



Political ecology of tiger conservation in India: Adverse effects of banning customary practices in a protected area

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Protected areas have had significant impacts on local communities primarily through the physical removal of people. In some instances, people continue to live within protected areas due to the inability of the state to evict them. The restrictions on livelihoods placed on people living inside protected areas lead to *in situ* displacement. We show how conservation enclosures in the Biligiri Rangaswamy Temple Tiger Reserve have produced a class of people that the state 'lets die' by banning customary practices such as fire use, hunting and harvesting of forest produce. Using longitudinal ethnographic, socio-economic and ecological data, we demonstrate that conservation policy has alienated indigenous forest dwellers from their agricultural and forest-land. The outcomes of conservation policy include dispossession through increased crop losses, reduced income from agriculture and forest produce, as well as a forest that is dominated by weeds due to fire suppression. The ban on hunting in particular has increased wildlife densities, which has enabled the state to accumulate revenues through the establishment of wildlife tourism facilities. All in all, centralized protected area governance has changed the relationships among people, forest and the state in a way that has produced adverse effects for both livelihoods and the ecosystem.

Keywords: Political ecology, displacement, protected areas, web of relations, tiger conservation

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Introduction

The tiger (*Panthera tigris*) has for decades played an iconic role in the global conservation movement. In India, The World Wide Fund for Nature (WWF) helped the government to finance the Project Tiger from 1973 (Greenough, 2003), while the Global Environment Fund (GEF) has supported eco-development programmes around protected areas, including tiger reserves, since 1996 (Green *et al.*, 2010). The World Bank supports tiger conservation internationally through its Global Tiger Initiative, which hosted the Tiger Summit in Russia in 2011 that raised 33 million British pounds for international tiger conservation. This type of support and funding has resulted in a steady increase in the number of tiger reserves and tigers.

In India, there are currently 50 tiger reserves covering 2.08 per cent of the land area, which are managed by the Forest Department (National Tiger Conservation Authority, 2016a). As of 2013, 787 villages consisting of 51 329 families still lived in the by-then 41 established reserves, while 145 villages with 8197 families had thus far been relocated from tiger reserves (Lok Sabha, 2013). Most people in these reserves are Adivasis who are indigenous forest dependent communities. They constitute about 8 per cent of India's population.

The late 1960s was a significant period for Indian conservation policy formulation. International attention came to bear on the status of Indian wildlife, especially the tiger. At the International Union of Conservation of Nature (IUCN) conference in New Delhi in 1969, the then Prime Minister of India, Indira Gandhi, declared a ban on the export of tiger and leopard skins as well as on safari hunting (Rangarajan, 2001). The stage was being set for a comprehensive conservation policy. The Wildlife Protection Act (WLPA) was notified in 1972 (Lewis, 2005). It mandated the establishment of national parks and wildlife sanctuaries that would be controlled by the Forest Department and staffed by members of the Indian Forest Service. This centralization of control was a key feature of the WLPA. Following the results of a task force report that recommended 'safe havens' for the tiger, the government implemented Project Tiger in 1973.

While WLPA represents the first proper attempt at conservation legislation, earlier efforts by the state for controlling the forest was accomplished through the Indian Forest Act (IFA) enacted by the colonial British government in 1865. The IFA notified reserve forests for the purpose of timber extraction meant for the colonial capitalist enterprise. The WLPA converted some of these reserved forests into protected areas, specifically wildlife sanctuaries and national parks. Local practices such as grazing, swidden agriculture, forest produce collection, fire management and fuelwood collections that were regulated under the IFA were now banned or heavily regulated depending on the protection category. National Park notification was accompanied by attempts to relocate forest dwellers from within the area (Shahabuddin & Bhamidipati, 2014).

One of the main management aims of the National Tiger Conservation Authority (NTCA), the central agency that establishes, funds and governs tiger reserves, is that 'voluntary relocation of people needs to be carried out only in the identified core/critical tiger habitats of a tiger reserve' in order to create inviolate areas (NTCA, 2016b). This idea of inviolateness has a long history in the conservation literature and conservationists continue to argue for the relocation of forest dwellers from reserves (Karanth, 1998; Walston *et al.*, 2010). The social costs of such relocations include adverse effects on livelihoods through lost access to land and resources (Lasgorceix & Kothari, 2009; Rangarajan & Shahabuddin, 2006; Kabra, 2009). Efforts by the state to evict people have been met with resistance by local people (Johari, 2007; Mukherjee, 2009). The difficulty in finding available land outside protected areas for relocation as well as resistance to relocation from forest dwellers resulted in people continuing to live inside wildlife sanctuaries. As customary livelihood practices have been restricted or banned, forest-based livelihoods have increasingly become difficult. As Kashwan (2017) notes, areas were being enclosed for conservation even as the remaining available land was being opened up for large industrial and developmental projects with their own set of adverse outcomes for people and the environment.

