Changing Natures: a democratic and dynamic approach to biodiversity conservation

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Summary

This essay gives a brief historical background of the dominant conservation paradigm and its social-political context before calling for a holistic approach. This holistic approach, the essay argues will break from an exclusionary paradigm, replacing it with a vision for the future that conforms to the ideals of social and environmental justice while striving towards achieving conservation targets.

Neo-liberalism has promoted commodification in several forms, such that nature is viewed in economic terms. The contemporary approach to conservation is largely about capitalist expansion and is far removed from the fundamental principle of conservation, i.e. social and environmental justice. This essay argues for reconciliation ecology that aims for greater conservation values for the countryside and recognises that ethnic and linguistic influences have resulted in heterogeneous, multi-use landscapes with an amazing array of bio-cultural diversity. Any conservation approach has to embrace community and traditional knowledge as an ethical and moral imperative to distributive justice so that it can address a variety of issues ranging from inequalities to oppression.

Introduction

India encompasses an enviable diversity of flora and fauna within its territorial boundaries. Despite being one of the 17 mega-diversity countries in the world, and host to four global biodiversity hotspots, India has perhaps lost fewer of its large vertebrates to complete extinction than many others. This outcome is the result of a range of factors including (but not restricted to) a long history of conservation and tolerance to species accorded by human communities throughout the length and breadth of the country, and the numerous historical and political contingencies and biophysical features that together sustain this

impressive diversity. On the flip side of this optimistic outlook can be found issues such as local extinctions of species, habitat loss and the overwhelming negative impacts of development and of conservation itself: of dispossession, loss of livelihoods and the loss of cultural diversity and dignity. The conservation scenario in India therefore remains a paradox with elements of hope entwined with loss.

Protected areas have now become a global model for the conservation of biological diversity with some scholars even demanding that half the land area of the earth be enclosed as a formally protected network in order to stem the decline in biological diversity (Wilson, 2016). Modern day conservation in India, comprising largely of protected area (PA) establishment and legal protection of threatened species outside PAs, has its roots in British colonial era initiatives premised on the demarcation and notification of areas initially for timber management and later as wildlife reserves (Saberwal & Rangarajan, 2003; Rangarajan, 1996a). American discourses on sustainability and dessication such as those of Marsh (1864) and romanticist contributions such as Muir, Thoreau and Leopold were also influential in determining forestry and conservation trajectories (Guha, 1989; Saberwal, 1997). A focus on colonial era practices and extra-local influences, however, hides the longer history of forest protection that India has experienced for many centuries. Forests have always been an important resource for kings, colonial rulers and now the independent state, and therefore been protected and controlled in a variety of ways (Trautmann, 2015). It is safe to assume that such control by the state will continue into the future. The social and ecological costs of such top down conservation and control approaches have, however, been high.

As researchers and practitioners working in this field, we attempt a critical appraisal of key aspects of conservation in India with a view to suggesting approaches that are already pertinent and likely to become even more so in the next few decades. More specifically, we argue that the continuing emphasis on inviolate conservation and 'pristine' landscapes has had adverse social and ecological consequences. Though the numbers of certain species may have increased, this, by itself, need not mean that there have been positive impacts at a broader level, and in some cases, the increase itself has had some social and economic costs such as herbivores raiding agricultural crops. The shortcomings of the protected area model call for the adoption of a holistic approach that not only interrogates the different elements within the conventional conservation framework, but also incorporates concerns related to uneven development, socio-economic inequalities, and ethical and cultural specificities, all of which lead to multi-scale and multi-actor power differentials. In our opinion, such an approach could provide a viable alternative to the exclusionary

paradigm and hopefully usher in a vision for the future that conforms to the ideals of social and environmental justice while striving towards achieving conservation targets. Further, we submit that a broader environmental and social agenda is of paramount importance in an era of unprecedented global transformations ranging from climate change to the local and regional impacts wrought by globalisation and industrialisation.

We begin this essay with a brief historical sketch of the development of the dominant conservation paradigm in India, and the socio-political context that generated it. In this section, we stress that as the comparative histories of tropical developing countries affirm, both exclusionary conservation and development in the last century share a common history in the legacies of large-scale socio-political processes such as colonialism, post-colonial agendas and neoliberalism. Hence, there is a need to view conservation and development as linked agendas. In the sections following this, we use a simple thematic interrogation (of what? where? who? and how?) to offer suggestions for a broadening of the conservation agenda from a protection-centric model to a more spatially as well as socially heterogeneous framework that could adequately address India's long-term ecological and social goals.

Conservation and Development: two sides of the same coin

Across most of the world, modern conservation has been largely driven by notions of wilderness as 'pristine' nature and the need to protect such landscapes from a variety of human-induced impacts. While the assumption of pristineness itself has been called to question both in terms of its authenticity and of its questionable creation as a political project across colonial landscapes, it should suffice to say that conservation in India too has followed a similar trajectory. A focus on protected areas (especially officially created, exclusionary ones) remains the hallmark of the conservation movement globally, as well as in India. Although there were also pre-colonial forms of this conservation approach, (e.g. protection of individual species such as elephants, establishment of hunting preserves and forest patches along the boundaries of kingdoms), the colonial period consolidated the idea of exclusionary conservation (Trautmann, 2015). During British rule in India, the control of forests was taken over by the state to fuel various colonial enterprises such as plantation development, ship-building and the construction of railways. Forests were put under a system of intense management for production of timber (scientific forestry) while at the same time placing restrictions on traditional practices such as shifting cultivation and hunting by forest communities (Guha, 1983; Pouchepadass, 1995). Although wildlife, especially species involved in crop-raiding and direct attacks, were systematically eradicated during the earlier colonial period, concerns about scarcity of animals for hunting prompted

the establishment of reserves for the purpose of managing wildlife populations. (Rangarajan, 1996a; 1996b; 1998) Many of these reserves were demarcated as the continuations or extensions of already existing royal hunting preserves. By the end of the colonial period, forests in India were thus simultaneously under intense production for timber and intense 'protection' for hunting.

