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WORLD WETLANDS DAY CELEBRATED AT SULTANPUR NATIONAL PARK

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav on World Wetlands Day 2022 stated that the government under the leadership of Prime Minister Shri Narendra Modi is taking affirmative action, involving communities and citizens, in halting and reversing wetlands degradation and loss.



The Union Environment Minister was speaking at the national level celebration of World Wetlands day 2022 held today at Sultanpur National Park, a Ramsar site of Haryana. The function was presided over by Sh. Manohar Lal, Chief Minister of Haryana. Union Minister of State for Environment, Forest and Climate Change, Sh. Ashwini Kumar Choubey and Forest Minister of Haryana, Sh. Kanwar Pal were also present.

Two new Ramsar sites (Wetlands of International Importance), Khijadia Wildlife Sanctuary in Gujarat and Bakhira Wildlife Sanctuary in U.P were also announced on the occasion by Shri Yadav.

India has established the largest network of Ramsar Sites in South Asia.

Happy to inform that two more wetlands, Khijadiya Wildlife Sanctuary in Gujarat and Bakhira Wildlife Sanctuary in UP have been added to this prestigious list.

Our tally now stands at 49. pic.twitter.com/RL6BvjtTNB

India now has a network of 49 Ramsar sites covering an area of 10,93,636 hectares, the highest in South Asia. Bakhira Wildlife Sanctuary in UP provides a safe wintering and staging ground for a large number of species of the Central Asian Flyway while Khijadia Wildlife Sanctuary is a coastal wetland with rich avifaunal diversity providing a safe habitat to endangered and vulnerable species.

As a part of India's commitment towards conservation, restoration and management of India's wetlands, Shri Bhupender Yadav administered the wetlands pledge to the wetland mitras and everyone present to protect and conserve our wetlands. Dignitaries also participated in ceremonial plantation and visited exhibition area and Interpretation Centre.



On the occasion, "National Wetland Decadal Change Atlas" prepared by the Space Applications Centre (SAC), Ahmedabad was also released highlighting the changes which have happened in Wetlands across the country in the past decade. The original Atlas was released by SAC in 2011 and has over the years been used extensively by all the State Governments also in their planning processes. The change Atlas is available on the wetlands of India portal <https://indianwetlands.in/resources-and-e-learning/library/> website.

A National Wetland Decadal Change Atlas prepared by the Space Applications Centre was released today highlighting the changes which have happened in wetlands across the country over the past decade. [#WorldWetlandsDay2022 pic.twitter.com/Z3W20gAWLv](https://twitter.com/Z3W20gAWLv)

Expressing happiness that Haryana has last year only received International Ramsar tag for two of its sites, Chief Minister of Haryana exhorted all to conserve the wetlands and nature in general and also emphasized the importance of balancing development and Ecology.

Terming the functions of Wetlands equivalent to the function played by Kidney in human body, Minister of State, spoke at length on the benefits and necessity of conserving the Wetlands of the country.

World Wetlands Day is observed every year on February 2nd all over the world. It is celebrated to raise global awareness about the vital role of wetlands for people and our planet. This day also marks the date of the adoption of the Convention on Wetlands on February 2, 1971, in the Iranian city of Ramsar. This year's theme of World Wetlands Day is "Wetlands Action for People and Nature", which highlights the importance of actions to ensure the conservation and sustainable use of wetlands for humans and planetary health.

HRK

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VILLAGERS RESIST SANCTUARY TAG FOR LANGUR HABITAT

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Golden Langur

Neighbours of a golden langur habitat in western Assam's Bongaigaon district have opposed a move by the State government to upgrade it to a wildlife sanctuary.

Kakoijana Reserve Forest is one of the better-known homes of the golden langur (*Trachypithecus geei*) found only in Assam and Bhutan and a Schedule-I species under the Wildlife Protection Act of 1972. It is listed as among the world's 25 most endangered primates.

The Assam Forest Department had in January issued a preliminary notification for converting the 19.85 sq. km. patch of forest into the Kakoijana Bamuni Hill Wildlife Sanctuary.

Sustainable conversion

In a memorandum to Bongaigaon Deputy Commissioner M.S. Lakshmi Priya, the villagers of Bogoriguri Rabhapara said they have been protecting and conserving the flora and fauna of Kakoijana Reserve Forest for more than 25 years.

The memorandum submitted on February 2 was on behalf of 34 villages around Kakoijana inhabited by the Koch-Rajbongshi, Boro, Garo, Rabha and Gorkha communities. As primary stakeholders, the villagers demanded that the "conventional idea of wildlife sanctuary" be dropped and the reserve forest converted into a community forest resource "using Forest Rights Act, 2006, to ensure community co-managed system of participation for sustainable conservation".

"We consider some of the areas inside the forest as sacred and its sanctity should be maintained. The joint forest management committee in the surrounding villages are doing a good job in protecting the forest and have an intricate relation with the forest," the memorandum said.

Efforts of conservation

The villagers pointed out that the conservation efforts of the locals had helped the authorities concerned to restore the forest canopy from less than 5% to more than 70%.

This in turn helped increase the golden langur population from less than 100 to more than 600 over almost three decades.

Ms. Lakshmi Priya, down with COVID-19, said an update can be provided after the issue is studied.

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ICELAND TO END WHALING AS DEMAND DWINDLES

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Iceland, one of the only countries that still hunts whales commercially, said on Friday it will end the practice from 2024 as demand for whale meat dwindles. Demand for whale meat has decreased dramatically since Japan — Iceland's main market, especially for fin whale meat — returned to commercial whaling in 2019 after a three-decade hiatus. The extension of a no-fishing coastal zone has also made whale hunt more costly.AFP

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SARISKA WEARS THE STRIPES OF SUCCESS

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Toil for conservation: A tigress with her cub drinking water at a pond in the Sariska Tiger Reserve. Special arrangement

The measures for habitat management for tigers launched about six months ago at the famous Sariska Tiger Reserve in Rajasthan's Alwar district have started bearing fruit. The tiger population in the wildlife sanctuary has gone up to 25, while the resources are being provided to create water holes and develop grasslands for ungulates as a prey base.

New tourist route

The forest administration has opened a new route in the tiger reserve's buffer zone, adjacent to Alwar town, for tourists to facilitate better sightings of the big cats. The new Bara-Liwari route, located in the region where a tigress gave birth to two cubs recently, will reduce pressure on the core area and increase livelihood opportunities for the rural population.

A foundation established by a private bank has started delivering goods and resources which the Forest Department could not arrange because of a variety of handicaps. As part of its corporate social responsibility expenditure, the foundation is funding development of grasslands, earthen bunds and water holes for wild animals at 10 different locations and making livelihood intervention for the villagers being relocated from the sanctuary.

The tiger reserve, spread across 1,216 sq. km, witnessed the first-of-its-kind tiger relocation from the Ranthambore National Park by helicopter in 2008 after the felines became extinct in the sanctuary. Since then, the animal has taken some time in multiplying at its own ease, unlike the Panna tiger reserve in Madhya Pradesh, where a similar aerial translocation was carried out in 2009.

Aid for guards

The foundation has distributed 23 motorcycles with helmets to the forest guards in Sariska for monitoring the tiger movement with the pledge that one new motorcycle per new tiger will be given in the future.

Tourism & Wildlife Society of India (TWSI) honorary secretary Harsh Vardhan, who has been visiting Sariska for the last four decades, told *The Hindu* that the forest was now depicting an appropriate balance between the prey and predator.

The grassland habitats developed in dry patches of land have helped ungulates to feed better and breed in the areas such as Naya Pani, Dabli and Bhagani, leading to an enhanced feed for tigers.

The forest administration, assisted by the foundation, has created new water sources at 10 diverse habitats within the forest, where solar pump-based tube wells were being sunk. This will facilitate the supply of water to far-off areas, even in the elevated zones without any diesel pump noise as faced in the past.

Sariska Tiger Reserve's Field Director R.N. Meena said three more zones in the core area would be opened for tourists in the near future. Re-routing has been done for the visitors'

vehicles so as to occasionally remain off-beat and cover inner forest regimes to gain better sightings of tigers.

Amid the efforts being made for relocation of villages, about 1,000 families are still staying in the forest area, with some of them residing within the core area of 881 sq. km, such as in Madhopur, Indala, Kundalka and Haripura.

According to the forest officials, the rehabilitated villagers' needs, including the *khatedari* rights on the land allotted to them, have been met on priority to act as a catalyst for the remaining villages to be shifted out of the reserve areas.

'Immense potential'

Mr. Vardhan affirmed that all issues of the wild species in Sariska would become easier to tackle if the ecology of the forest was understood and action taken accordingly. Being the nearest Project Tiger reserve to the national capital, Sariska holds an immense potential for ecotourism with its rich wildlife and beautiful mountains, streams and lakes, as it is flourishing again with tigers.

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NEW GECKO SPECIES RECORDED IN ATTAPPADY

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

New gecko species *Hemidactylus easai* recorded in Attappady Hills in Western Ghats | Photo Credit: [Sandeep Das](#)

A team of researchers has identified a new gecko species from the hills of Attappady, in the Western Ghats, Kerala. The new large species of gecko belonging to the genus *Hemidactylus goldfuss* was found close to human habitation — in tribal settlements and rock formations in the region. The team was on an expedition surveying amphibian reptiles in the forest areas of Attappady.

The new species, named *Hemidactylus easai* after former director of the Kerala Forest and Research Institute (KFRI) and wildlife conservationist PS Easa, was found in the drier parts of the region.

