ISSN 0974-0953

Current Conservation

Protection or Conservation?

Madagascar's Environmental Crisis

Real and Imagined Landscapes

Beyond Placebo Discussions

Issue no - 2.4
Oct 2008

Current Conservation online is available at www.currentconservation.org

Cover Photo: Mohamad Sy-ar
Baobab and rice field

ISSN 0974-0953

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The Forest Rights Act

MADAGASCAR

THE SCHEDULED TRIBES AND OTHER FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS) ACT, 2006

Section Summary

Perspectives on the Forest Rights Act

Siddhartha Krishnan

The contentious Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006, (henceforth RFRA), contains in its preamble a sentence, 'to strengthen the conservation regime of forests'.

The three articles in this section on the RFRA look at how such strengthening can happen from the perspectives of collective action and institutions. Collective action alludes not so much to the social science theory on how people can collectivise, but instead to the practical reasons why conservationists need to build constituencies involving local communities for better conservation outcomes. The institutional perspective is on clarification of the status of committees privileged in the RFRA for conservation.

The conservation regime of forests, then, can be strengthened if there is consensus and a sound institutional roadmap. Shanker argues that it is essential to have consensus on the opportunities that the RFRA offers for conservationists to work with forest communities who stand to gain the most from conservation initiatives and education, and who share the common goal of conservation.

Institutionally, Lele prescribes a clear roadmap for forest management. For instance, the legal status of committees to be constituted under the RFRA requires clearer explication, as do the statutory powers of its members, to stop felling. He stresses the need to learn from the unsuccessful history of Joint Forest Management (JFM), and is critical of the draft rules of the RFRA, which tended to legitimise JFM.

Unlike Lele, I am less critical of the draft rules, and feel they offered some institutional structure. In my opinion, the changes made to the draft rules reflect a reduction of community roles—from potential epistemic partnerships of local and scientific knowledge in conservation to mere protection.

But the genuflection to community is not uncritical. Shanker writes about the long-term aspirations of forest dwellers, even as he critiques the suggestion in the RFRA that 'people-will-dwell-in-forests-permanently.' Lele cautions about hierarchies of caste, gender, etc., that characterise community pursuits and mentions the need to ensure equity in institutionalising participative conservation. All three essays seek to engage the reader with institutional, epistemic, and consensus-building perspectives on the RFRA.

Siddhartha Krishnan is the guest editor for this section.

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The Forest Rights Act: What's in it for Conservation?

Kartik Shanker

Are conservationists addressing substantial threats to biodiversity or are they perhaps influenced by other issues such as charisma and contingency? On one hand, some conservationists give undue attention to large attractive animals and to obvious immediate threats such as poaching. On the other, they are also constrained by what they, as an interest group, can politically achieve. In developing countries like India—where the focus has been, and continues to be, on economic growth—conservationists tend to be relatively powerless. At a national level, conservationists are low on the agenda of both politicians and bureaucrats, who do not believe that environmental conservation helps growth. Thus many conservationist battles are fought against the absolutely powerless and marginalised. Instead of gaining popular support from these constituencies, such battles have furthered the rift between people and the environment. This enhances the perception that conservation is really for, and of, the elite.

Conflicts and constituencies

Nothing exemplifies this better than conservationists' recent battles over the Scheduled Tribes and Other Forest-Dwellers (Recognition of Forest Rights) Act, 2006 (RFRA), where they pitted themselves against forest dwelling communities and tribal interest groups. The RFRA presented an unprecedented opportunity, and political and administrative framework, for conservationists to join force with forest dwellers all across the country, but what followed were large volumes of vitriolic press and misinformation about the extent of 'prime forest' loss. Much of the opposition to the RFRA has come from conservationists who favor inviolate pristine areas. For this reason they strongly advocate relocation of communities. Some of these communities do have negative impacts on their environment, but surely no more so than the conservationists who are fighting the RFRA, and certainly far less than large industrial interests. And while many conservationists are fighting these industrial interests, so are forest dwelling communities, sometimes at the cost of their lives. There is a need to build different constituencies of support. The RFRA does, in fact, allude to such constituency building when it states in its preamble that inclusion of responsibilities (and not just rights) of sustainable use and biodiversity conservation will 'strengthen the conservation regime of forests'.

Relocation

But conservationists (henceforth protectionists) oppose the RFRA, among other things, over the issue of relocation. And this despite procedure laid in Section 4(2) of the Act. This section allows for resettlement of rights in critical wildlife habitats, with a rider that certain procedures are followed. These include completion of rights vesting, establishing irreversible impacts of activities of rights-holders on wildlife, ruling out of co-existence options, preparation and communication of resettlement packages, and written Gram Sabha consent on resettlement. Finally, forests thus emptied of people shall not be diverted for any other purpose.

Despite the RFRA trying to allocate land and overcome ambiguity over current tenancy, protectionists continue to claim that the alternative to land allocation and tenancy ambiguity is relocation. It is not clear that relocation helps conservation. There are few examples where it has been fairly and effectively implemented. Bad relocation almost invariably results in social and political disempowerment and further marginalisation. Relocation studies from Southeast Asia show that once people are moved out of an area it becomes open to the introgression of other vested interests including political and industrial interests. Protectionists, on the contrary, argue that continued or legitimate presence of people would actually facilitate introgression by vested interests such as land and timber mafias.

Contradictions

Protectionists who oppose the RFRA are the same people who spend considerable time and money educating the public on conservation—an effort they consider significant and perform well. Yet they do not realise the counterproductivity of opposing the legitimate interests of forest dwelling communities who have the most to gain from environmental protection—theirs is a sensitivity born of necessity. Protectionists are ignorant of the fact that such contradictory efforts will only turn millions of people against nature or conservation.

Community aspirations

The common goal of conservation and natural resource dependent communities is the long term survival of the resource. But there is an assumption in the RFRA that communities will remain forest residents—the RFRA does not just seek to rectify 'historical injustice,' but, also to 'strengthen the conservation regime,' an aim that has futurist overtones whereby communities continue to reside in forests and conserve them. As protectionists have emphasised, many forest dwellers

are on the same economic and social path that most urban and rural dwellers are. In the long run they will surely choose, or at least aspire, to move on from forest areas and assume consumerist identities like the rest of us. But for the time being one needs to pay attention to studies that have shown, time and again, that tenurial rights play a significant role in the sustainable use of resources by communities as long as they depend on them. The terms on which people leave the forests, and the sharing of ownership and benefits, may ultimately be critical.

Converging for conservation

Unlike certain protectionists who have been viscerally opposed to the RFRA, the responses of academicians and activists who engage with conservation have been more constructive. They seek to ensure that the RFRA has positive consequences for both forest dwellers and the environment. They genuinely believe that the goals of conservation have much in common with the concerns of livelihoods of local communities, and that, working together, these common goals can be achieved.

This article has been modified from a previous article in Tehelka Magazine with inputs from Siddhartha Krishnan

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Right direction, but long way to go

Sharachchandra Lele

Conservation and 'sustainable use' are fuzzy terms. Nevertheless, together they encompass the two broad goals of forest management: the former about ensuring a wider set of environmental benefits in the present, and the latter about ensuring resource availability for the future. Ironically, neither dimension was explicitly articulated in the Indian Forest Act of 1927, leaving the colonial state free to take over and manage forests for whatever objective it desired. Later, the Wildlife Act of 1972 focused on conservation objectives alone. More recently, the National Forest Policy of 1988 set 'environmental balance' and 'meeting local needs' as the priorities of forest management, but these concepts were never internalised into the forest laws. The Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006 (RFRA), is thus a landmark legislation, because for the first time a forest law explicitly recognises both the objectives of forest management, namely, conservation and sustainable use, right in its preamble itself.