In political ecology, displacements caused by conservation practices have recently been framed as a form of accumulation by dispossession following Harvey's (2003) development of Marx's notion of primitive accumulation (Marx, 1995) (e.g. Büscher, 2009; Corson, 2010; Kelly, 2011; Benjaminsen & Bryceson, 2012). According to Li (2009) it is the places and the resources in these places that are valued and not the people. Dispossession may therefore, not create surplus labour to be used in capitalist production as in Marx's classic example of the enclosure of the English commons, wherein the dispossession of smallholders created labour for the industrial revolution.

The places that are emptied of people might for instance become sites for investments in large-scale production of food crops, climate mitigation or for the development of ecotourism. In many cases, non-capitalist spaces and resources are opened up for capital accumulation, while local people tend to be in the way of such investments (Li, 2009). Hence, they will be 'let die'. This is taken from Michel Foucault's notion of 'biopolitics' where sovereign power will either make a population live (through enhancing their health and well-being) or let them die (through abandonment) (Li, 2009). The abandoned people may be seen as a 'surplus population' in the sense that it is surplus to the requirements of capital accumulation (Li, 2009). There is limited or no need for their labour in the new economic activities created through their dispossession.

In this article, we examine the consequences of long-term restrictions imposed by conservation policy on the livelihoods and life of forest dwellers in a protected area, more precisely the Biligiri Rangaswamy Temple Tiger Reserve (BRT) in the Western Ghats. Drawing on this case, we discuss to what extent the notions of 'accumulation by dispossession', 'letting die' and 'surplus population' suitably describe the current situation of the indigenous Soligas in this tiger reserve. We then add to the growing literature in India and elsewhere on how current conservation policy is changing the relationship of people and forests.

The case study

Located at the eastern reaches of the Western Ghats, BRT (Figure 1) with an area of 575 km² has a diversity of vegetation types ranging from dry scrub forests, woodland savanna, deciduous forests, evergreen forests, shola forests to grasslands. The forest came under the control of the British in the early 19th century. While a substantial portion of the district was in the Madras Presidency that was ruled by the British, the remaining area was ruled by the Maharaja of Mysore. The administration and control of the BR Hills were divided between the British and the rulers of Mysore along a north-south line that ran along the ridge of the hill range. In 1887, the British administration granted a lease to a Scottish planter named Randolph Morris to convert the forests of the upper reaches of the BR Hills to coffee plantations (Rice, 1897).

Labour for the plantation was sourced, then as now, from the local adivasi *Soliga* population. The coffee plantations in BRT are still a major source of employment for the Soligas. Over 30 per cent of the households from the 42 Soliga settlements that are located close to the coffee estates, are employed regularly or seasonally by the coffee estates. The plantations are dependent on Soliga labour. When the area was declared a wildlife sanctuary in 1974 and Soliga settlements (*podus*) were relocated to the periphery and the main roads, eight settlements were established around the coffee estates to ensure continued labour for the estates. In addition to working in the coffee plantations, Soligas also worked in state timber extraction and elephant capture operations known locally as *khedda*.

Adivasis have historically been moved around by the state as part of corvée labour requirements for timber and plantation activity. The colonial forest department used the labour of the Adivasis in timber operations. Their cheap labour, as well as their being resistant to diseases such as malaria were seen as advantageous by the British (Münster, 2014). Soligas hunted small game and assisted in the hunting of larger animals such as elephants and tigers by the maharajas of Mysore and also the British. The temple that lends its name to the area has a history that dates to the 18th century and

