endowing of the regions with the financial and human resources they need to fulfil additional duties such as safeguarding the provision of public goods and services from forests, instead of additional tax disincentives on the benefits derived from successful community management of forest resources. After recognising the importance of institutional diversity, the challenge is to shape the context-specific patterns of that diversity and to identify starting points for action.

This requires awareness building, communication, trust-building, guidance, and mediation. In Ethiopia today those measures are still heavily supported by NGOs and the international aid community. Governmental support in the form of tax and other incentives and extension services do not exist, or fail to reach local resource users. The attempt to conserve Ethiopia's wild coffee forests illustrates that all stakeholders have their individual interests but also share a common vision. Well co-ordinated collective action is a necessary consequence of institutional diversity.

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Ankila Hiremath

Non Timber Forest Products

Non timber forest products – the fruits, roots, bark, flowers, resins, and fibres that people collect from forests – make an important contribution to both subsistence and market economies, worldwide. In India alone, more that 50 million people are estimated to depend on forests for non-timber products (hereafter, NTFP). Locally, NTFP can account for 30-40 % of cash incomes for forest-dependent communities, and at a global scale the value of trade in NTFP runs into billions of dollars.

Our relationship with NTFP has a long history – humans were hunter-gatherers much before they learnt settled agriculture. But managing forests for NTFP has only captured the imagination of conservation scientists in the last couple of decades. This change can be traced back to an influential article by Charles Peters and others, written in 1989, suggesting that the long term economic benefits from managing tropical forests for NTFP far exceeded the benefits from converting them to agriculture or other land uses. This provided a justification for tropical forest conservation that was socioeconomic as well, and not just biological: Forests and their component biodiversity could be conserved, while at the same time enhancing livelihoods of forest-dependent communities through their sustainable extraction of NTFP. Enthusiasm for the dual promise of this "good extractivism" has since had to be tempered – it turns out that managing forests for NTFP often has higher ecological costs and lower economic benefits than originally expected. Yet, understanding the constraints to good extractivism may enable us to seek solutions for sustainably managing forests for NTFP. The set of pan-tropical articles in this special collection attempts to do just that.

Shahabuddin and Prasad, review research on the ecology of NTFP harvesting in India, and provide an overview of the kinds of ecological costs potentially associated with NTFP harvesting. There can be direct deleterious impacts on the target NTFP species, either due to over-harvesting, or due to destructive harvesting practices. In India one of the few places where there has been extensive research on various aspects of NTFP harvesting is the Biligiri Rangaswamy Temple Wildlife Sanctuary, Karnataka. Uma Shaanker and colleagues summarise a series of studies that demonstrate how the NTFP harvesting can have consequences that range from genes to ecosystems: Trees of three important NTFP species – *Phyllanthus emblica*, *Terminalia chebula*, and *Terminalia bellerica* – showed reduced genetic variability closer to human settlements, as compared to further away, a difference that the authors associate with a gradient in harvesting intensity. This same effect of harvest intensity was reflected in the number of seedlings and saplings of these NTFP species, a sign of whether or not there is a next generation of individuals necessary to maintain the population. These studies also show that there may be effects of harvesting and other associated human use that extend to other non-target species. For example, they describe altered species composition in forests closer to human settlements relative to forests further from settlements, and lower total biomass in forests closer to human settlements relative to forests further from settlements.

Photo: Nitin D. Rai

In another study, also in the Biligiri Rangaswamy Temple Wildlife Sanctuary, Ganesan and Setty describe the case of two species of amla, *Phyllanthus emblica* and *P. indofischeri*, which both occur in this area. *P. emblica* occurs in moist deciduous forests, whereas *P. indofischeri* occurs in drier scrub forest. Both species of amla are subject to similar harvest pressure, but *P. emblica* shows very little regeneration of young individuals, unlike *P. indofischeri*. The authors suggest that anthropogenic disturbances not directly related to harvesting (e.g., fire and grazing) can also have an impact on NTFP species.

Ecological effects of NTFP harvesting can vary according to the plant part harvested. This is illustrated by Runk and others, from a study in the Darién Province of Panama, where the Wounan and Emberá communities rely on several important NTFP such as fruits of the tagua palm (*Phytelephas seemannii*) for its vegetable ivory, and fronds of the chunga palm (*Astrocaryum standleyanum*) for fibre that is woven into fine baskets. Tagua harvest does not jeopardize regeneration of the palm, but the chunga palm is killed to obtain its fronds. The authors also draw attention to the year-to-year variation in availability of certain products, as well as to the variation in harvest amounts, relative to proximity to tourist markets. They use these findings to make the important point that most studies on harvesting of NTFP are based on short-term observations, made on small populations, which thereby limit the recommendations that can be made on their basis.

But ecological consequences of NTFP harvesting are not just a consequence of the biology or natural history of the plant or animal concerned. Socio-economic factors such as equity in access to resources, and tenure regime, can also have important impacts on harvest practices, thus on ecological sustainability. Rai and Uhl, in their study of uppage (*Garcinia gummi-gutta*) rind harvesting in Uttara Kannada district, Karnataka, show that Brahmins, who have tenurial rights in Soppinabettas, can afford to wait until the fruit is ripe and the rind falls to the ground. This way, there is no damage to the trees, nor competition for fruits with fruit-eating animals, and seeds are left in the forest to germinate. On the other hand, people – largely lower caste non-Brahmins, as it happens – who rely on open-access reserve forests for their harvest of uppage, are compelled to harvest the fruit before it is ripe, often cutting

Photo: Rucha Ghate

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branches in order to maximize their gains and pre-empt others from getting the fruit. In the process, the trees are damaged, other non-human consumers of the fruit are deprived of their food, future regeneration is jeopardized, not to mention that collectors get less income per kilo harvested for the lower-quality rind from unripe fruit.