Besides a better definition of 'goals', the RFRA also provides a radically new 'means' for forest management, namely, community-based management. It does so in steps: first—requiring that the land rights (rights to habitation and cultivation) be recorded and settled, second—that the right to a community forest resource be identified and settled, and third—asking the communities (through their Gram Sabhas) to take up the management of this resource. The first, to which the RFRA pays most attention, is a pre-condition for participation in forest management, because forest dwellers would not be willing to engage in forest management if the land they dwell on or cultivate is itself disputed. All along, it had been assumed that land rights are generally well settled, with the exceptions of conversions that may have taken place after the Forest Conservation Act 1980 was passed. However, as the movement that led to the passing of the RFRA convincingly argued, a large fraction of forest-dwelling communities, especially in the central Indian forest belt, had been declared encroachers in their ancestral lands or in forest villages created by the government itself. The RFRA and its rules address this problem head-on, by providing a mechanism for members of scheduled tribes and other forest-dwelling communities to stake their individual (or community) claims to lands already under their use for dwelling and cultivation.

Further, going beyond the problem of arbitrarily drawn forest boundaries, the RFRA also asks for a more systematic and transparent procedure for identifying the boundaries of 'critical wildlife habitat' within the forest. And the Act provides for assigning community rights over forests that communities wish to manage for sustainable use.

Missing institutional road-map

After boundaries are (re-)drawn, the question of institutionalising the management of both community forest resource and critical wildlife habitat looms large. The institutional arrangements will necessarily be complex and nested, as they need to ensure long-term sustainability and the balancing of interests of different beneficiaries of the forests, onsite and off-site. Here, however, the RFRA seems to have fumbled. It does not provide a clear institutional road-map for institutionalising and democratic forest management in the long-run.

As Siddarth Krishnan points out in his article in this issue, some fairly technocratic, centralised and muddled norms for functioning were sought to be introduced by the bureaucracy (vide section 24 in the draft rules) — norms that imposed harmonisation with official prescriptions and working plans and a back-door legitimisation of Joint Forest Management and watershed management committees. But in shooting down this attempt, the tribal rights groups may have thrown the baby out with the bathwater. In their final form, the RFRA rules only require the Gram Sabha to 'constitute Committees for the protection of wildlife, forest and biodiversity, from amongst its members.' There is no attempt to clarify the internal structure and functioning of these committees, nor their external relationships with and roles of other legitimate agencies (Forest Departments or otherwise).

Internal powers and democracy

The rules, as they stand today, do not specify the legal status and powers of the committees constituted for forest protection, or the land over which they would have rights. Will the members of the committee set up by the Gram Sabha for protection have statutory powers to stop unsanctioned forest felling? Will the community forest resource recognised under the Act have the legal status of, say, a 'Village Forest' under the Indian Forest Act? What happens to other rights and privileges that have been granted earlier, for instance, individual forest privileges granted in the Western Ghats of Karnataka? In the absence of such specification, there is a danger that individual rights holders will also get rights in the community forest resource, aggravating existing inequalities, as has happened in the Joint Forest Management (JFM) context.

Similarly, the rules do not pay attention to the fact that the so-called 'forest-dwelling communities' are often undemocratic in their functioning and are often (if not always) afflicted by hierarchies of caste, class, and gender. This requires rules about election of the committees and some *a priori* structuring of the decision making to ensure representation of and a voice for the marginalised groups. The JFM programme, for all its faults, at least paid some attention to this issue by specifying processes and composition in some—sometimes too much—detail. It is nobody's case that specifying this will automatically ensure a democratic process, but it is a first step towards that. Furthermore, learning from the JFM experience, the rules should have incorporated provisions to ensure that the rights holders can generate income from the resource without the elite capturing the surplus.

Redefining mandates

Externally, the RFRA and its rules do not specify how the local forest management committees will interact with or fit within the larger structures of forest governance (and, indeed, how the larger structures need to be redefined in light of the RFRA). The draft rules did specify that the Forest Department must respond to requests for assistance from the Gram Sabha, and the omission of this specification is a weakness of the final rules. But even this specification would have been hardly enough. The mandate and jurisdiction of the Forest Departments need to be redefined. The notion of 'assistance' must be clearly defined and its mechanisms clarified. If communities require assistance in forest protection, this should be provided by a specialised forest protection force. On the other hand, ensuring that the hamlet- or village-level committees set up under this Act actually discharge their responsibility of protection and conseration will require a statutory agency that is more democratic, transparent and knowledgeable about sustainable use than the current Forest Departments.

The absence of an institutional road-map will hamper the management of critical wildlife habitat or other conservation-oriented zones. On one hand, the wildlife wing of the forest department should probably become an independent, differently-trained, wildlife management service, on the other, local communities must also be given a role in the management of critical wildlife habitat.

And finally, the Forest Conservation Act must be amended to ensure that the informed consent of the Gram Sabhas that have been recognised under the RFRA is necessary in any conversion of their forest lands to non-forest uses.

Conclusion: The need to engage

The RFRA faced tremendous opposition from the Ministry of Environment and Forests and therefore its proponents were forced to convert the issue into one of tribal development and bring it up through the Ministry of Tribal Affairs. (Although other forest dwellers were included in the interest of equity, the focus of the RFRA is on tribal communities.) But if the radical restructuring of forest management envisaged by the Act is to become a reality, the lessons of almost two decades of experiments with JFM have to be taken on board, and new multi-layered arrangements and mandates will have to be created. The onus for this is on the foresters and their ministry, who have to shed their resistance and engage with the restructuring, if they truly share the goals of conservation and sustainable use.

This article has been written for *Current Conservation*.

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What can the Forest Rights Act Decentralise: Protection or Conservation?

Siddhartha Krishnan

The Rules for The Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006 (henceforth RFRA) were finally gazetted in January 2008. The six month wait in gazetting the rules, which first appeared in draft form in June 2007, is only representative of delays that have beleaguered the Act since its introduction as a Bill in 2005. Conflict prevailed between conservationists and tribal rights groups in the form of protests and lobbying. The very process of writing the provisions of the Act, wherein each lobby at different junctures in the nearly 3-year legislative career of the Act included and excluded favourable and unfavourable clauses and whole sections, reflects this conflict. This essay refers to such conflicts, especially the one that possibly prevailed in the changes made to the draft rules. It draws implications these changes could potentially have for how the RFRA achieves what is stated in its preamble, namely, to 'strengthen the conservation regime of forests'.

Drafting Conflicts

Sunita Narain, in an editorial in Down to Earth (November 2007) describes well the conflicts among lobbies while the bill was being drafted. She writes that after the tiger lobby blocked the bill, an uneasy truce was brokered to provide for relocation of people and to maintain their rights. The bill later presented to parliament included a provision of temporary pattas (land deeds) for people who were to be relocated from sanctuaries and national parks. This ensured protection of rights even as it allowed for the government to undertake relocation within a time-bound schedule. But the tribal lobby, with an advantage in parliament, raised the stakes, and in late 2006 the Act, finalised by a joint parliamentary committee, dropped this clause. A new term, 'critical wildlife habitats,' was inserted instead. These habitats would need to be *established* as inviolate wildlife zones. Further, the rules for the Act required guidelines regarding the nature, process, validation, and interpretation of data to be collected for designation of such critical wildlife habitats. This virtually questioned 'the legality of all protected areas'. Conservationists, in turn, reacted and wanted all wildlife areas (over 600 of them) to be re-designated as critical wildlife habitats and removed from the ambit of the Act.

