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# current conservation

Geothermal energy in Kenya **03** | Melemchi herders **08** | Monetising destruction **14** | Interview: Harini Nagendra **17**





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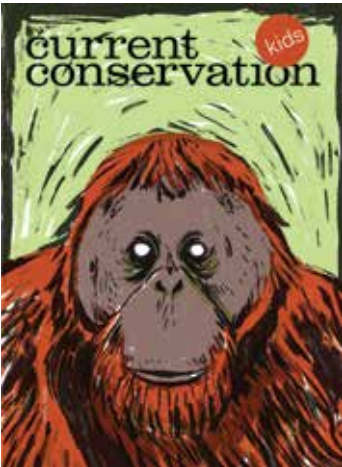
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MATTHEW CREASEY AND THE SUMATRAN ORANGUTAN SOCIETY



Cover art by Ananya Singh

The last year has seen an array of social movements across the world which have changed political and cultural landscapes, for better or worse. Conflicts over resources and ideologies, covering both urban and rural demographics have taken over headlines both overseas and at home. In this issue our authors have tried to capture the need for us all to stay informed of developments around us, especially in this so-called ‘post-truth’ era. Caitlin Kight reviews Andrea Wulf’s tribute to Alexander von Humboldt, once a household name but now forgotten by most. Making knowledge accessible to laymen has never been more critical and we would do well to imitate Humboldt’s efforts. Kanchi Kohli and Manju Menon lay bare the murky world of compensation for environmental damage. Clarice Wambua and Rose Birgen, describe the common tensions between large development activities and local community livelihoods through their case study from Hell’s Gate National Park in Kenya. Bharti Dharapuram interviews Harini Nagendra about the field of urban ecology and Harini’s work addressing Bangalore’s environmental woes. She also reviews Harini’s new book which traces Bangalore’s environmental history.



Prabha Mallya

In this edition of Current Conservation Kids we look at our relationship with Nature, and explore our place within it. In the first article, we really are talking relations. Known in Indonesian as “people of the forest”, orangutans are one of our closest relatives in the animal world, sharing 97% of their genes with humans. They are also an endangered species. Follow Dr Ricko Jaya and his team through the forests of Indonesia, and reflect on how we relate with animals in our world. In our Species Profile, learn more fascinating facts about this astonishing ape. Did you know orangutans can live to 45 years old in the wild, use tools and love honey? Finally, hear about a recent workshop at Vidya Vihar School in Odisha, India, in which the pupils expressed their own connections with nature through their artistic creativity. While some painted a house with the flowers of the forest, others built a tree house in the heart of the jungle – new meanings to living with nature. How does nature come into your life at home?

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# Quest for geothermal energy in Kenya: challenges for conservation

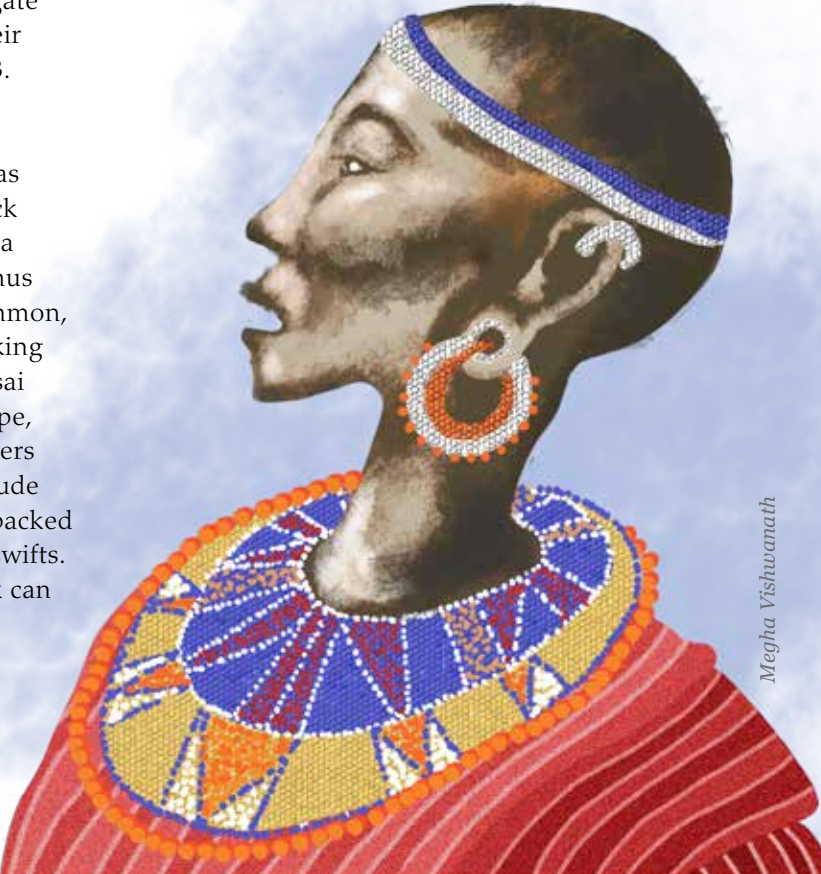
Hell’s Gate National Park located along the Great Rift Valley is one of Kenya’s most spectacular national parks. It was gazetted in 1984 to conserve wildlife whilst earning essential tourism revenue for the country, and is under the management of the Kenya Wildlife Service (KWS). Before the park was gazetted, it was an area inhabited by Kenya’s Olkaria Maasai community. This community currently lives within the park, with the constant threat of being pushed to the fringes, as development increases within the park.

The origin of the name Hell’s Gate is unclear. According to KWS, the park is named for the intense geothermal activity within its boundaries. Other KWS statements are that the name is derived from the most impressive feature in the park, the *Njorowa* (*Ol Jorowa*) Gorge which runs through the middle of the park. Some scholarly accounts however suggest that the park was initially named “hell’s ground,” translated from the Maasai language, but soon received the name “hell’s gate” from explorers Fisher and Thompson, after their defeat in a battle with Maasai warriors in 1883.

The park’s beauty though, is undisputed. It measures approximately 68.25km<sup>2</sup>, and as far as the eye can see, towering cliffs, gorges and rock towers, stand astride the dusty African savanna dotted with themeda grasses, and tarchonanthus and acacia shrubs. Large carnivores are uncommon, and visitors to the park enjoy cycling and walking past numerous baboons, common zebra, Maasai giraffe, Thomsons gazelle, Klipspringer antelope, African buffalo and common eland. Birdwatchers can enjoy over 100 species of birds. These include vultures such as Ruppell’s vulture and White backed vulture, Verreaux’s eagle, Augur buzzard, and swifts. In addition to nature trails, visitors to the park can go rock climbing or hiking in the gorge.

Hell’s Gate is a popular tourist attraction, and an unassuming visitor could not easily tell its tumultuous history. This history is well conceptualized by the ongoing conflicting ancestral claims by the Maasai in the area, legal claims by the development actors within the Park, and environmental concerns over geothermal development in the heart of this magnificent work of nature. Exploration began in the 1950s, however it was only in the 1980s that the attempts to produce geothermal energy from this area began to bear success.

Since then, geothermal activity has been developed at the Olkaria area within the park, with production in phases, at steam fields in Olkaria I (commissioned between 1981 and 1985), Olkaria II (commissioned in 2003 and 2010), Olkaria III (commissioned in 2000) and Olkaria IV (commissioned in 2014). By 2016, the country



Megha Vishwanath



was producing 544MW of geothermal energy. All generated in Olkaria, and resulting in Kenya's ranking as the top producer of geothermal in Africa and among the top ten globally.

In addition to this, a Strategic Environmental Assessment (SEA) for an Olkaria geothermal expansion programme kicked off in January 2014. The programme aims to increase geothermal energy generation by 1,110MW between 2012 and 2020, and some of the proposed projects that form the expansion programme are located within the park. Proponents of geothermal energy have propounded that this long and continued existence of geothermal project development in Olkaria, is evidence of its successful co-existence with park activities and integration of social and economic issues.