Independent India continued with the management of forests for timber and the hunting of wildlife in reserves until 1972 when a global movement in conservation and a growing awareness of environmental degradation resulted in the enactment of the Wild Life Protection Act by the Government of India. The Act banned hunting of listed species and protected areas were notified mostly as wildlife sanctuaries and national parks across the country. Additional forest, grassland, marine, and mountain areas came under these conservation categories even as India continued to lose forests outside these islands of protection, to meet its development goals. The intensification of conservation within protected areas and the conversion of forests outside for developmental purposes has not only continued, but in recent years accelerated to worrying levels.

At the core of the conservation discourse leading up to this period was the reliance on presumably inviolate, wild and pristine landscapes for the singular purpose of conserving biological diversity. That such pristine areas do not exist outside of a political construct is often ignored with the result that landscapes that have had long histories of people's use and residence are targeted for conservation and eventual displacement of the people who historical managed and produced these landscapes. The notification of these landscapes as PAs has resulted in adverse social and ecological outcomes such as the displacement of people and the curbing of local management and traditional use systems (Wani and Kothari, 2007). As a consequence of the negative implications of protected areas, the decades leading up to the new millennium saw the initiation of a number of inclusive approaches to conservation. These include the Integrated Conservation Development Projects (ICDPs) of the 1980s' to more recent community-based conservation (CBC) with a focus on poverty alleviation models and their variants. ICDPs were top-down strategies that were aimed at reducing the resistance to exclusionary approaches while not changing the essence of the fortress approach. (Hughes and Flintan, 2001) In India, a number of initiatives such as Joint Forest Management (JFM) and the 'India Ecodevelopment' projects were initiated around some protected areas to reduce pressure on forests and garner community support. (Sundar, 2005; Shahabuddin, 2010)

Following on the heels of the global turn towards neo-liberalisation, India too liberalised its economy in 1991. The slow but sure integration of the Indian economic system with

global markets resulted in the increasing commodification of nature. Over the years, commodification has taken several forms, such as the valuation of forests for its subsequent conversion to non-forest purposes on payment for each hectare of forest diverted; or the conversion of protected areas into tourism destinations through the construction of these areas as pristine and wild. Neoliberal policies have also been instrumental in catalysing large-scale changes in modified landscapes through their impact on land use, agricultural practices, and food security and sovereignty. (Shrivastava and Kothari, 2012) In addition, neoliberal commodification has also been the key driver of payments for ecosystem services (PES) strategies such as REDD and REDD+ (Dressler and Roth, 2011; Büscher *et al.*, 2012) which are now also being employed in India with unclear benefits for conservation or communities. (Jha, 2012; Lele, 2012; Ghosh, 2015)

To summarise, a broader look at large-scale land-use and conservation trajectories in tropical developing countries (including India) over the past century or so reveals that there are common overarching processes such as colonialism and neo-liberalism. Though not without their own regional and place-based specificities, colonial practices were instrumental in the transformation of the tropics along several fronts such as deforestation and plantation agriculture. At the same time, to overcome the scarcities induced by excessive extraction, colonial policies eventually prompted the establishment of exclusionary protected areas, which resulted in adverse impacts such as exclusion of people from native lands, the creation of inequalities, and the erosion of cultural connections with land. (Grove, 1995)

Recently, economic neo-liberalisation has brought about shifts in agricultural commodity production and increase in demand for land resulting in the separation and intensification of agricultural production and state led conservation within their respective 'zones'. The establishment of protected areas for conservation lends itself to its eventual commodification for tourism and more recently as repositories of carbon. Thus, neoliberal policies have been increasingly integrated into the conservation agenda under which capitalist expansion and conservation are not only deemed compatible, but also desirable. (Igoe & Brockington, 2007; Castree, 2010) The socially problematic outcomes of conservation interventions mandates a more inclusive and ethical strategy with a strong foundation in the principles of social and environmental justice. In the sections below, we critique the contemporary approach to conservation and present approaches that we believe offer a more sustainable and holistic alternative.

What: re-imagining diversity

Conservation in India has historically revolved around charismatic large mammals and

the protection of their populations and habitats. Terrestrial mammals like elephants, rhinos, tigers, lions and primates still command a significant proportion of time, effort and financial resources in the country's conservation efforts. Even on the marine side, large iconic vertebrates such as sea turtles garner both headlines and money (Shanker, 2015). While this focus on flagships has been valuable for raising the profile of conservation in the public eye, and may have been relevant during the early part of the conservation phase, it is necessary to revisit the contemporary relevance of this approach. Single species efforts need to be evaluated not only on their positive outcomes, but also for their counter-productive impacts and inadequacies that affect India's conservation context as a whole. For example, there are pockets of extensive conflict between elephants and humans in north eastern and southern India when populations have spilled over from nearby sanctuaries, resulting in numerous problematic impacts. (Münster & Münster, 2012; Barua *et al.*, 2013) Similarly, conservation of green turtles both locally and in nearby Sri Lanka may have led to increases in foraging populations in the Lakshadweep Islands, which has led to both direct and indirect (through decimation of sea grass patches) conflict with fishers. (Arthur *et al.*, 2013) Many large herbivores such as elephants and sea turtles are charismatic icons for conservation, but are also known to be ecosystem modifiers, with transformative effects on tree and sea grass communities respectively. (Lal *et al.*, 2010; Christianen *et al.*, 2014) In Bharatpur National Park for instance, grazing by domestic water buffaloes created the wetland habitat that was essential for birds. When grazing was banned by the Forest Department, the vegetation grew so rapidly that the habitat transformed and bird densities dropped to alarming levels, provoking the department to allow grass cutting by people to mimic grazing. (Lewis, 2003) These cases demonstrate that a single species focus can impede or even act counter to the larger goals of biodiversity conservation.

