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Cover art Labonie Roy

In many ways, this issue of Current Conservation feels very different, produced as it was under the shadow of a pandemic. There has been no dearth of coverage on what life under COVID-19 looks like. It's impossible to miss the severe bumps in our systems unveiled by the virus' spread, and its effect on the marginalised. Despite an onslaught of information, I wonder if we share moments of denial. We've registered the anxiety, but not necessarily its symptoms. Is it just the virus we're worried about or the very lethal fallibility in systems painstakingly designed to protect us from situations like this? Our "normals" were already terrifying to those living with disabilities, neurodivergence, and marginalisation. As we try to function today, I can't help but hope for a redefinition of normalcy.

Though 14.1 has been put together through stressful bouts of selfquestioning, you will find no mention of them in these pages. For our team, working together on this issue served as a relief from our concerns, our minds. We return to voices in conservation that don't threaten to shout louder over the engulfing noise of fear, but exist quietly, and go where they are needed. These principles speak to me with urgency now more than ever.

In this spirit, I do hope you take a moment for yourself, enjoy reading this issue of Current Conservation, and go where you are needed.

-Shruti Sunderraman

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Author Kartik Shanker | Illustrator Maanvi Kapur

In 2004, Archana 'Itti' Bali joined the first 'brood' of the Masters programme in Wildlife Conservation at the National Centre for Biological Sciences, Bangalore. For her dissertation, Archana had decided to study mammals on coffee estates. But Archana was also determined to study policy – specifically, how various laws affected conservation on these estates. I remain unsure as to why I became her mentor in this endeavour, but then, no one could really say No to Archana. Not even her instructors, some of whom were somewhat skeptical of her foray into policy.

She was the very first student I had supervised for a Master's dissertation. Little did I know then how special she would be. But I should have had an inkling.

When she visited me to discuss her project, I would often be distracted by my then two-year-old son, Vishak, who was competing with her for my attention. Archana found an ingenious solution. She would, without hesitation or awkwardness, narrate her ideas to him as a 'coffee story' as if no tale could be more exciting for a child. Almost like an Archana in Wonderland being chased by bully bureaucrats and finding shelter in shade grown coffee.

As this part of her thesis was on policy and practice relating to conservation laws, Archana interviewed a range of actors from plantation owners to Forest officers to Coffee Board officials and others. She had a disarming nature, and engaged easily, even with those who would otherwise have been hard to extract information from. She coaxed all sorts of information out of estate managers, workers and owners on their hunting practices and shade management. The Grinch would have been putty in her hands.

Ankila Hiremath Junior Editors

Archana's research uncovered that Karnataka's Tree Preservation Act was unwittingly leading estate owners to plant more exotics, because the Act prevented them from cutting native trees. The exact opposite of the effect it was intended to have, a perverse consequence. She also got workers to talk about how they set traps and snares for small mammals, and the owners to describe their hunts for larger game. Though her dissertation was about the factors that promoted mammalian diversity in coffee plantations, Archana never passed judgement about the illegal hunting itself. Her goal was to understand its role in the communities she was studying.

This interest in human communities and wildlife led Archana to the University of Alaska, Fairbanks, as the first George Schaller Fellow, for a PhD on humancaribou systems in the context of climate change. She worked with indigenous peoples from Alaska to Quebec, and her participatory videography project resulted in the award winning film *Voices of the Caribou People*. As passionate as Archana was about conservation (she staunchly defended her days in Greenpeace and would proudly show photos of her friends dangling from iconic buildings in London and elsewhere), she was equally adamant that consumptive use of wildlife was acceptable as long as it was sustainable. This may have been in stark contrast to many of her wildlife conservation friends and contemporaries, but Archana was as stubborn as she was endearing; she held firm to her position that consumptive use and conservation could coexist.

I visited her in Fairbanks in 2011 after a conference on the West coast of the U.S. We had still not written our paper together, and we joked that I had followed her as far as Alaska to get it done. We made a very memorable trip to Denali National Park with her friend, Eduardo Wilner, philosopher of science. Only to be expected, the three of us argued all the way there and back, on subjects ranging from science to astrology. Archana had become renowned among her PhD cohort for her spirited and well-grounded academic discussions, whoever and however prestigious be the presenter of the information. We saw Denali, the highest mountain in North America in the distance, shrouded in dark clouds like something from Lord of the Rings. And of course, in keeping with her views on hunting, I was served moose, which had been shared with her after a hunt, as is the tradition there.

Tragically, Archana was diagnosed with advanced ovarian cancer in 2013. After a long battle that she fought with courage, cheer, and very little complaint, she passed away in 2014. Even with her illness and intense schedule of chemotherapy, Archana found the strength and enthusiasm to work on her dissertation, and present her research at conferences as far afield as Canada and France. Her siblings, Anuja and Akhil, her mother, Raj or 'Maaji' as she was known to all, and her fiancé, Martin Robards, remained by her side throughout. Her final dissertation was subsequently collated and submitted for her doctoral degree,





which was received posthumously by her mother. Her passing robbed her family of a loving daughter and sister, a favourite aunt; and the community of a champion and friend. The world lost an individual representing some of the finest of what humanity has to offer.

Our work together, which was published last year in an edited volume on wildlife, law and people, is featured as part of a collection from the book in this issue of *Current Conservation*. It seems apt to reminisce about her as she was a pioneer in the field, one of the first to bring policy and practice together in conservation.

The Masters programme at the National Centre for Biological Sciences (NCBS) has, over the last decade, produced some of the best students of wildlife biology and conservation in the country. Archana represented what is best and brightest about them; as an environmental conservationist, she was devoted to her cause of 'saving wildlife' but not at the expense of people's rights and livelihoods. She was committed to both rigorous science as well as conservation action. There can be no better role model for the upcoming generation of wildlife conservationists.

Archana famously stated when she was young that she planned to be a star in the field of conservation. Her insightful research has been published in several international journals. She fought for the causes of conservation and community with equal vigour. But most importantly, she was a star in everyone's life.

All those who knew 'Itti' will remember her as one of the most caring, irrepressibly cheerful, and irresistibly charming persons they will ever meet.

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# Nature Conservation in a Changing Economy

### Edited by Ghazala Shahabuddin and K. Sivaramakrishnan | Illustrator Shrujana N. Shridhar

The second half of the 20th century marked a remarkable spurt of nature conservation activity in independent India. The 1970's marked a period of energetic consolidation and strengthening of wildlife laws and environmental regulations. Importantly, the Wildlife Protection Act of 1972 marked a watershed in the way Indians perceived, experienced and protected nature. There was also a steep, almost triple-fold increase in wildlife sanctuaries and national parks from 194 in 1980 to 578 in 2002. Prominent among the new initiatives was Project Tiger, a government programme to step up protection of the endangered Bengal tiger across the country.

Since those early times, however, the fast changing economic conditions, altering democratic frameworks and new ecological stresses created, necessitate a deeper understanding of the conservation successes and failures We took up this task in this edited book whose central aim is to assess the ability or inability of conservation laws and policies to safeguard and protect natural ecosystems in India. We also wanted to explore the institutional, political and social constraints in meeting ecological goals, especially given our long history of conflict not just between wildlife and humans but also amongst various strata of Indian society.