Later, though it appears that the conservation lobby had prevailed in rewriting the draft rules, an opinion prevails among rights sections that the changes introduced in the final rules (especially the exclusion of Section-24, which provided an institutional roadmap for operationalising duties), were all for good, after all. The reason? Because the section contained clauses that required Gram Sabha plans for conservation and protection to be 'harmonised' with working plans. Also these committees were to guide Joint Forest Management (JFM), thereby potentially lending legitimacy to schemes that usually lacked 'jointness'. A comparison of the finalised rules with the draft rules will show that the functions of the Gram Sabha have been diluted even as it is required to accommodate conservation interests. And, as mentioned, the institutional process for implementing the 'Duties' provision of the RFRA has been excluded.

Draft Rules

So what exactly did the draft rule Section-24 provide for? It provided a possible framework to institutionalise the 'Duties' clause of the RFRA. The clause 'empowered' right holders and Gram Sabhas to protect biodiversity and ensure the preservation of their habitats against destructive practices that affect their cultural and natural heritage. It required that plans, norms, methods, and procedures be prepared for protection and management of community forest resources, and that these be harmonised with official prescriptions and plans. Norms for protection, regulation and sustainable use were required to be institutionalised. So were norms for community wildlife management. Section 24 has, instead, been collapsed into one function of Gram Sabhas under subsection 'e' of Section-6 of the final rules, namely, that Gram Sabhas must 'constitute Committees for the protection of wildlife, forest, and biodiversity, from amongst its members, in order to carry out the provisions of Section-5 of the Act'.

The other alterations made to Gram Sabha functions render temporary any relief that the rights lobby felt over the exclusion of the institutional roadmap. For instance, subsection 'a' of Section-4 of the final rules states that Gram Sabhas will 'initiate the process of determining the nature and extent of forest rights,

receive and hear the claims relating thereto'. The word '*settle'* that appears in the draft rules has been removed. This implies that the Gram Sabhas cannot settle disputes over rights. Before passing any resolution on rights they need to consider the forest department's disputes over rights that are sought to be given. If unsatisfied with the Gram Sabha's resolutions, the forest department can appeal to the sub divisional committee according to subsection 'g' of Section-6. The italicised portions of this subsection, which reads 'hear petitions from persons, *including State agencies*, aggrieved by the resolutions of the Gram Sabhas' have been inserted in the final rules. Leave alone the scenario of Gram Sabhas having to harmonise their plans with official ones, it now appears that vesting such rights could itself be difficult as Gram Sabhas have to take cognizance of objections by the forest department (of which there may be plenty, especially in the context of 'critical wildlife habitats') even as it would be difficult to resolve such objections.

'Conservation' and 'Protection'

In the interim, between the draft and final rules, many a forest in India and its people may have been engaged with by NGOs and scientists, natural and social, broadly in the legislative spirit of the RFRA but also specifically in the context of the institutional roadmap suggested in the draft rules. The positive aspect of the draft provision was that by providing an institutional framework for right holders and Gram Sabhas to carry out their duties it ensured that the duties clause was indeed operational.

Also, by using the words 'protection' and 'conservation' separately, the draft rules facilitated an interpretation of duties as entailing conservation (recruiting local knowledge, e.g., observations through an epistemic partnership) and protection (policing/vigilance) functions. The separate usage of 'conservation' and 'protection' in the Act's provisions seemed intended. Thus, in phrases such as 'right to protect, regenerate, or conserve or manage,' or 'traditionally protecting and conserving for sustainable use,' these two words seem at best to be used as options but not really as substitutes. As legal codes have to be crisply written for unambiguous interpretation, using 'conserve' and 'protect' in a repetitive sense of meaning the same thing, e.g. policing and vigilance over resources, is counter productive. Also from an external perspective 'protect' and 'conserve' can plausibly be interpreted to mean 'policing', and 'formal' or 'local knowledge' application, respectively, by way of an appropriate analogy of what a Protected Area means and what happens in terms of management within it.

A forest is protected by wildlife law. An administrative hierarchy consisting of bureaucratic roles that range along a super and subordinate continuum protects a park or a sanctuary using the threat of punitive sanction and physical policing. Within this protected space, 'conservation' happens as a scientific endeavour entailing sometimes theoretically esoteric but usually empirically oriented research in biodiversity. Thus, the use of the word 'conservation' offered scope for recruiting local communities as epistemic partners under decentralised circumstances. This is why the provisions in the draft rules gave scope for decentralised 'conservation,' and not just for 'protection'.

Conclusion:
The Problem with 'Protection'

The suggestion that plans and procedures for protection and conservation needed to be harmonised with official working and management plans, may have been resisted by rights groups and sympathetic alliances. The conservation lobby would not have been happy with striking epistemic partnerships with local constituencies either. One could attribute lobbying and counter lobbying by rights and conservation lobbies for the insertion of the word 'conservation,' and the need to 'harmonise' plans and procedures for the same with official plans, respectively. Similarly, one could attribute to lobbying the removal of the institutional framework in the final rules. But who lobbied for what is not an easy surmise. The conservation lobby would certainly have resisted the roadmap to decentralisation of not just protection but conservation, which the draft rules provided. The rights lobby, likewise, would have been uncomfortable with such an elaborate institutional roadmap for protection and conservation, and especially with the clause to harmonise.

What now remains is only protection through the impermanent and unstable arrangement of 'committees'—a mode that the government is quite familiar with, and one that has been subject to widespread criticism. And as for 'protection', it is not some unique prescription of the RFRA, but a general constitutional guideline. Every Indian citizen has the right to protect the environment. The bestowal of protection duties would only create a policing proletariat in Indian forests. Decentralised conservation involving epistemic partnerships—using local and customary knowledge, say in the form of observations and practices in conjunction with scientific knowledge—would remain a dormant democratic agenda.

This article has been written for *Current Conservation*

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Introduction

The Anthropology of Madagascar's Environmental Crisis

Jeffrey C. Kaufmann

Photo: JC Kaufmann

Malagasy houses in a riverine forest

Can anthropology make a difference in the future of the biodiversity of Madagascar? Common sense suggests that as a holistic discipline, one that studies human diversity from multiple perspectives and methodologies, anthropology disseminates useful empirical knowledge about Madagascar's struggle with its environmental crisis. But in practice, primatologists might lean toward the zoological side of physical anthropology, losing sight of the search for what it means to be human in the family of primates. Likewise, cultural anthropologists might slide into an extreme form of cultural relativism that diminishes Malagasy malfeasance in their environments. This article asks how anthropology might develop methodologies that find a common ground that melds nature and culture.

Chipping away at the nature / culture dichotomy in the social-environmental literature on Madagascar starts by avoiding polarising of the Malagasy rural people as either extrinsic to nature or as intrinsic. Drawing on Michael Herzfeld's (2001) collaborative work in defining the middle ground in anthropology, I argue that methodologies that include more team fieldwork leading to jointly published research articles offer new opportunities for both primatologists and cultural anthropologists. Anthropologists can have a more positive effect in Madagascar if they disseminate the synergisms between nature and culture in various Malagasy contexts.

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Originally published as:

Kaufmann J.C. 2006. Introduction: The Sad Opaqueness of the Environmental Crisis in Madagascar. *Conservation and Society* 4(2): 179–193.