Another frequently raised caveat is that a focus on an iconic species or small group of species can divert attention away from a variety of others, perhaps equally deserving in attention but lacking in charisma. The Indian wild pig is a case in point. Despite being one of the most problematic species of crop-raiding animals in the country, very little research attention has been focused on this important species. The case often made for the reliance on large mammals and other iconic species (as flagships, umbrellas and indicators) is also that they serve as surrogates for other diversity and can be effective tools to spatially prioritise areas for conservation. In general, it has been found that many such 'indicator' species do not serve as particularly good surrogates for biodiversity in general. (Andelman and Fagan, 2000; Das *et al.*, 2006) The extensive diversity of plants, as well as terrestrial and marine invertebrates which dominate some of these ecosystems

both in terms of abundance and diversity, and which have the potential for a variety of human benefits (many still undocumented) do not get adequately represented in these species-centric studies/strategies. By ignoring this diversity, we also ignore important ecosystem processes and function.

In other cases, successful species conservation has resulted in increases in populations of large vertebrates that have historically been involved in conflicts with people (elephants, wild pig, macaques). Many local communities who are involved in long-term antagonistic relationships with such species, or find themselves engaged in new conflict where there may have been none earlier, blame either the State (as custodians of these species) or conservationists (as guardians) for these conflicts. Forest margins, especially the peripheries of parks with large vertebrates, are likely to continue as zones of escalated conflict under better protection regimes that result in the spill over of species.

Moving on from flagships, one of the primary imperatives of conservation efforts in India should be to broaden the notion of biodiversity, that is, to understand diversity at different scales, to appreciate the value of biodiversity in terms of its utilitarian, aesthetic, symbolic and intrinsic benefits, and for the preservation of long-term ecosystem function and services. However, as much as conservation needs to conceptually broaden its canvas to include lesser known species, given the scale of diversity, more single species studies and interventions will be neither easy, nor efficient or desirable. Moreover, research on tropical systems has drawn explicit attention to the importance of maintaining and facilitating ecological and evolutionary processes. (Gardner *et al.,* 2009) Planning for long-term persistence of biological diversity and ecosystem services requires a shift from species-based to process-based thinking, and perhaps by complementing long-term in-depth studies with 'satisficing' strategies – approaches that can provide good enough solutions (Simon, 1956) to a greater number of species and habitats. This also requires a concomitant shift in perspective from a protected-areas-as-islands mentality to a more holistic conservation framework that addresses landscape mosaics which comprise land uses that range from high to low diversity, as well as an openness towards embracing more efficient research methodologies.

In this vision, conservation would privilege processes which enable the long-term maintenance of biological diversity and ecosystem services such as the maintenance of meta-populations, pollination and climate regulation. Prioritisation exercises would accommodate a much broader range of taxa and use modern conservation planning methods that include principles of complementarity (Margules and Pressey, 2000) wherein areas are selected, not individually, but to maximize their benefit as a whole, or even better,

as a network. Conservation would also then mandate the exploration of fundamental socio-economic trade-offs and networks and large-scale influences on an equal footing with ecological processes. Closer examinations of neoliberal and globalising agendas that bring about large-scale changes in land use, agrarian practices and urbanising processes that affect the mobility of populations, and trade policies that impact food security would need to be a part of this shift to a broader conservation agenda. Understanding these changes is essential to tackling conservation challenges due to the interlinked and considerable outcomes of these processes on biodiversity and landscapes.

Where: from exclusionary enclaves to reconciled landscapes

Broadening the notion of biodiversity begs for a larger spatial spread of conservation initiatives beyond these exclusionary spaces (Chazdon *et al.*, 2009; Shankar Raman, 2015). In the past century, protected areas have no doubt played an important role in saving endangered species and habitats in India. However, their creation and spatial configuration have been the consequence of historical contingency. The existence of royal hunting grounds and preserves and the exclusionary practices of Indian forestry transitioned easily into a formal network that has little to do with the principles mandated by formal conservation planning exercises. Significant biophysical spaces such as the marine realm have hardly any representation in the conservation network. Moreover, the restriction of wildlife to protected areas has resulted in reduction in connectivity, alteration of genetic flows, reduction of home ranges, increase in local abundances of wildlife causing conflict with humans and erosion of local peoples' ability to live with wildlife. In the current conservation scenario, areas outside the formal PA network are accorded little value by conservationists themselves, and are perceived by local people as spaces where wildlife should not be occurring. Often, local people consider wildlife spilling over into the countryside as government property, a widespread perception with antecedents in colonial and recent conservation practices which enclosed wildlife in exclusionary reserves and removed them from outside parks (see Treves, 1999, for a similar pattern in Africa). Frequently, the fallout of such a perception is escalated conflict, especially retaliatory attacks on endangered species of conservation significance. A range of hidden dimensions ranging from uncompensated psychosocial impacts to opportunity and transaction costs have increasing been shown to be contributing to the problem. (Barua *et al.*, 2013)

The critical question for future conservation is whether the current PA network would be capable of serving the greater goal of conservation that not only protects select species, but also achieves its long-term ecological processes-based goals. By setting a strict

protectionist agenda of securing a certain percentage of the country's area with too extreme a focus on the preservation of wilderness, we need to question whether we are ignoring or exacerbating issues in areas outside reserves which could nevertheless be of critical importance in the long-term maintenance of biological diversity and ecosystem services. In addition, unfettered development in these areas is likely to impact not just the biodiversity in these locations. Through a variety of ecological, geographic, and social processes, the biodiversity in adjacent (or even distant) locations, which may include high priority areas for conservation, would also be impacted.