The Forest Conservation Act (1980) was created to safeguard forest areas from other uses by creating a rigorous clearance process for any proposed diversion. The Wildlife Protection Act gave as much power to the Union Government as to the states in the decision-making and enforcement of anti-hunting laws.

Yet, such an emphasis on strong rules, centralised authority, and the creation of inviolate spaces inevitably led to pushbacks. One of the major issues that later came to haunt nature conservation was the largely coercive displacement of villages from within Protected Areas (PAs), such as National Parks and Wildlife Sanctuaries, to create people-free spaces. Such social dislocation ignored the socio-economic and political costs of doing so. The increasing restriction of public access to forest resources in PAs, necessitated by the Wildlife Protection Act (1972) only added to local communities' hardships. For instance, local residents faced reduced incomes from forest-based livelihoods, which was only intensified by their vulnerability to wildlife-caused damage. The new policies, seen



as centralizing authority in a federal system, invited resistance from provincial governments as well. State governments saw as an obstruction to development and natural resource extraction, and to growth of state revenues.

The strengthening of conservation laws in the last decades of the 20th century took place precisely in the same period when such centralization was being challenged by demands for a greater degree of local and regional self-government from forest workers, village panchayats and even well-established local forest institutions. The 1990's and 2000's saw a marked spread of rights-based approaches to social inclusion in India, in parallel with the observed growth and entrenchment of wildlife bureaucracies and programmes. The amendment to the Panchayat Raj Act in1992 which strengthened local self-government, and more recently, spread of legislation such as Right to Information Act (2005) and Forest Rights Act (2006), sought to redress citizens' grievances on a range of issues, such as land ownership, access to forests, benefits transfers, education and health facilities and provide a more active role to people in governance.

Against the backdrop of conflicting claims on natural resources, economic liberalization starting in 1990, further complicated the challenges to the biodiversity, due to escalating demands for minerals, fossil fuel, land, and water, and energy. The quest for these resources, to serve unabated consumerism and urbanization, soon brought development



and conservation into a serious confrontation by 2000s. Industry, urban spaces and infrastructure encroached parks, forests and water bodies and put unrelenting pressure on remaining wildlife habitats.

Both liberalization and wildlife conservation had irreversible effects on the way natural resources would be controlled and used; and they led to growing marginalisation of tribals, forest workers and fisher folk.

There were other exigencies that inspired this book: As of now, there are very few books that attempt expressly to bridge the sciences-humanities divide in understanding conflicts over nature. For this edited volume, we brought together scholars and practitioners who are working in the area of nature conservation from different perspectives.

From the historical perspective, too, this volume occupies an important place. There do exist a number of treatises but they are on isolated aspects of the wildlife protection trajectory. For instance, the early role of Indira Gandhi in wildlife protection and Michael Lewis on the politics of Project Tiger in India starting in the 1960s. So far there is little published that deals with the period of 1985-2015 during which significant changes were unleashed through the country-wide economic reforms process. The influence of such large-scale economic and social changes on the status of nature or wildlife conservation remains largely unstudied, despite their immense spatial scale and intensity.



Our volume also extends the understanding of the impact of conservation policy to an array of ecosystems and landscapes, both inhabited and largely wild, including freshwater wetlands, highaltitude alpine forests, coastal zones, urban forests and tropical rainforests, and in a frame that includes not only all forms of life but also the immense and sometimes intangible ecosystem services that they provide. For instance, Kanchi Kohli and Manju Menon look at the regulatory laws on coastal ecosystems which impinge on marine conservation. In 'Hunting stories and Shady tales,' Archana Bali and Kartik Shanker look at the impact of wildlife conservation and tree preservation laws in the coffee plantations of the Western Ghats, a heretofore unrecognised but significant habitat for wildlife. Ambika Aiyadurai explores the challenges of implementation of the Wildlife Protection Act in the remote hills of Dibang in north-eastern India, using an anthropological lens to understand the constraints at a very local scale.

We also examine in this book whether developments in the ecological and conservation sciences are entering policy formulation and field implementation in adequate ways, and whether spreading knowledge of conservation science in civil society and the media have been able to spark new directions for public debate and social protest. I look at the role of science in conservation action as played out in the government proposal to bring back the Asiatic cheetah back to the Indian grasslands, showing how science is often used as a political tool, rather than as a realistic means to recover ecosystems and species. In another article, Neha Sinha looks at the shortcomings in the legal definition of wetlands which is fraught with lack of understanding of their ecology and ecological roles. Such poor understanding has significant implications for real-time conservation, for public perception as well as the priorities of local government. Meghna Agarwala applies quantitative methods to assess the impact of long-term forest produce extraction on dry deciduous forests in Central India, showing the problems in simplistic approaches typically used in forest management.

Of particular import to conservation effectiveness is the role of institutions- both state-level as well as highly local- which have shown inconsistent trajectories lately. In an increasingly urbanising country, and after several years of agrarian distress, rural and forest-dependent people find some long-standing attachments and knowledge related to forest and field being disrupted. This is being manifested in weakening of community-formed institutions at the local level which were earlier managing resources sustainably. In this volume, Rinki Sarkar explores the threats to regeneration of chilgoza pine forests in Western Himalayas in an era of weakening forest institutions. In a similar vein, the long-term changes in community and state-owned forests in Jaintia hills of Meghalaya are juxtaposed by Rajkamal Goswami and T Ganesh in this book. Moving from local to governmental institutions, a retrenchment of positions has been very much the case despite years of training, better scientific knowledge and greater involvement in even state-level policy and implementation, since independence. M. Vikas takes a historical view of the people-park relationship in and around Asola-Bhatti Wildlife Sanctuary in Delhi, to show how forest-dependent pastoral people have been marginalised with the ingress of urbanisation, mainly due to the rigid protection ethos of the forest bureaucracy.

*Nature Conservation in the New Economy* is an exposition of the ways in which the protection of nature, a largely state-led project in the initial decades after Indian independence, has become a realm where science, social concerns and governmental regulations, more often than not, collide. The issues brought up by the authors in this edited volume will hopefully inspire many more such in-depth locale-specific analyses that can help to uncover the conflicts and constraints of nature conservation in India, from which we can learn.

#### Further Reading

Bindra, P.S. 2017. The Vanishing, India's Wildlife Crisis. Penguin-Random House, India. Pp. 326.

Shahabuddin, G. 2010. *Conservation at the Crossroads, Science, Society and the Future of India's Wildlife*. Permanent Black, Delhi and New India Foundation, Bengaluru. Pp. 288.

Shrivastava, A. and A. Kothari. 2012. Churning the Earth, The Making of Global India. Penguin Books, New Delhi, Pp. 394, xxi.

**Ghazala Shahabuddin** is an ecologist and author who has worked on issues such as land use change impacts, communitybased conservation, and protected area management in India. Currently she is involved in long term research on the avian communities in Kumaon Himalayas and a related outreach programme.