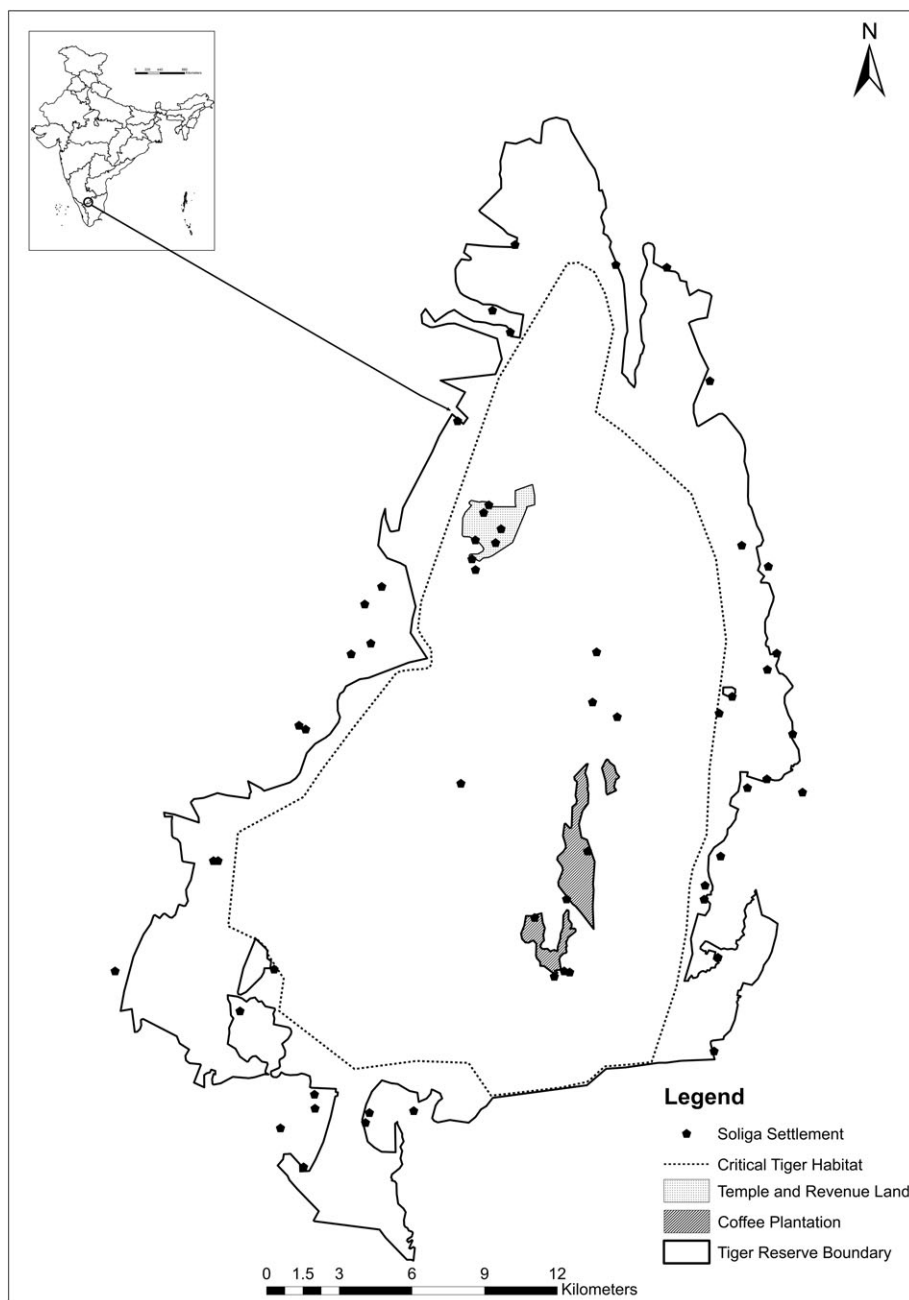


Figure 1. Map of Biligiri Rangaswamy Temple Tiger Reserve. The boundary of the critical tiger habitat is drawn based on the 2011 notification of the reserve.

Source: Prepared by Tania Bhowmick at the eco-informatics centre, ATREE.

has been patronized by the maharajas of Mysore. The history of the BR Hills shows that the landscape has been used and managed by a number of different actors ranging from the colonial state, Mysore kings, commercial coffee planters, temple authorities

and Adivasis. This history of the landscape demonstrates that the area was far from a wilderness landscape that current management strategies strive to recreate.

The Soligas were shifting cultivators until four decades ago when the area was declared a wildlife sanctuary. They were sedentarized after BRT was notified as a Sanctuary under the WLPA. Prior to the establishment of the sanctuary, they used fire extensively to burn the forest to maintain it as savanna woodland with a grassy understory. They cleared areas of forest for the cultivation of millet, beans and a variety of subsistence crops. Soligas and peasants living in the surrounding villages burnt the landscape regularly to ensure grass for livestock and maintained an open forest as this ensured visibility, ease of movement and access to a range of products such as tubers and grasses (Sanderson, 1907).

The data for this article comes from a mix of quantitative and qualitative methods and from both primary and secondary sources. The observations and research have been conducted over a decade of work in BR Hills. The methods include in-depth interviews, focus group discussions, workshops, participatory mapping and socio-economic household surveys. The household data for 1995 was obtained from published surveys conducted by Hegde *et al.* (1996). The household socio-economic data collection was repeated for 210 households in 2005 and for 310 households within the tiger reserve in 2009. Data on land holding size, family structure, sources and amount of income and expenditure and other socio-economic indicators were collected during these surveys. Data on crop loss was collected in 2010 from a subset of 40 households in four villages that were surveyed in 2005. The villages were chosen to represent the variation in forest type (dry to wet forest) and land ownership regimes (full ownership to insecure tenure).

In order to analyse the relationships between the various policy decisions and their impacts on livelihoods and ecology, we use a 'web of relations' approach (Rocheleau 2008, Mariki *et al.*, 2015). This is an approach that is inspired by Blaikie and Brookfield's 'chains of explanation' (Blaikie & Brookfield 1987). However, since such 'chains' may be seen as rigid hierarchies of power, Robbins (2004) proposes instead to view these relations as 'networks'. Rocheleau (2008: 724) further suggests 'webs of relation' by stating '(t)he centre of gravity is moving from linear or simple vertical hierarchies (chains of explanation) to complex assemblages, webs of relation and "rooted networks", with hierarchies embedded and entangled in horizontal as well as vertical linkages'.

In describing chains of explanation, Blaikie and Brookfield (1987) suggest that the analysis begin with the immediate land manager—meaning, the individuals or institution that in practice manage the land or natural resources. Webs of relations may, on the other hand, take any component as a point of departure and use a stepwise process to map out how the various links in a network are inter-connected and how changes in one element will impact other elements. A web of relations comprises of events, actors and policies that affect lives and landscapes at a variety of scales. Chains and webs of relations should be seen more as a conceptual framework to identify links and processes, rather than as a detailed methodological approach. This conceptual framework helped us in the research process in two ways. It assisted us as researchers in clarifying and making explicit the links between the various elements, and it also helps us to communicate these links through Figure 3. Hence, the web of relations approach is helpful in highlighting the interrelated nature of outcomes of conservation policy on the ecology of the forest as well as on the livelihoods of local people.