In addition to ecological sustainability, there are a variety of other considerations that constrain good extractivism. These include the low density at which most NTFP occur, their low (and variable yields from year to year), their relative remoteness from markets, and the variability in these markets, thereby making harvest economically unprofitable, even if ecologically sustainable. Plowden illustrates this in his study of andiroba (*Carapa guianensis*) in humid tropical forests of the Brazilian Amazon region. Andiroba seeds have traditionally been harvested for their oil used as an insect repellent and to relieve rheumatism. There is now growing interest in it as a source of oil for medicinal soaps and natural insect repellent candles. Traditional methods of oil extraction yield small amounts of oil compared to mechanized methods, and investment in the required machinery for local processing may help overcome this difficulty. Nonetheless, the small quantities of andiroba available for harvesting remains a constraint to profits from collection, and Plowden suggests enrichment planting of this species as a means to achieve economic profitability. Enrichment planting of NTFP has also been suggested by Kathriarachchi and others, from Sri Lanka. They present the case of two important lianas, Calamus ovoideus and Coscinium fenestratum, the former, a rattan used to make furniture and baskets, the latter, an indigenous medicinal plant. Both have been over-harvested in the wild, and the authors describe results from experiments that suggest they can be grown on degraded land, or in buffer zone plantations outside protected areas.

In contrast to andiroba, açaí (*Euterpe oleraceae*) is a rather atypical NTFP. It occurs at high densities, it grows in flood plain forests in the Amazon region, making it relatively accessible (by boat), and it is a multi-stemmed palm, so it is possible to harvest both its high value fruits, and the heart of the palm, without killing the tree. However, there is a downside to açaí: given its high value, and the increasing demand for it, regionally and internationally, there is an increasing trend of forest enrichment with açaí, which is converting mixed flood plain forests to near monocultures. While this type of conversion is not damaging or degrading to ecological processes when compared with clear felling for timber, or forest conversion to ranches, it nonetheless comes at the cost of other native biodiversity. Weinstein and Moegenburg suggest that there may be ways of achieving a win-win situation with açaí, for instance, by invoking market instruments such as certification, thereby providing people an incentive to maintain native diversity.

A win-win situation is something that Uma Shaanker and others also discuss. They stress the need to monitor impacts of harvesting at several scales in order that they can be mitigated or prevented. In fact, Uma Shaanker et al. suggest that a win-win situation is not merely achievable, but essential, for both ecological security and livelihood security in the long term.

Re-Placing Nature

Ben Campbell

Photo: Ben Campbell

As the environment has become an object of global concern, anthropologists have increasingly paid attention to the ways in which conservation projects and approaches have understood and reconfigured, local patterns of human-environment interactions. The articles in this special section compare the historical and cultural particularity of the idea of nature as a non-human domain, with the changes represented by the adoption of more people-friendly conservation policies.

North American-style wilderness preservation is now recognised as not viable for many areas of biodiversity that contain, or are surrounded by, human communities. But just as conservationists' understanding of nature has shifted, anthropologists also no longer see cultures as the discrete, formative meaning-structures they were once presumed to be. The case studies from Nepal, Portugal, Spain, Finland, Cameroon, Greece and Brazil investigate how policies and discourses of conservation have made interventions that produce meanings of cultural diversity, as much as they have demarcated and regulated activities to protect areas of biodiversity. Who comes to be recognised as a local in areas designated for conservation, and what attendant rights and expectations follow from this?

Conservation solutions from the 1870s to 1970s tended to ghetto-ise nature in enclaves of bio-authenticity, or as resource reserves that excluded human intervention. The outcome of such conservation was a territorial nature-society divide. Nature was 'purified' of its social networks. As Ingold argues in his commentary on the collection, the terms nature and society do not so much describe the world as make certain kinds of claims for it. The ways in which environmental protection is now thought about are deeply entwined with developments in global economy and social change. Post-Cold War adjustments of trading patterns, investment, and rural subsidies have rendered many areas of agricultural production unprofitable, while the market for ecotourism, and scientific interest in bio-prospecting have grown, all of which have consequences for how claims are made for valuing nature. In order to evaluate the extent to which conservation has become socially reflexive, these ethnographic case studies present the view points of people who are on the end of chains of policy-impact. These studies make apparent the cultural forms and terms of relevance in which conservation appears to them. These people have often had no comparable sense of a non-human context implied by a conservation worldview, yet they have to face, on a daily basis, the socially powerful consequences of this worldview.

Ethnographers increasingly record encounters with explicit formulations of the environment as being materially threatened by human activity. These formulations were once perhaps recognisable as culturally specific. They are now no longer a straightforward criterion for defining the difference between cultural universes. There are now several examples of people's adoption of the language of environmental protection as a discourse of the powerful to position themselves for instance, as 'forest people'-- in order to make claims for environmental entitlements.

The principal means by which communities are encouraged to view conservation favourably is through the provision of incentives