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### feature

# Arborification instead of Ecological Restoration: Management of the Ridge in Delhi

Author M. Vikas | Illustrator Harmeet Rahal

"Pig abound all along the banks of the Jamna[SS1] (as the Yamuna was colloquially addressed)[H2], being found in the jhau jungle where there are no crops, and in the latter when they are high enough to afford cover. Foxes and hares are plentiful on the eastern bank of the Jamna... Blackbuck are found almost everywhere. Chinkara abound in the range of hills which runs north-east of Delhi, being especially numerous at Bhunsi, Sinah, and the part of the-*Ridge in this neighbourhood. Wolves are not plentiful, but* they are to be usually found in the neighbourhood of the old cantonment... Jackals abound. Hares are found generally throughout the district. Peafowl are plentiful. Duck and snipe are plentiful in ordinary years but in dry years they are scarce. The Nilgai is to be constantly found... Leopards are found in the outlying villages. I have myself seen them at Tuglakabad..."



Few would believe that this text from the Delhi According to municipal records from the time, the District Gazetteer of 1883-84 describes Delhi's British planted approximately 3000 Neem (Azadirachta landscape. Within the last century, Delhi's wildlife has indica) and Babul (Acacia nilotica) trees between 1878 and 1879 alone. However, tree plantation in Delhi been decimated to such an extent that Asola Bhatti Wildlife Sanctuary (ABWS) located in southern Delhi was started in earnest by them around 1883[SS6] in was termed as an 'artificially created', 'man-made' the northern Ridge. There were many motivations protected area by the Zoological Survey of India that propelled the colonialists to start afforestation; amongst others, they were tormented by the searing in 2003, while other organisations questioned its wildlife sanctuary status given the paucity of wildlife. heat of the city and hoped that an extensive green Although there are no census numbers to cite due cover would make their lives more bearable. The open to lack of data, it is certainly true that the herds of scrub forests were also an eyesore, and given that Blackbucks and Chinkaras mentioned in the Gazetteer people like Sir Frederick Treves described Delhi as are long gone. Today, a few Blackbucks and Spotted "a desolate plain covered with the ruin and wreckage Deer or Chital (as it is locally called) roam in the of many cities", greening was seen as an aesthetic sanctuary, having been brought into ABWS in zoo-like improvement of the bare surroundings. In order to enclosures in the last few decades (although the latter expedite greening of the landscape, the British also species does not have a recorded presence in introduced Prosopis juliflora or Vilayati Kikar, a sturdy the Ridge). tree native to Mexico, which has since become an invasive species. The Indian forest department has So, how did we come to this? And what can be dutifully continued to pursue afforestation as an important national goal, with the country aiming a 33 percent forest cover.

speculated about the ecological future of Delhi's last remaining forests and wildlife? These questions are discussed in 'Conservation in Urban Spaces People-Wildlife Interactions and Management of Delhi's Although planting trees is certainly a noble act, the Forests,' a chapter from the book Nature Conservation choice of species and restoration plan should be based in the New Economy: People, Wildlife and the Law on local environmental and climatic conditions, soil *in India*. The chapter interrogates the dynamics of type and water availability. Most of Delhi's protected forest management in Delhi and its socio-ecological areas encompass the Ridge, the tail-end of the Aravalli impacts. At a time when rapid deforestation is mountain range. Champion and Seth categorised necessitating action to protect and increase greenery, Delhi Ridge's floral composition as semi-arid, open the chapter critically analyses afforestation in Delhi scrub, with a primarily open landscape dotted by within its eco-climatic context and history of British mostly thorny, secondary forests. However, instead of implementing an ecological restoration by introducing colonisation..

12 current conservation 14.1



pioneer species of grasses and shrubs that would foster the growth of trees, the government has been steadfastly expanding tree plantations and densifying tree cover across Delhi. Their efforts are bearing fruit, and the Delhi forest/ tree cover has increased from 1.48 percent in 1993 to 20.22 percent in 2015. As fumes bellowing from cars and the machinery of industry have cumulatively contributed towards making Delhi's air one of the world's most noxious, arborification has gained more legitimacy as a natural solution to combat pollution.

Explaining Delhi's Ridge management, the chapter argues that a multiplicity of governing bodies is problematic and requires urgent streamlining. From the Delhi Development Authority and Central Public Works Department to the forest department and even the Sports Authority of India, several governmental bodies have management control over portions of the Ridge. While some departments want to conserve the Ridge as a forest, others are interested in converting it into parks and recreational areas. These contradictions at the policy and planning stage are a key reason for the lack of a comprehensive and integrated Ridge management policy, and distinct (and often disparate) management of different protected areas of the Ridge.

Although ABWS [H7] is a relatively small protected area, it is part of a much larger, still-broadly contiguous block of Aravalli forests spread across Delhi, Gurgaon and Faridabad districts. Despite fragmentation and severe anthropogenic pressures,

the undulating landscape continues to function as a wildlife corridor that extends approximately 200 kilometres from Delhi to Sariska in Rajasthan. Given the management of different pockets of the Ridge in isolation and absence of a comprehensive wildlife management policy by the Delhi and Haryana governments for the Aravalli stretch, ABWS may well end up being nothing more than a glorified zoo.

By closely analyzing the colonial history of Delhi's environmental management, the chapter claims that Delhi's post-independence forest governance has perpetuated the historical marginalisation of commons and pastoralism, and retained a disdain for arid ecosystems. This becomes especially evident in the process of ABWS' notification. Although most of northern and central Ridge were declared as reserved forests under colonial rule, the creation of ABWS is relatively more recent. In 1989, the Delhi administration decided to notify some portions of Delhi's forests as a wildlife sanctuary per Wildlife (Protection) Act, 1972, and 1882.80 hectares of Gaon Sabha land was notified as Asola Wildlife Sanctuary. Subsequently, 866.5 hectares of contiguous Gaon Sabha land was also alienated and merged into the sanctuary in 1991 to create ABWS. The sudden alienation of the commons had a profound impact on both the Gujjars, an agro-pastoral community that historically has lived in these areas, and Hind Odh settlers in Sanjay Colony, who are landless migrants from Sindh, Pakistan. In recent years, there has been a concerted attempt to remove all 'encroachments' from the wildlife sanctuary, and the Forest Department has

around ABWS, probably having crossed over from the raised security concerns citing the 'illegal' presence of Ridge areas of neighbouring Faridabad and Gurgaon. "Pakistani nationals" in Delhi and advocated for their In the last decade, conclusive evidence of the eviction. leopard's continued presence in ABWS was obtained in 2013, when one of them was found impaled on the It would be erroneous to portray Gujjars as a spiked high walls of farm houses that have cropped completely forest dependent community, and the chapter does not indulge in romanticising the Gujjar up on the Ridge. Despite these discouraging trends, the chapter offers hope that all is not lost. Much of community's diverse way of life. With many of the the Ridge in southern Delhi and Haryana remains younger generation employed in businesses and jobs, contiguous, and with the Supreme Court having aspirations for a different life has taken many Gujjars halted mining in the area, wildlife has reportedly been away from an agro-pastoral lifestyle. However, not recovering. Planning a scientific and consolidated every household evolved away from natural resource management of the Aravalli to conserve the habitat dependence, and many residents in and around would not only be beneficial for wildlife, but also ABWS who accessed the village commons for natural protect water security and combat other ecological resource collection were forced to modernise very problems in the region. quickly. Urbanisation was enforced in villages without

providing any alternate means of employment, sources for fodder or economic support to help transition from pastoralism. The rural character of some villages was altered radically after the Delhi Development Authority acquired vast tracts of M. Vikas is a doctoral student at the Nelson Institute for Environmental Studies, University of Wisconsin-Madison. Vikas agricultural land for development. State induced loss can be reached at vikas@wisc.edu. of agricultural land later became a reason to justify exclusion of people from forests since they had lost Harmeet Rahal is a bombay-based artist, zine-maker & a proud their 'rural' character. mom of two dogs.