The outcomes of this narrow focus are not only ecological, but also social such as retaliatory attacks on species, organised protests against conservation practices and acts of every day resistance. Examples of increasing human-wildlife conflict include leopard attacks on humans, elephant raids on agriculture and the constant but not very visible impacts of primate and herbivore related crop losses. (Karanth *et al.,* 2013) These wildlife induced impacts combine with the livelihood implications of protected area establishment such as curtailment of access and displacement to give rise to vocal campaigns by human rights groups against the establishment of protected areas. (Bijoy, 2011)

In any case, 'pristine' protected areas with no human activity are conceptually a paradox. On the one hand, the enforcing authority (say government) will need to be present to ensure that there is no unauthorized presence in the area. Second, those in favour of such pristine areas (typically conservation biologists and urban conservationists) will argue that their presence is required for research and monitoring. In effect then, like colonial preserves for hunting, this then becomes little more than a land grab for yet another elite section of society.

Considering these problematic impacts, a revised framework for conservation is in order.

For many years, Michael Rosenzweig has championed the idea that species richness patterns across the globe are largely driven by the species-area relationship, that is, the larger the area, the more the species. The corollary, of course, is that when the available area for species disappears due to one reason or another, in the long run, the total number of species that can be supported will also decline. (Rosenzweig, 2001) Hence, the preservation of enclaves that form a tiny fraction of the Earth's area will never be sufficient either for the long-term maintenance of species and even less so for that of critical ecological services. In his proposal for 'reconciliation ecology', Rosenzweig argues that human landscapes must therefore be managed to be friendlier to biodiversity, creating a win-win system for both humans and non-human species. (Rosenzweig, 2003a, b) While the idea is not new and

has been subjected to scrutiny, controversy and support, it is appealing at more levels than just its biological implications of greater areas for species survival.

The biological consequences of such a project lie in transforming or maintaining human dominated or influenced landscapes in different ways. For a range of smaller and motile taxa, it may be possible to make the matrix itself less hostile. This may come about by marginally altering land use policies to promote diverse vegetation types. For other taxa, it may be necessary to create corridors and refuges that allow them to use larger landscapes that are currently inaccessible to them. In the Indian context, which is dominated by less intensive agricultural practices and a diversity of traditional use systems, a reconciliatory approach might be a more feasible solution than a strict PA vs. non-PA division. Moreover, in many parts of India, management regimes such as common property land use have traditionally incorporated at lease some features of reconciled landscapes. Low intensity agriculture and pastoral landscapes in the country often serve as biodiversity friendly matrices.[1] Hence, 'reconciliation' landscapes that have benefits for both people, biodiversity and ecosystem services are not hard to imagine in India.

However, the cultural implications of this project may be even more profound. A combination of traditional property and resource management systems, production and extraction practices, locally-suited agricultural varieties and livestock breeds, religious factors, ethnic and linguistic influences have resulted in heterogeneous, multi-use landscapes with an amazing array of bio-cultural diversity. When viewed from this perspective, there are a wide constituency of people who, by living on the land and working it, already fall within the ambit of conservation, though not explicitly categorised or articulated as such; globally there is recognition of such practices as Indigenous Peoples and Community Conserved Territories and Areas, or ICCAs. (www.iccaconsortium.org) Current development and agricultural (including pastoral and fisheries) practices are rapidly transforming landscapes from diverse multi-cropped areas to single cropped and high yielding areas. For reconciliation approaches to work in such changing contexts there needs to be better integration of conservation and agricultural policy.

Reconciliation ecology therefore envisages greater conservation values for the countryside and hinges on the re-conceptualization of landscapes and seascapes as connected, historical and dynamic. Recognizing that these landscapes were historically used and managed by local residents and that landscapes are connected to each other and therefore allow the movement of many species will not only extend the area under a new conservation paradigm but also reduce the conflicts that form part of the current conservation practice. This is likely to be not only more effective, but more socially just (and therefore viable in the long

term) than Wilson's 'half-earth' alternative (2016) which would also create more area for biodiversity and wildlife but at the considerable cost of further marginalising communities and alienating people from nature.

In practical terms, this would involve the move to a more dynamic categorisation of conservation areas where the focus is not on conservation alone but a multiple set of ecological and livelihood priorities that are negotiated amongst local and regional stakeholders. This will mean, however, that practices that are seen to fundamentally alter the landscapes such as intensive agriculture, mining and large infrastructural projects will have to be regulated and are likely to affect the industrialisation goals of the state. We therefore believe that any discussion of conservation needs to necessarily include a reconsideration of the economic growth models which currently assume that conservation can happen in bio-diversity islands while the rest of the land and sea is put under some form of intense production.[2] The future of conservation in India is therefore intrinsically linked to the developmental approach that the government and local stakeholders can negotiate amongst themselves.

Who: saviours, scoundrels and scapegoats

The issue of conservation governance dealing with *who* takes conservation decisions, has become quite well- established in the last few years, at least at global levels, as recognised by both the Convention on Biological Diversity (CBD) and by the International Union for Conservation of Nature (IUCN) (Borrini-Feyerabend *et al.*, 2013). In conceptual terms, modern Indian conservation is a mix of several ideologies ranging from utilitarian colonial and post-colonial extraction to Western romanticist notions among elite intellectuals and conservationists who were influential in the creation of exclusionary spaces that today constitute India's parks. As Cronon (1995) explains in the case of North America, this cultural tradition of 'undisturbed wilderness' is also characterised by misperceptions about historical use of land and by an erasure of history, (e.g., colonial land grabs). Together this has resulted in a modern tendency to view any kind of use of natural spaces, species or resources as abuse. The exclusion of people from their land went hand in hand with both systems. In the colonial period, extractive practices for imperial expansion were justified in the form of the White Man's burden which mandated the colonist to manage the native and his land as the latter was considered to be incapable of taking care of his own legacy. A similar throwback from colonial times is visible in the treatment of local communities and tribal populations by conservationists. Although this has been pointed out several times, a point worth reiterating is a tendency to treat people living inside or close to protected

areas as the primary threats to species and ecosystems without adequately problematising the milieu that brings about local extractive practices.

In India, these values can be traced to a spectrum of ethical standpoints adopted by conservationists and other stakeholder groups over the years. Reflecting a wider conservation agenda that includes diverse stakeholder groups and multiple use landscapes, as suggested by Norton (2000), we urge for the adoption of a more pluralistic and inclusive ethic. This calls for the contextual adoption of a continuum of human values related to biological diversity that are not only held by conservationists but also by tribal communities, agriculturalists, pastoralists, urban folk and numerous other stakeholder groups.