The outcome of conservation practice

In an incisive discussion of the role of ethics in contemporary environmental conservation, Sivaramakrishnan (2015: 34) says 'the paternalist outlook of the nation-state leads to the presentation of all aspects of life in the language of protection. Looking back to the colonial antecedents of these ideas of protection, existing studies abundantly document that the protection of forests from fire was one of the earliest examples.' He goes on to say that the hunter-gatherer and the swidden cultivator was targeted by colonial and national policies over the last century. Hence 'protection was always, of course, also the language that masked acts of expropriation. Resources, livelihoods, homes, and futures were taken away, by national and regional states from their citizenry, in the name of protecting everything from soils, to species, to sacred spaces, and citizens themselves. This has led to new kinds of conflicts and vulnerabilities'. Others such as Annu Jalais have shown how the relationship between tigers and people have changed from empathetic to adversarial as a result of the state's prioritization of sanctuaries and tourism over people (Jalais, 2010). The case of BRT demonstrates the consequences of such expropriation for the forest and the people who reside in them.

The declaration of BRT as a wildlife sanctuary in 1974 under the WLPA transformed the forest and agricultural practices of the Soligas. No longer could they practice swidden agriculture, set ground fires or hunt. Such customary practices were perceived by the forest administration to be primitive, degrading, and harmful for wildlife and forests (Pyne, 1994; Williams, 2003; Chhatre & Saberwal, 2006).

The ban on hunting that ensued as a result of the WLPA was implemented all over India, and especially stringently in protected areas. In BRT, Soligas were forced to surrender their guns with which they hunted small game. Soligas who we interviewed, reported that people generally complied with these orders and that hunting of animals was reduced drastically from the mid-1970s onwards. Hunting of wildlife in BRT was carried out not only by Soligas, but also by peasants living in and around the forest area. The ban on hunting resulted in an increase in wildlife numbers across the BRT landscape as it has in other parts of India. Herbivores such as sambar (*Rus unicolor*), chital (*Axis axis*) and wild boar (*Sus scrofa*), which were hunted for meat experienced a steady growth in numbers as a result of the decreased hunting. Kumara *et al.* (2012) show that the biomass density of large herbivores in BRT is among the highest in the country (4127 kg/km²). Forest Department data on tiger population indicates an increase in the number of tigers from 35 tigers in 2010 to 68 in 2014 (*Survival International*, 2015).

Sanctuary notification and the eventual ban on hunting is commonly perceived by the Soligas as the reason for increase in wild boar numbers. Soligas describe a long history of hunting of wildlife in BRT by the British, the maharaja of Mysore and Soligas themselves who had been given firearms for hunting and crop protection. After the establishment of the wildlife sanctuary, all firearms were confiscated and hunting banned. Soligas claim that the cessation of hunting has resulted in the increase of wildlife densities especially of wild boar, which thrive in the forest around the podus, due to the availability of crops and cover provided by the vegetation in the forest.

Soligas claim that wild boar and elephant populations have increased due to the hunting ban. Soligas also suggest that the reason for the increased raiding of crops by wild boars is because forage has decreased within the sanctuary due to the higher density of *Lantana camara*, an ornamental plant turned weed that was introduced to

India by the British in the early nineteenth century. Ecological studies in BRT have shown that Lantana growth has increased tremendously over the last few decades. There was a 3-fold increase in density of Lantana in BRT between 1997 and 2007, and a doubling in the geographic spread within the tiger reserve during this period (Sundaram & Hiremath, 2011).

Some Soliga farmers say that while raiding of crops by wild boars did occur during the shifting cultivation phase, the problem was less intense as wild boars also found abundant forage in the forest and only a few wild boars would raid crops. Fires in the forest facilitated regeneration of tubers edible to boars, which kept them off the fields. Soliga maintain that the invasive species Lantana has reduced tuber availability and that wild boar raids have increased since sanctuary notification.

In a study on animal crop raiding in Karnataka, Karanth *et al.* (2013) found that 67 per cent of the surveyed households surrounding BRT reported crop loss. The largest proportion of loss (56 per cent) was attributed to wild boars. We estimated crop loss due to wildlife experienced by 40 households in 4 podus in BRT. The podus ranged from one that was entirely millet producing to one that was entirely coffee cultivating and two podus in between had a mix of millet and coffee cultivation. The crop loss proportion ranged from an average of 79 per cent in the entirely millet producing podu down to 4 per cent in the coffee cultivating podu with 25 per cent and 26 per cent crop loss in the podus that had a mix of coffee and millet cultivation (Figure 2). The loss of the millet crop to wild boar raids was exceptionally high.