The gecko measures 105 mm from snout to vent (10.5 cm) and is a light brown to grey in colour. The genus *Hemidactylus goldfuss* has 180 species of geckos distributed across the globe and India has 48. Kerala has over 30 species of gecko and with this new addition, there are nine under the *Hemidactylus* genus.

The team first spotted the *Hemidactylus easai* in June 2020. This was followed by months of study, which involved analysing the morphology, habitat, geography and molecular aspects. The team submitted a report of its findings to *Vertebrate Zoology*, a scientific journal published by the Museum of Zoology, Dresden, Germany, in October, 2021. The report was published in February 2022.

The team led by herpetologists Sandeep Das and Surya Narayanan included Jafer Palot, Deepak V, Saunak Pal and Siddharth S. The study was supported by National Geographic grant and the Zoological Society of London.

“Geckos don’t pose a threat to human habitation and they play an important role in controlling the insect population. Though their relevance to humans may seem negligible, it is still significant,” says Sandeep, who is also a research scholar at the KFRI. “The forests of Attappady hold huge potential for those interested in the scientific study of reptiles and amphibians,” he adds.

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A video explainer on the large variations in the country's monsoon cycle and how it is related to global warming.

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CONSERVING THE WETLANDS OF ANDHRA PRADESH

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

In a first attempt to map the wetlands of Andhra Pradesh, the Forest Department has identified 26 new wetlands and collaborated with WWF - India to prepare documents and wetland health cards.

The project was initiated in 2019-20 with an aim to notify the water bodies officially as wetlands, which provides legal protection under the Wetland Protection Rules, 2017. The findings brought to light many significant issues. “Most wetlands had similar issues — siltation, changes in drainage pattern — inflows and outflows, encroachment and spread of invasive alien species,” says Farida Tampal, State Director, WWF - India.

During the survey, many species of birds, especially aquatic, were noted. “Ibis, pelican, duck, coot and cormorant, pheasant tailed jacana and bronze-winged jacana, sandpiper and sand plover were spotted in the wetlands. The notable ones are the great knot and Indian skimmer that have been noticed in wetlands around Kakinada but have faced threats of development, wiping out their foraging grounds. Many mangrove associated plant species are also found in marine wetlands like Coringa, Krishna,” says Farida.

The project also surveyed lesser known wetlands like Perali Porugu near Guntur, which had good biodiversity. “In Visakhapatnam there are many wetlands that have dried up. It is imperative to safeguard the ones that are left,” says Divisional Forest Officer Ananth Shankar. He adds, “One of the main wetlands here is Kondakarla Ava. It is unique for its location as well as the biodiversity it hosts.” The freshwater wetland is host to over 150 species of birds and has a rich biodiversity with a range of fish, aquatic, animal and plant species. “Identifying and notifying wetlands is one way to safeguard wetlands. To keep the natural characteristics intact, the inflow and outflow channels of water need to be cleared, water levels should be monitored, suitable endemic species need to be introduced and bio-remediation of water (a process used to treat water, soil) needs to be initiated,” says Ananth.

The wetlands of Andhra Pradesh are also home to some species listed as ‘threatened’ in the IUCN Red List. The Eastern Ghats Wildlife Society (EGWS), an organisation working towards wildlife conservation in the region, documented the presence of smooth-coated otters from the wetlands of Krishna River Delta in Krishna and Guntur districts back in 2016. “Incidentally, we have also documented signs of smooth-coated otters from the wetlands of Visakhapatnam and East-Godavari districts in the recent years. There are negative interactions between otter and fishing communities due to snatching of fish catch and damage of fishing gear by otters leading to economic loss,” says Murthy Kantimahanti, founder of EGWS.

Smaller animal communities like invertebrates, fish and amphibians are indicators of ecosystem health. Healthy populations of these animals indicate the overall health of the wetland. “Higher mammals like smooth-coated otters depend on this prey base for their survival. There are also species such as the fishing cat which is strongly associated with wetlands. Especially adapted to surviving in the wetlands, they are often used as an ‘ambassador’ for conservation,” Murthy adds.

Currently, these habitats are heavily fragmented and degraded due to anthropogenic activities like sand mining, agricultural intensification, aquaculture ponds, overgrazing, deforestation, poaching and unsustainable fishing practices. “There are also increasing instances of human-wildlife conflicts that need conservation interventions. Engaging local communities to safeguard

these precious habitats, recognition of these areas for conservation, legal protection and regulation of human activities is critical for conservation of such unprotected and heavily exploited wetland habitats,” says Murthy. The Ramsar Convention definition for wetlands includes marshes, floodplains, rivers and lakes, mangroves, coral reefs and other marine areas no deeper than six metres at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs. “Unfortunately, wetlands are still regarded as wastelands in many of these areas and their significance is largely ignored,” Murthy adds.

Wetlands in Andhra Pradesh host several resident and migratory birds like black-bellied tern, spot-billed pelican, Asian open bills, Pallas’ fish eagle, Indian river tern, green shank and Eurasian curlew. Deccan mahseer is an endangered fish species inhabiting the Sileru river basin of the North Eastern Ghats.

Big or small, they play a critical role in temperature regulation and ground water recharge. “Governments spend huge amounts for supplying water to homes. Today, rivers are being tapped to bring water to the city. We ignore the fact that if the water bodies are protected, they will help in recharging our groundwater table. It requires huge infrastructure to bring river water to our houses. Heat island effects are well known in built-up areas, especially in the urban and semi-urban areas. Water bodies help regulate heat and are therefore critical to be protected,” explains Farida.

Experts say that each notified wetland can have a multi-stakeholder committee to maintain and monitor the wetland. “The committee should be inter-departmental, have wetland experts, political representatives as well as local people,” states Farida, adding “Unless the immediate communities are made equal stakeholders and not alienated from using the water bodies, protection will never be achieved.”

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A video explainer on the large variations in the country's monsoon cycle and how it is related to global warming.

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SAMSUNG TO USE RECYCLED OCEAN PLASTICS IN ITS DEVICES

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Discarded fishing nets. | Picture by special arrangement.

Samsung has announced that its upcoming Galaxy devices, which are slated to be launched this week, will be made partly with recycled fishing nets. Its entire product line-up would also incorporate repurposed ocean plastics going forward, it confirmed.

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The South Korea-based company said it has developed a new material made with repurposed ocean-bound discarded fishing nets that would otherwise become dangerous waste.

Also Read | [IISc researchers find a way to substitute for single-use plastics](#)

The move that gives ocean plastics new life is part of the company's ongoing effort to eliminate single-use plastics and expand the use of other eco-conscious materials, the tech giant noted. "Repurposing ocean-bound plastics is just the first step in our collective mission to address the climate crisis," it added.

According to the company, [about 6,40,000 tons of fishing nets](#) that are a "hidden threat" to the environment, are abandoned and discarded every year.

"Lingering in our oceans for centuries, these 'ghost nets' are responsible for trapping and entangling marine life, damaging coral reefs and natural habitats and even ending up in our food and water sources," Samsung explained.

Using recycled ocean plastics in electronic devices is something that other companies have also considered. Last year, [Microsoft had announced an Ocean Plastic Mouse](#) for its surface devices. The mouse was created using a resin made of 20% recycled ocean plastic recovered or washed ashore from oceans and waterways.

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Amazon says its new wireless buds are 20% smaller, and are optimised for an increased fidelity in bass and treble to reduce distortion during media playback.

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IS INDIA'S FOREST COVER REALLY INCREASING? OFFICIAL MAPS DON'T TELL YOU THE WHOLE TRUTH

Relevant for: Environment | Topic: Environmental Degradation - GHGs, Ozone Depletion and Climate Change

Over time, the definition of 'forest' has been changed to include tea estates like this one, coconut plantations and more. | Photo Credit: [Getty Images/iStockphoto](#)

It is not long after dawn, but the air in the Borajan rainforest in upper Assam is already warm and heavy with humidity. On a fig tree by the dirt track cutting through the forest, a pair of oriental pied hornbills hop heavily from branch to branch, searching for ripe fruit. From the boughs above them comes the *be-quick* call of a fairy bluebird. Then, the chorus begins.

What starts as a couple of hesitant, mellow coos, erupts into an exuberant crescendo of shrill, rising hoots, shrieks and yowls. The arboreal orchestra reverberates through the forest for a full 20 minutes. Yet, these powerful vocalists — a family of hoolock gibbons, India's only ape and a gravely endangered primate — are surprisingly bashful and hard to sight. When they finally reveal themselves, the chorus is over, and the family is perched quietly on a shamkathal tree. With one hand on her clinging infant, another holding on to a branch above, the brown-furred mother sits still, with an almost wistful look in her eyes, as she gazes into the distance.

If you follow her gaze, you'd see the forest canopy thin out rapidly, and the undergrowth become a thick, disorderly tumble for a 100 or so metres, then open out into a vast, manicured area of waist-high tea bushes. It is a green expanse, with a tree here and there, but neither the scattered trees nor the tea is gibbon territory. Her performing stage, the home of her family — and indeed, her entire world — is in the dense canopy of rainforest trees, strung with lianas, full of flowers buzzing with myriad insects, and laden with fruit over which birds, squirrels, and monkeys squabble. And that world ends with the forest where she sits, beyond which an unliveable green expanse opens out.

Going extinct

In 15 years, the Borajan rainforest patch has lost over two-thirds of its gibbons. The remaining gibbons that can neither live in nor move through the surrounding tea plantations are isolated. In the nearby forests of Bherjan and Podumoni, which together make up a sanctuary, the gibbon has already gone extinct. Other primates, such as macaques and capped langurs, too have declined or disappeared.