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Section Summary

Madagascar's Social-Environments

Jeffrey C. Kaufmann

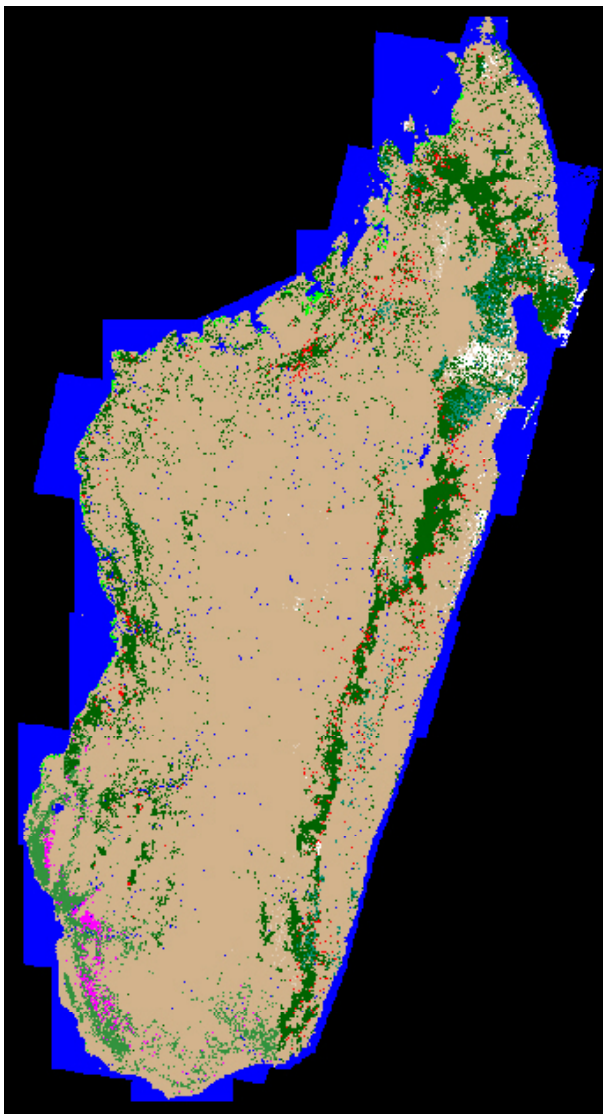

Photo: Conservation International, 2005

Madagascar's Forests

The six articles in this special section try to humanise the problem of the environment in Madagascar. By 'humanise' I mean that they consider Malagasy people as much a part of the solution as the problem of Madagascar's environmental crisis. Rather than point fingers of blame at Malagasy peasants, pastoralists, and peripatetics, and leave it at that, the authors strive to interrogate how nature and culture, resources and economies, discourses and politics intersect and impact each other.

The special section offers readers a wide geographical sampling of social-environmental studies from this large African island, the fourth largest in the world. Kaufmann and Tsirahamba introduce readers to forest-pastures in the southwest's spiny forest and clarify deforestation pressures from immigrant farmers in one case and forestation practices among pastoralists in another case. Lilette gives readers a comparative study wherein environmental heritage activities have had different successes in marine biodiversity conservation along the southwest coast. Hume excavates the multiple perspectives, at various human scales, toward swidden cultivation practices in eastern rainforests. Sandy provides a social-environmental guide map along varying scales of human impacts on the dry deciduous forest of western Madagascar.

Together, the articles demonstrate the benefits of social-environmental studies that delve into local Malagasy environmental attitudes and their practices on the land, and then weigh how outside pressures affect the empirical social-environmental relationships.

Originally published as:

Kaufmann J.C. 2006. Introduction: The Sad Opaqueness of the Environmental Crisis in Madagascar. *Conservation and Society* 4(2): 179–193.

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The Effects of Immigration and Farming on Forest-Pastures in Southwest Madagascar

Jeffrey C. Kaufmann and Sylvestre Tsirahamba

We look at two case studies along the Linta River, which cuts through the 'spiny forest' ecoregion in southwest Madagascar. In both cases, we follow the fates of hybrid forest-pastures in the territory of Mahafale pastoralists. We trace the distinct environmental histories of the three forest-pastures—the Fatrambey, the Ankara, and the Samata.

The northern Linta case, at the river's source, demonstrates deforestation of the Fatrambey forest-pasture arising from immigrant farmers in search of land to grow cash crops for the international maize market. Pastoralists had long held the forest-pasture as a pastoralist reserve, as a place to pasture and to shade their cattle from prying eyes. We emphasise that raising cattle in Madagascar does not mean transforming forest into pasture. The two landscape types are not only compatible but preferred by pastoralists who live in the heart of the Mahafale territory.

We predict that the Ankara forest-pasture awaits a similar fate as the Fatrambey. The government has continued to make policy that supports farming intensifications in pastoralist landscapes. An interesting collaboration is emerging in which Mahafale pastoralists have turned to NGOs, in particular the World Wildlife Fund, for help. Pastoralists are adapting their indigenous conservation ethic to a Western conservation ethic in hopes of retaining control of their forest-pastures. This development invites further research.

The southern Linta case, at the river's mouth, reveals how the hands of pastoralists have made the Samata forest-pasture. In the grass-scarce deep south, pastoralists have managed to create more food for their stock by favouring an endemic tree that cattle can eat (samata, *Euphorbia stenoclada*) and by planting large plantations of non-endemic prickly pear cactus (*Opuntia* sp.). These Mahafale pastoralists have found an answer to feeding and watering their zebu cattle by developing a plant that they categorise as 'water-food'. The inventiveness of pastoralists is emphasised, even though their ventures into cactus husbandry means a cut back in their herd mobility.

The cases demonstrate the difficulty in generalising about pastoralist peoples. Pastoralists might not be as married to grass as many observers have thought. Mahafale cattle raisers put forests on an equal footing with grass. Moreover, contrary to much conventional wisdom about pastoralists' impacts on Madagascar's forests, it is the immigrant maize farmers seeking to benefit from the international market, who are having a negative impact on pastoralist forest-pastures. We move away from studies that stress the cultural devotion of pastoralists to their cattle, to a perspective that brings out an indigenous economic practice that considers cattle as a bank.

Photo: JC Kaufmann

Mahafale woman near the Fatrambey forest-pasture

Originally published as:

Kaufmann J.C. and S. Tsirahamba 2006. Forests and Thorns: Conditions of Change Affecting Mahafale Pastoralists in Southwestern Madagascar. *Conservation and Society* 4(2): 231–261.

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Indigenous Conservation Ethics among Vezo Semi-Nomadic Fishers

Valérie Lilette

Photo: Rémy Ravon

The Red-tailed Tropicbird, Nosy Ve

A great many conservationists may be familiar with the Red-tailed Tropicbird; few may know about the Marine Turtle. This article takes the author into the reader into the world of Vezo fishers who live along the southwest coast of Madagascar and engage in conservation projects involving the Red-tailed Tropicbird and the Marine Turtle. The two case studies reveal that there is no one recipe for conservation success. Uneven incentives for including conservation into local economies and social spheres of exchange have led to patchy results in the conservation of these important species on the island of Madagascar.

The Tropicbird has a long association with Vezo residents, who have judged the bird an important part of their social community. An indigenous conservation ethic has been in play involving the preservation of the bird and its nesting places. With ecotourism bringing more monetary incentives to the residents, they continued to protect this bird species.