While there have been sporadic efforts to involve people in conservation in India, little has changed about the underlying approach. The much touted eco-development initiatives of the government were aimed at reducing dependence on the forest through the provision of alternative livelihoods. The goal of increasing incomes from non-forest based livelihoods was met through the establishment of eco-development committees (EDCs) consisting of local peasants and forest dwellers but under the control of the forest department. The forest department pushed the formation of these EDCs and undermined the role of constitutional local bodies. (Sundar, 2000) At the same time, civil society advocacy of and guidance on more inclusionary, participatory conservation pathways such as joint protected area management based on co-governance, diversification of governance types and co-existence have been ignored by official agencies; even formal commitments under legally binding instruments like the Convention on Biological Diversity's Programme of Work on Protected Areas which enjoin India to move towards rights-based, participatory conservation, have not been implemented. (Kothari, 1996; FOC, 2007a; b) Even the few measures for participation that were officially mandated in the Wild Life Protection Act (WLPA) and the National Wildlife Action Plan, such as Sanctuary Advisory Committees, have not been implemented for any protected area. On the contrary, conservation has become more centralized and exclusive. Even as legislation for granting of forest rights, the Forest Rights Act (FRA), was being notified, the WLPA was being strengthened and inviolate areas for tiger conservation were being legislated. (Bijoy, 2011)

Local participation in conservation and forest management received a boost in 2006 with the notification of the Forest Rights Act. This unprecedented legislation gives adivasis and traditional forest dwellers rights, not just to livelihoods such as cultivation and forest produce harvest, but also, and more relevant to our account, the right to manage and conserve areas according to their customary practice. This is an empowering legislation under which many communities have in the last few years begun to claim rights. It is worth noting

that while state governments have been willing to grant rights to individual households for cultivation of forest land, there has been resistance by the state, and especially the forest administration, to granting rights to the community for use and management of forests. The reason for the reticence is that community forest rights (CFR) threaten state control over forests and landscapes. Even in cases where CFRs have been granted, communities have found it difficult to exercise their conservation rights due to the conflict between the FRA and the WLPA in determining who controls conservation areas. (Rai, 2014) Neither of these legislations has a process laid out for post rights situations. In the decade since the FRA has been notified, there have been a few examples of local conservation efforts within protected areas. After years of struggle, communities in 3 protected areas have received CFR rights: Biligiri Rangaswamy Temple Tiger Reserve (BRT, Karnataka), Shoolpaneshwar Wildlife Sanctuary (Gujarat) and Simlipal Tiger Reserve (Odisha). In BRT, although rights were granted in 2011, *gram sabhas* have not been allowed to exercise their rights due to the singular implementation of the WLPA over the FRA. (Madegowda *et al.*, 2013)

Much of the recent scholarship on conservation endorses the 'principle of local support', which proposes that conservation cannot succeed without local communities. This often serves as the *raison d'etre* for involving local people, but as Brockington (2004) points out, this premise is often overrated, as the realities of power have shown that conservation alliances have routinely marginalised the poor, displaced people from their native lands or excluded them in different ways. In other words, the idea of local support is a myth given that the communities are powerless to defend their rights or interests in the face of more powerful interests who determine conservation goals. Following Brockington's argument, we would like to emphasise that community involvement should not be contingent on whether a project will succeed or fail (without community support) but rather, on the ethical and moral imperatives relating to justice and democratic principles.

How: dynamic systems, plural solutions

In our essay, we have argued that there need to be changes in three dimensions: what, where and who. First, we need to re-imagine diversity so that it accommodates a broader array of life forms, what Charles Darwin (1859) might have referred to as 'grandeur in this view of life'. This re-imagination needs to occur not merely in the corridors of science, but in society. This vision of biodiversity then accords value for a variety of landscapes, not just a select preserves that house a few iconic species. Hence, we propose that conservation is best served by landscapes that reconcile a range of human use and biodiversity values, emphasizing ecosystem function and process as well as justice and equity. We suggest going

beyond the current categories of protected areas to acknowledge a range of community-based and customary areas such as the indigenous peoples' and community conserved territories and areas or ICCAs. (Pathak, 2001; Jonas *et al.,* 2014) Finally, we need to abandon any approaches that lead to further alienation between people and environment, such as exclusionary areas would do. Broadly, a proportion may very well need to be designated as free of extractive use or destructive activities, but such designations need not exclude people from those areas. In fact, we endorse the notion that communities that are connected with the land and the sea are the best stewards of the environment and resources. We emphasise that the biggest driver of ecosystem and biodiversity decline today are current economic growth models based on accumulation at any cost which has resulted in not only enormous social and economic inequality but also ecological degradation at unprecedented scales.

In summary, our vision is for a landscape that contains many constantly changing ecological and social elements which acknowledges that these systems are governed by non-equilibrial processes and cannot therefore be managed as static systems. We envision connected landscapes that are open for access by all citizens. This will mean putting more land under common property regimes managed by nested democratic institutions.[3] We need to move to a more dynamic categorisation of conservation areas to facilitate the inclusion of more land into a new conservation rationale where the focus is not on conservation alone but a multiple set of priorities that are negotiated amongst local and regional stakeholders. This will result in making more areas biodiversity friendly and accommodate species in landscapes that are currently seen to be unfriendly to biodiversity such as agricultural and urban landscapes. For example, cities may have relatively little biodiversity and certainly few endangered or iconic species (though there are some), but they have a disproportionate effect on the environment, as well as policy relating to it. It therefore becomes imperative to re-imagine conservation in these spaces. While there is a recent focus on urban biodiversity and conservation, and there have been some successes at city-wide scales, we suggest that small communities work best together. We envision a neighbourhood scale greening of cities with a city scale focus on certain icons that can promote and sustain interest in conservation.

