucetich, et al. 2018). Partnerships with social movements and broad coalitions of diverse actors can help transform how human-wildlife interactions are managed to create more just multispecies landscapes (Kremen and Merenlender 2018).

E. Conclusion

Aside from threatening the lives of millions of people who live in forested areas across India, the recent FRA case seems to have reignited the debate between protectionist and emancipatory conservation strategies in India. While this debate initially helped advance questions about the equitability of conservation, (and these questions have surely not gone away), it has become paralyzing and misguided. The question of whether to create inviolable spaces for wildlife distracts from more important questions about creating shared landscapes for humans and wildlife (López-Bao, et al. 2017). Conservation can better be served by forging collaborations between people who have different relationships with wildlife, and by following what emerges from those collaborations. Ultimately, the relationality of humans and wildlife is not only a fact, but a means of creating just and livable multispecies landscapes. It is only by listening to and working with those whose lives are already entangled with wildlife that coexistence will become reality.

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