Photo: Valérie Lilette

The removable point of the harpoon pierced the carapace of the green turtle

The Marine Turtle has a far more complicated relationship with these fishers. Being a large animal that is difficult to acquire, in some ways the turtle is like a zebu cow to Vezo Sara people. Malagasy throughout the island acquire cattle for economic, religious, and social purposes. Sacrificing the blood of cattle marks important ceremonies commemorating kin and requesting numerous blessings from ancestors; working cattle till the soil in rice fields and pull ox-carts. The Marine Turtle performs similar functions for semi-nomadic fishers. People exploit the turtle to exchange it through various spheres of value: for money, for rituals, and for prestige.

Written with a deep understanding of coastal life, of Vezo social thought and practice, and of the challenges facing wildlife species in marine environments, this article should ignite new interest in conservation and society in Madagascar.

Originally published as:

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Belief Systems and Stakeholders in Madagascar's Swidden Farming

Douglas William Hume

Photo: DW Hume

Tavy in Eastern Madagascar

Several local, national, and international institutions and agencies are currently exploring possible methods of changing existing agricultural practices in the eastern regions of Madagascar, but have not studied the socio-cultural consequences of such a change. The proposed agricultural revolution plans to replace local swidden farming with irrigated terraced fields. Each of the stakeholders in Madagascar's agricultural revolution has its own specific goals. The goals of agricultural development groups are to create new farming techniques and provide crop seed to increase agricultural yield; the goal of conservation groups is to attempt to protect the remaining forests from agricultural use; and the goal of rural merchants and farmers is to make a living from rice agriculture to support themselves and their families.

Tavy (swidden rice farming in Madagascar) is of particular interest to the Malagasy government, scientists, and conservation groups not only because of its adverse effect on the endemic flora and fauna, but because, as practiced with current human population densities, it is both ecologically and economically unsustainable. The transition from *tavy* to terraced farming is essential so that the Malagasy population has a stable source of food and is able to maintain its environmental and economic integrity. Conservation agencies and institutions seek to protect the remnants of rainforest that remain, and hope to restore the degraded lands that surround protected areas. The practice of swidden agriculture prevents this restoration.

Tavy is not merely a method for farming, however. It is intertwined with religious beliefs expressed through rituals performed during *tavy*, and is thus also culturally important. For example, before farmers cut vegetation in preparation for *tavy*, they ritually pray and offer both rice and honey to the *zanahary* (ancient spirits that live on the land and may harm the farmer). Farmers then pray and offer rice, honey, and rum to *andriamanitra* (God) so he will protect them from harm before they burn the dried vegetation. The cost of the replacement of *tavy* with irrigated techniques includes the loss of the religious rituals practiced only during *tavy*. If farmers stop practicing *tavy*, they will not practice these and other rituals.

Of all of the institutions and agencies interested in agricultural development in Madagascar, only one recognised that understanding the cultural institution of *tavy* would be critical to success in the planned agricultural change. Most of the institutions and agencies assumed that change would be welcomed if it provided more benefits than costs, regardless of the implications for cultural beliefs that these changes would bring. The transition from *tavy* to wet field methods would result in the loss of meanings ascribed to farming. All of the farmers interviewed practiced both *tavy* and wet field methods. Yet, none of the farmers interviewed practice the rituals associated with *tavy* with wet field agriculture. All of the farmers interviewed stated that without the practice of *tavy* they would lose their identity as farmers.

Malagasy farmers may resist cultural change if the non-indigenous knowledge introduced does not mitigate the loss of meaning they ascribe to *tavy*. This is a classic example of a development project that ignores culture and attempts to fix a problem with money and through technology. One cannot simply replace a practice that has significant meaning to individuals solely with technology. The probability of success of the planned agricultural change would be enhanced if a study of cultural change were incorporated into the larger study of an ecologically and economically viable solution to the issue of swidden agriculture and conservation.

Originally published as:

Hume, D.W. 2006. Swidden Agriculture and Conservation in Eastern Madagascar: Stakeholder Perspectives and Cultural Belief Systems. *Conservation and Society* 4(2): 287–303.

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Real and Imagined Landscapes:
Land Use and Conservation in the Menabe

Clare Sandy

Despite conservation efforts, the remaining dry deciduous forests in the Menabe region of western Madagascar are severely threatened by deforestation. I examined local concepts of landscapes in the village of Andranomena in the Menabe region in order to explore the underlying conditions and exacerbating factors causing deforestation and unsustainable land use. I investigated how the landscape is defined by the people who live in it, and how land use and economics are tied up in their concepts of land. The traditional and modern concepts of the same physical landscape contrast so starkly that the local people and those with the task of promoting conservation are functioning as though in two different realities. This disjunction has serious ramifications for conservation. Diverse local groups with different ideas about the landscape, and modern influences that run counter to conservation, further complicate the picture of deforestation.

In Andranomena, the following categories of land were used in everyday speech: *tana* (town or village), *tanimbary* (rice field), *baibo* (lowland garden), *ala* (forest), *hatsake* (slash-and-burn or swidden cultivation), and *monka* (fallow/spent land). Each of these categories carries fixed assumptions about different modes of land use, ownership, and economic participation. The traditional uses associated with these categories highlight important aspects of local Sakalava culture, and economic and social structures of rural Menabe. For instance, villages are made up of 'natives' – descendants of the person who first settled the land (the 'master' or 'owner' of the land), and 'strangers.' Natives and strangers are not on equal economic footing, as natives retain control over the most productive lands in the village. Rules for use of other lands limit strangers' ability to make long-term investments. This distinction shows how certain groups within a community have more economic pressure on them to participate in deforestation, and less cultural pressure to protect the forests. This situation, combined with the high value the Sakalava place on humility and community cohesion, also helps explain why the conservation strategy of investing money generated from tourism in the local community may be ineffective.

The custom of the landholder granting permissions for use, rather than buying and selling land, reinforces the power and responsibility natives hold. Forest and former forest land, understood as public resources, are an important source of basic subsistence needs for all, especially the most economically disadvantaged. Modern attempts to limit or control land use conflict with this outlook and with the traditional power structure. By taking, delineating, buying, or selling land that they have never worked, colonists and Malagasy government agencies alike have incurred resentment among those who follow the 'first-come, first-served' and permission-based system. Charging an entrance fee for a protected area disenfranchises the natives by placing the authority with outsiders who have cash, not those who know the land and are entrusted with upholding tradition.

To be effective, conservation must take into consideration the complexities of local culture and economics. Understanding traditional ways of seeing the landscape is one important component of this effort, and can help explain discrepancies between policy and practice.

Originally published as:

Sandy, C. 2006. Real and Imagined Landscapes: Land Use and Conservation in the Menabe. *Conservation and Society* 4(2): 304–324.

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Beyond placebo discussions

Bram Büscher

A colleague once told me that many conservation biologists see the interaction between humanity and biodiversity as sitting in a bus that is going downhill without any breaks. Would it then not be nice if conservation of the world's biodiversity could go hand in hand with unbridled economic growth, international peace and freedom, and an end to poverty? Of course it would. And neoliberalism promises just that. Yet, in this short opinion piece I wish to argue that following the neoliberal model is going to be a big mistake in the long run.

Let me start with an example. Popular with conservation biologists these days is the concept of 'payments for environmental services'. Simply put, this neoliberal concept does three things. First, it changes biodiversity's intrinsic and utility values into exchange values, that is, the value biodiversity would get on a market. Second, it creates a market around biodiversity. As such, roles are assigned to 'stakeholders' based on their economic interaction rather than their social or political relations. Third, it chops biodiversity up into little pieces that can be traded on the market. All this sounds straightforward enough; I can hear the reader think. Why, then, won't it work?