The proposal for such a democratic and dynamic approach to conservation has been made for India in the past, and most comprehensively in the National Biodiversity Strategy and Action Plan. (Kalpavriksh and TPCG, 2005) Amongst the major actions listed in the NBSAP were a landscape approach for conservation; a move to a public trust doctrine for land and water management; a decentralized nature governance structure; and recognition

of local knowledge and management systems. The NBSAP, which was prepared by a coalition of civil society groups, was rejected by the Ministry of Environment and Forests, which had commissioned the plan in the first place. The rejection of the plan indicates the challenges that face efforts to change the nature of biodiversity conservation governance in India. We imagine a future in which both state and society are open to questioning and revising established conservation practice and welcome new and hybrid ways of governing nature based on customary and scientific knowledge through democratic processes.

In order to achieve these goals, we need to engage constantly both with nature as well as with society to find equitable and appropriate paths to environmental conservation and sustainability. Both knowledge and action need to be democratised in order to adopt an equitable ethic and approach to addressing. Although inputs from the natural sciences have dominated conservation frameworks, an increasing acceptance of the need for ecology and society to be managed as an interlinked system has led to an increased analytical focus on conservation social science in the past few decades. Political ecological and historical explorations that deal with asymmetric power relations, the analysis of fortress conservation, and neoliberal approaches have been important axes of political ecological enquiry. Of particular relevance in this context would be the acceptance of topics that dare not be broached, which upset the long-held tenets of the 'Edenic sciences' (Robbins and Moore, 2012) such as hunting and sustainable use that often provoke the ire of animal rights activists and radical conservationists.

Conservation in socially heterogeneous systems also brings into context the different constituencies of knowledge that could inform future directions. While the dichotomy between scientific and traditional knowledge has been explored at a theoretical level, (Agrawal, 1995) two practical cautions are significant. Firstly, there is a privileging of scientific knowledge, despite the fact that this form of science is often normative, reflecting the biases and preferences of its providers. (Lackey, 2007) An examination of this politics of science at the science-policy interface is especially pertinent because conservation biology is a 'mission-driven discipline' which often requires its practitioners to take a stand, and advocacy for a particular cause should be scientifically and ethically justified. (Chan, 2008) Similarly, there is also a need to examine the 'new traditionalist discourse' (which valorises traditional systems as benign, sustainable and exclusively indigenous) not only in terms of the claims of sustainability of different traditional practices, but also its embedding in social domination and subordination. (Sinha *et al.*, 1997) The power to produce certain forms of knowledge gives selected actors the power to govern in specific ways. We hope to see in future a democratic production of knowledge in which more forms of knowledge are

included enabling what Visvanathan (2005) has called 'cognitive justice'.[4] This will ensure more equitable conservation governance than is currently the case.

Finally, we would like to emphasise a critical concept that is inherent in the idea of this collection of essays – that futures are intertwined. Environment issues are connected to development, health, education, poverty, dignity, democracy and justice. We believe that the path to a better environmental future lies in being able to understand and act on these connections. This calls for the breaking down of boundaries that separate areas of enquiry and of action.

In closing, we would like to emphasise a brave new hopeful vision for environmental conservation that requires us to think beyond the boundaries of ecology. Our social, psychological and physical well-being is closely linked to the health of the planet, but we can only achieve those goals by adopting a pluralistic philosophy to human environment relations and by instituting processes which promote connections, at every level, with nature, in all its forms.

Endnotes

1. Pl. also see Food and Agriculture Futures essay in this volume.
2. Pl. also see Localisation Futures, Dare to Dream, and Concluding essay of this volume.
3. Pl. also see Democracy, and Power futures essays in this volume.
4. Pl. also see Knowledge Futures essay in this volume.

References

Agrawal, A., 1995, 'Dismantling the Divide between Indigenous and Scientific Knowledge', *Development and Change*, (26), pp. 413-39.

Andelman, S.J. and W.F. Fagan, 2000, 'Umbrellas and Flagships: Efficient conservation surrogates or expensive mistakes?' *PNAS* (97), pp. 5954 – 59.

Arthur, R., N. Kelkar, T. Alcoverro and M. D. Madhusudan, 2013, 'Complex Ecological Pathways underlie Perceptions of Conflict between Green Turtles and Fishers in the Lakshadweep Islands', *Biological Conservation,* (167), pp. 25–34.

ATREE, Council for Social Development, Himal Prakriti, Kalpavriksh, Samrakshan, SHODH, Vasundhara, Wildlife Conservation Trust, and WWF-India, 2007, *Proposed Guidelines on Identification of Critical Wildlife Habitats, Co-existence and Relocation related to Tiger Reserves: Suggestions to the*

National Tiger Conservation Authority, Future of Conservation Network, http://kalpavriksh.org/images/CLN/FOC/foc20073.pdf (accessed 1 Feb, 2017).

ATREE, Foundation for Ecological Security, Himal Prakriti, Kalpavriksh, Samrakshan Trust, SHODH, Vasundhara, Wildlife Conservation Trust, and WWF-India, 2007, *Proposed Guidelines for Identification of Critical Wildlife Habitats in National Parks and Wildlife Sanctuaries under Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006,* Future of Conservation Network, India.

Barua, M., S. A. Bhagwat and S. Jadhav, 2013, 'The Hidden Dimensions of Human-Wildlife Conflict: health impacts, opportunity and transaction costs', *Biological Conservation* (157), pp. 309-16.

Berry, W., 1981, 'Solving for Pattern', in, The Gift of Good Land: Further Essays Cultural and Agricultural, Originally published in the Rodale Press periodical, *The New Farm,* (Volume/Number unavailable)

Bijoy, C. R., 2011, 'The Great Indian Tiger Show', *Economic & Political Weekly,* XlVI (4), pp. 36–41.