### The Environmental Concerns

On the ground however, production from Olkaria has been disputed. Located within a fragile ecosystem, the project implementation has raised challenges for conservation within the park and its environs. Through installation of structures such as elevation steam pipes and power plants, and use of fences, large sections of wildlife corridors and dispersals areas have been removed to accommodate the change in land use. As a result,

the constricted and sometimes segmented corridors have become less effective as travel lanes for wildlife dispersal and other ecological functions.

The excavation for the project structures has resulted in loss of habitat and interference with bird breeding sites, whilst the use of heavy equipment during geothermal development has contributed to emission of uncontrolled noise. High vehicular and human traffic within the park has also significantly raised the project footprint, negatively impacting wildlife. Conservation groups such as Nature Kenya, noting that unsustainable geothermal power generation within the park is a threat to biodiversity, have attempted to raise awareness on this issue and raise the profile of the park in national and international conservation fora. These groups have ensured the listing of the park as an Important Bird Area (IBA), in a bid to stem the decline in bird numbers.

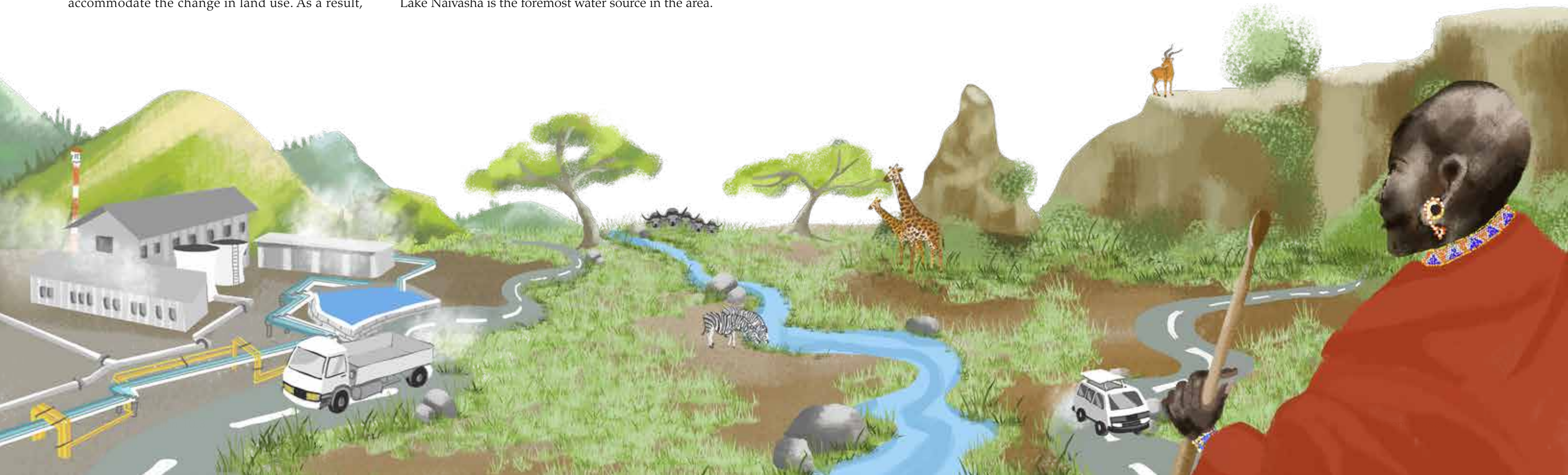
Further, the substantial quantities of brine from production wells have contaminated water and soil, and the increased demand for water used for drilling geothermal wells has led to use of water abstracted from Lake Naivasha (a Ramsar Site) for domestic and industrial purposes. The effects of geothermal production in the park thus extend beyond the park area, and have an impact on a wider community, as Lake Naivasha is the foremost water source in the area.

*The excavation for the project structures has resulted in loss of habitat and interference with bird breeding sites, whilst the use of heavy equipment during geothermal development has contributed to emission of uncontrolled noise. High vehicular and human traffic within the park has also significantly raised the project footprint, negatively impacting wildlife.*

The aforementioned environmental concerns are occasioned by actions of project proponents, KenGen and Orpower 4, operating with the knowledge and co-operation of KWS. The KWS Hell's Gate Management Plan (2010-2015) acknowledges that construction and operation of geothermal plants constricts wildlife habitat and produces impacts such as gaseous emissions, noise and potential ground subsidence. However it points out that given the advantages of geothermal power over conventional power sources, the facilitation of geothermal power production with effective measures put in place to mitigate negative impacts is key. This highlights how KWS conceptualizes the realization of wildlife conservation, where development priorities are in conflict.

### Balancing Competing Interests

The Olkaria experience is a case study of what happens when environmental interests and development interests collide. On one hand, the state has a stated goal of enhancing conservation to stem the decline in wildlife numbers and loss of biodiversity. On the other hand, the state has in place an ambitious goal of substantially increasing





geothermal energy in Kenya’s energy mix, by utilizing a good share of the estimated total geothermal potential of between 7,000 MW to 10,000 MW.

An attempt at ensuring these two priorities co-exist has seen KWS lease part of the park to the project proponents, and enter into a Memorandum of Understanding (MoU) with them to ensure a harmonious co-existence between conservation and geothermal project development. KWS and the project proponents hold joint quarterly meetings on the MoU, which deals with issues of environmental impacts and mitigation measures to be undertaken, and highlights areas that require collaboration between the parties to ensure conflict-free progression of the projects. KWS has over time reviewed the MoU document to reflect developments in the field, and the MoU document is always attached to the tender document for geothermal projects to inform contractors of the environmental obligations within the park. In addition to adhering to terms of the MoU, project proponents are required to implement mitigation measures to deal with the adverse impacts of the projects in park.

However, there have however been concerns that project activities are ongoing with inadequate mitigation measures in place. Further, the Olkaria geothermal expansion programme aims to increase geothermal energy production by 1,110MW between the periods 2012-2020. With this new development, the impacts of geothermal production at Hell’s Gate are likely to be felt on a wider scale, as noted by the KWS Management Plan which highlights a concern that the expansion of geothermal activities is not well coordinated between KWS and KenGen, and conflicting land uses foster mistrust with other stakeholders.

Conservation and Community Livelihoods

The presence of the Maasai community further increases the conservation complexity at Hell’s Gate. This community has historically laid claim to the Olkaria area as part of their ancestral land, and has protested interference with their culture, due to the designation of Hells Gate as a National Park in 1984 and the geothermal developments since 1971. This is because the community has been repeatedly forced to move to adjacent lands initially to make way for

the park, and each time a new geothermal project phase is initiated, negatively impacting community livelihoods.

Whereas KWS reached a solution with the community to allow them to cross the park along traditionally used routes to and from traditionally used grazing areas, a more recent concern for the community has been their improper resettlement to make way for geothermal production. Whilst KenGen asserts that resettlement has been proper and community livelihood interests are adequately considered in its operations through the implementation of various community projects, the local community is unsatisfied.

In 2014, members and representatives of the community filed a complaint with the World Bank’s Inspection Panel (IPN). Following this, an eligibility assessment and investigation was carried out on the alleged issues of harm and related non-compliance with Bank Policies on Indigenous Peoples, Physical Cultural Resources, and Involuntary Resettlement. The



Bank has now set up a mediation process between KenGen and the community, to agree on actions to address the issues facing the community. In the absence of a resolution for this issue, this clean energy project would stand accused of ‘dirty’ development, by aggrieved community members.

Indeed, large scale infrastructure projects are complex around the world. However as has been shown in this case study, the complexity increases in the case of the Olkaria power plants which are operating in an environmentally sensitive and culturally rich ecosystem. While a section of actors may term the success achieved in the development of geothermal energy in the park a perfect demonstration that geothermal development, wildlife conservation, and communities can co-exist, no conclusive evidence exists to support this school of thought. If anything, environmental and social concerns persist. Further, continued acceptance of extractive projects within this conservation area increasingly render it more of an industrial area than a park.

National parks however remain a cornerstone of global conservation efforts, though oftentimes there exists tension between conservation and livelihoods. On one hand the objective of establishing a protected area should ideally be for environmental effectiveness; protecting biodiversity or cultural heritage. On the other hand, conservation measures may instead operate to the detriment of social equity, leaving affected communities contesting conservation and any other attendant developments authorized by those mandated to manage the conservation area.