Well, because it is like putting little short-term plasters over a wound, creating dynamics that ultimately will make the wound worse in the long-term. In the 'straightforward' model whereby biodiversity is transformed into 'environmental services' that can be 'paid' for in a market, certain assumptions are made that have proven not to hold, time and again. First, there is a limit to the extent that people can be regarded as *Homo economicus*. The neoliberal model mistakenly assumes that in principle everything can be traded, that everybody understands how trading works, and that everybody keeps to the rules. The second point is that in the process of turning biodiversity and people into a market, other dynamics such as competition and commercialisation are stimulated. Both these processes have steadily (although not linearly) accelerated over the past centuries and are generally recognised to lead to greater resource extraction, increased use, and the generation of waste. All these processes are part of the problem and thus cannot be the solution. The last—and arguably most dangerous—dynamic stimulated by neoliberal conservation is that it becomes profitable to pollute.

One merely has to think about the commercial possibilities unleashed by, for instance, those benefiting from and marketing mitigation services to deal with pollution, to understand how real this danger is.

In sum, the neoliberal 'solution' will only increase the environmental problems in the long run. Yet, the basic mistake that is made over and over again is that simple solutions are forwarded for what everybody recognises are immensely complex problems. It is time that conservation biologists—and others—start looking for the real breaks on the bus. And let's not fool ourselves: this is no easy task. Simple answers are just not available and shouldn't be expected in a world as complex as ours. Still, there are ways to avoid yet another placebo discussion. We could start by questioning the sacredness of economic growth or the unbridled escalation of advertising and marketing everywhere. Some conservation biologists are already seriously discussing these issues but they are still few and far between. With this kick-off I hope to entice the readers of *Current Conservation* to chip in and let their opinions be heard on the subject of conservation and neoliberalism, specifically by addressing the issue of economic growth.

This article has been written for *Current Conservation*

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Biodiversity implications of land use change around nature reserves

Ruth DeFries, Andrew Hansen and Jianguo Liu

Nature reserves are the cornerstone for preserving biodiversity in an increasingly crowded world, but they are not isolated entities. They are embedded within the landscapes around them; species within nature reserves respond to changes in land use and other human activities in surrounding landscapes. Beyond this obvious truism, how can ecology help understand these interactions? More importantly, can understanding these interactions provide insights into management approaches that maintain biodiversity in nature reserves while balancing human needs for food, fiber, domestic animals, and settlements in surrounding areas?

Ecological Interactions between Nature Reserves and Surrounding Landscapes

Nature reserves interact with surrounding landscapes through multiple mechanisms. In almost all reserves, movements of organisms, water, and other ecological processes extend beyond the reserve's administrative boundaries to the surrounding landscapes. Expansion of agriculture or settlements in these areas outside the reserve reduces the *de facto* effective area of the reserve. Reduced effective area can lead to trophic cascades, where predators with large home ranges are disproportionately lost and prey populations expand. Reduction in the effective area of nature reserves also constrains the total number of species according to well-known relationships between area and number of species. Furthermore, recolonisation following disturbances such as flood, wildfires, and landslides is constrained with the decline in the effective area of a nature reserve.

In addition to reduction in the effective area, land use change outside nature reserves can alter flows of water and other materials into the reserve. A dam placed upstream of a nature reserve, or movement of fire across the landscape, will alter the flow regime and species composition inside the nature reserve. Regional land use changes also alter climate, for e.g., clearing of forests in Costa Rica's Caribbean lowlands appears to have reduced cloud cover in the tropical montane cloud forests of Costa Rica's Monte Verde National Park.

As a third mechanism linking nature reserves with their surroundings, habitats outside reserves may be rich in resources and critical to some portion of a species' life history for breeding, seasonal migrations, or movements between critical habitats. Land use change in these key locations can have disproportionately large consequences for biodiversity in reserves. Nature reserves often do not contain the full suite of required habitats, particularly because reserves are often located in relatively harsh biophysical settings where human land use is less desirable. For e.g., in tropical forests of Borneo, Indonesia, long-distance migrations of bearded pigs have been disrupted by logging of dipterocarp trees whose fruits are prime food sources for the pigs.

A final, and perhaps most important, mechanism linking reserves with their surroundings is exposure to hunting, poaching, exotic species, and disease from human presence. For e.g., lions in Serengeti National Park underwent dramatic population declines from canine distemper that they contracted from domestic dogs living outside.

Reserves are often a magnet for development – both in affluent and less affluent settings, exacerbating the potential for human activities to negatively affect biodiversity in reserves. Counties around Yellowstone National Park are among the fastest growing in the United States with increasing number of affluent rural homes. In Ranomafana National Park in Madagascar, people have aggregated around park boundaries in search of jobs.

Many reserves, particularly in the tropics, have people residing within them. Many others have people living in close proximity. The conservation community has recognised that management of reserves must consider people's needs and aspiration for resources, particularly because human populations around reserves are often indigenous, tribal, and traditional peoples whose livelihood depends on local resources. The scientific challenge remains to identify those aspects of human activities that are most harmful to the functioning of nature reserves and the limits for sustainable use.

Wolong Nature Reserve, China

Wolong Nature Reserve in Sichuan, China was designed for the protection of the endangered giant panda and is home to more than 6000 animal and plant species and approximately 5000 local residents. The reserve protects the habitat of approximately 10 percent of the wild giant panda population and has drawn international attention. Local residents are primarily farmers and carry out a

Photo: Vanessa Hull

A giant panda in the Wolong Nature Reserve, China

Photo: Jianguo Liu

Cropland and homes in the Wolong Nature Reserve, China

range of activities including fuelwood collection, livestock breeding, herbal medicine collection, road construction and ecotourism. Connectivity of giant panda habitat between Wolong and other reserves maintains the population and reduces possible detrimental effects of stochastic processes such as fire, disease, extreme weather events, and bamboo flowering.

Land cover changes outside the reserve sever habitat connectivity for the giant panda. Analyses of satellite images reveal that total habitat declined substantially within the reserve (0.62% per year) and in a 3 km buffer (0.74% per year) between 1965 and 2001. However, the buffer experienced a slight increase in moderately suitable habitat from 1997 onwards, possibly in response to afforestation and shifts to nonagricultural activities with expansion of industrial production in surrounding townships. In this case, land use change locally around the reserve has been detrimental to connectivity of panda habitat between reserves. However, at a broader scale, recent economic opportunities in the surrounding landscape have allowed many local residents to shift to nonagricultural livelihoods and switch their energy consumption from fuelwood to electricity, with an overall positive impact on giant panda habitat.