Had the mother gibbon in Borajan not been reading her landscape as every gibbon learns to do, but instead consulted India's official maps of forest cover, she would have discovered that, according to the authorities, her forest, in fact, did not end at all. It stretched beyond the rainforest, well into the tea. Even as India's official reports have been claiming every two years that the country's forest cover is going up and up, the same reports have also been lumping natural forests and commercial plantations as 'forest', a decision defended recently even by the environment Minister.

To understand the sleight of hand, one needs to understand how forest cover is being defined and recorded, and why, if not done right, headlines claiming 'forest cover up' may, in reality, imply a forest cover-up.

Since 1987, the Forest Survey of India has put out India State of Forest Reports (ISFRs) every two years. The broad intent of these reports has been to track the wealth and health of our forests. In its first decade, the ISFRs reported a decline of some 7,400 sq.km. Thereafter, the forest cover of India, as reported in the ISFRs, has increased by an eye-popping 80,000 sq.km. Yet, for ecologists in the field, and for communities on the ground, this official narrative of steadily increasing forest cover has been remarkably hard to validate. So, what is *actually* going on?

Starting in 2001, the ISFRs made some big changes to the way they classified and counted pixels in a satellite image as forest. They began using finer-scaled satellite imagery and an entirely digital workflow to analyse them. In addition, the ISFRs also changed their definition of a forest. They now explicitly included *any* lands of at least one hectare area and with 10% or more tree cover, regardless of the tree species on the land, or the purpose for which it was grown, or its ownership, as forest. So, all of a sudden, tea estates, coconut plantations, mango orchards, homestead gardens of suburban housing developments, and even tree-lined avenues in densely built-up cities were being classified as 'forest'. In one stroke, just between the 1999 and the 2001, this redefinition helped raise India's forest cover by over 38,000 sq.km., the size of Kerala.

Gardens and boulevards

To be clear, there is no harm in mapping and counting tree-covered areas such as plantations, estates, orchards, farms, gardens, and boulevards created through human activity. But what is pernicious is that the ISFRs lump them into the same category as natural forests, whose ecological, economic, and cultural values are incomparably greater and more diverse.

Converting any natural habitat into a human-managed land-use area has huge consequences for the land, the kinds of livelihoods it can sustain, and for the lifeforms that can survive in it.

Scientific studies have shown that monocultures, such as of eucalyptus or acacia wattles, have a pronounced hydrological impact. Compared to forests or other natural vegetation such as grasslands, such plantations deplete groundwater, have higher surface water runoff, poorer infiltration, and allow only shorter duration dry season flows in nearby streams. Recent studies from the Nilgiris by researchers from ATREE, Bengaluru, and FERAL, Pondicherry, also indicate that plantations can expose catchments to higher risk of floods during extreme rainfall events.

Plantations are also poorer than forests in carbon sequestration, a key ecosystem function essential to tackling the climate crisis. In the Western Ghats, scientists report that carbon stocks in plantations such as teak and eucalyptus are 30% to 50% lower than in natural evergreen forests. Even where carbon stocks in plantations match some forests such as deciduous forests, they are still less stable and resilient than those of natural forests, especially in drought years. India's ambitious goals under the Bonn Convention and UNFCCC to absorb 2.5 to 3 billion tonnes of carbon dioxide from the atmosphere would be far better served by protection and restoration of natural forests than through tree plantations.

Natural produce

Natural forests are also important livelihood and cultural spaces for millions of forest-dependent people. Tree plantations, in contrast, tend to erode such cultures and livelihoods. In central and eastern India, tribal communities dependent on a wide range of produce from natural forests (such as tendu leaves, mahua flowers, fruits, firewood, and medicines) have had their access to these resources curtailed or denied when the areas were converted to 'compensatory afforestation' plantations. A teak plantation is simply no match for a diverse natural forest in the

range of resources it provides local people.

The loss and fragmentation of natural forests can also lead to severe economic losses and elevate public health risks. Extensive deforestation in Sonitpur, Assam between 1997 and 2005 led to huge increases in crop losses, deaths of both elephants and humans in conflicts, and an eight-fold increase in malaria in the deforested regions. Mapping such landscape transformation accurately is vital for conservation planning. But sadly, this is easily overlooked when we make poor maps of forest cover that do not distinguish natural forests from highly-modified landscapes merely because the latter meet ISFR's minimum criteria of 10% tree cover across a hectare to qualify as a 'forest'.

A third aspect, one that the Borajan gibbons know with every fibre of their being, is amply evidenced by research from around the world. For biodiversity, especially for endemic and forest-dependent species such as gibbons, plantations support far fewer species than forests. Studies from many parts of India have shown that monoculture plantations of various kinds — oil palm, teak, eucalyptus, pine, and others — have fewer plant and animal species compared to the natural forests in their respective regions. In Mizoram, for instance, oil palm plantations have only about one-seventh the number of bird species compared to the natural evergreen forests here. Most of the species that manage to survive in plantations are plants and animals of disturbed, open habitats — such as common tailorbirds — that replace native species that include many rare ones and endemics, such as understory flycatchers and trogons. Similar differences exist between forests and other human-modified tree-covered habitats such as urban parks, campuses, and home-gardens.

Mapping changes

It is not that plantations or urban parks do not have any value for biodiversity. Tea plantations may never be able to support species like gibbons, because the habitat is too altered and the resources such as fruits that the gibbons need are simply not there. But some plantations, such as coffee plantations established under native shade trees in the Western Ghats, may support animals including lion-tailed macaques, an endemic and endangered primate, when such plantations adjoin the wet evergreen forests that are the natural habitat of the species. Forest birds including minivets and tree-dwellers such as giant squirrels may also survive in such plantations, but at lower numbers and only when they adjoin natural forests. Agro-forestry plantations may serve as a kind of buffer habitat in the countryside landscape just as urban parks provide welcome greenery in a city, but neither can become a replacement for natural forests.

So, for all these reasons, if India's overall increase in forest cover is due to an increase in plantations, while natural forests are declining, it will have serious negative impacts on ecology and economy, climate and biodiversity. This is why it is essential to tease them apart and map changes in plantations and natural forests separately.

Going forward, it is vital that we understand the huge differences between natural forests and other tree-covered landscapes created by humans. The FAO's Global Forest Resources Assessment 2020 reports that since 1990, India's naturally regenerating forests increased only marginally by 6,700 sq.km. while, over the same period, plantations increased by 75,500 sq.km. About 92% of India's so-called 'forest cover increase' between 1990 and 2020 has thus been via plantations.

It is critical that the ISFRs start tracking the well-being of our natural forests separately from

other 'green' areas that humans are continuing to create by destroying natural habitats. Failing to do so means that we could be presiding over the loss of our natural forests and hastening the impact of climate change even as we mistakenly cheer the increase in various forms of commercial tree cover as gains in forest cover.

Natural forests are not merely the volume and variety of trees they contain. They are an entire magical world unto themselves, a vast web of complex relationships between countless lifeforms, holding incomparably greater ecological value and offering vastly greater economic and cultural benefits than the densest plantation, the most bounteous orchard, or the prettiest tree-lined boulevard.

But what we choose to call a forest must also make sense to that mother gibbon in Borajan, swinging and singing in her rainforest canopy, and to countless other creatures like her for whom the forest is home.

The authors are ecologists.

[Our code of editorial values](#)

Exercise in view of increasing man-animal conflicts due to rapid infrastructure development

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UNION MINISTER DR JITENDRA SINGH SAYS, UDHAMPUR'S RIVER DEVIKA PROJECT WILL BE COMPLETED BY JUNE THIS YEAR

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Union Minister Dr Jitendra Singh said here today that the historic River Devika project, built at the cost of over Rs 190 crore, will be complete by June this year. North India's first river rejuvenation project will offer a unique destination both for pilgrim tourists as well as recreation tourists, in addition to being a state-of-the-art cremation centre, he said. This will bring Udhampur prominently on India's map, he added.

Comparing it with the pioneer "NamamiGange" project of the Central Government, Dr Jitendra Singh thanked Prime Minister Narendra Modi for sanctioning the Devika project, which was formally launched by Modi during his visit to Jammu in early 2019. He said, it is now the responsibility of all of us to accomplish this project by June this year at any cost.



The project includes the construction of three sewage treatment plants of 8 MLD, 4 MLD and 1.6 MLD capacity, sewerage network of 129.27 km, development of two cremation ghats, protection fencing and landscaping, small hydropower plants and three solar power plants. On completion of the project, the rivers will see reduction in pollution and improvement in water quality.

Later, speaking to media after presiding over the DISHA meeting, Dr Jitendra Singh said that the country's first Highway Village being constructed by NHAI is coming up on fast track on Udhampur National Highway and the Centrally funded Medical College will start its classes next year through NEET selection.

Udhampur-Kathua-Doda is possibly the only Lok Sabha constituency in the country which got three centrally funded Medical Colleges in Udhampur, Kathua and Doda respectively with the efforts of Dr Jitendra Singh as its MP.

To review the physical/Financial achievements of the programme/schemes being implemented in the District Udhampur covered under DISHA, Dr Jitendra Singh chaired a District Development Coordination & Monitoring Committee Meeting (DISHA) at Conference Hall DC Office Complex Udhampur.