Despite almost two decades having passed since ABWS was notified, the government lacks a clear boundary or authoritative map. The original intention was to create the sanctuary as a deer or tiger safari, with the possible introduction of carnivores. In the last few years, leopards have been sighted in and



# Throwing shade at the wrong tree

Authors Archana Bali and Kartik Shanker | Illustrator Sawani Kumar

For nearly a century, conservation across much of the world focused on creating people free enclaves, typically national parks and sanctuaries. In recent decades, there has been increasing recognition one cannot rely completely on these conventional protected areas to preserve diversity. Given current human population sizes and growth rates, it may not be feasible, or fair, to substantially increase the area under reservation or restoration, since many biodiversity rich areas coincide with where the world's poorer communities live. This has led to the development of alternate conservation approaches, which include greater empowerment and participation of local communities. Thus, human dominated areas, particularly matrices which include both natural areas and agricultural lands, are set to play an increasingly important role in long-term biodiversity conservation.

The agricultural matrix has, in particular, received a lot of attention in last couple of decades as an opportunity for the protection of biodiversity, since it covers 38 percent of land worldwide. In the Western Ghats, coffee plantations cover approximately 3600 km<sup>2</sup>; they have traditionally been almost entirely shade-grown. Throughout the tropics, such traditional agricultural practices which incorporate trees are found to be compatible with the conservation of native biodiversity. Coffee plantations in the Western Ghats region provide habitat for some species as well as increase the overall connectivity of natural habitats considerably. Given that they provide significant support for biodiversity, these shade coffee plantations provide excellent opportunities for the conservation of wildlife outside protected areas.



While national forest laws and policy were implemented after independence in 1947, whereby State-owned forests were managed by the Forest Department, indiscriminate felling of trees continued on private lands, resulting in the loss of timber and soil erosion in hill areas. To prevent this and promote conservation of trees in private areas, the Tree Preservation Order was issued in various states in 1952. This prohibited the felling, lopping or wilful destruction of native trees. Various states then enacted tree preservation legislations including Tamil Nadu, Maharashtra, Karnataka, Goa, Kerala and Delhi.

The Karnataka Preservation of Trees Act, 1976 provides for the preservation of trees in the state by regulating the felling of trees and planting of adequate numbers of trees to 'restore ecological balance'. There is a provision for the appointment of a 'tree officer' by the Forest Department and a 'tree authority' for each urban and rural area, whose duty is to preserve all trees within his/her jurisdiction. The tree officer is supposed to carry out a census of existing trees and specify the minimum numbers and kind of trees that each region and land type should have. In specific cases, however, the 'tree authority' can grant permissions for tree felling.

All this sounds good for native trees, which should have positive outcomes for the preservation of genetic diversity, local forest types and habitats for other species. However, over the years, this did not play out quite as expected. For example, there were other simpler ways for acquiring permits for timber harvest. One coffee planter said: Silver oak is free. No permit required for its harvest. But we need a permit to transport it. Also, jungle wood harvest is a problem. It takes long time to get permits [for it]. For us it is difficult to deal with the Forest Department. So we just give a contract to timber agents. These agents are very efficient at getting permits. They have got a fixed 'cut' for each level, starting from the top till the guards. They have got things under control.

The Act provides for an annual tree census to be conducted in all private properties as a means to keep a check on violations of any of the provisions of the Act. However, the managers reported that the census of trees had never been conducted in the estates. One of them said:

If there is excess shade, we need to remove it. Timber from silver oak is sold in the market and jungle wood is used as fuel wood by our labourers. It is part of shade management. But we have no need to worry, as no officer will come to check in the estates.

A young planter, one of the few who was wellinformed about the Act, pointed out that the KPTA provided for a decision on an application for timber harvest within a three-month period, but he had been waiting at least 18 months for permission to harvest an old rosewood tree. However, the most interesting response came from an elderly owner of a very large plantation:

For us there is a totally different procedure for timber harvest, one just needs to pay some bribe and in case of valuable trees like rosewood, give them their share of timber too.

There was very low awareness among the planters about direct implications of the Act on the management of coffee plantations. While all plantation owners interviewed knew about the





existence of 'some tree law', very few understood its details. In the absence of the tree census, there was no way that the Forest Department could determine non-compliance of the law.

Most ironically, due to the constraints imposed by the law on felling native trees, private land-owners planted more non-native timber species. Thus, a law that was intended to protect native species actually had the opposite effect and has led to a decline in native species in human dominated landscapes. Others have found a similar situation in Kerala, where the Tree Preservation Act actively discourages planters from growing native trees on their land.

There can be many gaps between policy and practice. Policy can be poorly framed or implemented. But in the case of tree preservation in these states, while there was also poor implementation, the perverse consequence (of leading to more non-native trees) has been a greater failure. If human-dominated landscapes, especially those with the potential to be biodiversity friendly (like coffee) are to contribute to conservation, policy needs to be framed in a way to incentivise land owners to promote native biodiversity on their properties.

**Archana Bali** was a conservation scientist who worked in India and Alaska. She received her PhD posthumously from the University of Alaska, Fairbanks, USA.

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# Voices from Dibang Valley: Idu Mishmi, wildlife biologists and a Wildlife Sanctuary

Author Ambika Aiyadurai | Illustrator Harshita Borah

The news of tiger research in Dibang Valley, Arunachal Pradesh 'Tiger in the snow' and the research article in Journal of Threatened Taxa (November 26, 2018) created a buzz among the wildlife conservationists, but projected only a partial story. The story of a charismatic species, 'new discovery' of a species, news about undocumented landscapes and the use of high technology in studying wildlife make a happy story of wildlife conservation. The 'human-story' in wildlife research and conservation is emerging but the voices of the local communities who are affected by wildlife conservation are often not discussed.

### l'du 'Mishmi and the tiger

Dibang WLS

Lohit

Dibang Valley

East Siang

> For the local Idu Mishmi tribe of Dibang Valley, the "discovery" of tigers is not new. They not only share the mountainous border landscape with tigers but every Idu Mishmi proudly narrates the mythological story of Mishmi and tiger as a kin. For members of this tribe, killing tigers is a sin. If a tiger is killed for self-protection or is trapped accidentally, a senior shaman is invited to carry out a ritual, which involves a huge expenditure, equivalent to a funeral for a human being. The Mishmi assert that they are also conservationists and that their role must be acknowledged in the field.