Whereas generation of energy derived from a green, cost-friendly and stable source is vital for driving

Kenya’s economic development, the national need for it should not take precedence over the conservation needs of both communities and the environment. KWS, which under Kenyan law is mandated to enhance conservation, must therefore redouble efforts to ensure it actualizes this core mandate within Hell’s Gate National Park.

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*Clarice Wambua and Rose Birgen are Legal Researchers at Natural Justice: Lawyers for Communities and the Environment.*



# Melemchi: a history of herders

Climbing up out of the Kathmandu valley in Nepal through the Sunderjal waterworks and along the rising crest of the Thare massif toward Tibet, you pass through two small villages before finally reaching Thare Pathi, an isolated pasture about 50 miles from Kathmandu. In the summer monsoon months, you may hear the deep mellow sounds of lowing cattle and sonorous bronze bells well before you see the stone shelter amidst the heavy clouds and fog that envelop the mountain side at 3800m.





The cattle appear through the mist as they graze on the hillside, stumbling over rocks, standing braced on the steep slope, waiting for evening milking. They are dzomo, a cross between a yak father and a cow mother. They are all female – male crosses are called dzopkio and people in this region don’t keep them.

Livestock are kept by people in the Himalaya to provide transportation, agricultural labor, food (milk, meat, and blood), raw materials (wool, hair, and horn), and manure. Through the labor and products of animals, humans gain access to energy sources in the environment that are indigestible to people, such as plant cellulose, as well as materials needed for daily living. It is possible to combine herding, or pastoralism with agriculture, but not easy. Pastoralism requires mobility and access to adequate resources to support numbers of large animals; it can require just a few shepherds or be more labor intensive if dairying is involved. Agriculture doesn’t move and requires intensive human labor in one spot. In the Himalaya, what you grow and what you herd is dependent on the local ecology in which you live and the historical and social factors that have shaped your culture.

The families who use the Thare Pathi pasture come from Melemchi, a village down below at 2600 m. *Dzomo* herding is a way of life with a long history in this valley. The region is called Hyolmo and its original settlers were lamas from Kyirong, Tibet, who established a series of Buddhist temples here in the mid-1800s. Each temple was surrounded by land and forest, and ultimately grew into a village. Hyolmo villages are all situated high on the slopes of the Melemchi and Indrawati river valleys -at around 2550m. The only crops that can grow there are potatoes, high altitude wheat and barley, and at the lower spots, corn. It is the upper limit for lowland cattle (zebu) and water buffalo, which can be kept tethered and stall-fed in the village to provide household milk and manure. Hyolmo temple villages vary in exposure, size, slope, and microclimate. Some have very steep slopes and no room for agricultural fields. Some are at the southern end of the valley and closer to roads and lower villages where rice and millet are grown. Melemchi village is spread out over a gentle slope on the western side of the Melemchi River. It is the most northern of the temple villages and has sole

*Dzomo herds are owned and managed by households; the family moves over the year with their herd, up to high pastures in the summer and low pastures in the winter. They live in temporary structures built with the bamboo mats they carry with them, although many pastures have a stone-walled floorless hut with a plank roof that provides more protection and comfort.*

access to the forest resources on the hillside. Wheat, barley and potato fields surround the houses and there is lots of open space. But it is *dzomo* herding that defines the village, not agriculture. As far back as living residents can remember, Melemchi families herded *dzomo* and they kept that way of life longer than all but one of the other 18 villages. There are no *dzomo* herds there today, but in 1971 when I began my work there, most residents lived with their herds. Over the years, I have come to know *dzomo* herding as a unique Himalayan adaptation with great time depth and much to teach us about how mountain people make a good life.

There is something incongruous about the appearance of a *dzomo*. Like their cow mothers, they have short hair, long faces, and long legs, and can produce a calf every year (yak produce calves every two years). Like their yak fathers, they have bushy tails, a stocky bulky body, and a physiological tolerance for high altitude and cold. In some ways, *dzomo* are an improvement on their parents. *Dzomo* produce more milk and lactate for longer periods than either cow or yak. And they have their first calf at an earlier age than either parent species. *Dzomo* are

specialized for milk-production in high altitudes – or actually, the middle altitude zone of 2100m to 3600 m, which is too high for cows and too low for yak.

*Dzomo* herds are owned and managed by households; the family moves over the year with their herd, up to high pastures in the summer and low pastures in the winter. They live in temporary structures built with the bamboo mats they carry with them, although many pastures have a stone-walled floorless hut with a plank roof that provides more protection and comfort. Traditionally, men receive part of their parents’ herd when they marry, along with rights to the family pastures. The work of *dzomo* herding is relentless and difficult. Although a husband or wife can do it alone for a day or two, two adults are necessary to keep it going. Women do the milking twice a day, make butter, and manage the household. Men cut firewood and fodder, supervise livestock breeding, buy and sell livestock, carry the heavy equipment (churn, bamboo mats) to new pastures, and travel to resupply from the village or sell cheese and butter. Butter and cheese are made every other day. Children as young as 5 years old help with tasks at the pasture, so there is no benefit in curtailing family size. Five to ten times a year the family must move to a new pasture; some are over a half-day away. The bamboo mats are four adult loads; the

household effects, another five. The family carries everything on their backs; *dzomo* don’t carry loads.

A *dzomo* herd is a dairy herd, usually 10 or more *dzomo* and a bull. Melemchi people prefer the dwarf Tibetan bulls because they do better at the higher altitudes where *dzomo* live, and they produce smaller calves called *pamu*, which are easier for their *dzomo* mothers to birth. The animals cluster around the shelter at night and, after milking in the morning, are sent out with one of the children to graze in the pasture and surrounding forest until late afternoon when they return for another milking. *Dzomo* are bred in the summer months at high pasture and give birth during the spring. They lactate for 3 to 7 months, including the first few months of their next gestation.

Dairy herders, the world around, face the same problem. In order to lactate, cows must give birth to calves, but dairy farmers want the milk, not the calf. The most common solution is to sell them. Melemchi herders can’t do this. A *pamu* is a second-generation hybrid. They have none of the vigor of their first generation hybrid mothers. They are small, sickly, and produce less milk than their mothers. They have no market value. Kept through adulthood, they are a drain on the environment and the family’s energy and income. As Tibetan



John Bishop



Buddhists, Hyolmo herders don't kill animals. So, in fact, most *pamu* die of illness and neglect within the first few weeks of life. Some *pamu* are spared because their mothers won't lactate without them and others thrive despite neglect, so most herds eventually accumulate several adult *pamu*.

There are other economic challenges to *dzomo* herding. You can't recruit your herd from within. You need to buy your animals from people who breed cows and yaks, so you need a source of cash. Livestock is expensive so herders may buy a cheaper immature animal and raise her to breeding age, taking a chance that she may not thrive or be a good breeder. Since you can't kill *dzomo*, injured, unproductive, or elderly animals must remain in the herd so ultimately the herd becomes less and less productive. Keeping a bull alive and healthy at altitudes beneficial for the health of *dzomo* takes knowledge and extra work. In fact, experience with and knowledge of livestock management is essential, and forms a core of traditional practice that is held in this community without access to veterinary medical care. Harsh and unpredictable weather, predators, and disease also increase economic risk and uncertainty.

In the early 1900s, residents of Melemchi had large *dzomo* herds and few grew anything in the village. They traded butter and cheese for agricultural

products or sold them for cash to buy salt or tea or the few manufactured commodities they needed. Even though they lived with their herds away from the village, the village with its temple or *gomba* was the center of community life. The land surrounding the *gomba* is endowed for its support, so even those out with herds are members and are responsible for maintaining the *gomba* and for its annual ritual cycle. Physical labor as well as taxes in the form of grain, butter, or cash are required from each household. Eventually some people built houses in the village, for their old age, or to store things, or to live in when they were between herds. As families and herds grew in size, they could spare time and people to manage both crops and herds, so house numbers grew. Agriculture began to be more practical when people were around to do the work. Economic diversification reduces risk in an uncertain and harsh environment. The *dzomo* herding system, combined with winter rain-fed annual crops like wheat, barley, and potatoes, provides a flexible subsistence system for families in Melemchi where there is access to excellent pasture above the village, a large open village space with good water sources, and a low population density.