Households in podus that could switch to coffee from millet did so to avoid losing crops to wild boars. Coffee only grows in wet areas and is not therefore an option for all villages. Moreover, as it takes a few years to produce any yield, only households that have the ability to forego income from agriculture for a few years could afford to switch to coffee. The high proportion of loss of crops to wild boars in BRT has produced food insecurity and deprivation.

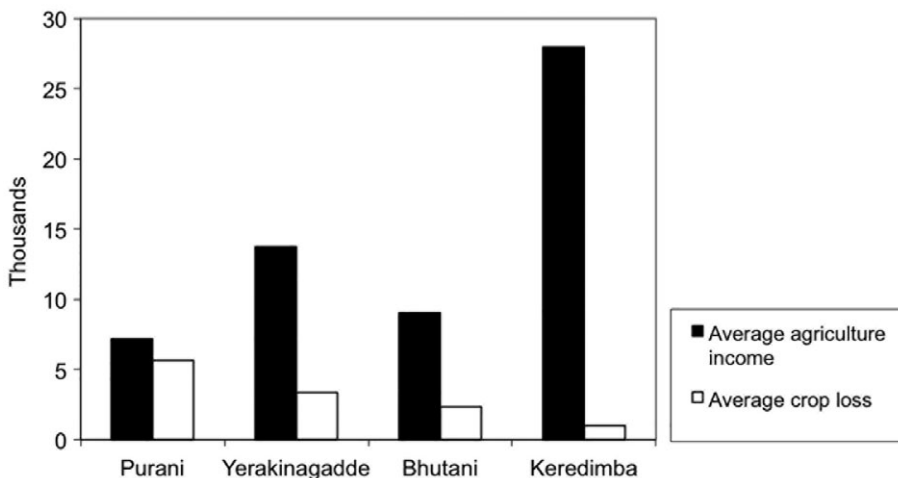


Figure 2. The average household income in USD from agriculture and average crop loss per household due to wildlife in four villages located inside the Biligiri Rangaswamy Temple Tiger Reserve. Villages arranged from left to right in increasing proportion of coffee crop as proportion of total acreage under coffee cultivation. Source: Graph prepared by the authors based on data obtained during fieldwork.

For instance, a Soliga respondent said:

When the District Forest Officer came [30 years ago] he said, “Don’t enter the forest, don’t cut trees, don’t set fire.” Do you know what is the result? The forest is full of Lantana, which allows no trees to bear fruits. Earlier, wild boars ate these fruits and grew well and we also ate well, but now only coffee estate people eat three times a day.... This land is the basis for our life, the produce is eaten by boars; we are trying hard to live. The Forest Department has banned the harvest of forest produce. They get a salary every month, but what do we do? If even two wild boars come to our field everything will be lost. During Indira Gandhi’s period we had cows, sheep, goats, but now we have nothing. They let our stomachs burn (Anonymous, pers. comm., Monukai, February, 2010).

During interviews Soligas describe crop raiding by wild boars in groups of varying sizes. Both male and female boars participate in raiding crops. A group can damage two acres of crops in one raid. Ten to 15 boars can damage half to one acre of crops during a raid. Individual boars might also attack humans. Raids are observed to start around sunset and may go on until the morning.

Soligas suggested the culling of wild boars as a solution to the crop loss problem saying that before the establishment of the sanctuary, Soligas and other peasant communities commonly trapped and killed wild boars, and that the strict ban on hunting was the reason for the explosion of the wild boar population. Ecological studies on herbivore densities show that the wild boar is the third most common ungulate species in BRT after sambar and chital (Kumara *et al.*, 2012). For the Soligas the constant presence of wild boars in their fields is an indicator that boar densities are high in nearby forests. Govindrajan (2015) has similarly observed that in the forests of the Western Himalayas, the abandonment of fields ‘creates microhabitats capable of supporting small groups of wild animals’ such as wild boars.

Most Soligas interviewed recounted a process of forest change that they say has further exacerbated the problem. They claim that the ban on the use of fire has transformed the once open forest into dense vegetation. Fire kept the undergrowth open and facilitated movement, use and visibility. Lantana densities and cover have increased significantly enough to affect the vegetation dynamics of many tree species due to suppressing growth and recruitment (Ticktin *et al.*, 2012). Soligas have listed over a hundred species of plants and trees that they say have declined over the past 40 years. This decrease in the population of many plant species including *Kydia calcina* (an important fodder species of elephants and nectar for bees), tubers and grasses, as well as the decreased visibility in the forest has resulted in Soligas not harvesting a range of forest produce. Hence, the combined impact of restrictions, vegetation transformation and wildlife increase has considerably reduced forest-based livelihood opportunities.

There is a differentiated response of Lantana spread in vegetation types. Sundaram and Hiremath (2011) have shown that there was a ten-fold increase in Lantana densities in the dry forests compared to a four-fold increase in moist forests. Soligas refer to the dry forests as *Beggadu* and this vegetation type occupies the largest area of BRT. This is where historically, most of the shifting cultivation occurred. The dependence of people on forest-based incomes is highest in this vegetation zone as these podus are far from coffee estates, and are not conducive to the cultivation of coffee on their agricultural land due to the lesser rainfall. As a result, households in this vegetation zone have far lower total household incomes and agricultural incomes than households in the

wet forest zone. Hence, podus that are located in this vegetation type, experience the most significant impacts of the altered management practices.