> There has been a great reluctance to accept the views of the locals by wildlife biologists. In 2006, a wildlife researcher even disregarded the presence of large carnivores at such a high altitude. In 2013, the Wildlife Trust of India carried out a rescue of two tiger cubs from Angrim Valley, close to the Sino-India border. This changed everything. Since then Dibang Valley has become an active site for wildlife studies and conservation, largely focused on tigers. Geographic Information System experts from the World Wide Fund for Nature (WWF-Delhi) visited to map the sanctuary. The Wildlife Institute of India (WII) carried out a study to document tiger presence, its habitat, and its prey. The news about Dibang tigers is a result of this new interest in the region. Most of this research has a clear idea about what needs to be done for tigers' survival but not on what the local Idu Mishmi want. This biased approach towards the 'non-human' world of wildlife research is very obvious but it is extremely disturbing not to consider the views of the local people.

Recommendations from these visits have led to a proposal suggesting a reconstitution of the existing Dibang Wildlife Sanctuary (DWLS) as the Dibang Tiger Reserve. Local residents have mixed responses to this development. The villagers living close to the sanctuary were anxious about what will happen if a tiger reserve is established. Many even welcomed the possibility of a tiger reserve with the hope that there will be some employment. The Idu Mishmi Cultural Literary Society (IMCLS) wrote a letter to the National Tiger Conservation Authority stating that the right strategy for conserving Dibang tigers would be to create a new kind of tiger reserve based on a 'cultural' model. Any new model needs to be debated but taking the local people into confidence is always a better approach.

spotlight

Steps taken towards conserving wildlife should be done in consultation with the local residents, unlike how the DWLS was established in 1998. One of the villagers said, "What has happened in the past is that the government has taken a lot of our land without our consent". During my research, local community members hardly had a clue about how the wildlife sanctuary was established. It was only when a 2013 letter requesting land for the Eco-Sensitive Zone arrived that the residents knew that there was a wildlife sanctuary in their district.

Research activities in the last four to five years have scaled up, and there is worry and anxiety among the local residents, which sometimes ends up creating unpleasant situations. A wildlift researcher was stopped from carrying out a camera-trap exercise, and the mapping team from WWF-Delhi had to go through some tough questioning before they could start their work. One of the residents was candid; They said, "If they write in their report that there are tigers, then our forests will be under the jurisdiction of the tiger reserve, and the forest department may take away our land." Another resident was in support of a tiger reserve under the hope of "development".

These voices of resistance or anxieties by the Idu Mishmis were ignored and left unaddressed till 2019 when a high-level meeting with the forest department and NTCA (National Tiger Conservation Agency) agreed to carry out mapping exercises of the border.

### Sociological 'tokenism'

There are valid reasons why the 'social' is often not included in research and conservation initiatives, such as the one in Dibang Valley. The views of enthusiasts and wildlife experts were heard 'loud and clear' as the Dibang tiger news flashed all over the media but not the views of local Idu Mishmi. Researchers often do not consider issues outside the preview of wildlife research, particularly when they are fixated on one particular species. In this case, it was a 'tigers-only' policy. This form of separation and disintegration of the species from its anthropological and social meaning, according to Paige West is 'ecofetish'. This ecofetishism blinds the viewer to the social implications and creates what Ulrich Beck calls 'sociological emptiness'. In the Dibang case, I would call it 'sociological tokenism'. The wildlife reports from Dibang did carry some information about Idu Mishmi, but not their views or opinions as highlighted earlier. A complete silence by the wildlife researchers about the socio-political issues is unjust.

### Pedagogical challenges

Wildlife researchers are often not trained to carry out social surveys and sometimes do not take interest in the local social issues. Scientists trained in wildlife sciences also implement conservation projects, where aspects of biological sciences dominate. These are shaped by scientific knowledge that contain little to no insight from the social history of the landscapes. Therefore, when wildlife scientists design projects, there is often a lack of people's perspectives, and less priority is given to the needs of the local people. A senior wildlife biologist confessed that for a long time, the word 'communities' for him meant 'bird communities', 'forest communities' and only much later, he realised that the word also included 'humans'.

What is heartening is that Idu Mishmi are not against a wildlife sanctuary, but they are demanding the reduction of the area and questioning why there is a need for such a huge land mass. These sentiments have the potential to usher a new era of community centric conservation. This may provide a new direction and a great opportunity to truly integrate community voices in tiger conservation.

Finally, the credit for the mega claims made by wildlife biologists of tigers' presence must go 👪 partially to the local Idu Mishmi's socio-cultural ethos and also to the formidable landscape of these sparsely populated borderlands, which are largely uninhabitable and unfit for agriculture. Such landscapes are de facto natural reserves, and because of their remoteness and local indigenous conservation practices, places such as Dibang Valley are a safe haven for biodiversity. It would be a mistake to assume that new scientific knowledge of wildlife in local people's conservation ethos could save wildlife. Large dams, better road and market connectivity to these borderlands could prove more damaging. Meanwhile, the multiple voices from the ground need to be acknowledged. Local communities must be given due credibility instead of their voices being drowned in the loud celebratory claims about tigers being made by wildlife scientists.

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### Wildlife Trafficking in the Age of Social Media: The Story of the Slow Loris

Author Riley Hamrick | Illustrator Labonie Roy

Slow lorises are small, nocturnal primates that occupy a wide range across southern Asia including western Indonesia, parts of India, Myanmar, China, Thailand, Vietnam, Laos, and Cambodia. The first time I saw a slow loris, I was across the world in landlocked Denver, Colorado, browsing YouTube on my couch when a recommended video appeared depicting a cute, furry mammal with giant eyes. Before me, an owner of an illegal pet slow loris proceeded to "tickle" the animal while it threw its arms up and stared deeply into the camera with its large pouty eyes. This video led to another video depicting a slow loris holding a cocktail umbrella, a slow loris eating a rice ball, a slow loris being brushed.

How had an animal that only exists on the other side of the world end up in someone's home in the U.S. being filmed, laughed at, and cooed over?

### Journey of a Captured Slow Loris

The journey of the slow loris begins in the jungles of Southeast Asia. Primates are among the most ubiquitous species affected by illegal wildlife trade, with the slow loris being under extreme pressure due to their high demand as pets. There are five species of slow loris that are generally recognized, and all five are currently listed as either endangered or vulnerable. Since 2007, every one of these species has been banned for international commercial trade in the United States. Despite this ban, and aided by a lack of initiative from law enforcement and a lack of international awareness, slow lorises remain endangered and the demand for them remains high.

This high demand for slow lorises motivates poachers and hunters to collect the animals from their natural habitats to sell into the black market. Because the slow loris is small and lightweight, it can be easily transported in baskets, boxes and sacks, with some accounts even mentioning them being tied to poles or sticks. If the animals are destined to be sold at local markets, this journey is often short but extremely stressful. Other slow lorises are prepared for international transport - a lengthy journey that often has extremely poor conditions. These animals are reported to have high levels of transport-associated health problems such as stress, injuries, dehydration, and exhaustion.