Over the twentieth century, Melemchi grew into a large village, with increasing numbers of houses. When my husband and I lived there in 1971, wheat, barley and potato fields occupied the central area and 24 families herded *dzomo*. There were 30 houses in the village, but only 6 were lived in year round. The others belonged to herding families whose members occupied them for short periods to tend crops or help with village work. By 1986, the fields remained but there were 78 houses and the number of herds had dropped to 20. Still, lots of those houses were empty – in addition to absent herding families, other families were building roads and working construction in Tibetan Buddhist areas of the Indian Himalaya.



People moved back and forth throughout the year, bringing back money for houses and living expenses for themselves and their relatives, and in a few cases, for new herds of *dzomo*. Today there are more than 125 houses, as well as a school, seasonal road access, and electricity. The agricultural fields are still there, with new housing and the school built on the edges. Many Melemchi people live outside the village and send money home to their families remaining there.

Diversification and flexibility are hallmarks of successful mountain communities everywhere. In the Nepal Himalaya, at 2600 m, the *dzomo*, a hybrid yak-cow, built and sustained a Tibetan Buddhist lifestyle for thousands of people into the twenty-first century. While no one in Melemchi today herds *dzomo*, there are still *dzomo* herds in a few Hyolmo villages, as well as elsewhere in Nepal. Young and old continue to live in Melemchi, or maintain their houses there for future visiting or residence following their stint as global workers. The children and grandchildren of our herder friends may live in Kathmandu or abroad, yet they return often to visit, and participate in village business and ritual obligations from afar via satellite phones and social media. Regardless of residence and current occupation, *dzomo* herding continues to define a heritage that is now spread around the globe. Many Melemchi people living today in places as far flung

*Diversification and flexibility are hallmarks of successful mountain communities everywhere. In the Nepal Himalaya, at 2600 m, the dzomo, a hybrid yak-cow, built and sustained a Tibetan Buddhist lifestyle for thousands of people into the twenty-first century. While no one in Melemchi today herds dzomo, there are still dzomo herds in a few Hyolmo villages, as well as elsewhere in Nepal.*

as Korea, Crete, Qaatar, and Jackson Heights, New York grew up in *dzomo* herding families and carry that knowledge, heritage, and conviction into their lives and into their futures. It defines who they are and provides sustenance and value as they encounter new challenges.

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Naomi Bishop is a Professor emerita in anthropology at California State University, Northridge. Together they have made a film, Himalayan Herders ([www.media-generation.com](http://www.media-generation.com)) about their work in the village of Melemchi.



# Monetising the destruction of ecological landscapes

The idea of compensation is not new to conservation policy across the globe. Payment for ecosystem services (PES), offsetting the depletion of carbon stocks, and rehabilitating livelihoods affected by wildlife protection have been concepts that both conservation science and policy have tried to operationalize for the last several decades. These compensations are a compromise that has to be struck between ecological requirements and developmental aspirations.

More recently, compensation mechanisms seem to have lost their stated purpose of reducing or offsetting ecological and livelihood losses. They have instead turned into funding mechanisms that have little or no intent to compensate for the damage to the environment or the communities who live in landscapes targeted for intensive development. In the last two years, two laws have institutionalized monetary compensation, paid by project developers to government agencies, as the sole form of addressing project impact on landscapes. These laws routinise loss of habitats and livelihoods, and displacement on the basis of such financial compensation. In addition they make it nearly impossible to hold individual projects accountable for the impacts they leave behind as it is the government agencies who receive these large funds that are vested with the responsibility of implementing projects and schemes that they consider as “compensatory”.

## Recovery from Forest Diversions

Since 1980, the Forest (Conservation) Act (FCA) has legally required projects using forests for non-forest use to carry out compensatory afforestation (CA) in an equal amount of non-forest land or double the amount of degraded forestland. The objective was purportedly to reduce the loss of forests due to high impact projects such as mining and dams and also to substitute what is lost by planting an equal or twice the amount of forest. For two decades the forest departments of all state governments

managed this practice while the projects deposited the money needed to comply with this requirement. Money collections under the FCA have also included deposits arising out of penalties and fines. Nearly 24000 projects have been granted forest clearance on the condition that forest loss would be compensated. Did this happen? Yes, but mostly within government account books.

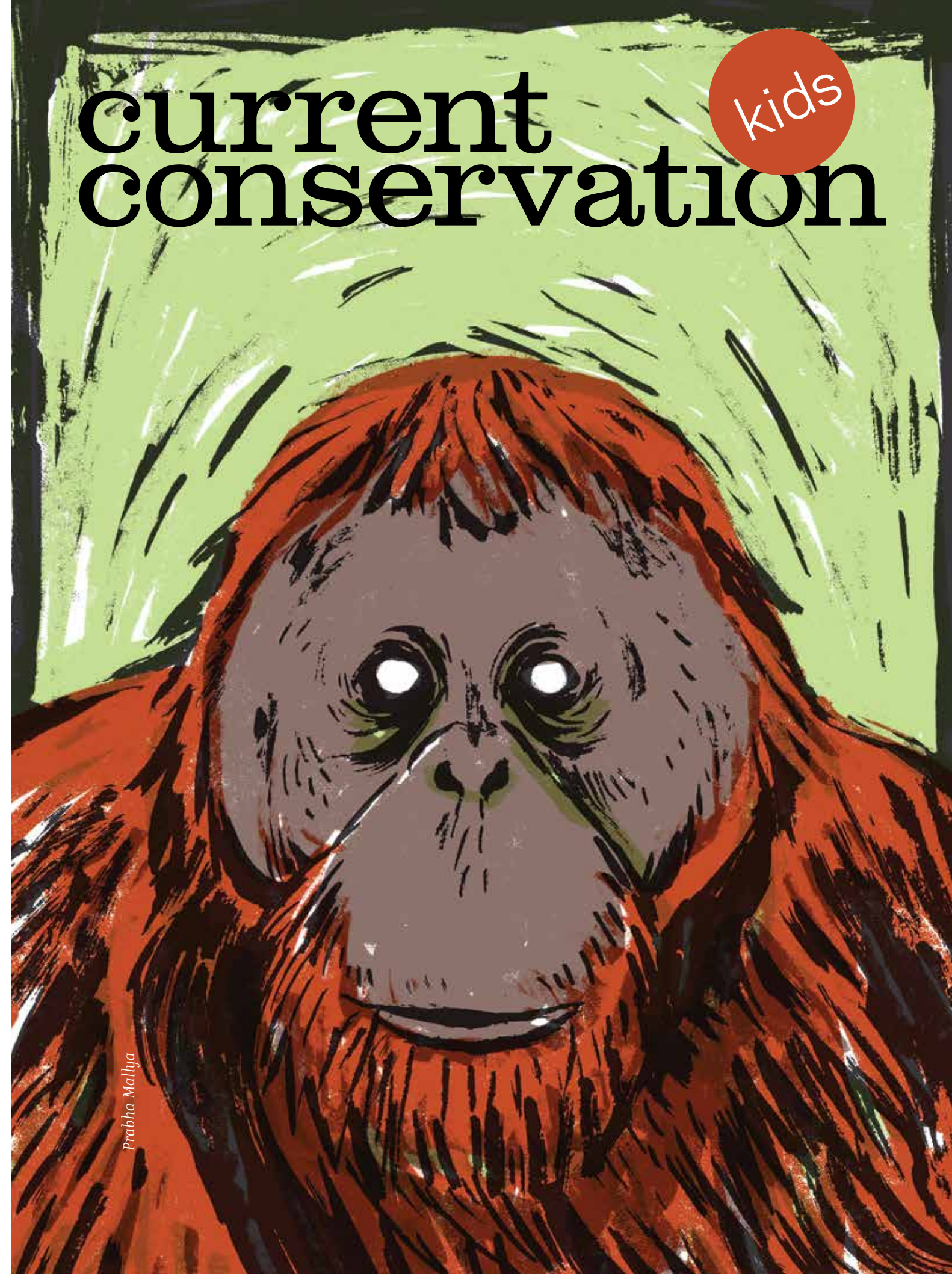
Prompted by the massive failure of operationalizing CA on the ground, in 2002, the Supreme Court’s Godavarman bench directed the setting up of a centralized Compensatory Afforestation Management and Planning Authority (CAMPA). Comptroller and Auditor General (CAG) of India reports and state government affidavits filed in the Supreme Court had pointed out that there were three key reasons for this failure of CA. First, no land was available for afforestation, second that the money was not forthcoming by the user agencies and finally the funds that had been collected were mismanaged. Rather than reopening the logic of CA in which lay the seeds of its failure, the solution that the SC ordered is the centralized management of CA funds and the creation of an additional offset mechanism in the form of the Net Present Value<sup>1</sup>, that expanded the fund and tied it to conservation.