DDC Chairperson, Udampur Lal Chand, DDC Vice Chairperson, Juhi Manhas, Pathania, Deputy Commissioner, Udampur Indu Kanwal Chib, SSP, Vinod Kumar, BDCs, President MC, Dr Jogeshwar Gupta, MC Ramnagar, MC Chenani, DDCs and other nominated members of DISHA Committee i. e. PRIs, Women, representatives of ST, SC, NGO besides District/Sectoral Officers of different departments attended the meeting on the occasion.



Threadbare discussions were held on various schemes being implemented in different sectors of the District like Mahatma Gandhi National Rural Employment Guarantee Scheme, NRLM, Pradhan Mantri Gram Sadak Yojana, National Social Assistance Programme, Pradhan Mantri Gram Awaas Yojana, Swachh Bharat Mission (SBM) Pradhan Mantri Krishi Sanchaye Yojana, Pradhan Mantri Fasal Bima Yojana, PMKSY, Soil Health Card, Pradhan Mantri Awas Yojana Urban (PMAYU), Pradhan Mantri Gramin Awaas Yojana (PMAYG), 14th FC, MGNREGA, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana, Status of Chenani –Sudhmahadev (NH-244), Status of Medical College, Status of Degree Colleges, PWD, Financial status under CSS (District Capex budget 2021-22), PMGSY, PM Kisan Samman Nidhi Yojana, Distribution of soil health cards, Pradhan Mantri Fasal Bima Yojana, PMKSY, Status of ongoing projects, DILRMP, PMMVY, Poshan Abhiyan, Education, FCS&CA, Network Problems, Beautification of National Highways and Tunnel, PMGSY/CRF Roads, National Highways & Local Employment, Jal Jeevan Mission, Scaling up of New initiatives, Proper Supply of Electricity, etc discussed in detail.

At outset, Deputy Commissioner Udampur Indu Kanwal Chib extended a warm welcome to Dr Jitendra Singh and gave a sector wise detailed powerpoint presentation of the physical/financial progress achieved during the year 2021-22 under various flagship programmes/schemes incorporated under DISHA being implemented in the District, besides mega projects.

Dr Jitendra Singh took extensive review of all schemes undertaken by different departments in the district. District heads of various departments apprised the Union Minister about the status of different schemes taken up and their status as on date. The Minister directed the concerned departments to mobilize their men and machinery for effective implementation of all schemes and coverage of 100% eligible beneficiaries under all schemes and no eligible beneficiary to be left out. The Hon'ble MoS directed all the officers to work in coordination for better results at the grass root level. He further directed the officers to remain in touch with the people, pay regular visits and organize camps in all the remote and far-flung areas so that the people are made aware about the benefits of these schemes.

Dr Jitendra Singh informed that Pradhan Mantri Jan Arogya Yojana (PM-JAY) "SEHAT" is the

largest health insurance scheme which aims at providing a health cover of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization across public and private empanelled hospitals in India. The Hon'ble Union Minister directed the concerned department to expedite the process in the District so that all the eligible beneficiaries can avail the benefits of this scheme. While reviewing the progress of Devika project, Chief Engineer UEED, apprised the Union Minister that package-1 DevikaGhat development work stands completed and handed over to concerned authorities. It was directed that DDC shall conduct regular meetings with all concerned including Councilors/ President MC, Udhampurexpeditethe works on package so that it can be completed within the time frame.

While reviewing Pradhan Mantri AwasYojana (PMAY), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 14th FC, SBM-G, Dr Singh asked concerned officers to ensure all the works taken up are completed within time frame. The Union Minister directed all the concerned departments to ensure 100% coverage of all eligible beneficiaries and golden cards for the whole population in the district.

During the meeting, it was desired that Jal Jeevan Mission shall be implemented in Mission Mode for 100% piped water connection to the public. The Jal Shakti Department Udhampurwas directed to expedite the tendering process. The Hon'ble Chairman issued directions regarding smooth and proper supply of electricity in far flung areas of Mounгри, Panchari and Upper reaches of Basantgarh as demanded by various BDCs Chairpersons. In this regard, PDD Deptt. /District Administration to explore funding provision for improving/ augmenting the Power Scenario by filling the infrastructure gap. It was decided that proposal for Foot over Bridge at Tikri and Jakhani on National Highway be submitted to the National Highway Authorities for early construction of the same as demanded by the BDCs Chairpersons and President Municipal Council, Udhampur.

It was decided that the National Highways viz. NH-44 and NH- 244 should be beautified by developing viewpoints, green areas, parks, raising monuments enroute to these important Highways and Tunnels as per feasibility. The Chairman issued directions to the PMGSY and PWD while identifying the new roads projects under PMGSY network the same shall be vetted by the Members of PRIs and the CRF roads by the BDCs and DDCs. Further, officers of PMGSY and PWD were instructed to ensure quality work in all the projects and if the quality is not upto the mark, then the elected members of PRIs and ULBs shall bring the same into the notice of Deputy Commissioner.

DDC Chairperson, Lal Chand, Vice Chairperson, BDCs and PRIs appreciated the efforts made by District Administration for effective implementation of various centrally sponsored schemes in the district on ground. They projected several demands before the Chairman for consideration. The Hon'ble Chairman gave a patient hearing to their demands and directed the District Administration to take appropriate action to ensure that the genuine demands are projected and fulfilled well in time.

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DABUR INDIA TURNS PLASTIC WASTE NEUTRAL

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

New Delhi: Packaged goods company Dabur India Ltd., has become a plastic waste neutral company after having collected, processed and recycled around 27,000 metric ton of post-consumer plastic waste in the current financial year.

"With this, Dabur has become the first Indian consumer goods company to achieve this landmark. Today, Dabur collects, processes and recycles the same amount of plastic waste that Dabur sells in its product packaging in a year, thereby becoming a 'Plastic Waste Neutral' enterprise," the maker of Real juices and Vatika shampoo said.

The company has worked towards collecting all types of plastic waste, from PET and HDPE bottles, PP caps and labels to multi-layered plastics and beverage cartons, the company's executive director of operations, Shahrukh A. Khan, said.

Dabur had set the target of collecting, processing and recycling over 22,000 metric ton of post-consumer plastic waste from across India in the current fiscal year.

Dabur surpassed the target three months ahead of schedule, Khan said.

"We work with government-registered recycling partners across the country and have taken progressive actions to reduce plastic waste in cities, town, villages, while also raising awareness about plastic waste management within the community. The collected plastic waste is being sent to different Recyclers, Waste-to-Energy Plants and Cement Kilns," he added.

Dabur's Plastic Waste Management initiative was rolled out in the year 2017-18 as part of the Plastic Waste Management (PWM) Rule 2016, 2018 (amended).

Companies have been focussing on recycling efforts over the last few years in a bid to achieve plastic neutrality. India has a significant plastic waste problem.

As India's consumer market has opened up over the last decade, middle-income households are buying more of everything from detergents, to colas leading to more plastic waste. India's per capita consumption of plastic at 11 kg per year is still among the lowest in the world, yet it generates a staggering 26,000 tonnes of plastic waste every day. Of this, 60% is recycled.

Dabur said it has till date collected a total of over 54,000 metric ton of plastic waste (recyclable and non-recyclable) direct from the end-users with the help of local ragpickers in 150 cities across India.

More recently, the company announced the launch of a new 'Save the Environment' campaign in Himachal Pradesh to create awareness within communities on managing plastic waste within their household.

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INDIA, AUSTRALIA, AND SINGAPORE COME TOGETHER TO ADDRESS MARINE POLLUTION WITH A FOCUS ON PLASTIC DEBRIS

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

The Government of India, in partnership with the Government of Australia and the Government of Singapore, conducted an international workshop on combating marine pollution focusing on marine plastic debris on February 14-15, 2022. The workshop, held virtually, brought together the world's leading experts, scientists, government officials with policy expertise, and representatives from industry, innovation and informal sectors. It aimed to discuss research interventions toward monitoring and assessing marine litter and plausible sustainable solutions to address the global marine plastic pollution issue.

The workshop had four major sessions; the magnitude of the marine litter problem-monitoring program and research on plastic debris in the Indo-Pacific Region; best practices and technologies; solutions to prevent plastic pollution; and polymers and plastics: technology and innovations and opportunities for regional collaboration to remediate or stop plastic pollution. The sessions involved panel discussions and interactive break-out sessions to encourage discussion amongst participants from East Asia Summit countries.

The East Asia Summit (EAS) is the premier forum for discussions on important strategic issues in the Indo-Pacific and a leading confidence-building mechanism. Since its inception in 2005, the EAS has been advocating regional peace, security, closer regional cooperation and prosperity of the Asia-Pacific and the Indian Ocean region. The EAS is uniquely placed to share expertise and lessons learned between regions and sub-regions faced with interlinked and similar challenges to develop sustainable transboundary solutions. EAS countries recognise the coastal and marine plastic pollution challenge. The Hon'ble Prime Minister of India, Shri Narendra Modi, had announced the agenda of promoting maritime cooperation in the wider Indo-Pacific region at the 14th EAS held in Bangkok in November 2019. India, Singapore, and Australia are committed to implementing the EAS decisions.

This workshop provided an impetus to EAS countries for exploring and informing each other about the challenges, questions, and solutions to marine litter – especially plastic research, use, design, disposal, recycling, and future collaborations for a plastic-free and healthy ocean for sustainable development through knowledge partners – the National Centre for Coastal Research (NCCR), Chennai, an attached office of Ministry of Earth Sciences (MoES), the Government of Singapore and the Commonwealth Scientific and Industrial Research Organisation, Australia. Dr M Ravichandran, Secretary, Ministry of Earth Sciences, Government of India, delivered the keynote address at the workshop. He suggested considering the application of technological tools such as remote sensing, artificial intelligence and machine learning to map the distribution of marine plastics and developing models to understand the dynamics of plastics in the Indian ocean. He also emphasized that a well-designed and tailor-made management strategy considering regional distinctiveness will significantly reduce plastics in the environment.