Borrini-Feyerabend, G., N. Dudley, T. Jaeger, B. Lassen, N. Pathak Broome, A. Phillips and T. Sandwith, 2013, *Governance of Protected Areas: From understanding to action,* Best Practice Protected Area Guidelines Series No. 20, Gland, Switzerland: IUCN.

Brockington, D., 2004, 'Community Conservation, Inequality and Injustice: myths of power in protected area management', *Conservation and Society* 2(2), pp. 411-32.

Bryant, R.L., 1998, 'Power, Knowledge and Political Ecology in the Third World: A review', *Progress in Physical Geography* (22), pp. 79-94.

Büscher, B., S. Sullivan, K. Neves, J. Igoe & D. Brockington, 2012, 'Towards a Synthesized Critique of Neoliberal Biodiversity Conservation', *Capitalism, Nature, Socialism* (23)**,** pp. 4-30.

Cafaro, P., and R. B. Primack, 2014, 'Species Extinction is a Great Moral Wrong: sharing the earth with other species is an important human responsibility', *Biological Conservation* (170)**,** pp. 1-2.

Carruthers J., 1989, 'Creating a National Park: 1910-1926', *Journal of Southern African Studies*, (15), pp. 188-216.

Castree, N. M., 2010, 'Neo-liberalism and the Biophysical Environment 1: What neo-liberalism is, and what difference nature makes to it', *Geography Compass* (4), pp. 1725-33.

Castree, N. and B. Braun, (eds.), 2001, *Social Nature: Theory, Practice and Politics*, Massachusetts, USA: Blackwell Publishers.

Chan, K. M. A., 2008, 'Value and Advocacy in Conservation Biology: Crisis Discipline or Discipline in Crisis?', *Conservation Biology* 22(1), pp. 1-3.

Chazdon R. L., C. A. Harvey, O. Komar, D.M. Griffith, B.G. Ferguson, M. Martínez Ramos, H. Morales, R. Nigh, L. Soto Pinto, M. Van Breugel and S. M. Philpott, 2009, 'Beyond Reserves: A Research Agenda for Conserving Biodiversity in Human-modified Tropical Landscapes', *Biotropica* 41(2) pp. 142-53.

Christianen, M. J., P. M. Herman, , T. J. Bouma, , L. P. Lamers, , M. M.van Katwijk, , T.van der Heide, P. J. Mumby, B. R. Silliman, , S. L. Engelhard, M. van de Kerk, and W. Kiswara, 2014, 'Habitat collapse due to overgrazing threatens turtle conservation in marine protected areas', *Proceedings of the Royal Society of London B, Biological Sciences* 281(1777), pp. 2013-2890.

Cronon, W. A., 1995, 'The Trouble with Wilderness, or, Getting Back to the Wrong Nature', in, *Uncommon Ground: Rethinking the Human Place in Nature*, New York: W.W. Norton & Company Inc.

Darwin, C., 1859, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life,* London: John Murray.

Das, A., J. Krishnaswamy, K. S. Bawa, M. C. Kiran, V. Srinivas, N. S. Kumar and K.U. Karanth, 2006, 'Prioritisation of Conservation areas in the Western Ghats, India', *Biological Conservation* (133), pp. 16-31

Demerit, D., 2001, 'Being Constructive about Nature', in *Social Nature: Theory, Practice and Politics*, N. Castree and B. Braun (eds.), Massachusetts, USA: Blackwell Publishers.

Dressler, W. and R. Roth, 2011, 'The Good, the Bad, and the Contradictory: Neoliberal Conservation Governance in Rural Southeast Asia', *World Development* (39), pp. 851-852.

Escobar, A., 1995, *Encountering Development: The Making and Unmaking of the Third World*, Princeton, USA: Princeton University Press.

Gardner, T. A., J. Barlow, R. Chazdon, R. M. Ewers, C. A. Harvey, C. A. Peres and N. S. Sodhi, 2009, Prospects for tropical diversity in a human-modified world, *Ecology Letters* 12: pp. 561-82.

Grove, R. H., 1995, *Green Imperialism: Colonial Expansion, Tropical Island Edens, and the Origins of Environmentalism*, Cambridge and New York: Cambridge University Press.

Guha, R, 1983, 'Forestry in British and post-British India: a historical analysis', *Economic & Political Weekly* 18(44), pp. 1882-96.

Guha, R., 1989, 'Radical American Environmentalism and Wilderness Preservation: A Third World Critique', *Environmental Ethics*, (11), pp.71-83.

Herrnstein, R. J., and C. Murray, 1994, *The Bell Curve: Intelligence and Class Structure in American Life*, New York, USA: The Free Press.

Hughes, R. and F. Flintan, 2001, *Integrating Conservation and Development Experience: A Review and Bibliography of the ICDP Literature*, London: IIED.

Igoe, J. and D. Brockington, 2007, 'Neoliberal Conservation: A Brief Introduction', *Conservation and Society* 5(4), pp. 432-49.

Kalpavriksh and TPCG, 2005, *Securing India's Future: Final Technical Report of the National Biodiversity Strategy and Action Plan*, Pune/Delhi: Kalpavriksh.

Karanth, K.U., and K. K. Karanth, 2012, 'A Tiger in the Drawing Room: Can Luxury Tourism Benefit

Wildlife?', *Economic & Political Weekly* XLVII (38) pp. 38-43.

Karanth, K. K., A. M. Gopalaswamy, P. K. Prasad, and S. Dasgupta, 2013, 'Patterns of Human-Wildlife Conflicts and Compensation: Insights from Western Ghats Protected Areas', *Biological Conservation* (166), pp.175–85.

Kothari, A., N. Singh, and S. Suri, (eds.), 1996, *People and Protected Areas in India: Towards Participatory Conservation*, New Delhi: Sage Publications.

Lackey, R.T., 2007, 'Science, Scientists and Policy Advocacy', *Conservation Biology* 21(1), pp. 1-17.

Lal, A., R. Arthur, N. Marbà, A.W. Lill, and T. Alcoverro, 2010, 'Implications of conserving an ecosystem modifier: Increasing green turtle (*Chelonia mydas*) densities substantially alters seagrass meadows', *Biological Conservation* (143), pp. 2730-738.