In mid-2016 the Indian Parliament went a step further and legislated The Compensatory Afforestation Fund (CAF) Act to formalize the institutional mechanism to recover and disburse money arising out of forest diversions. It was headlined that this bold move would unlock INR 420 billion that remained unutilised. This money had been collected both in compliance and violation

<sup>1</sup> The Supreme Court’s Godavarman bench in its order dated 26.09.2005 has defined Net Present Value (NPV) as “the present value (PV) of net cash flow from a project, discounted by the cost of capital”. In simple terms, it is arrived at by deducting the cost of investment from the present value of all future earnings. If the cost of putting up a project is I and the value of earnings from the project from now till the end of the project is X, then NPV is X-I

# current conservation

kids





# SAVING THE PEOPLE OF THE FOREST

My name is Ricko Jaya and I am 33 years old. I first fell in love with the “People of the Forest”, the meaning of “Orang Hutan” in the Indonesian language, when I was a student. They are truly incredible but also critically endangered, mostly because their home in the Indonesian rainforest is shrinking due to deforestation and large scale agriculture expansion. Less than 15,000 of them are still roaming freely in the wild forests on the island of Sumatra. So I decided to take action.

Now I am a veterinarian at the Orangutan Information Centre, an organisation which cares for injured Sumatran orangutans (*Pongo abelii*), and works to protect them and their habitat. We intervene when orangutans get too close to villages and could start raiding local farmers’ crops. Follow me today and I will describe to you how we save these beautiful creatures!

It is August 21st, and I have received a phone call from a ‘local’ farmer, living 8 hours away from Medan, the capital city of North Sumatra province, where I live. He and his friends have spotted a large male orangutan stranded in a deforested area, near their fruit orchards. He is malnourished and far from the forest with no high trees around for him to build his nest, in which he sleeps at

night. I call my team, and the five of us prepare our equipment: ropes, a strong cage, veterinary supplies, and a landing net. We will drive all night to reach the village, then take a small boat to where we will finally find the orangutan. During an emergency case like this one, we forget sleep: the safety of the orangutan comes first!

Now begins the most stressful part—catching the orangutan. He is big and scared and tired, so before we can catch him, we must put him to sleep using a tranquiliser dart. This doesn’t hurt the big boy, but it means we can transport him safely. One of the team takes aim with a tranquiliser gun. He fires and the dart hits the back of the orangutan, who will soon start to feel sleepy. Meanwhile, the rest of the team prepares a large landing net. After a few minutes, the male orangutan is falling asleep and begins slowly moving towards the ground. Soon we have him in the net.

The most difficult part of the mission is accomplished!

Now, it is a race to get everything done before he starts to wake up. I have 10–15 minutes to conduct a medical check-up, make sure he is not injured, and provide vitamins and food supplements. Then we put him in a cage on the back of our pick-up truck and drive to the national park. The cage is heavy as it must be strong, and the orangutan weighs some 80 kilos. We reach a safe, quiet spot on the edge of the national park and lift the cage down. Most of the team now move back while one of us opens the door. The big orangutan slowly emerges from the cage, and turning towards us a last time, he climbs up into lianas and branches. I am sure he winked at us to say “thank you” before disappearing into the rainforest. Mission accomplished!

Good luck big boy!



Special thanks to Fabien Garnier for his help with this article.

If you want to know more about the work of the Orangutan Information Centre and would like to support us, you can visit our web-sites:

-<http://orangutancentre.org/>  
-<http://www.orangutans-sos.org/>

Or follow us on Facebook:  
-<https://www.facebook.com/Orangutan-Information-Centre-249175758613943/?fref=ts>

-<https://www.facebook.com/orangutanssos/>





# The Person of the Forest



Orangutans are one of the five species of great ape. The others are humans, chimpanzees, bonobos and gorillas.

Once widespread throughout the forests of Asia, orangutans are now found on just two islands in Indonesia, Sumatra and Borneo. Each island has its own unique species.

Indigenous people of Indonesia and Malaysia call this ape “*Orang Hutan*,” which literally translates as “Person of the Forest”.

Humans are closely related to orangutans. We share 96.4% of our DNA with them. We and they evolved from the same early ape ancestor, splitting from them about 13 million years ago.

Orangutans can live for around 45 years in the wild.

They don’t live in groups like the other great apes, although the relationship



between females and their offspring remains close for years after the young can feed and look after themselves.

Females have their first offspring when they are 15-16 years old and will usually have no more than 3 offspring in their lifetimes.

Orangutans eat ripe fruit and find over 90% of their food in the forest canopy.

Because their food is often scattered and unpredictable, orangutans spend up to 60% of their time finding food and eating. Orangutans also sleep in the tree tops and make new ‘nests’ each night made by bending branches into a platform to support their weight. These nests can be 100 feet above the ground and males can weigh 80 kilos, so the nests need to be strong!



Prabha Malliya

Orangutans are very intelligent, and have even been seen making simple tools.



*Twigs* to scratch themselves.

*Leafy branches* to shelter themselves from rain and sun.

*Branches* as tools during insect foraging and honey collection, and for protection against stinging insects.

*Tools* to extract some seeds from their shells that can contain stinging hairs.

*Leaves* as gloves to help them handle spiny fruits and branches, or as seat cushions in spiny trees.

*Leaves* as napkins to wipe their chins. Good table manners are important, even in the forest!



Both species of orangutan are highly endangered. One hundred years ago, there were thought to be 315,000 orangutans in the wild. There are now less than 1/4 of this number left: 14,600 in Sumatra, and less than 54,000 in Borneo. The main causes of their decline are cutting down trees for building and agriculture and poaching for meat and the pet industry. Because females have only three offspring in their lifetimes, orangutan populations grow very slowly, and take a long time to recover from habitat disturbance and hunting. This is why the work of organisations like the Sumatran Orangutan Society and the Orangutan Information Centre is so important.



# BEYOND THE **classroom**

## REDISCOVERING **nature**

### **An Initiative by Kalpanadham in association with Gram Vikas**

Satyabhama Majhi and her group led a nature exploration workshop that was organised at Vidya Vihar school, in the Ganjam district of Odisha. Ninety five percent of the children at the school come from tribal communities.

The idea of the workshop was to introduce children and teachers to the concept of creativity through the life forms. The screening of “Rivers and Tides”, based on the British artist, sculptor and photographer—Andy Goldsworthy’s work, created much curiosity amongst the participants about using brightly coloured flowers, icicles, leaves, mud, stones, rocks, pinecones, snow, stone, twigs, stems, roots, thorns, etc. The participants worked at five locations.

#### *The Pond*

‘The lollipop’, a spiral, which symbolizes desires, aspirations and dreams. On realization of their dreams, the fulfillment, accomplishment and happiness provides for their families and community. Amazingly all the children knew how and where to dig the earth without having to be taught!



#### *The River Stream*

After much experimentation with sand, berries and leaves the children still felt something was amiss. There were no flowers! In the heat of Odisha, it was difficult for the delicate flowers to bloom in the summer heat. ‘The Giant Stone Flower’, grown in a pot zigzags its way into a fine full bloom by the flowing river.



#### *Sasmita’s Garden*

As the group of children were interacting with the villagers in an “adivaasi” (Tribal) cluster, they met a young girl named Sasmita. Her home was painted with terracotta and cowdung paste. She told the children about her dream of having a garden with flowers and butterflies around her home. A vibrant colorful garden was created, and it will continue to thrive in the relentless summer heat!