While a complete picture of mortalities of captured slow lorises has not been well described, the physical and behavioral impacts of the illegal wildlife trade on slow lorises is devastating. In a 2018 study following 77 greater slow lorises who were confiscated from the illegal trade and brought to Cikananga Wildlife Center in Indonesia, 28.6 percent of the total slow lorises and 100 percent of infants died within six months of capture. Of the surviving slow lorises, 25.4 percent displayed abnormal behavior. Reports from rescue centers consistently demonstrate these high mortality rates and high rates of abnormal behavior from primates rescued from the wildlife trade. As the only venomous primate in the world, handling slow lorises involves a presumed risk when humans get close enough to pose a threat. To create their venom, the slow loris mixes oil from the brachial gland in their mouth, then uses their powerful toothcomb (long, flat front teeth arranged like a comb) to inject that venom into their victims. Due to this venomous nature, traders frequently clip the slow lorises sharp lower teeth that create this toothcomb, both to protect their handlers from bites and to make the animals better suited as house pets. The teeth are often removed with wire cutters, nail clippers, or pliers, and many animals die from infection after the process. To a slow loris, having these teeth removed is life changing. The toothcomb is a vital defense mechanism, but it is also used for grooming, socializing with other lorises, and gouging for gum; a staple in the wild loris diet.

After all of this turmoil and stress, the slow lorises that survive these rigorous conditions are sold in the marketplace or auctioned off on the internet. Unable to ever be released back into the wild, these animals are destined for a life of captivity in a private home, as "photo-props" for tourists. The lucky few that are rescued spend the remainder of their days in rehabilitation centers.

But how did this once unknown primate indigenous to southeast Asia become such a desired worldwide phenomenon? The increasing use of the internet and the access it provides has allowed this species to be shared and traded in ways that were never possible in the past.

### Wildlife Trade in the Age of Social Media

The owning of wild animals for companionship and entertainment has been a part of human culture throughout history. Records of a diverse range of exotic companion animals date back to both Ancient Greek and Ancient Roman culture. However, demand for these exotic animals has increased exponentially with the use of the internet and social media, which is now becoming the medium of choice for illegal wildlife traders. And slow lorises are one of the most well-known faces of this internet-driven craze.





Online videos of slow lorises frequently show them in close proximity to humans - wearing clothes, or using human-made props. This viral domestication creates the illusion that they make suitable pets, and overlooks the devastating fact that the slow loris species is both threatened and endangered. Online viewers often comment "how cute" and ignore their ecological and biological needs, causing misconceptions about the animal to form and grow. What viewers think is "cute" i.e. raising their arms, clinging to a cocktail umbrella, or eating strawberries, is in fact them displaying response actions related to high stress, such as defensive movements, crouching, mouth folding, freezing, attacking, scratching, or vocalizing. In these online videos, the primal responses of the slow loris are skewed and depicted instead as the animal being ticklish, singing or smiling. These videos normalize and glorify exotic and cruel pet ownership.

Celebrity social media accounts have added an additional element in the glorification of owning exotic pets such as the slow loris. In the tickling video, there were over 250 comments about how the viewer discovered the video because of a celebrity promotion. In 2013, pop icon Rihanna Instagrammed a picture with two illegally traded pygmy slow lorises in Thailand. When celebrities blatantly ignore laws banning ownership of illegal animals and openly share content depicting wild animals in captivity, their followers may view their actions as acceptable.

People push boundaries to appear adventurous on social media. Therefore, tourist attractions involving direct physical contact with wild and exotic animals are becoming more prevalent, particularly using captive wildlife as photo props. Many people that fall for these tourist traps do not know that most of these animals were obtained illegally, are privately owned, and often live in poor conditions not suited to their needs.

Slow lorises, particularly, are often misidentified by hashtags on Instagram as a lemur, monkey, or bushbaby, showing that many tourists do not know what animal they are posing with, let alone anything about its ecology or conservation status. Additionally, 17 percent of slow loris photos on Instagram showed the nocturnal animals paraded in bright daylight, and 62 percent of the photographs featured the slow lorises dressed in clothing. A further investigation into one of these tourist traps in Marmaris, Turkey showed the nocturnal animals being photographed awake during the day or with flash photography during the night which can be damaging to the slow loris' light sensitive eyes and cause health problems from the disruption of natural sleeping patterns. They were also being stored behind a small DJ booth, and being fed unsuitable foods including fruit wedges taken from cocktails.

The future of the slow loris may seem bleak after learning how these animals are used for entertainment both at home and as tourist attractions, but there is still hope for a better life for many of these small primates. The living conditions of these slow lorises are a result of both lack of knowledge and lack of empathy for these smaller beings. However, the path to a better future for these animals and many others begins with educating the general public and promoting positive changes in consumer behavior. And that can start with us.

### What Can You Do

A majority of us do not own exotic pets or even know anyone who does, but that does not mean we are not actively participating in the promotion of exotic pet ownership. Taking selfies with wildlife for social media likes promotes the idea that these animals are wellsuited to be around humans. Even if the animals are legally owned, in the wild, in a rehabilitation centre, or in a sanctuary, the picture is still actively glorifying the animal selfie.

The most effective strategy is to change our attitudes around exotic wildlife, stop posting pictures with them, remove photos you may already have posted, and encourage friends and family to do the same. In fact, many sites like Instagram now allow you to report photos of wildlife exploitation. Instagram works with wildlife groups such as World Wildlife Fund, TRAFFIC, and World Animal Protection to spread education about appropriate interactions with nature and encourages mindfulness when posting photos with animals.

While social media sites are often villainized in the scope of the illegal wildlife trade, they also hold a great power to spread education and awareness to a large audience. Commenting on posts, channels, and websites when you see something immoral can have a huge impact. As consumers of these apps and websites, we can hold people accountable for the content they choose to share and can open up a place for learning when we see animals being exploited.

The animals that fall victim to the illegal wildlife trade cannot speak for or defend themselves against harmful people and situations. It is our job to be their voice by reporting videos and photos that exploit animals and by educating people when opportunities present themselves. Slow lorises gained much of their popularity as pets through social media, but this power of technology also can be used to spread knowledge and change the perception of human wildlife relationships.

### Further Reading

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# Studying secrets from dead sharks

Author Zoya Tyabji | Illustrator Barkha Lohia

At a social gathering recently, I was asked by an old relative the ubiquitous question of what I do. "I study sharks", I usually respond. Conversations stopped, sounds dropped, and all eyes were on me. After a second of disbelief, they asked "Aren't you scared of getting into the water and swimming with them though?"

It's a common misconception to think that studying sharks entails swimming in the ocean like a scene from Jaws. But sharks can be studied in multiple ways depending upon the questions you want to answer - from underwater visual surveys through diving, putting baited remote underwater cameras, or tagging methods. However, I study them at fish-landing centres, one of the most efficient and cost-effective way to acquire a whole lot of secrets from them. The Andaman and Nicobar Islands of India has one of the few targeted shark fisheries that remains in India, along with sharks caught as bycatch here. By visiting landing centers, I document biological and fisheries aspects so as to inform management in the hope that it can lead to better conservation strategies.