Soligas give an account of forest change that is hard to ignore and that is now being confirmed by ecological studies. They describe the impacts of fire suppression as not only increasing Lantana densities, but also that of a mistletoe (*Taxillus tomentosus*) that infects adult trees leading to their early death. The mistletoe is susceptible to the smoke from ground fires and the absence of these fires has resulted in an increase in its density. In corroboration of what the Soligas have been describing, long-term ecological studies in BRT have shown that a) Lantana has increased significantly (Sundaram & Hiremath, 2011); b) mistletoe-induced mortality of trees is high (Rist *et al.*, 2008); c) the combined effect of the increase in Lantana growth and mistletoe infection has resulted in population decline of two major non-timber forest produce (NTFP) species, *Phyllanthus emblica* and *P. indofischeri* (Ticktin *et al.*, 2012).

Farmers switch to coffee as it is not eaten by wild boars and hence considered a safe crop to cultivate. But not all farmers can switch to coffee as they do not live in coffee growing areas. Out of the 61 podus in BRT, only 16 podus are involved in coffee cultivation as coffee grows well in wet and high elevation zones in which these podus are located. While coffee cultivation provides higher cash income than millet, it has changed the food basket of households as Soligas now have to buy all their food from the market. Food security impacts are high due to a reduction in the number of food items in their diet. Under their customary cultivation practice, Soligas grew a range of species in their agriculture lands such as greens, pumpkin, field beans, maize and millets. The move to monoculture cash crop such as coffee has removed a number of crops from their diet. They now buy their grain from the state run public distribution system that is dominated by the supply of polished rice that is of a far lesser nutritional value than the millet they used to grow (Mundoli *et al.*, 2016). This shift in cultivated species also has impacts on cultural practices such as the offering of cultivated food to the gods during the harvest festivals such as *Rotti habba* and *Hosa raji habba*.

Soligas in BRT have harvested and sold forest produce for decades. A significant portion of the income of many households is derived from the sale of NTFP. Studies have shown that up to 60 per cent of the cash income of Soliga households comes from the sale of NTFP (Hegde *et al.*, 1996). Such harvest continued in the wildlife sanctuary until an amendment to the WLPA in 2012 resulted in the ban on NTFP harvest for a few years. The amendment proscribed the harvest of NTFP from wildlife sanctuaries. The ban was implemented in the year 2006 in BRT despite protests and challenges to the ban by Soliga institutions. The ban continues to be in place, but Soligas have now invoked provisions of the Forest Rights Act, that was enacted in 2006, to harvest NTFPs. The Act provides for Adivasi communities' rights to reside in and use the forest for a variety of customary purposes provided they claim and are granted these rights. Many Soliga villages have claimed these rights in 2011 and have now resumed harvest. However, the harvest of forest produce has declined due to (a) the expansion of Lantana growth reducing the accessibility to NTFP trees in the forest and (b) the mortality of NTFP trees due to mistletoe infection.

The decadal data on household income shows a reduction in proportion of household income from the sale of NTFP (Table 1). According to Hegde *et al.* (1996), 55 per cent of household income was derived from NTFP. Household data that we collected in 2005 and 2009 show that household income from NTFP dropped to 33 per cent in 2005 and to 7 per cent in 2009. The annual household income derived from NTFP decreased from USD 104 in 1995 to USD 19 in 2009 (when corrected for consumer price index). During the same period, the proportion of income from wage labour increased from

19 per cent in 1995 to 43 per cent in 2009 (USD 37 in 1995; USD 114 in 2009). During the ban on NTFPs, in 2006, 35 per cent of Soliga households migrated seasonally outside BRT in search of wage employment. The significant reduction in NTFP income and the increase in income from wage labour are consistent with the process of proletarianization that is evident in many parts of rural India (Kurien, 1980; Harriss *et al.*, 2010).

Accumulation by dispossession

The loss of livelihoods due to the curtailment of access has not been compensated by the state. Tourism is the main form of accumulation of capital in the BR Hills landscape that derives from the establishment of the protected area. The Jungle Lodges and Resorts (JLR) is a tourism enterprise that is owned and operated by the Karnataka State Forest Department. The first JLR tourism complex was established in 1980 in Nagarhole National Park. Subsequently, 22 other complexes have been set up in protected areas across Karnataka including in BRT. JLR's revenues have increased from USD 3000 in 1982 to USD 8.4 million in 2016. The Kabini River Lodge in Nagarhole National Park, JLR's flagship property, recorded profits of USD 1.6 million in 2016. No portion of these considerable revenues is shared with local people. Neither does tourism offer sufficient livelihood options for people who have been displaced by protected areas. The employment of Soligas in JLR is negligible. In 2010, out of the 31 employees in the BRT JLR, nine employees were Soligas, eight of who were temporary employees performing low-paid janitorial tasks. The 'make live' possibilities that might have existed in the form of employment in tourism or in the redistribution of tourism revenues have been ignored.