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CLIMATE: PM TICKS OFF DEVELOPED NATIONS

Relevant for: Environment | Topic: Environmental Degradation - GHGs, Ozone Depletion and Climate Change

NEW DELHI : Prime Minister Narendra Modi on Wednesday said that successful climate actions require adequate financing and developed countries need to fulfill their commitments on finance and technology transfer to the lesser developed countries.

Addressing the TERI's World Sustainable Development Summit, the Prime Minister said that environmental sustainability can only be achieved through climate justice.

He was said that energy requirements of the people of India are expected to nearly double in the next twenty years and denying this energy would be "denying life to millions".

"Successful climate actions also need adequate financing. For this, developed countries need to fulfill their commitments on finance and technology transfer," he said.

He was of the view that although there has been a lot of talk on climate change since the 1972 Stockholm Conference, "very little progress" has been made so far. However, India has walked the talk in terms of policies to curb climate change and address environmental concerns, he added.

He emphasised that sustainability requires coordinated action for the global commons. "We must work towards ensuring availability of clean energy from a world-wide grid everywhere at all times. This is the 'whole of the world' approach that India's values stand for", he further said.

Outlining the government's steps towards environment protection along with energy access for the poor, the Prime Minister said: "Equitable energy access to the poor has been a cornerstone of our environmental policy", he said.

He said that 90 million households have gained access to clean cooking fuel under Ujjwala Yojana and renewable energy has been available to farmers under the PM-KUSUM scheme. Under PM-KUSUM, farmers are encouraged to set up solar panels, use it and sell surplus power to the grid to promote sustainability and equity.

The LED bulb distribution scheme that has been running for the last seven years has helped save more than 220 billion units of electricity and 180 billion tonne of carbon dioxide emissions per year, Modi said adding that the national hydrogen mission aims to tap into green hydrogen.

He encouraged academic and research institutes like TERI to come up with scalable solutions to realize the potential of green hydrogen.

"We firmly believe in fulfilling all our commitments made under the U.N.F and Triple C. We have also raised our ambitions during CoP-26 at Glasgow", Modi said.

He also raised concerns over the vulnerability of island nations and said that these 'island developing states' need urgent protection.

"The Coalition for Disaster Resilient Infrastructure (C.D.R.I.), aims to build strong infrastructure in areas prone to frequent natural disasters. On the side-lines of CoP-26, we also launched an initiative called 'Infrastructure for Resilient Island States'. The island developing states are the most vulnerable and hence need urgent protection," Modi said.

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ENVIRONMENT MINISTRY NOTIFIES GUIDELINES ON EPR FOR PLASTIC PACKAGING

Relevant for: Environment | Topic: Environmental Pollution - Air, Water, Soil & E-waste

Union Environment Minister Bhupender Yadav. File

Taking forward the clarion call given by Prime Minister Narendra Modi to eliminate single-use plastics, the Environment Ministry has notified comprehensive guidelines on Extended Producer Responsibility (EPR) for plastic packaging, Union Environment Minister Bhupender Yadav said on Thursday.

Announcing the notification of the new Plastic Waste Management (Amendment) Rules, 2022 through social media late on Thursday night, Mr. Yadav said the guidelines provide a framework to strengthen the circular economy of plastic packaging waste and promote alternatives to plastic.

“Taking forward the clarion call given by PM Shri @narendramodi ji to eliminate single-use plastics, @moefcc has notified comprehensive Guidelines on Extended Producers Responsibility on plastic packaging,” Mr. Yadav tweeted.

“The guidelines not only provide a framework to strengthen the circular economy of plastic packaging waste, but also promote development of new alternatives to plastics. They provide a roadmap for businesses to move towards sustainable plastic packaging,” Mr. Yadav said in the tweet.

According to the notification, the new guidelines shall come into force with immediate effect.

The new rules classify plastics into four categories- category 1 will include rigid plastic packaging; category 2 will include flexible plastic packaging of single layer or multilayer (more than one layer with different types of plastic), plastic sheets and covers made of plastic sheet, carry bags, plastic sachet or pouches.

Multi-layered plastic packaging (at least one layer of plastic and at least one layer of material other than plastic) will come under category 3 and plastic sheet or like used for packaging as well as carry bags made of compostable plastics fall under category 4.

With respect to plastic packaging, the EPR covers reuse, recycling, use of recycled plastic content and end of life disposal by producers, importers and brand-owners.

According to the new rules, the producers, importers and brand-owners shall have to provide the details of recycling certificates only from registered recyclers along with the details of quantity sent for end-of-life disposal, by June 30 of next financial year while filing annual returns on the online portal.

“The details provided by producers, importers and brand-owners and registered plastic waste processors will be cross-checked by the online portal,” it said.

“In case of difference, the lower figure would be considered towards fulfilment of EPR obligation of producers, importers and brand-owners. The certificates shall be subject to verification by Central Pollution Control Board or State Pollution Control Board or Pollution Control Committee,

as the case may be,” it said.

The government has also called for establishing of a centralised online portal by Central Pollution Control Board (CPCB) for the registration as well as filing of annual returns by producers, importers and brand-owners, plastic waste processors of plastic packaging waste by March 31.

“The online system developed by CPCB for the registration as well as for filing of returns by producers, importers and brand-owners shall reflect the plastic packaging material introduced in the market by them in a financial year. It shall also reflect the details regarding the audit of the producers, importers and brand-owners as well as recyclers or other waste processors of plastic packaging waste,” it said.

The centralised portal would act as the single point data repository with respect to orders and guidelines related to implementation of EPR for plastic packaging under Plastic Waste Management Rule, 2016.

Environmental compensation shall be levied based upon polluter pays principle, with respect to non-fulfilment of EPR targets by producers, importers and brand owners, for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environment pollution, the new rules said.

“Payment of environmental compensation shall not absolve the producers, importers and brand owners of the obligations set out in these guidelines. The unfulfilled EPR obligations for a particular year will be carried forward to the next year for a period of three years,” it said.

As per the new notification, the government has announced setting up of a committee which shall be constituted by the CPCB under chairpersonship of CPCB chairman, to recommend measures to the environment ministry for effective implementation of EPR, including amendments to Extended Producer Responsibility (EPR) guidelines.

“The committee shall monitor the implementations of EPR and also take such measures as required for removal of difficulties. The committee shall also be tasked with the guiding and supervision of the online portal, including approval of requisite forms or pro forma,” it said.

The committee shall comprise of representative from concerned ministries/departments such as Ministry of Housing and Urban Affairs, Ministry of Micro, Small and Medium Enterprises, Department of Drinking Water and Sanitation, Department of Chemical and Petrochemicals; Bureau of Indian Standards, three State Pollution Control Boards or Pollution Control Committees, Central Institute of Plastic Engineering and Technology (CIPET), National Environmental Engineering Research Institute (NEERI), and three industry associations, and any other invitee as decided by the chairperson of the committee.

Under the new guidelines, SPCBs or PCCs shall submit annual report on EPR portal with respect to its fulfilment by producers, importers and brand-owners (which include manufacturers of plastic packaging material) and plastic waste processors in the state/Union Territory to the CPCB.

“The report shall also be submitted to the state-level monitoring committee constituted under the Plastic Waste Management Rules, 2016. The SPCB or PCC shall also submit an annual report with respect to recyclers or end of life disposal in the state or UT to the CPCB by July 31 of next year,” it said.

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A PLANETARY ADJUSTMENT: THE HINDU EDITORIAL ON INDIA'S CLEAN ENERGY PRIORITIES

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Prime Minister Narendra Modi, in perhaps his first address this year on the theme of the environment, remarked that it was not the planet that was “fragile”, but people and their commitment to conserving nature. From James Lovelock’s Gaia hypothesis — that posited the inter-connectedness of nature — to Nobel Laureate Paul Crutzen, who warned that chemical effluents were altering the planet’s atmosphere and causing harmful climate change feedback effects, many have made the case that humanity is in the Anthropocene era and is like a geological force that is shaping the planet’s destiny. However, this gives the distorted sense that it is a vaguely defined ‘planet’ that needs protecting, a notion reinforced by apocalyptic documentaries on melting glaciers.

The truth is more complex. Man’s embrace of agriculture, the dominance of wheat and rice as food crops and the clearing of forest tracts caused the first major large-scale changes to global climate though their effects were apparent only over centuries. Atmospheric changes due to the dawn of the Industrial Age and the use of fossil fuels happened, relatively speaking, in a blink of an eye. What is common to both these eras is that those who suffered the most are the poor, or those with the least agency to shield themselves from a perturbed nature. Last year, Uttarakhand saw an avalanche of rock and ice destroy two hydropower projects and cause deaths. The geology of the Himalayas, scientists have long warned, makes the region inhospitable to large mega-engineering projects and the several floods, landslides and earthquakes over the years have underlined this time and again. But while the earth rearranges itself, it does so in a manner that can be destructive and lethal to those least responsible for causing the disequilibrium. Thus, if “fragile” were to mean a brittleness needing care, then it is people and animals that need protection than a vaguely defined ‘planet’. India’s position of climate justice is that it cannot be denied the right to rely on polluting fossil fuel to ameliorate the living conditions of most Indians who have limited access to reliable energy. Thus, India will continue to fire coal plants, raze forests for industry and build roads in fraught geology — in other words, put the lives of millions of the vulnerable at climate-risk in the pursuit of economic development. India’s commitment to net-zero is set decades into the future at 2070. Unknown unknowns characterise climate science and India, given its size and population, will be disproportionately vulnerable. It must accelerate and prioritise the transition to energy sources that are minimally perturbing to the natural balance because — and on this the science is certain — the planet, which may be in a form incomprehensible at present, will long outlast its current residents.