Yellowstone National Park, USA

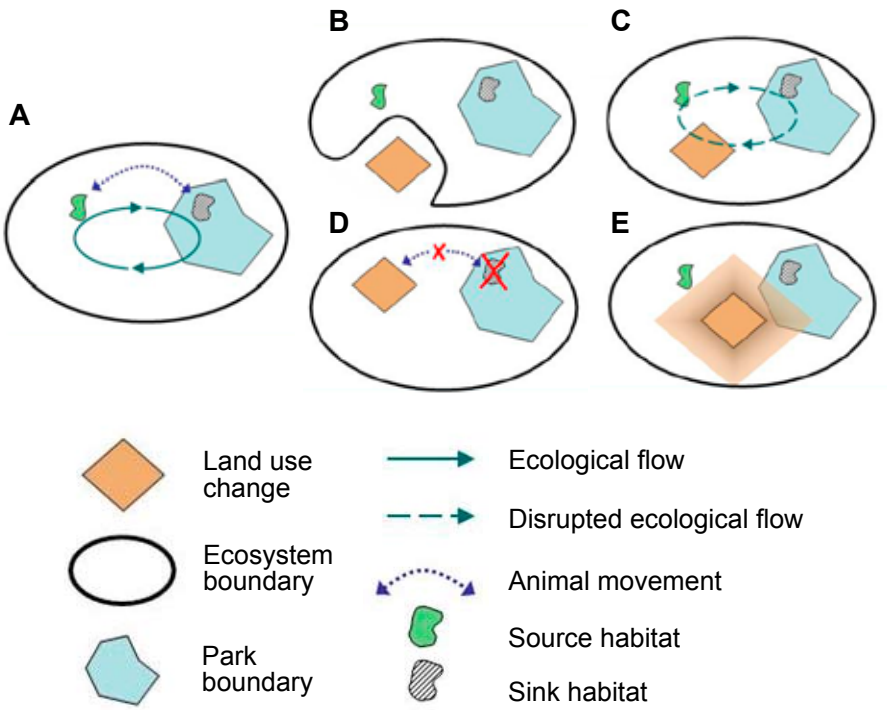
Yellowstone National Park in Montana, USA offers another example where land use surrounding the park is critical to the functioning of the park itself. The park is located at a high elevation, on low productivity lands relative to its surroundings. Consequently, species rely on lower elevations outside the park for resources and breeding habitats.

Land use is rapidly expanding in the Greater Yellowstone Ecosystem as the number of rural homes increases. Analysis of the spatial patterns of rural home development reveals that homes are preferentially located in areas important for biodiversity, including riparian habitat, bird hotspots, grizzly habitat, and migration corridors. Existing growth patterns provide minimal protection to biodiversity. Modeling the effects of alternative growth patterns on several measures of biodiversity (for e.g., corridors, elk winter range, bird hotspots) provides a basis for testing scenarios. A growth management policy that includes clustering future growth near towns could protect much of the 'at risk' habitat types without limiting plans for overall growth in housing.

Implications for management

The type and degree of interactions between reserves and the surrounding landscape varies depending on the biophysical and socioeconomic setting. Reserves in the lower reaches of a watershed, for instance, are vulnerable to altered flow regimes and land cover changes in the upper watershed. Reserves surrounded by human populations who are reliant on local resources, such as most reserves in Asia, have the primary concern of human activities in and around the reserve. Management possibilities vary accordingly. In the former case, for e.g., the management need is to maintain forest cover to reduce soil erosion and downstream flooding, such as the logging ban imposed by the Chinese government following the devastating 1998 floods in the Yangtze River.

The two examples of Wolong Nature Reserve and Yellowstone National Park illustrate the potential to balance needs for both human land use and biodiversity. In Yellowstone, alternative placement of rural homes could reduce negative impacts on biodiversity while



Conceptual model illustrating the effects of land use change on ecosystem function:

(**A**) Nature reserves as part of a larger ecosystem with energy, materials, and/or organisms flowing through the ecosystem.

(**B**) Land use change reduces effective size of the ecosystem.

(**C**) Land use change alters ecological flows.

(**D**) Land use change eliminates unique habitats and disrupts source-sink dynamics.

(**E**) Edge effects from land use negatively influence biodiversity.

allowing some increase in the number of homes. In Wolong, non-agricultural employment benefits economic well-being of the local population and reduces their reliance on fuelwood and other forest resources. While not all cases are so clear-cut, these examples illustrate possibilities for regional management to address the struggle against declining biodiversity as land use changes rapidly in many parts of the world.

Originally published as:

Hansen, A. and R. DeFries. 2007. Land Use Change around Nature Reserves: Implications for Sustaining Biodiversity. Invited Feature in Ecological Applications 17 (4): 972-973.

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Conserving ecosystems – can maths help efficiency?

Ferenc Jordán, Zsófia Benedek and András Báldi

It is a surprisingly hard question in conservation biology: what to conserve? Various programmes and projects may focus either on individual species or important habitats. Recently, there is growing interest in trying to conserve 'systems' and 'functions'. We intuitively feel that these are the best, and yet the most abstract solutions. How to protect an ecological function or an ecosystem?

Somewhere at the intersection of all of the above approaches, there lies the management of highly important species. These include keystone species (having a disproportionately large effect on others, compared to their biomass), umbrella species (living in a large habitat providing shelter for many other species if they are protected) and flagship species (characteristic species conservation efforts can be focused around them). If these species have healthy, stable populations, we may expect many others to feel well too (the majority of the community, across a large area). So, the challenge seems to be to find the adequate species for conservation practice.

Currently, many species are already protected, of course, typically because they are rare. But there is a tricky relationship between importance and

rarity. Probably most of the rare species are not really important anymore in maintaining the various ecological functions their ecosystems perform. For e.g., flowers are mostly pollinated by abundant pollinators; the contribution of the rarest pollinator species is much less because they are rare. Great exceptions are sharks: most of the shark species are very rare and live at the brink of extinction, still, they seem to be highly important and absolutely non-replaceable. Their major role is to keep the number of their prey low. On the contrary, the extinction of many Red Data Book species would cause probably no ecological catastrophe (major, cascading, community-wide effects). Their conservation is also critical – primarily not for ecological but for moral, ethical reasons: it is our shared responsibility not to kill thousands of species, out of ignorance.

But how to define importance? Many important species are thought to be important because their extinction is supposed to cause many others to die, too. This is mostly because individual species do not live separately in nature but they are interwoven by a complicated web of interactions. Most species have predators, preys, mutualists, facilitators and competitors. So, important species may have a relatively rich interaction network around them. Simple mathematical tools of network analysis seem to help to identify the most important species. Recently, there is a great interest in how to adapt these techniques for better understanding ecological problems, i.e. which methods are mostly helpful in the quest for keystones. For example, there are network analytical techniques to quantify the relative strength of direct and indirect interactions a particular species have on others. An example of indirect interaction is trophic cascade: the big fish may have a positive effect on zooplankton, simply by eating the small fish. If there are more big fish, there will be less small fish and more zooplankton remains. Several types of indirect effects have been described and analysed in great details. Based on network metrics, it is possible to rank species based on the richness of their interaction structure, and to suggest protecting the first ones in the rank. To put it very simply, they are the hubs in food webs.

However, if species are analysed and characterised one by one, even as members of a network, it is not really a comunity-level approach. Modelling the synchronous extinction of two or three species reveals that their interaction networks can strongly overlap. This means that they play redundant, overlapping roles in the ecosystem, so even if they all are very important, it is not reasonable to focus conservation efforts on all of them. Instead, it can be studied and quantified which group of species plays the most important but least redundant roles in the community. The basic structure of the interaction network will partly determine to what extent particular conservation efforts focusing on individual species can help each other. Efficiency can be limited by community structure and it would be interesting to recognise these ecological constraints. The authors of the cited paper present these techniques and discuss the perspectives of this approach in conserving real (not model) communities. These are plant-pollinator communities facing the current pollination crisis: as natural habitats are more and more fragmented, the behaviour of several pollinator species have changed. Plants cannot reproduce without their pollinators, and the loss of pollinators in certain areas already has measurable effects on plant populations. In order to better understand and manage the pollination crisis, it is imperative to try to protect this 'ecosystem function' (pollination) instead of focusing conservation efforts on certain rare species. As the main aim is to maintain the network of plant-pollinator interactions, the relevant question is — which species are the most important ones in keeping the community together (i.e. the loss of which species would cause the worst effect)? From this system-based view, quite different species seem to deserve the attention of conservationists.