Lele, S., 2012, 'Buying our way out of environmental problems,' *Current Conservation* 6 (1), pp. 11-13.

Lewis, M., 2003, 'Cattle and Conservation at Bharatpur: A Case Study in Science and Advocacy', *Conservation and Society* 1(1), pp. 1-21.

Jha, S., 2012, 'Does REDD+ induce inclusive exploitation of forest people?' *Current Conservation* 6 (1), pp. 14-19.

Madegowda, C., N. D. Rai, and S. Desor, 2013, 'BRT Wildlife Sanctuary (Karnataka): A case study' in Desor, S. (ed), *Community Forest Rights under Forest Rights Act: Citizens' Report 2013,* Pune: Kalpavriksh, Bhubaneshwar: Vasundhara, and Delhi: Oxfam India, pp. 50 – 57.

Margules, C. R. and R. L. Pressey, 2000, 'Systematic conservation planning' *Nature*, (405), pp. 242 – 53.

Marsh, G. P., 1864, *Man and Nature, or Physical Geography as Modified by Human Action*, New York: C. Scribner.

Münster, D. and U. Münster, 2012, 'Human-Animal Conflicts in Kerala: Elephants and Ecological Modernity on the Agrarian Frontier in South India', in Münster, U. D. Münster and S. Dorondel (eds.), *Fields and Forests: Ethnographic Perspectives on Environmental Globalisation*, Munich, Germany: Rachel Carson Centre Perspectives, pp. 41-50.

Naughton-Treves, L., 1999, 'Whose animals? A history of property rights to wildlife in Toro, Western Uganda', *Land Degradation and Development* (10), pp. 311-28.

Neumann, R.P., 1992, 'Political ecology of wildlife conservation in the Mt. Meru area of northeast Tanzania', *Land Degradation and Rehabilitation* 3(2), pp. 85-98.

Norton, B.G., 2000, 'Biodiversity and environmental values: in search of a universal earth ethic', *Biodiversity and Conservation* 9(8), pp.1029-44.

Pathak, N., 2001, *Community Conserved Areas in India: A Directory*, Pune/Delhi: Kalpavriksh.

Pouchepadass, J., 1995, 'Colonialism and Environment in India: comparative perspective', *Economic and Political Weekly* 30(33), pp. 2059-67.

Rai, N. D., 2014, 'View from the podu: Approaches for a Democratic Ecology of India's Forests', in *Democratising Forest Governance*, Lele, S. and A. Menon, (eds.), New Delhi: Oxford University Press, pp. 25-62.

Rangan, H., 2000, *Of Myths and Movements: Rewriting Chipko into Himalayan History*, London, UK: Verso.

Rangarajan, M., 1996a, *Fencing the Forest: Conservation and Ecological Change in India's Central Provinces, 1860-1914*, New Delhi: Oxford University Press.

Rangarajan, M., 1996b, 'Environmental Histories of South Asia: A Review Essay', *Environment and History* 2(2): pp.129-43.

Rangarajan, M., 1998, 'The Raj and the Natural World: the war against 'dangerous beasts' in colonial India', *Studies in History* 14(2), pp. 265-99.

Rodney, W., 1973, *How Europe Underdeveloped Africa*, London: Bogle-L'Ouverture Publications & Dar-Es-Salam: Tanzanian Publishing House.

Rosenzweig, M. L., 2001, 'Loss of speciation rate will impoverish future diversity', *PNAS* 98(10), pp. 5404-410.

Rosenzweig, M. L., 2003a, 'Reconciliation ecology and the future of species diversity', *Oryx* 37(2), pp. 194-205.

Rosenzweig, M.L., 2003b, *Win-Win Ecology: How the Earth's Species can Survive in the Midst of Human Enterprise*, London, UK: Oxford University Press.

Saberwal, V. K., 1997, 'Science and the dessicationist discourse of the 20th century' *Environment and History* 4(3), pp. 309 -43.

Saberwal, V. and M. Rangarajan, 2003, *Battles over Nature: Science and the Politics of Conservation*, New Delhi: Permanent Black.

Shahabuddin, G., 2010, *Conservation at a Crossroads*, New Delhi: Permanent Black.

Shankar Raman, T. R., 2015, 'Expanding the conservation landscape', *Seminar* (673), http://www.india-seminar.com/2015/673/673_shankar_raman.htm (accessed 1 Feb, 2017).

Shanker, K., 2015, *From soup to superstar: the story of sea turtle conservation along the Indian coast*, New Delhi: Harper Collins.

Sharma, M., 2011, *Green and Saffron: Indian Environmentalism and Hindu Nationalist Politics*, New Delhi: Permanent Black.

Shrivastava, A. and A. Kothari, 2012, *Churning the Earth: The Making of Global India*, New Delhi: Penguin, India.

Simon, H. A., 1956, 'Rational choice and the structure of the environment', *Psychological Review* 63(2), pp. 129-38.

Sinha, S., S. Gururani and B. Greenberg, 1997, 'The 'new traditionalist' discourse of Indian environmentalism', *The Journal of Peasant Studies* 24(3), pp. 65-99.

Sundar, N., 2000, 'Unpacking the 'Joint' in Joint Forest Management', *Development and Change*, 31(1), pp. 255-79.

Sundar, N., 2003, 'The construction and deconstruction of 'indigenous' knowledge in India's Joint Forest Management Programme,' in *Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives*, A. Bicker, R. Ellen and P. Parkes (eds.), UK: Routledge, pp. 79-100.

Wani, M. and Kothari, A., 2007, 'Protected areas and human rights in India: the impact of the official conservation model on local communities', *Policy Matters* (15), pp.100-114.

Zackey, J., 2007, 'Peasant Perspectives on Deforestation in Southwest China –Social Discontent and Environmental Mismanagement', *Mountain Research and Development* 27(2), pp.153-161.