Such basic information is scarce and severely hampers effective management measures. Contrary to the glamorous belief, my field site is the fish-landings at Junglighat and Burmanallah, located in Port Blair, the main city of South Andamans, which I have been visiting every alternate morning or when weather permits for the past year and a half. My subject of study are sharks caught by fishermen for their meat, fins and liver oil which is then exported out of the Islands.

### Sampling sharks

On sampling days, my team member Tanmay Wagh and I wake up alongside the chirping of the first morning and ride sleepily to the landing site. It is imperative to get there early so that we can sample the sharks before they are auctioned and sold off. Once we enter the landing sites, we are caught in the commotion of the place.

The only constant here is coordinated chaos. Fishers separate their catch on the boat and land it on the platform of the fish landing site. Then they either

transport it to the market or sell it to traders who such shark and was taking measurements from the tip export the fish to peninsular India. In this chaos, our of the tail to the tip of the snout, when I realized that noses guide us to the pungent and very characteristic the gills, spiracles and eyes of the shark were moving. smell that emanates from the pile of dead sharks. The shark was alive! Walking towards a pile, I put my disposable gloves on and pick up a measuring tape and weighing scale, After more than a year of sampling, I suddenly while Tanmay gets ready with the data sheet, pen and blanked out on how to sample sharks that day. Little did I know that my wish to see a live shark would be camera to record the data. We record the species of the shark, size, gender, maturity and weight. This is granted in such a situation and so soon. methodically carried out for every individual shark in different boat catches which are randomly sampled. Unexpected events This cost-effective sampling method provides us with comprehensive information on seasonal diversity of Our experiences at the landings paralleled that of the elasmobranchs; biological traits such as size frequency, hustle bustle, such that they were always eventful. sex ratio, maturity and length-weight relationships; Sharks here are called 'Badmaash' (translating to interactions of shark species with fishing gear and 'naughty rascal'). While researchers working on grounds. turtles are called turtle man or researchers working on snakes are called snake man, I am sometimes referred However, after sampling more than 2000 dead sharks, to as 'Badmaash madam' at the landing site.

I craved to see a live shark. On one such sampling day, we were recording shark species that mainly live in The lack of theatres in the Andaman Islands makes the deep sea, characterized by their small size (approx. everyone crave drama. While people on the mainland 1 metre total length), huge green eyes and spines on watch James Bond movies, we witness first hand their first and second dorsal fin. I had picked up one inspiration for such action movies. One such occasion



was when we suddenly heard a big boom in the midst of sampling sharks. We turned towards the sound to see that the fuel tank on a boat had caught fire and burst, resulting in the boat splitting and catching fire. The two fishers on the boat had caught fire and were flung into the sea. However, instead of the water healing, the high salt concentrations in the sea can lead to severe injuries and infections (which is why you should not believe the movies). The fishermen had to be rushed to the hospital immediately. Luckily, both of them are now safe with their families, although gravely injured.

On another occasion, a fisherman was trying to offload a 2-meter Bull shark, weighing almost a 100 kg. While pulling the shark from the boat, instead of landing onto the platform, the fisherman lost his balance and instead fell over the side of the boat, and into the water with the shark on top of him. After a few small physical bruises and a big one on his ego, and with the help of the onlookers, he successfully brought the shark onto the platform. The fisher is now a good friend and we have had plenty of discussions over a morning cup of chai where we still laugh about his fallacy.

### Findings and future directions

I developed an interest in sharks while working on a coral reef project. The lack of sharks while studying the health of reefs, followed by innumerous interactions with locals who remarked on the steep decline of sharks in the past decade, is what made me question their status in the islands. Being greeneved and enthusiastic, I never realized it would mean me studying dead sharks for a year and a half. The experience provided me with a skillset to study sharks, wherein I learnt species identification, techniques to study them and it became a stepping stone for my professional development; and to value ground truths. pungent smell of working with dead sharks, it was one

As I spent more time at the fish-landing site, my interactions with fishers changed my perception that sharks had to be studied through top-down protection approaches and management measures. While overfishing is one of the most serious threats to the marine ecosystem, the blame is often and easily placed on fishers. However, we fail to recognise that fishing is one of the most lucrative and primary livelihood opportunities for them. It is indeed the demand from the consumers that feeds this problem. and that attacks the ethical practices of fishers and their livelihoods. Additionally, being the primary and most important stakeholders, fishers are often the last ones to know or have a stake in policies which raises conflict between stakeholders and fishers. This further causes a lag for efficient management to take place.

The experience thus convinced me that it was a holistic approach that we need to take, one that certainly involves a balance between top-down and bottom-up approach. But also, one that involves the target species and the communities who depend on the fisheries for their livelihoods. Most importantly, we need to turn fishers into allies instead of alienating them. Thus, it is a complex and multipronged approach of understanding aspects of the biology and fisheries of sharks with socio-economics of the stakeholders.

While interacting with fishers, we also gained insights into the historical catches of sharks and current trends, their distribution, species vulnerable to fishing gear and perceptions of fishers towards sharks. However, even though this contributes a lot to the bigger picture of sharks, we still require a lot more studies in order to gain a holistic approach towards shark conservation.

Finally, despite the nauseating, strong and very

of the most eventful and fruitful sessions I have had,



### Crocodile Survey with Rajamani

Author Romulus Whitaker | Illustrator Upasana Agarwal

Rajamani, an Irula snake hunter in his early 20s was my field assistant and a special friend with a great sense of humour. Though he wasn't "book educated" (having only studied till Standard 3 in school), he was eager to learn about the world outside of his tribe - the Irula people. Since he knew only Tamil, I usually had to be his interpreter up north, with my rudimentary Hindi.

In our travels, there were long walks along the highway when we couldn't get a ride. Once Rajamani found some tracks of a snake going into a termite mound. He dug for about 20 minutes and pulled out a 6 feet long banded krait, a snake he had never seen before since they are found only up north.

The year was 1973 and I had a grant from World Wildlife Fund India for Rs. 3,000 to do a preliminary crocodile survey. I knew the money wouldn't take us too far but crocs in India had been badly hammered for skins, eggs, meat, and their unfortunately exaggerated reputation as human eaters. They were also losing their habitat. Rajamani and I headed up north and stood on the Agra highway hoping for a ride.

It was late evening, when we got off on the outskirts of Indore. We curled up in a nearby park with jackals howling around us. The only croc distribution data we had was from old hunting books and of course, the Journal of the Bombay Natural History Society. Shortt's Hints on Crocodile Shooting published in 1922, provided us with a list of places along the Ganges river where 'good sport could be had' as long as you could get close enough for an instantly fatal shot. Any basking croc that was merely wounded would disappear into the water and "the trophy" would be lost.