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NEW GECKO FROM NE GETS ARMY TAG

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Distinct identity:The Indian Army's bent-toed gecko, recorded from a forest in Meghalaya.SPECIAL ARRANGEMENT | Photo Credit: Special Arrangement

A lizard new to science is wearing the Indian Army's tag.

A team of herpetologists have recorded a new species of bent-toed gecko from a wooded part of the Umroi Military Station in Meghalaya. Its scientific name is *Cryptodactylus exercitus* and English name is Indian Army's bent-toed gecko. *Exercitus* in Latin means army.

"The name was given to honour the Army for its services to the country. The military station where the bent-toed gecko was discovered was also a factor behind its name," Jayaditya Purkayastha of green NGO Help Earth and one of the authors of a study on the gecko told *The Hindu* on Friday.

The finding of the study was published in the latest issue of the European Journal of Taxonomy. The paper recorded another new bent-toed gecko, the *Cyrtodactylus siahaensis* named after Mizoram's Siaha district where it was found.

These lizard specialists had in a separate study recorded the *Cyrtodactylus lungleiensis*, a new species of bent-toed gecko named after Mizoram's Lunglei town.

Mr. Purkayastha said a team of researchers has been scanning the urban, rural and jungle areas across the northeast to uncover the herpetofaunal diversity of the region. India is now home to 40 species of the bent-toed gecko with the northeast accounting for 16 of them.

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UN DRAFT RESOLUTION SHOWS COUNTRIES AIM TO CREATE CHEMICAL WASTE BODY

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

File photo used for representation. | Photo Credit: Reuters

A Swiss-led proposal could form a new intergovernmental panel to study the dangers of chemical waste and pollution, a draft resolution on the agenda of a UN environment summit showed.

Proponents say that pollution from pesticides, plastics and electronic waste is an overlooked problem and that there is currently no global body to assess the scale of the risks. This week, a UN expert warned that such pollution was contributing to more deaths globally than COVID-19 and called for action, including a ban on some toxic chemicals.

The proposal, co-sponsored by 14 other countries, including Britain and six African countries, would aim to create an authoritative "Science-Policy Panel" similar to the UN Intergovernmental Panel on Climate Change (IPCC).

Switzerland's Ambassador Franz Xaver Perrez who is representing Bern at the summit in Kenya this month told Reuters that chemical waste represented a "more imminent" threat than climate change.

With climate change "the bigger impact is in the future," he said. "But the chemicals impact is the immediate future, it's right now."

"This (proposal) would bring together, like with climate change, the best available science to better understand the threats and risks that we do not fully understand yet."

He added he expected the proposal to be adopted by consensus and said the panel could be set up within "one to two years" under the oversight of the World Health Organisation and summit host the United Nations Environment Programme.

The main focus of the Kenya summit will be the drafting of a blueprint for a global plastics treaty, which is touted as being the most important environment pact since the 2015 Paris climate agreement.

Switzerland already hosts both the WHO and the IPCC and would have a financial stake in creating such a panel, were it to be based in Geneva.

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NIGHT POLLINATORS: HOW MOTHS HELP THE HIMALAYAS

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

An erebid moth on a flowering plant. Special Arrangement

Moths are vital to pollination in the Himalayan ecosystem of northeast India, reveals a recent study. The study establishes 91 species of moths as potential pollinators of 21 plant families in Sikkim and Arunachal Pradesh in the northeastern Himalayas.

The results assume significance as a majority of the pollination-related studies are based on diurnal pollinators (bees and butterflies) and the role of nocturnal pollinators have so far received less scientific attention.

The details of the study were recently published in *Scientific Reports*, a publication from the *Nature* group of journals.

“In the present study about 65% moths (91 species) carried sufficient quantities of pollen grains to be considered as potential pollinators. *Teliphasa* sp. (Crambidae) and *Cuculia* sp. (Noctuidae) are found to carry the highest quantity of pollen,” the paper reads.

Navneet Singh, lead author of the study, said that *Geometridae* (geometer moths) and *Erebidae* (erebid moths, tiger moths, lichen moths, among others) turned out to be the most important moth families for pollen transportation in the Himalayan region.

“We also found frequent interaction of moths with Betulaceae, Fabaceae, Rosaceae and Ericaceae. Though the Betulaceae is predominantly a wind-pollinated plant family, some recent studies indicate that wind-pollinated plant families also benefit from enhanced dispersal by insects,” Dr. Singh, who is associated with the Zoological Survey of India (ZSI), added.

Mutual benefit

Another interesting outcome of the study is that the moth species *Achaea janata* (a well-known pest of various economically important plants) was identified as a potential pollinator of three plant families, indicating that moths can provide net benefits as pollinators even when acting as larval herbivores of the same species.

According to Dr. Singh and his fellow authors, the research, which is part of a project funded by the Ministry of Environment, Forest and Climate Change, was among very few large scale studies at a global level where the research team studied the effect of various seasons and different altitudes on the pollination ecology of moths.

The research is based on the field work conducted in the Himalayan terrains, from the foot hills to elevations up to 3,000 m. Along with Navneet Singh, the other contributors to the publication are Rajesh Lenka, Pallab Chatterjee and Dipayan Mitra.

Dhriti Banerjee, Director of ZSI, said that generally moths are considered mysterious denizens of nights, and for a long time they were better known as pest species. “This study revealed the importance of moths in nature. When we are sleeping in our bedrooms, they are tirelessly working for the ecosystems to work, on which our survival is invariably dependent, and are

helping in a great way towards food security,” Dr. Banerjee said.

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WATCH

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

On 11th February 2022, the Australian government declared the koala an 'endangered' species.

The 'endangered' status is one of the highest levels of mortality for a species, and is just below critically endangered and extinct. Earlier, the koala had been recognised as a 'vulnerable' species.

The decline in its numbers is due to land clearing and bushfires, which have been shrinking the koalas' habitat.

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CLIMATE CHANGE LIKELY TO FAVOR SOIL-BORNE PLANT PATHOGENS FOR DISEASES LIKE DRY ROOT ROT OF CHICKPEA IN FUTURE

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Indian Scientists have identified that high-temperature drought conditions and low soil moisture content are favorable conditions for dry root rot (DRR), a disease that damages the roots or girdles the trunk in chickpea. This work will be useful for the development of resistant lines and better management strategies.

Dry root rot disease causes reduced vigour, dull green leaf colour, poor new growth, and twig dieback. If extensive root damage occurs, the leaves suddenly wilt and dry on the tree. The increasing global average temperature is leading to appearance of many new plant disease-causing pathogens at a rate hitherto unheard of, one of them being *Macrophomina phaseolina*, a soil-borne necrotrophic that causes root rot in chickpea. Currently, the central and southern states of India have been identified as the prime chickpea DRR hotspots with an overall 5 – 35% disease incidence.

Considering the destructive potential of the pathogen and a real possibility of an epidemic scenario in the near future, a team led by Dr. Mamta Sharma at ICRISAT embarked on a journey to unravel the science behind DRR in chickpea.

The team which closely monitored the disease identified that high temperatures ranging between 30 to 35 degrees, drought conditions, and less than 60% soil moisture content are favorable conditions for dry root rot (DRR).

This work supported and funded from the Department of Science & Technology, Govt. of India at the Center of Excellence in Climate Change at ICRISAT proved the close association of this disease with climatic factors. The results have been published in '*Frontiers in Plant Science*'.

The scientists explained that *Macrophomina* survives in a wide range of environmental conditions, even at extremes of temperature, soil pH, and moistures. In chickpea, DRR is highly prevalent during the flowering and podding stages coinciding with high temperature and drought conditions. They are now exploring ways to use the study for development of resistant lines and better management strategies.

The team is also trying to address the disease favourable conditions identified from a molecular perspective. In a recent breakthrough in gene expression studies, scientists have identified a few promising chickpea genes encoding for enzymes like chitinase and endochitinase, which can provide some degree of defense against DRR infection.

The team at ICRISAT, in collaboration with ICAR research institutes, has also adopted several multi-pronged approaches, including continuous surveillance, better detection techniques, development of forecast models, screening assays, etc., to fight against such deadly plant diseases.



(a) *Infected Chickpea plant*



(b) *Stress Field*

Publication links:

<https://doi.org/10.3389/fpls.2021.653265>

https://www.icrisat.org/icrisat_happenings

For more details, Dr. Mamta Sharma (mamta.sharma@cgjar.org) can be contacted.

SNC / RR

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A SHRINKING GREEN IN INDIA'S GROWING MEGACITIES

Relevant for: Environment | Topic: Environmental Pollution - Air, Water, Soil & E-waste

Urban green spaces are essential to ensure a delicate balance between development and the environment | Photo Credit: G. Moorthy

Urbanisation is an inevitable process of development that has the potential to provide privileged social and economic advantages, including better education, health, housing and employment opportunities. Though only half the world's population lives in urban areas with [the ability to generate 80% of the Global Gross Domestic Product \(GDP\)](#), urbanisation has a good capacity and rich potential to improve well-being in societies. As the UN World Cities report highlights, we expect the present population of urban areas to increase from 55% to 68% by 2050. The urban population of Indian cities is projected to reach near 60% from 31% (2011) by 2050. By 2030, India will have seven megacities which will include Ahmedabad and Hyderabad apart from New Delhi, Mumbai, Kolkata, Chennai and Bengaluru.