#### *Amo Khelo Gharo, Our Play Home*

Creating play in the playground— the children found different kinds of wood for the structures. Some thick and strong, others needed to be thin and flexible. ‘The Giant Swing’, ‘The 3D sea-saw’, which moves sideways and round in a circle, and ‘Hula Hoops’. And from everything around them, a play home was created!





## Mancha, The Tree House

A mancha is a quiet rest place in the middle of the jungle. Made from dried branches and grass, decorated with origami butterflies, jute-rope-ring curtains, Mancha is a resting spot. Craftily placed tags tell us about the various species found in surrounding jungle.



## The flip side

Jim Jourdane illustrates some of the misadventures experienced by field biologists



### Ambika Kamath

A lizard that had eluded capture for weeks jumped on my head and ran down the entire length of me. I still couldn't catch it.

Jim Jourdane (fieldworkfail.com)



Manju Menon

Talabira coal mines, Odisha

*In the last two years, two laws have institutionalized monetary compensation, paid by project developers to government agencies, as the sole form of addressing project impact on landscapes. These laws routinise loss of habitats and livelihoods, and displacement on the basis of such financial compensation.*

of the FCA, as it included money to be spent for penal afforestation to be carried out to compensate for damage caused. Even though it is established that compensatory afforestation cannot be realized due to structural reasons like the unavailability of land, ecologically valuable forests continue to be diverted under the FCA and the legal clauses for a CA fund legitimize forest loss for development.

### Welfare funds from mining

The Mines and Minerals (Development and Regulation Act) 1957, amended in 2015, has enabled the creation of District Mineral Foundations (DMF) all across the country. The DMF draws its rationale from the 'resource curse' argument; regions rich in mineral wealth are left impoverished by the mining activity. The intent is to share the benefits accrued from mining with those who are affected by it. It acknowledges that gains from mining activity rarely reach the people who have lost their livelihoods and health and views the DMF as a benefit sharing mechanism to compensate the losses incurred by people, even as mining is carried out unabated.



Mining companies are to mandatorily contribute 10-30% of royalty from their projects into the DMF, to be used for the welfare of the people living in the impacted area. The DMF is now under the national level Pradhan Mantri Khanij Kshetra Kalyan Yojana (Prime Minister's Mining Area Welfare Scheme). While the state of Odisha tops the list of national DMF collections (INR 7.56 billion), Keonjhar district takes more than half of that share at INR 3.79 billion. One reason for this is because Keonjhar tops the list of six districts in Odisha with 31.28% of its area under mining activity. The Indian Bureau of Mines states that Keonjhar holds 75% of the iron ore reserves of Odisha and makes up more than 30% of the country's reserves.

It just takes a short walk into any of the 200 villages surrounding any iron or manganese mine in the district to see what mining does to landscapes: the shaved face of hills that were ones forested, the air thick with fine dust created by blasting and trucks carrying the ore; piped water trickling into pots even as the streams run dry or red with slurry. These are just common visuals which cloud the justification for the DMF. With over two decades of unresolved issues, the mining companies are seen as necessary to fill up the DMF. Many who have lost lands and livelihoods to the mining have already moved away from Keonjhar. Those who remain are left fighting for small jobs, drinking water, and the right to public spaces like roads. Is it not clear who will benefit from DMF funds used to 'improve' public facilities in a district written off to mining? Would the government consider preventing more mines and impacts when companies and state agencies can make money hand over fist through more mining?

As projects pocket approvals more easily than ever, centre and state level environmental regulators benefit from the monetization of the lawful destruction of landscapes. With so much money

at stake through compensatory mechanisms, does conservation stand a chance? It is time for conservationists to engage the government and persuade them of the dangers of monetizing the destruction of ecological landscapes.

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Kanchi Kohli and Manju Menon are researchers associated with the Centre for Policy Research (CPR)-Namati Environment Justice Program.

# An interview with HARINI NAGENDRA

Harini Nagendra is a Professor of Sustainability at Azim Premji University, Bangalore. She studies the interaction between humans and nature in cities using research methods spanning ecology and social sciences. Her book, *Nature in the City: Bengaluru in the Past, Present, and Future* which was published by Oxford University Press in 2016, derives from several years of her work on urban ecology of Bangalore.



Paromita Bathija



Every new method was prompted by how to engage with people. I found that if you have a little bit of history in the beginning of a story, it makes people interested. That started us off, but then we found that there is so much in history which explains why we do what we do in the present. So, we looked at archival work – didn't know how to access the archives, didn't know where the archives were or how to read archival material. We had to really train ourselves along the way.



*Bharti Dharapuram: What motivated your work on urban landscapes, studying the ecology of cities?*

Harini Nagendra: I moved to ecology to do something that was more meaningful. One of the big attractions for me was working on conservation challenges of direct and immediate relevance. I worked on forests in the Western Ghats for my PhD, then in Nepal, North Bengal and a number of different places. The main shift was in 2005-06 when I started looking at some of the impacts of our work, its policy relevance. I found that if you are not living in the forest it is very hard to make the policy connect. You are always doing policy relevant work but to see those results getting translated into practice is a frustrating exercise. It has worked for some people but it was really not working for me. I started thinking about being located in a place – my place being Bangalore, and a chance to do something meaningful there.

A couple of other things happened that were more personal. We were building a house in Bangalore and I started thinking about creating a new place in the peri-urban city. For instance, the very rapid land-use changes which nobody is paying attention to. When my daughter was born in 2007, I started thinking about what kind of an experience she would get growing up in the peri-urban city which is full of pollution and filth. At the same time, I became a part of this group of people working with BBMP [Bruhat Bengaluru Mahanagara Palike] to restore the Kaikondrahalli lake near our house, which was getting degraded. This work satisfied me much more in terms of policy relevance, at which point I said – let’s start looking at this city.

*BD: What were the challenges you faced while starting out – especially because your work is at an intersection of various disciplines?*

HN: When I started looking at urban ecology I thought it would be a side project, something that would help us quickly say what the changes in Bangalore are from the past to now. And then I realized that there is no baseline data, and we spent years getting baselines of various kinds. We realized that baselines in Bangalore are so driven by social context that you need a baseline for home gardens, parks, streets – each is different in nature.

Documentation is important, if we need to know what is wrong with certain changes and how to fix them, we need to know how they were in the past and why they were that way.

The inter-disciplinarity was woven into the heart of this project, because when I started, it was to do something which was a mix of research, outreach and practice. Every new method was prompted by how to engage with people. I found that if you have a little bit of history in the beginning of a story, it makes people interested. That started us off, but then we found that there is so much in history which explains why we do what we do in the present. So, we looked at archival work – didn’t know how to access the archives, didn’t know where the archives were or how to read archival material. We had to really train ourselves along the way. There have been a number of studies we have discarded because the methods weren’t quite right and we didn’t have conclusive answers.

*BD: How was the history of Bangalore shaped by ecology?*

HN: When I started looking at the oldest information we have on the city, it was from inscriptions and I started digging into these. One of the things we started seeing was how the city turns out to be two kinds of places. If you are looking at the topography of the city, there is one part to the east which is the *maidan* or the *bayalu* – grassy, rolling plains where the soil is fertile, and some people suggest it gets more rainfall. The area to the west is rocky, undulating, there are a couple of ridges around it and they call this the *malnad* area. It has granite rocks and the vegetation it supported was very thin with open thorny-scrub, dry deciduous forest with a lot of wildlife. And not much rain because reports suggest that these areas were in the rain shadow region of the Western Ghats. Early settlements started off in the *maidan* and the inscriptions tell you that they were practising a particular kind of livelihood - creating tanks and using that for irrigated agriculture of paddy, around which you would have orchards of fruits or flowers, a temple and village civilization. In the *malnad*, villages settled later and the descriptions are of a very different kind of ecology. They talk about a lot of cattle herding, wildlife attacks and cattle raid fights. It is these inscriptions that made me

really aware of the fact that the city is actually two ecologies coming together. It has disappeared from our popular imagination and knowledge at some point – people don’t see the topography except that the underlying ecology is still there. All the low lying areas that get flooded during the monsoons are basically wetlands that were built on, and if you had the drought mapping of the city I suspect many of these areas are in rocky places to the west.