Talking to some of the old tannery owners in Kanpur and later in Allahabad, it was clear that crocs were no longer to be found in those old hunting areas. Both mugger and gharial had been hammered so bad that most of the sacred Ganges were virtually free of them. A member of one of Rajasthan's royal families who also happened to be an old hunter told us that the last place to see gharial and mugger was on the Chambal River which runs through Rajasthan, Uttar Pradesh and Madhya Pradesh. So Rajamani and I set out for Dholpur, Rajasthan with a somewhat cryptic warning that it was a pretty dangerous place. A Conservator of Forests advised us not to go because of dacoits who were at large then. I guess our well wishers were thinking, "This tall white guy and short dark man would be easy targets". I explained what dacoits are to Rajamani and he looked suitably impressed. We stood on yet another busy highway looking for a ride to Morena.

A kind soul, working for the Public Works Department, had somehow heard of the Madras Snake Park and was happy to help the oddball American who started it. He drove us to Rajghat, the bridge across the Chambal River in his official jeep, determined to show us gharial. Lo and behold there were half a dozen of the crocodilians basking on a sand bank, the first wild ones we had ever seen. Later we spent the day walking along the banks of the Chambal counting gharial tracks, getting startled at the sight and spoor of a huge Chitra softshell turtle and finally seeing a group of basking gharials accompanied by a large Ganges softshell turtle. Rajamani showed me where several turtles had laid eggs but in every case the nest had been dug up, some by jackals and some by mongooses. We were actually somewhat disappointed that we hadn't run into any dacoits!

By the time we headed east from the Chambal we were almost out of money. There was enough to buy a bit of food but nothing for travel, so we started hitchhiking again. After a couple of rides with lorry drivers, we reached Hazaribagh.



### field assistant

The next day we headed south for Orissa but no one would slow down for us on the highway. We walked until we reached the edge of Hazaribagh National Park. Rajamani called me over and pointed out very obvious snake tracks disappearing into one of the large holes at the base of a large termite mound. "Kattu virian" he said, a krait had gone in the night before. We just had a small crow bar (that essential tool of the Irulas) with us, but Rajamani couldn't resist digging into the mound to see this krait. With the skill that only the Irula have at digging, meticulously cutting roots and scooping out the dirt with one hand, Rajamani was soon well into the mound and suddenly jumped back. "Yena pambu ithe?" he asked ("what kind of snake is it?"). I gasped as I saw the bright yellow and black bands of a two-metre long banded krait emerging from the hole, no doubt very offended to be disturbed during his sleep period. As we watched the gorgeous snake search for another hole to escape into I explained to Rajamani that this was the banded krait, a snake we don't have in the deep south, but probably one of the most 'showy' snakes in existence. The snake entered another hole in the mound and disappeared from sight.

This was just one of the many varied experiences I shared with Rajamani. Come to think of it, up there in north India we must have appeared to be a pretty weird pair, this long haired whitey from New York and the short tribal man from Tamil Nadu.

One evening we sat down to talk with a sadhu under a banyan tree on the outskirts of Kota, Rajasthan, the day before our gharial survey along the Chambal. The sadhu was 'massowing' a ball of ganja along with beedi tobacco in his palm, sprinkling a little bit of water to make it pasty. We watched as he picked up his clay chillum and placed a little stone inside. "This is the gitak", he said and emptied his palm of ingredients into the chillum. "And this is the safi.", wrapping a piece of damp coloured cloth around the base of the pipe. He put a piece of burning coconut fibre rope on top of the chillum, took a couple of deep puffs to get it going well and handed the chillum to me. I held it clumsily and managed to get a puff down without coughing too much and handed the pipe to Rajamani who had much more finesse. It was getting dark when we left the sadhu in clouds of smoke with a bow and a thank you. As we walked down the road, everything seemed to have a silver lining under the street lights. Rajamani pointed at the man across the street with a bald head and said "Atho, aamai paar!" (There, look at the turtle) and indeed that shiny head looked just like a turtle shell gleaming in the sun. We both giggled uncontrollably.

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### This 'continent of smoke'

Author Michael Adams | Illustrator Aindri C.

went back to it. Most items used in Indian homes were completely natural and hence, compostable. Compost was a daily reality, without language or explanation necessary. But nostalgia can be dangerous, for it lacks context.

Australia has just experienced an unprecedented largest per capita emitter of greenhouse gases, a wildfire season. The state of New South Wales on the direct contributor to creating the conditions for the south east coast, where I live, was the worst affected, fires. recording the worst bushfires since colonisation. The Gospers Mountain fire was the largest recorded Estimates suggest that possibly one billion individual forest fire in Australian history. These fires coincided animals (mammals, birds and reptiles) died in the with the most extreme weather conditions on record. fires. Some of those belong to species also likely Nationally, Australia experienced the hottest day on to have been edged closer to extinction. Australia record, with a national average of 41.9 degrees on already has the worst record of mammal extinctions December 18, 2019, the hottest December on record, in the modern world - since colonisation commenced and the hottest and driest year on record. On January in 1788, thirty land mammal species have become 4, Penrith, a suburb of Sydney, had the highest extinct. temperature anywhere in the world of 48.9 degrees.

Those climate conditions, combined with the radical social and landscape changes wrought by 242 years of colonisation, have made Australia now critically vulnerable to large scale wildfire. Incongruously, a prosperous nation with a small population which you might expect to be able to shield itself from the effects of climate change, is now very exposed. Perhaps not so ironically, Australia is the world's



# There used to be a time when lifestyle started from the soil and

Nearly 6 million hectares of temperate broadleaf forest have burned in eastern Australia this past summer. That is more than 20 percent of that global forest biome type within Australia, and is a far higher annual percentage than usually burns (globally between 5-10 percent). Many of these ecosystems have evolved with fire, so now, a month or so after the fires and with widespread rain, extensive regeneration is evident.

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While many species in Australia co-evolved with fire, the unique nature of this summer's events has particular challenges. The sheer scale of these fires reduces the possibility of pockets of refugia from which surviving wildlife can repopulate burned areas. For many species, in-situ survivors for animals, and seed banks for plants, can be key to fire recovery. But the intensity of these fires means small refugia (fallen logs, burrows, deep soil) is less available – in many places, everything burned, including swamps and normally wet rainforests. Human infrastructure - roads, fencelines, agricultural fields - also creates barriers both for animals fleeing fire and animals subsequently trying to move into burned and unburned areas. Plants have different strategies, and in a scoping exercise one month after the fires I observed regeneration from seed banks; from epicormic growth on scorched mature plants; and lignotuber growth on apparently killed mature plants. I saw active wombat burrows in otherwise blackened landscapes, much insect activity, and also evidence of introduced predators, particularly red fox.

Captain James Cook, the naval captain who illegally 'claimed' Australia for the British Crown in 1770, made numerous diary entries recording his observations of smoke and fire on the continent: his words form the title of this article. He was one of very many colonial observers to see the activities of Aboriginal communities in effectively using fire to care for the country.

This summer's bushfires are unprecedented in many ways, and perhaps that includes marking the point where mainstream Australians change their thinking about this country. Is this a pivotal moment in Australia's environmental and post-colonial history? Is this the moment when Australians recognize the expertise of the people whose culture and knowledge prevailed for 99 percent of the continent's human history? Can we have a different kind of fire in Australia?

### Further Reading

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