Another of the 'make live' options that Soliga households rely on is now under threat from conservation related restrictions. Households that are located close to the coffee estates have for decades worked in the estates to augment their income. While 17 per cent of Soliga households in BRT are employed throughout the year in coffee estate work, 13 per cent are employed for a few months when labour requirement for berry harvest and processing is high. Although estate labour is a major source of income for many Soliga households, there have been recent attempts by the forest administration to terminate the leases of the coffee estates. Citing the provisions under the WLPAs that seek to remove habitations from inside critical tiger habitats, the Forest Department has recently gone to court against the coffee estates and sought to terminate the long term leases of the four estates that operate within the tiger reserve (*Deccan Herald*, 2017). The termination of the leases of the coffee estates will have a

Table 1. Changes in income (in USD) of households in Biligiri Rangaswamy Temple Tiger Reserve from 1995 to 2009. Number of households sampled in each year is denoted by n. NTFP stands for Non-timber forest produce.

Source of income	1995 (n = 60)		2006 (n = 210)		2009 (n = 370)	
	%	Average Income	%	Average Income	%	Average Income
NTFP	54	104	33	97	7	19
Wage labour	19	37	42	123	43	114
Agriculture	18	35	22	64	44	118
Other	9	17	4	11	5	13
Total		193		296		264

Source: Data for 1995 obtained from Hegde *et al.* (1996). Data for 2006 and 2009 collected by authors.

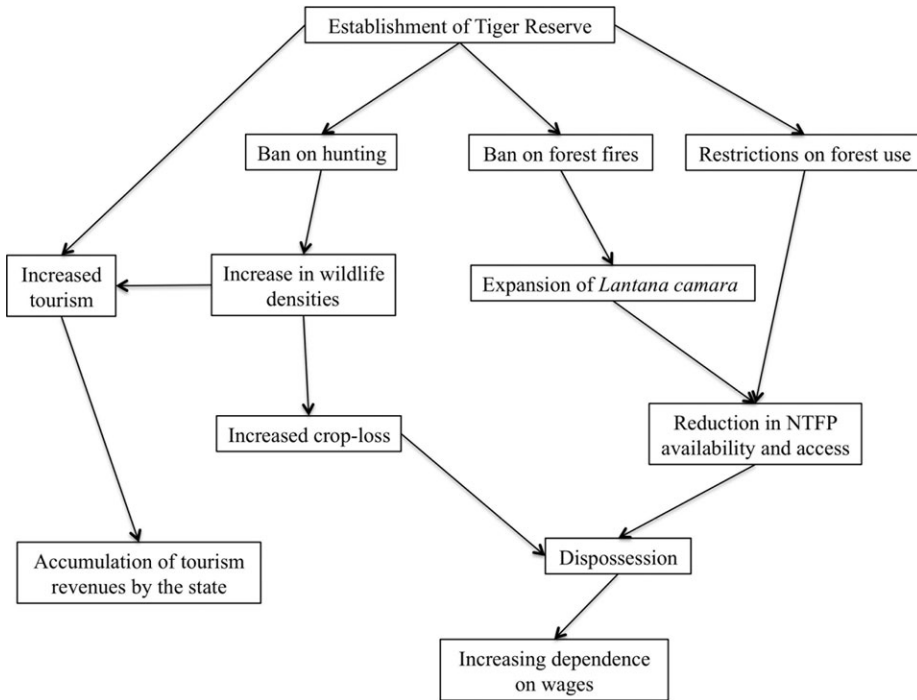


Figure 3. A web of relations of the impact of bans on fire, hunting and forest use and the accumulation of revenue in the Biligiri Rangaswamy Temple Tiger Reserve, India.

Source: Figure prepared by authors based on information and data obtained during fieldwork.

significant impact on Soligas and reinforce the ‘let die’ motivations of state conservation policy. As Tania Li writes, such appropriations produce outcomes that are lethal, ‘one in which places (or their resources) are useful, but the people are not, so that dispossession is detached from any prospect of labour absorption’ (Li, 2009: 69).

Based on our findings on crop loss, *Lantana* expansion, reduction of NTFP harvest and the squeeze on labour opportunity, we argue that the combined effects of restrictions on forest use and management has alienated Soligas from agriculture and forests. The alienation of Soligas from forest-based production and their increased dependence on labour wages and cultivation of cash crops is a recent and significant transformation in livelihoods as a result of conservation policy. These outcomes have occurred even without the eviction of Adivasis from the forest. The web of relations of these outcomes in terms of bans and their effects in BRT are depicted in Figure 3.

A web of relations

The mapping of the web of relations demonstrates how conservation measures have had some primary effects (increase in wildlife density, expansion of *Lantana*, reduction in NTFP availability) and some secondary effects (increased crop-loss, increased dependence on wages, farmers switching to coffee). These effects further led to a decrease in total income and in food security for the local population of Soligas. But as we have seen, restrictions on resource use have also had adverse environmental effects. The ban on fires has resulted in the proliferation of the invasive species *Lantana camara* and

reduced forage availability for wildlife due to the reduction of grasses and other browse by the Lantana. Through a decade of research in the BRT, we have investigated and documented these various socioeconomic and ecological effects.