*BD: In the same context, what was the importance of lakes in Bangalore’s past?*

HN: Bangalore is an unusual old city because it is distant from a large water source. And we clearly have evidence that Bangalore was a settled city and a centre of market trade a very long time ago. How did they do that in the absence of water from a large water resource? They built tanks, which we now call lakes, and inscriptions talk about clearing the jungle, scooping off the sand in the depression and basically creating a rainwater harvesting reservoir. Around that would be this system – the lake, *kalyanis* [temple tanks], very tiny pools called *kuntes* and large open wells. They were used for various purposes – irrigation, drinking, clothes and cattle washing. They were spatio-temporally variant and most of the small ones were seasonal. They would dry out in the summer and you would take the silt and use that for fields. Irrigation was an overflow system – you would open the sluice gate and the entire overflow area became your rice or sugarcane field or whatever else you grew. When the water receded you had these indigenous fish species which would flop around in the mud. When that went away, you had these greens – you would either harvest and cook them or cows would graze them. This landscape had a continuous system of some kind of ecological use.

*BD: How has Bangalore’s relationship with its lakes changed now?*

HN: You have a very different system now – there is a fence and a boundary and everything within that is lake, but the wetlands around are lost. You don’t have the wetlands which used to clean away a lot of the pollutants, sewage is coming in, there is no slew absorption, and lakes are silting up very fast. You have high levels of nitrogen and phosphorous, and

eutrophication. Which, all of this put together, means there is a complete change in the ecology and social use of lakes over time. You have sewage filled areas, even when they are clean eutrophication is a big challenge, and all you can do there is bird watching, jogging and some fishing contracts go out.

In terms of when this happened, we can really trace the shift. Bangalore had three years of successive drought in 1891-92 and they are running out of water. Arkavathy is dammed and they pump water into the city. Now the entire city gets piped water, and as soon as that happens, we see a complete decay in the way lakes, wells and *kalyanis* were treated and conserved. They now start talking of them as cesspools of sewage and the cause of malaria, plague and cholera. They drain the water because they say these are sources of flooding. They become waste space that get absorbed by the city, so you have bus stands, malls and all kinds of other things. The whole narrative around water changes completely.

*BD: What do you mean by urban commons? How can it guide nature conservation in cities?*

HN: Commons can mean two things from a definitional perspective – common pooled resources or a common property regime. In a city, it is hard to find the ‘common property regime’ type of commons because everything is owned by the municipality. What I’m talking about is ‘common pooled resources’ owned and managed by the community that serves a large proportion of people’s needs. We find a lot of biodiversity in the commons that we’ve studied – slums, sacred places, lakes, *gunduthopes* [woodlots]. All of these are commons because they are used by the community, which informally manages it in certain ways. There are rules and no one person can overharvest or degrade the place. Commons is where biodiversity survives, because people use them for a variety of things and would want to protect them. Different people want different things from them, and the idea of having diversity is valued. They [common pooled resources] also create a lot of social capital. When you have commons, you have a community and cross-talk. When you know everybody and are using this space, it is very difficult for the government to come and take it over.



# A city through the eyes of nature

We really need more studies of this kind [urban ecology] in India. Because, ecologists don't look at cities and people who study cities do not look at ecology. There is a lot of very rich urban work, but they think nature in cities doesn't really exist or it is just a by-line in their focus.

BD: Being an intimate account of nature in Bangalore, do you think your narrative resonates with people from other places?

HN: I have talked to people from a number of different cities and I did expect that let's say, a friend of my colleague working in Uganda, or Mexico would relate to it, and they have. But I didn't expect someone from London would say, "Oh, we have the same patterns here". I realize now that many of these patterns – simplification of biodiversity and ecosystem service uses, or the perception of a city as a flat space without terrain, geography and ecology – are as much a part of London today as they are of India. The processes are very similar and the challenges they face in terms of the way people think about nature are very similar.

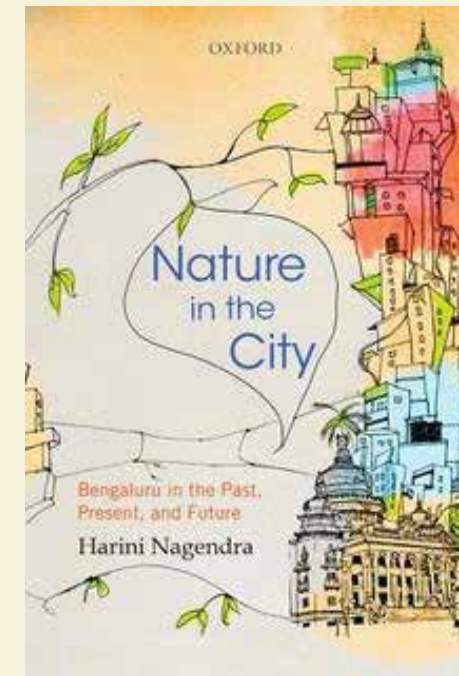
BD: Why are there so few urban ecologists? Do we not know of their work or there aren't any?

HN: They just don't exist, there are very few in India and also globally. I think it is partly the fascination for forests with ecologists, I have that too. [In my forest research] I worked in places where communities manage forests and I heard a lot of comments early on saying – "These are not real forests, so you can't be answering questions of real ecological importance here. Social sciences are soft sciences, ecology is a quantitative science and you must focus on that." When I started off, there was a lot of this coming in but I hear less and less of that now. I think people are realizing that even in the most pristine of areas, humans are there and are doing positive things.

We really need more studies of this kind [urban ecology] in India. Because, ecologists don't look at cities and people who study cities do not look at ecology. There is a lot of very rich urban work, but they think nature in cities doesn't really exist or it is just a by-line in their focus. Now we have some people working on Bangalore, Delhi, Pune, Bombay, Calcutta – larger cities, but nothing from our small cities. That's such a huge gap. The ecology of cities has to be a part of their resilience, especially under climate change.

A version of this interview has appeared in the December 2016 issue of CONNECT, the magazine of the Indian Institute of Science, Bangalore.

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*Nature in the City: Bengaluru in the Past, Present, and Future*  
by Harini Nagendra

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This year, one of Bangalore's largest citizen protests incidentally followed the publication of Harini Nagendra's book – 'Nature in the City – Bengaluru in the Past, Present and Future'. It saw thousands raising their voice against the construction of a massive steel flyover that aimed to ease traffic en route to the airport, but at the cost of several hundred trees. Such struggles to conserve nature amidst rapid urbanization exemplify the relevance of Nagendra's book today – of the need to understand nature and its immense contribution to the ecological, social and cultural fabric of a city.

Nagendra has close ties with the city she describes – she grew up here, and is now a Professor of Sustainability at Azim Premji University, Bangalore. She draws greatly from her academic research, covering the ecological history of Bangalore going back several centuries, and gives a detailed account of changes nature has undergone in its private and public spaces leading to the present. She looks at the ecology of Bangalore from various vantage points – home gardens, slums, avenues and parks, sacred places and lakes. But this is done in a very personal way, by weaving her findings with stories of people who interact with nature every day and whose reality is the changing face of this city. These multiple experiences of nature and people in Bangalore, come together to offer a picture that speaks of the city's disconnect from its underlying terrain, a shift in the role of nature in people's lives, simplification of biodiversity, and reduced access to nature.