The key message is that we have to pay much more attention to important species, even if they are not necessarily too rare, while we all want to protect the rarest ones, too. Protecting abundant species is not typical, but its significance is increasingly recognised. For example, the role and importance of copepods in subarctic waters is well known, and they attract more and more interest of conservationists. In certain ecosystems, not less than 95% of carbon atoms are transferred by a single copepod species from the bottom to the top of the food web. In short, many top predators (including whales, tuna and penguins) feed on a single species. According to the words of Edward O. Wilson, these invertebrates are among "the little things that run the world". Sexy mammals and birds must be accompanied by small invertebrates on our to-do-lists. But by no means replaced.

Originally published as:

Benedek, Z., F. Jordán and A. Báldi. 2007. Topological keystone species complexes in ecological interaction networks. *Community Ecology* 8:1-8.

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The Namibian Exception

Fred Nelson

Photo: Sand County Foundation Community Based Conservation Network

Namibia is a country that tends to avoid the headlines. Only twenty years old, having gained independence from then-apartheid South Africa in 1990, and with less than two million people, it is a relatively prosperous and peaceful African nation. Taking its name from the Great Namib Desert, Namibia is the most arid country south of the Sahara. Land use is dominated by cattle and sheep ranching, with diamond mining providing a major source of foreign exchange, as it does in neighboring Botswana.

Despite its relative global anonymity, Namibia has achieved something truly extraordinary in the realm of conservation, establishing perhaps the most successful track record in Africa. Namibia's success is based on an iconoclastic approach that runs counter to much of the conventional wisdom about how to conserve wildlife and endangered species.

Despite its rather stark environment, Namibia is home to a rich array of wildlife. The country's red rock valleys and sand rivers are reminiscent of the American southwest, but Namibia's are inhabited by black rhinos, desert-dwelling elephants, Hartmann's mountain zebra, and brown hyenas. What makes Namibia unique in the modern world is that its wildlife populations are generally on the increase, expanding in both size and distribution during the course of the past 30 years. Namibia now has an elephant population of over 15,000 animals, up from about 6,000 in 1990. Black rhinos have more than tripled in Namibia since 1980, from 300 to over 1,100, and Namibia now has about a third of this species' total wild population. About 20% of the world's cheetahs are found in Namibia, with nearly all of these cats found on private and communal lands outside state protected areas.

These wildlife population increases are largely a result of the innovative reforms Namibia has undertaken to devolve wildlife management to the local level and enable landholders to capture wildlife's economic value. In the late 1960's, Namibia granted private landholders—which at that time meant only the white minority population—legal rights to manage and harvest wild animals on their lands. Subsequently, wildlife numbers on private lands gradually increased, driven by the reality that once ranchers were allowed to utilise wildlife for meat or trophy hunting, they developed economic incentives to invest in wildlife production. The best available estimates suggest that wildlife numbers on privately held ranches in Namibia increased by about 80% from 1970 to 1990, with most of this faunal recovery represented by the more common species of large antelope such as gemsbok, springbok, and greater kudu.

After Namibia gained independence from South Africa, conservationists and policy-makers set about extending this conservation model to the communal lands that comprise over 40% of the country and where most rural Namibians reside. In 1996, Namibia formalised its 'communal conservancies' framework through an amendment to national wildlife laws, allowing rural communities to acquire the same rights to manage wildlife that white ranchers had possessed for nearly three decades.

Since the first conservancies were certified by the government in 1998, about 50 communities around the country have gained rights to manage and benefit from the wildlife on their land. The latest conservancy progress report issued by the Namibian Association of Community Based Natural Resource Management Support Organizations[1], states that by the end of 2006 over 14% of Namibia's total land area—over 118,000 sq. km—is now included in communal conservancies, with more than 220,000 people living in these areas. Conservancy formation has enabled local communities to earn income from wildlife in a number of ways, including hunting animals for meat, granting a concession to a safari hunting company, and starting tourism joint ventures with private operators. The returns from these activities now generate about USD 2.6 million annually, with the wealthiest conservancies earning over USD

100,000. Some, like Torra Conservancy, have paid out annual dividends to their members in addition to investing in development projects like schools and health services. While many community conservation programs around the world only allow local communities to capture a portion of the value of natural resources, a critical aspect of the Namibian approach is that communities that have formed conservancies are legally entitled to 100% of the revenues generated by wildlife utilisation therein.

Wildlife's increasing economic value at the local level has helped to fuel its recovery in these conservancies, as happened earlier on the private ranches. This recovery, in turn, contributes to Namibia's booming tourism industry, creating positive feedbacks between increasing wildlife populations, national economic growth, and expanding local incomes.

Namibia's conservation record stands in marked contrast to other countries in the east and southern Africa regions. Kenya, which has not allowed any hunting for 30 years, has lost about half of its wildlife since 1975. Tanzania, which contains a greater abundance and diversity of large mammals than anywhere else on earth, possesses a vast network of large protected areas, but is still losing wildlife both inside and outside of parks and reserves.

Namibia's approach challenges the conventional notion that when a species is rare it needs to be placed under strict government protection with all utilisation prevented. Namibia's philosophy is quite the opposite. Conservationists there contend that when something is rare, it becomes valuable by virtue of its scarcity, and the key to recovering endangered species is to allow sustainable levels of use in order to establish economic incentives for producing more of them. Species that have benefited from this approach include the Hartmann's mountain zebra, found almost entirely in Namibia, and the black rhino. Indeed, while other countries have concentrated on stopping the trade in rhino horn, Namibia has recently re-introduced strictly controlled trophy hunting of black rhinos as a way to increase this rare species' income-generating potential, thereby producing revenue and potentially giving local landholders more reason to support conservation. While this move has been controversial, it seems likely to reinforce Namibia's successful rhino conservation practices and result in both more money for conservation and more rhinos.

In his classic work, *The Structure of Scientific Revolutions*, Thomas Kuhn describes the importance of anomalies in providing the evolutionary basis for paradigm shifts in scientific knowledge. In the field of wildlife conservation, Namibia is an anomaly, both in terms of its increasing wildlife populations in a world of spreading faunal depletion, and in the decentralised and utilitarian strategies it has used to achieve them. Beyond its own success, the Namibian anomaly demonstrates how the interests of local communities can be reconciled with global biodiversity concerns in a synergistic way. Whether or not these strategies lead to broader paradigm shifts in the design of conservation strategies in Africa and beyond, only time will tell.

For more information visit:

http://www.irdnc.org.na (Integrated Rural Development and Nature Conservation)

http://www.nnf.org.na/index.php (Namibia Nature Foundation)

http://www.met.gov.na (Namibian Ministry of Environment and Tourism)

Endnotes:

[1] http://www.nnf.org.na/NNF_news/20071011_news.htm

Originally published as:

Fred Nelson. January 26, 2008. http://the-back-forty.net/2008/01/26/the-namibian-exception

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Photos: Sand County Foundation Community Based Conservation Network

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Current Conservation is published by an informal alliance of natural and social science professionals to promote interdisciplinary research in conservation and to foster communication among scientists, resource managers, educators and policy makers.

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In the text, citations with single, two and multiple authors should appear as (Gaston 1996), (Forman and Godron 1986) and (Pomeroy et al. 1982), respectively. If there are multiple references, they should be arranged chronologically, and may be separated by a semi colon.

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