This case study does not discuss physical displacements caused by conservation, but rather the impact of conservation measures on people who still remain in tiger reserves. Hence, the BRT is a case of *in situ* displacement (Feldman *et al.*, 2003), which implies socioeconomic, but not spatial displacement (Ince, 2014). The case of BRT differs from recently reported cases of conservation as accumulation by dispossession by the fact that the Adivasis are not (as yet) evicted to create 'wilderness' (for a review of displacement from PAs in India see Rangarajan & Shahabuddin, 2006; Lasgorceix & Kothari, 2009; For detailed case studies see Kabra, 2009; Sekar, 2016). Instead they maintain settlements within the reserve, but find their land and resource use restricted to the point that they are forced to replace farming with becoming labourers on nearby coffee estates.

The conversion from independent producer to labourer also involves rapid rural proletarianization (Hall, 2011). We argue that the Soligas are certainly a 'surplus population' (Li, 2009) who are 'in the way' of conservation and accumulation. The chronic squeeze on livelihoods and the resultant proletarianization makes it easy for Adivasis to be eventually removed from these landscapes. In BRT, 34 podus have been identified as being within the critical tiger habitat and attempts are being made to move them out of the reserve. The lack of land ownership, the alienation from the forest, and a forest filled with predatory wildlife might make the offer of even a meager compensation package attractive to these people.

Adivasis were denied access to land as part of targeted colonial policy that was aimed at generating revenue from forests and at identifying tribals as requiring special attention (Li, 2010). The denial of individual land rights to many scheduled tribes in colonial India resulted in dispossession that has continued into contemporary times due to constraints on the sale of land that they were granted. The Forest Rights Act of 2006 (FRA) provides rights to cultivation of forest land, but not to ownership of land, thereby not allowing the rights holder to claim it as an asset. While the granting of rights is an improvement over the lack of rights to land, it does not address the problems of lack of ownership to land and forms of production that are necessary to offset the impacts of *in situ* displacement. The lack of ownership to land, results in the inability of Soligas to obtain bank loans or access state welfare schemes that are aimed at smallholder agriculturalists. The additional restrictions on livelihoods due to conservation policy has resulted in Soligas losing their capacity to respond to livelihood failure as well as to opportunities.

Conclusion

The establishment of protected areas and the attempt to remake landscapes as wilderness have had impacts on forest dwellers. The creation of inviolate areas is achieved through the eviction of people. In actual practice, there exist political and demographic barriers to moving people out and settling them in new areas. Even as protected areas continue to have people living within them, there is a systematic erosion of their rights and curtailment of their livelihoods practice due to their being perceived as being in the way of conservation. We show that the walling off of these enclosures results in producing a class of 'surplus' people that the state 'lets die' through targeted neglect. This neglect is structural and has over time, produced a class of people who might

eventually be moved with little effort or persuasion due to the alienation and livelihood distress that the conservation enclosures cause. The resulting dependence of forest dwellers on wage labour to augment declining incomes increases mobility. The seasonal migration of people in search of work has been used by conservationists to claim that people are becoming less dependent on the forest. Conservationists have cited the increased dependence on non-forest income sources to suggest relocation of Adivasis into zones of production that lie outside the conservation landscape (Karanth & Karanth, 2012). This leaves the conservation enclosure under the complete control of the state to be remade as engines of economic production such as through tourism (Verma *et al.*, 2015).

Our study describes yet another instance of accumulation by dispossession that results from the alienation of people from their means of production (Li, 2010). Our argument that dispossession has led to an increasing need for people to find other forms of livelihoods such as wage labour should not be read as dispossession targeted at producing surplus labour for other forms of capitalist production. Adivasis dispossessed by conservation policy experience decreased development even as they stay within the enclosures and lack access to developmental schemes. They are both displaced *in situ* as well as 'let die' by having their sources of livelihoods taken away from them. Alongside this dispossession of Soligas from sources of production, the state has established tourism enterprises in the BRT tiger reserve from which it continues to accumulate revenues.

Protected area policy in India shows that Kalyan Sanyal's 'welfarist governmentality' in which the state attempts to mitigate the outcomes of primitive accumulation to maintain credibility, is not in evidence in tiger reserves (Sanyal, 2008: 221). Vasavi (2012: 173) describes how, in many Indian states, a range of programmes has been implemented in the rural agrarian areas to 'alleviate the very depredations of the intrusion of capital'. We show that people living in protected areas are worse off than rural households as there are no welfare programmes nor mitigatory practices to allay the adverse effects of accumulation. On the contrary, efforts are being intensified to marginalize and displace forest dwellers as recently demonstrated by a government decree issued by the NTCA in March 2017 banning the granting of forest rights under the FRA within tiger reserves (*The Wire*, 2017). Moreover, recent state efforts to cancel the leases of coffee estates, a major source of income for dispossessed Soligas, apply a further squeeze to their livelihood options. These conservation restrictions reinforce our argument that conservation produces 'let die' outcomes. We show through a web of relationship approach that the impacts of the many restrictions on livelihoods have had a series of complex and adverse effects on people and the ecosystem, even as the state is accumulating revenues through tourism. A centralizing policy has affected people and the relationships among people, forest and the state.

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