The most compelling parts of Nagendra's book are where she talks about the city's history. There are several interesting details here – the historic recognition of Bangalore as its *malnad* (rocky region) and *maidan* (plains) parts, written records of settlements in the city from as far back as the 6th century, records of tigers and wild boars in now residential areas, or the turbulence of 17th century Bangalore when it changed hands between half a dozen dynasties. Nagendra uses history as a tool



# Rediscovering a lost hero

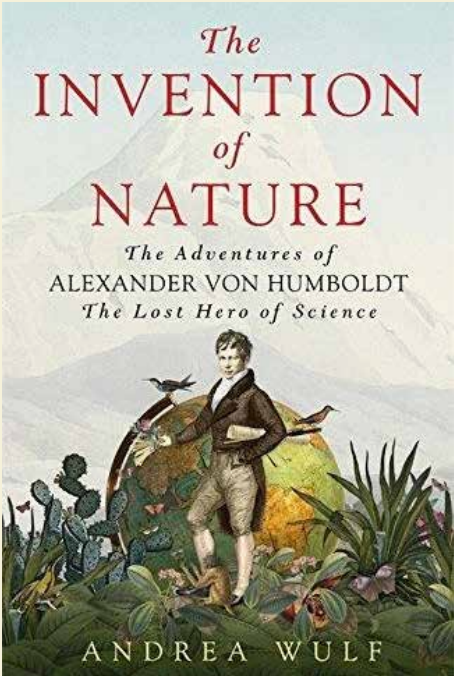
to explain ecological patterns today and the story of Bangalore’s lakes is one of her most moving narratives. Starting from a description of Agara lake from the 9th century to Col. R.H. Sankey’s construction of Sankey lake in the 1880s, she describes the centrality of lakes to the existence of Bangalore using several archival sources. She details the key events leading to their degradation, causing historic lakes such as Dharmambudhi to be converted into the city bus terminus, and Sampangi lake to be built over as Kanteerava Stadium.

Against the image of Bangalore’s past, Nagendra’s descriptions of the city’s present take new meaning. The shrinking of nature becomes apparent, not just in physical space, but also in the mental space of people who no longer directly depend on its trees and lakes. Those who do, are marginalized even further. One example is of the basket weavers on Krishna Rajendra Road in Basavanagudi, who worked in the shade of its large avenue trees for over

half a century, but were forced to move a few years ago when these trees were felled for the Bangalore Metro Rail project. Nagendra talks about people’s protests against this move, which unfortunately failed, but also many other civic protests in Bangalore’s history that were successful. Though the book makes one feel grim about the fate of nature in cities today, Nagendra is optimistic that collective action can still help make nature an integral part of cityscapes.

Nagendra’s work is a synthesis of Bangalore’s ecological history and an extensive case-study of the effects of urbanization on nature. To someone who is familiar with the city, it offers more – names and places evoke intimate images in the mind and the book speaks to the reader on a very personal level.

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Ocean currents, landscape features, towns, universities, wildlife: these are just a few of the many things named after the polymath Alexander von Humboldt, widely known and respected as the “most scientific man of his age” (to quote American president Thomas Jefferson). von Humboldt’s contributions to science were not just to particular fields of research, but also in the form of study techniques, collaborative culture, styles of thinking and communicating, and application of findings. He is also notable for making science accessible to laymen, and, in the process, inspiring art, conservation practices, and enlightened social policy. Today, von Humboldt is no longer the household name it once was. How was a man like this forgotten—and what shaped him to begin with?

Andrea Wulf seeks to answer these questions in her multi-award-winning *The Invention of Nature: The Adventures of Alexander von Humboldt, The Lost Hero of Science*. Because of von Humboldt’s central position in the global scientific community and his ability to bring together both potential collaborators and disparate topics, Wulf calls him “the hub of a spinning wheel, forever moving and connecting”. This is also a good visual for the way in which the author uses von Humboldt’s biography as a central theme from which she branches out to explore the evolution of science and society’s relationship with it.

*The Invention of Nature* is ambitious, which not only tells the story of a single interesting man, but also contextualises his intellectual contributions. Accordingly, the book sometimes feels as densely packed with information as von Humboldt’s homemade box-and-envelop filing system. For example, when discussing how von Humboldt changed science, Wulf first recounts previous research practices in detail before exploring von Humboldt’s modifications and then examining their modern manifestations. To demonstrate how von Humboldt sowed the seeds of contemporary nature writing, Wulf relates how his predecessors described their environments and then quotes both von Humboldt’s work and that of more current

*The Invention of Nature*  
by Andrea Wulf

ISBN-13: 978-1848548985

John Murray, 22 October 2015

*(winner of the 2015 Costa Biography Award and the 2016 Royal Society Science Book Prize)*



authors. And so on, for each of von Humboldt’s accomplishments—and there were many—Wulf provides both a history lesson and a comparison with contemporary culture; she even includes eight chapters with entire biographies of other great thinkers influenced by von Humboldt. Between these tangents and the repetition of some information in multiple places, the narrative thread is sometimes temporarily lost in a tangle of fact.

That said, one of the most remarkable aspects of the book is its extensive referencing of primary materials. The author cites correspondence, journals, notebooks, specimens, and multiple translations of scientific works (von Humboldt spoke and wrote in several languages); in researching the book, she even visited sites where von Humboldt conducted research. The resulting level of detail breathes life into the subjects, and, in particular, highlights the near-manic fervour that was both a gift and a curse to von Humboldt; although it spurred his prolific writing, it also ensured he was almost permanently restless. Wulf’s use of original quotations prevents *The Invention of Nature* from straying into the realm of hagiography; instead, readers can see von Humboldt as his contemporaries did: a man with genius, but also with flaws.

This multifaceted account of von Humboldt’s interdisciplinary life should appeal to a wide range of readers regardless of their age or area of expertise; his knowledge was so comprehensive, and his contributions so extensive, that there will inevitably be something here for everyone. The book also indirectly asks some profound questions for readers to contemplate long after turning the last page. For example: By pursuing increasingly

narrow specialisms, do individual scientists prevent themselves from seeing, as von Humboldt did, how many diverse pieces connect to create a whole? Might our publication and funding practices hinder the sort of widespread enlightenment that resulted from the open and generous knowledge sharing that von Humboldt fostered? If we diminish the role of subjective insights in the search for “truths”, could we prevent the creative processes that so inspired von Humboldt?

von Humboldt recognised that knowledge and power were intimately linked; he also saw that “nature, politics and society [form] a triangle of connections”.

These seem especially relevant observations in a year that has brought us Brexit, the election of Donald Trump, and a growing feeling that we live in a “post-truth” era<sup>1</sup>. In the context of these current events, Wulf’s epic story of a “largely forgotten” man whose “knowledge had bridged a vast range of subjects” including “art, history, poetry and politics alongside hard data” is infused with new meaning. It encourages the reader to value facts and to expend the energy necessary to verify them; it emphasises the dangers of elevating the worth of money over that of nature and of human rights; it celebrates the potential of art and nature to inspire and also to communicate. In short, it serves as an advocate for reason, initiative, pragmatism, and perseverance. We might do well to heed Wulf’s advice that we reinstate him as our hero.

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<sup>1</sup> <https://en.oxforddictionaries.com/word-of-the-year/word-of-the-year-2016>

# Current Conservation: Feedback Form

We’d like to hear from you! Please take some time to answer the following questions as this would help us greatly in improving your reading experience, and help us get support for the magazine.

The form is in two parts: the first part deals with the newly introduced CC Kids while the second part deals with the older sections of the magazine. Please fill out one section or both, as appropriate. You could either fill out the form and mail it to us at the address on the last page of the form or fill our online version at this link: <https://goo.gl/forms/uvfqpbuq2zLTGJz1>

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How long have you been receiving Current Conservation?

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a. Research in Translation    b. Feature    c. CC Kids    d. Interview    e. Book Review    f. Other

## Part 1: CC Kids

1. The language used in CC Kids is :

a. Very Difficult (I can’t understand anything)

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c. Easy ( I can understand most of the article but for few terms/parts which are too complicated in language and expression)

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e. Other

2. What do you like the most about CC Kids?

a. Illustrations

b. Easy language/quality of writing

c. The good mix of art and science

d. Relevance of articles to real-time/current environmental issues

e. I do not like anything about CC Kids

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3. What section of CC Kids do you like the most?

a. Poem

b. Species Profile

c. Column

d. Story-telling

e. Research in Translation

f. Other (Please explain)

4. What do you think we could do better to improve your CC Kids reading experience?



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2. Do you find the articles relevant to real time conservation/environmental issues?
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a. Illustrations

b. Easy language/quality of writing

c. The good mix of art and science

d. Relevance of articles to real-time/current environmental issues

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f. Other (Please explain)
4. So far, what has been your most favourite article in Current Conservation?
5. What do you think we could do better to improve your reading experience?
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