Chapter 1

Introduction

Conservation approaches- Towards comprehensive assessments

The fact that the biologically richest tropical forests are also among the most threatened ecosystems in the world is acknowledged with greater unanimity today than ever before. It has also been understood, beyond little doubt, that their loss would have unprecedented global repercussions in terms of the security and well-being of humans and life in general (FAO 2011). Therefore today, the entire globe shares the responsibility in protecting them and not merely the countries in question. Such realisation has driven the remarkable effort at mobilising concerted conservation efforts at global and regional scales to buffer these forests from further threats, particularly in the last 25 years (Millenium Ecosystem Assessment, 2005).

However, as conservation biologists, we are still grappling with the basic questions: have we been able to minimise these threats? Are species and their habitats more secure today owing to the wider realisation of the threats that acts against them? Unfortunately, from the emerging trends, it seems that the future of biodiversity is still not secure (Doak et al. 2014). In the last 4 decades, when the efforts to preserve the tropics have been at its highest ever, the world recorded a 56 per cent reduction in the populations of 1,638 species (WWF 2014).

Currently the debate in the conservation discourse as to why we haven’t been able to counter the threats to the biodiversity even after receiving mobilisations and support in favour of conservation like never before is an important one (Brook et al. 2014). One of the key answers to this important question is embedded in the way we have perceived and analysed the fundamental threats to biodiversity till date (Geist & Lambin 2002).

Biodiversity is threatened by proximate drivers expressed at local scales viz. hunting, shifting cultivation, subsistence level collections (of firewood and NTFPs) (Amin et al. 2006). But today a far more serious nature of threats are those whose drivers are underpinned in fundamental socio-economic and political process such as human population dynamics, global and/or national policies, markets, trade-agreements and political instability (DeFries et al. 2010; Goswami & Ganesh 2014). Current conservation priorities therefore demand that we identify the underlying global, regional and sub-regional drivers of forest and biodiversity
loss and analyse the effectiveness of the conservation regimes in countering such threats (Laurance 2007).

**Current Conservation Approaches**

On broad terms, the global response to arrest biodiversity loss has been either to implement strict and exclusive protectionism through state-led protected areas (PAs) (Le Saout et al. 2013) or through linking conservation goals to livelihood improvement through community-based conservation (CBC) (Berkes 2009). Even though there are serious debates around the conservation efficacy of CBC and PAs, very few inform us about their capacity to conserve biodiversity (Shahabuddin & Rao 2010). Past assessments have been based on meta-analyses of cases separated across space and time (Nagendra 2007; Porter-Bolland et al. 2012). Well-designed comparative assessments at landscape scale are few and have focussed on either management cost-effectiveness (Somanathan et al. 2009), forest cover (Ellis & Porter-Bolland 2008) or vegetation structure and biomass (Bhagwat et al. 2005). Few studies that have used animal offtake or abundance indicators to assess effectiveness across conservation regimes (Caro 2002) have measured variables across single dimension of the threats, thereby providing an eclipsed view of their efficacy. In the interest of making sound conservation decisions it is therefore important to understand both local as well as ultimate/remote pressures on biodiversity and the manner that the current conservation regimes respond against them (Beumer & Martens 2013).

**Conservation evaluation framework**

This thesis attempts to address this lacunae by using a comprehensive conservation evaluation framework which uses appropriate landscape variables nested across two broad conservation regimes-state and community forests (details in Chapter 2). The following were the broad goals of this thesis:

1. Understand the response of drivers of biodiversity loss at a landscape level across the two conservation regimes.
2. Assess the proximate (local) drivers of biodiversity loss (hunting) and its impact on animal abundances across the two conservation regimes.
3. Discuss the potential role of the existing institutional structures across the two regimes in countering threats emanating from local and regional drivers and conserving biodiversity.
These goals were broadly addressed across the next five chapters which I summarise below.

In **Chapter 2**, I develop the context around how the threats on biodiversity acts at larger spatiotemporal scales and how the current conservation approaches hasn’t lived up to their potential of fulfilling the desired conservation goals. I also introduce the case of northeast India in general and Meghalaya in particular where the rural indigenous (tribal) communities have been using and managing the forests since ‘time immemorial’ and how their rights upon these forests were recognised by the Indian constitution. Such indigenous forest-rights preservation policies also meant that the local traditional-knowledge borne out of use and management over large periods, didn’t suffer any discontinuity. The site also had fairly old (>100 years) state managed reserve forests within the same continuous ecological landscape. Thus the site allowed me to examine the outcomes of these two conservation regimes (state and community forests) over time and across space, to find answer to my central question: whether variability in conservation regimes produces differential outcomes? Embedded within these central questions were many sub questions: how do they respond against the different nature of threats acting at and from different scales? Are they equally vulnerable and resilient to these threats? Or do their responses vary depending upon the scales and drivers of threats? If yes, then which one is better at conserving biodiversity and in buffering them against threats? In the subsequent chapters I try to find answers to these questions.

In **Chapter 3**, I look at how the forest-habitat changed over time across the two conservation regimes. I identify the patterns and intensity of landscape changes across the conservation regimes and analysed each regimes’ response to the proximate and ultimate drivers of threats. I also discuss the role of the institutions responsible in mediating or responding to these changes.

In **Chapter 4**, I estimate the local pressures on animals by measuring hunting intensity on the large and medium vertebrate communities across the two conservation regimes while in **Chapter 5**, I measure the impacts of hunting pressures on animal abundances. I also look at how these pressures and the way they express upon the animal abundances varied across the two regimes. I also discuss the role of institutions in the context of controlling hunting pressures and conserving animals.

In **Chapter 6**, I synthesise the thesis by revisiting the central question: whether variability in ownership regimes produces differential conservation outcomes. In the light of the results that I have obtained. I also discuss how each conservation regime mitigated the impact of threats in the landscape and state the broader application of the thesis.
References