Green spaces in cities and towns besides providing various ecosystem services and public health benefits also offer services of psychological relaxation, stress reduction, physical activities and reduction of climate-related vagaries such as pollution, heat waves, etc. One of the major reasons warranting the need for urban green spaces is the fact that apart from consuming a huge quantum of natural resources by our cities, almost 70% of all greenhouse emissions is generated from an urban built environment. The ever-increasing pace of urbanisation is going to make this condition worse in the years ahead. In a [study by T. Endreny et. al](#) (2017), trees in megacities may save nearly \$500 million per year in services including environmental protection that make urban environments cleaner, more affordable and more pleasant places to live in. Urban green spaces have become essential for city planners and managers to mitigate negative environmental consequences and ensure a delicate balance between development and the environment.

A major reason that warrants the need for urban green space/s is the fact that apart from consuming a huge quantum of natural resources by our cities, almost 70% of all greenhouse emissions is generated from the urban built environment. The ever-increasing pace of urbanisation will make this condition even worse. There have been various international meetings, conferences and agreements to improve access to fair green space to achieve the objectives of sustainable urban policies. Ensuring environmental sustainability is one of the three interlinked principles of the [New Urban Agenda](#) adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in 2016. The importance of green space has also been highlighted in Self Development Goal 11 dealing with sustainable cities and communities to make cities and human settlements inclusive, safe, resilient and sustainable.

Green space and other nature-based solutions are an essential component for the development of sustainable, resilient and inclusive cities. The World Health Organization (WHO) has recommended per capita green space of nine square metres besides access to public green spaces within 300 m linear distance or a five-minute walk from the houses of urban residents. Though many western cities easily qualify when it comes to both these norms, the condition of Indian cities is quite inadequate. In terms of decadal change of forest cover in seven megacities, the [FSI Report 2021](#) noticed an overall increase of 68 square kilometres in the last 10 years. All megacities witnessed poor decadal growth except for Hyderabad which has witnessed a maximum 147% increase in forest cover. Hyderabad is the only city that has seen decadal

increase in per capita forest cover from 4.3 to 8.2 sq. met near the recommended green cover of 9 sq. met. The poor per capita forest cover in some cities needs corrective interventions for its improvement.

Telangana has accorded equal priority to improve green cover outside reserve forests under its flagship programme, 'Telangana Ku Harithaaharam'. Out of nearly 109 urban parks identified, 53 parks are in operation to usher in climate resilience and provide much-needed ecosystem services besides improving green cover. Further, each *gram panchayat* of Telangana is developing nearly 19,000 mini-park-cum-forests (Prukriti Vanam); each *mandal* of the State is developing a Brihad Palle Prukriti Vanam (BPPV) spread over 10 acres each. The historic amendments to panchayat and municipal acts of Telangana and the recently created provision of a Green fund have provided a much-required boost to facilitate its commitments to improve green cover. The ongoing interventions of the Hyderabad Metropolitan Development Agency (HMDA) and the Greater Hyderabad Municipal Corporation (GHMC) such as Miyawaki, median planting, green walls, facade greenery, hanging gardens, rooftop garden terraces and urban wetlands with local adaptations need further scaling up to compensate for the rapid decline in green and blue features of urban jungles in the coming years.

Urbanisation is an inevitable and important component of development and is considered an integral driver of a modern economy. Being a leader among developing countries, Indian cities cannot become an exception to growing urban growth and development. To ensure a delicate balance between development and the environment, the activities aimed at a reduction in negative environmental externalities and their impact on natural resources and environmental services as an important aspect of green growth have become essential for city planners and managers.

Densification-prompted activities causing a rapid loss and fragmentation of both public and private green space are one of the major challenges influencing urban green space. Additionally, activities such as infill development and redevelopment of land coupled with the real estate boom and skyrocketing land values always force a citizen to go in for maximising economic benefits with little or no priority to green space. These factors along with the lack of necessary policy support, priority and funds make urban green space-related issues insignificant and inefficacious. A lack of concern among citizens and official laxity in the strict implementation of regulations related to the maintenance of green cover further worsen what is already a bad situation. A relook of these factors may help reorient our strategy of urban planning and management to accommodate the green vision and action.

The [3-30-300 rule](#) of Cecil Konijnendijk (global urban forester, researcher, teacher, writer and speaker) stipulating the ability of everyone to see at least three trees from home, the presence of 30% canopy cover in each neighbourhood and a maximum distance of 300 m to the nearest park in a city needs adoption to the extent possible for a greener, better and more biophilic environs in our cities. Strict compliance of environmental obligations, including green space by user agencies, needs to be enforced without exceptions. Innovative concepts such as nature-based solutions, being 50% cheaper than [grey alternatives](#) and delivering 28% greater environmental benefits need to be incorporated in future urban planning. Together with multi-stakeholder involvement, adequate financial resources, and institutional support, this will strengthen urban governance to reorient our strategy of urban planning and management. In the end, this will ensure desired green cover in cities for our current generations as well as for the future.

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TOURISM HAS BROUGHT ECONOMIC PROSPERITY TO THE HIMALAYAN REGION, BUT THE ENVIRONMENTAL COST HAS BEEN CATASTROPHIC

Relevant for: Environment | Topic: Environmental Pollution - Air, Water, Soil & E-waste

The 10 States of India's Himalayan region attract droves of tourists whose environmental impact has been devastating | Photo Credit: Getty Images/iStockphoto

To say Kangra is enchanting would be trite. The sunlit valley stretches beyond cumulus clouds, flanked by the jagged Dhauladhar range on one side and rolling green hills on the other. Birches, chir pines and deodars sway in the wind.

As our small aircraft starts its descent, we get a glimpse of River Beas flowing below and the expansive Pong dam's reservoir. But all this beauty is deceptive — the Indian Himalayan Region is facing an as yet unrecognised existential crisis: mountains of solid waste.

Tourism in this region generates some eight million tonnes of waste every year. Added to this is the one million tonnes of annual waste generated by the urban population. By 2025, it is projected that 240 million tourists will visit the hill States every year: it was 100 million in 2018. If the problem of solid waste disposal is not addressed scientifically, the fragile ecosystem of the Himalayas will pay a price the country can ill-afford. Given that all our major glacial rivers originate in these mountains, it's not difficult to envisage the catastrophic implications.

The Himalayan region comprises 10 States, of which Uttarakhand and Himachal Pradesh bear the biggest brunt. Although the local population density is not very high, these States attract vast numbers of tourists — campers, trekkers, mountaineers, backpackers and pilgrims. And the waste they generate now impacts the ecology crucially.

Unlike the plains, usable land is scarce in the Himalayan region, with habitations either on the ridges of mountains or in valleys such as Kangra and Kullu. While hillocks of garbage can rise in the peripheries of cities on the plains, hill towns have no such space. What is mindlessly thrown out remains on the slopes forever, turning into major polluters of land, water and air.

From Kangra airport, I drive up to the office of Waste Warriors, an NGO based in Dharamshala, which works in Uttarakhand and Himachal Pradesh to educate and train people in solid waste management. Etoshi Chattejee, 33, heads the team. She was a software professional before joining the NGO. Shashank Prabhu, 24, is an electrical engineer from Karnataka and Nidhi Sharma, 29, from Shimla, has a degree in social work. Together, they work with the municipal corporation, district authorities, colleges, schools and households. This committed team organises workshops to train and create awareness, and works in two of the 17 wards in Dharamshala town. It also collects non-biodegradable waste for segregation, processing and recycling.

Documents they hand me have some astonishing information: cigarette butts take 12 years to decompose; plastic bottles 450 years; glass bottles thousands of years; cardboard two months; newspapers one month, juice cartons five years; cans 200-500 years; and polystyrene foam cups — never. My education begins.

Later in the afternoon I head to Rakkar village on the outskirts of Dharamshala. Here, on leased land, is the NGO's dry waste segregation centre, where some 200 kilos of dry waste is

segregated every day. Much of the material is shredded or made into pellets before it's taken for recycling elsewhere. I see paper, cardboard, cloth, glass, ceramic, metal and plastic. Together, they tell the story of modern living and patterns of consumption.

The municipality has recently allotted the NGO a new site, near a mountain stream, much nearer town, to set up a new material recovery facility for non-biodegradable and recyclable waste processing. Construction is on to set up a large galvanised iron shed. Dharamshala generates 25 tonnes of waste every month. The main waste, the biodegradable kind, is handled by the municipality. Composting, by various means, is the ideal means of disposal. Once done, biodegradable waste can be used as manure to fertilize the soil. But compost pits need land, and the magnitude of the problem dwarfs the efforts. So the bio-degradable waste is transported to a dumping ground in Sudher village.

This has, in turn, led to protests by Sudher villagers, who are facing the brunt of the pollution. Open dumping is unscientific, especially in the sub-zero Himalayan conditions. Cold prevents decomposition. Since such dumps are open to the elements, they could release harmful gases such as methane and carbon monoxide. When bio-degradable waste mixes with water, it forms leachate, a toxic liquid that permeates groundwater. Open waste also releases toxic chemicals into the soil. Rainfall then carries the leachate to rivers and streams nearby. This is the primary reason of river pollution in the hills rather than industrial activity.

As for air pollution, open burning of waste is a major source besides particulate matter emissions. Pollutants such as dioxins, carbon monoxide, sulfur oxides, toluene and benzene are released into the atmosphere. Carbon and other light-absorbing impurities darken glacial snow and trigger melting. As for plastic, it needs segregation, processing and recycling, but in actual fact much of the plastic is burnt or dumped. Micro particles are carcinogenic and enter the food chain and cause enduring damage. Plastic also chokes rivulets and streams on the hill sides. The rivers of Himachal Pradesh — Ravi, Beas, Sutlej, Chenab, Yamuna, Ghaggar, Parvati, Devprayag, Baspa, Spiti and Tons — all copiously water the plains, but today, all of them are affected in various degrees.

Tourism has surely brought economic prosperity to the hills, accounting for as much of 7% of Himachal Pradesh's GDP. This is a conservative estimate because there are many ancillary activities too. Besides, Dharamshala is now firmly on the cricket map of India. The new stadium is spectacular, with the Dhauladhar range as its backdrop and the cupolas of the pavilion silhouetted against its peaks. Some 25,000 spectators can be seated here, and people turn up from Delhi, Punjab and Himachal Pradesh for matches. Restaurants, hotels, resorts and homestays have come up.

But as the Council of Scientific and Industrial Research (CSIR) has pointed out, all this brings with it waste. A CSIR study finds that 55% of waste generated in the Himalayan region is biodegradable and comes largely from homes and eateries; 21% is inert such as construction material; 9% is paper; 8% is plastic; 4% is glass and ceramic and 3% metal.

In 2016, the Centre issued very progressive new rules for handling solid waste. Single-use plastic is now banned and the 'polluters to pay' principle has the potential to deter polluters. But the key lies in enforcement. As biodegradable waste constitutes the largest chunk, its disposal has to be scientific rather than resorting to open dumping or burning. Himachal Pradesh, according to the CSIR study, has 54 dumpsites but no operational landfill. Scarce land in the hills makes it difficult to create landfills.

I leave Kangra on a day when rain is lashing and fresh snow has fallen on the Dhauladhar. As I wait for the flight to be called, it occurs to me that Dharamshala town, with a population of about

60,000 and legions of visitors, is a microcosm of the problem of waste management in the country. Urban India produces approximately 52 million tonnes of waste each year. It is estimated that by 2047 we will be generating 260 million tonnes annually, requiring 1,400 sq.km. of landfill area.

Here, in the Himalayan region, at least there is the beginning of advocacy, awareness and action. But grave issues continue to loom in Kullu, Parvati, and Lahaul valleys, and in the Great Himalayan National Park, where tourist influx is very high. Even in the remote Kasol in Parvati valley, the ecosystem is under siege.

Himachal Pradesh has the advantage of literacy. People are change-embracing. Government agencies are willing to work with NGOs and experts to tackle waste management issues. Yet, as Etoshi, with her experience on the ground, tells me, entrenched social attitudes to waste and waste removal need to change fast. It is too big a problem to be tackled by waste collectors and street sweepers alone.

Gopinath is a photography and classical music enthusiast; Sharma works with the government in New Delhi.

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WAIT FOR CHEETAH TO GET LONGER

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Cheetahs at a conservation centre in Namibia. AFP/AFPAFP | Photo Credit: GIANLUIGI GUERCIA

It could be many months before cheetahs from Namibia make it to India. An expert team of wildlife officials from Madhya Pradesh, the Indian Forest Department and the Wildlife Institute of India that visited Namibia for a site visit last week is reportedly “satisfied”, but a formal Memorandum of Understanding (MoU) regarding the transfer is yet to be signed.

“It was a fruitful visit and we saw at least 70 cheetahs,” Y.V. Jhala, Dean, Wildlife Institute of India, told *The Hindu*. “A formal MoU is yet to be signed and the whole process of translocation can take months. The timeline is still to be determined.”

Union Environment Minister Bhupender Yadav launched an “action plan” at the 19th meeting of the National Tiger Conservation Authority (NTCA) on January 7 saying, “The cheetah that became extinct in independent India, is all set to return.”

The action plan states that a cohort of 10-12 young cheetahs that are ideal for reintroduction would be imported from Namibia or South Africa as a founder stock during the first year. The animals’ lineage and genetic history will be examined to ensure that they are not from an excessively inbred stock and are in the ideal age group, so that they make up a suitable founding population. Mr. Jhala said that around 35 cheetah would be needed over time to establish such a stock.

The proposed site for introduction is the Kuno Palpur National Park (KNP) in Madhya Pradesh, though at least three other reserves in Central India are being considered.

According to the plan, the Central government, along with the Environment Ministry and the Cheetah Task Force, will create a formal framework to collaborate with governments of Namibia and/or South Africa, through the Ministry of External Affairs.

A press release from Namibia noted that a delegation from India had visited the Cheetah Conservation Fund and had held “bilateral and technical discussions” on introducing the animals.

The Kuno National Park was also supposed to be a site for the Asiatic Lion that is now confined to Gir. However, the Gujarat government, as well as the Centre, for more than a decade, has been dragging its feet on sending the lions to this habitat. Independent conservationists have warned that introducing the cheetah, the only big cat that went extinct in Independent India, would mean shifting the focus from the more urgent need for a second home for the lion.

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TREES ON FOREST EDGES MAY GROW FASTER THAN THOSE INSIDE

Relevant for: Environment | Topic: Environmental Conservation, Sustainable Development, and EIA

Counting plantations: Following a trend noted in previous editions of the forest surveys, the increase in forest cover between 2019 and 2021 was led by growth outside the recorded area | Photo Credit: Getty Images

Is a tree in a forest the same as one outside it? The belief that it is, allays the conscience of government-backed afforestation programmes where dense forests are often razed for mines, and multiple saplings are commissioned in alternate locations that are usually outside forest boundaries.

Conservationists have on the other hand pointed out that this isn't the same because a loss of a section of forest means destroying an ecosystem that can't be easily substituted for. To account for these losses more minutely, Lucy Hutyra, a bio-geochemist and ecologist at the Boston University, Massachusetts, U.S., has been analysing the terrestrial carbon sink.

This is made up of the billions of square kilometres of forest in the world that are major storehouses of carbon. In net, forests store more carbon dioxide than they release and an estimated 30% of carbon emissions from emitting fossil fuels are absorbed by the forest, making them a terrestrial carbon sink.

Trees absorb carbon dioxide (CO₂), release oxygen by way of photosynthesis, and store carbon in their trunks. When they shed, soil microbes work to decompose the leaves and other organic matter that releases the trapped carbon dioxide. A major prong of countries' climate change strategy, including India's, is to increase the terrestrial sink area.

Hutyra, who has been researching the consequences of forest loss, examined if the same species of tree had different patterns of carbon dioxide storage when located at a forest edge or further away.

The textbook assumption was that trees at forest edges release and store carbon at similar rates as forest interiors, but Hutyra and her colleagues report this isn't true.

In two papers published in the peer-reviewed *Global Change Biology*, and *Nature Communications*, Hutyra's team found edge trees grew faster than their country cousins deep in the forest, and that soil in urban areas can hoard more carbon dioxide than previously thought.

Using data from the U.S. Department of Agriculture's Forest Inventory and Analysis program – which monitors tree size, growth, and land use across the country – Hutyra's team looked at more than 48,000 forest plots in the Northeast United States. They found trees on the edges grow nearly twice as fast as interior trees – those roughly 100 feet away from the edge.

"This is likely because the trees on the edge don't have competition with interior forest, so they get more light," says Luca Morreale, a PhD candidate in Hutyra's lab, in a press statement.

In another related study, Hutyra found differences even in the way soil in forests and outside released carbon dioxide. Warmer temperatures at the edge of the forest caused leaves and organic matter to decompose faster, as it forced soil microorganisms to work harder and release

more carbon dioxide than their cooler, more shaded peers in the forest interior. But, in urban forests, where the ground was significantly hotter and drier, those soils stopped releasing as much carbon, they note in a press statement from Boston University.

Though these studies were specific to Massachusetts, there are implications for India too. Conservationists have noted that plantations outside forests don't capture carbon efficiently and don't make up for biodiversity losses.

The India State of Forest Report (2021) released in January found that nearly 28% of the forest cover is outside the recorded forest area. About 12% of the forests classified as 'very dense' is also outside the recorded areas. Following a trend and noted in previous editions of the forest surveys, the increase in forest cover between 2019 and 2021 was led by growth outside the recorded area and the sharpest increase was in so called 'open forest' where any patch over a hectare and having a canopy density more than 10% counts as 'forest.' This brings in man-made plantations of cash crops such as tea and coffee plantations and mango orchards and even tree-lined avenues in densely built-up cities were being classified as 'forest'.

Ecologists M. Madhusudan and T.R. Shankar Raman note: "In one stroke, just between the 1999 and the 2001, this redefinition helped raise India's forest cover by over 38,000 sq.km." They highlight research in the Western Ghats that finds plantations deplete groundwater, have higher surface water runoff, poorer soil infiltration, compared to trees in natural forests. They also report that carbon stocks in plantations such as teak and eucalyptus were 30% to 50% lower than in natural evergreen forests and were generally less stable and resilient. The biggest loss, however, was that species dependent on forests—from insects to primates—were ripped apart from their natural habitats and plantations, which were mostly monocultures, rarely had the capacity to support a rich, biodiverse system.

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