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OVER 160-200 MILLION INDIANS COULD BE EXPOSED TO LETHAL HEAT WAVES ANNUALLY: WORLD BANK

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

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November 30, 2022 08:21 pm | Updated December 01, 2022 01:15 am IST - NEW DELHI

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With the demand for cooling shooting up, there will be a demand for a new air-conditioner every 15 seconds, the World Bank has said. File | Photo Credit: The Hindu

From 2030 onwards, more than 160 to 200 million people [could be exposed to a lethal heat wave in India every year](#), and around 34 million Indians will face job losses due to heat stress-related productivity decline. By 2037, the demand for cooling is likely to be eight times more than current levels, the World Bank has said in a report.

In this scenario, it is imperative for India to deploy alternative and innovative energy efficient technologies for keeping spaces cool. According to the report, "Climate Investment Opportunities in India's Cooling Sector", this could open an investment opportunity of \$1.6 trillion by 2040 besides reducing greenhouse gas emissions significantly and creating 3.7 million jobs.

With the demand for cooling shooting up, there will be a demand for a new air-conditioner every 15 seconds, the report said, leading to an expected rise of 435% in annual greenhouse gas emissions over the next two decades. Thus, there is a need to shift to a more energy-efficient pathway which could lead to a substantial reduction in expected CO2 levels.

The report proposes a roadmap to support New Delhi's India Cooling Action Plan (ICAP) 2019, through new investments in three major sectors: building construction, cold chains and refrigerants.

Adopting climate-responsive cooling techniques as a norm in both private and government-funded constructions can ensure that those at the bottom of the economic ladder are not disproportionately affected by rising temperatures. The report suggests that India's affordable housing program for the poor, the Pradhan Mantri Awas Yojana (PMAY), can adopt such changes on scale.

It also proposed enacting a policy for district cooling which could lead to the consumption of 20-30% less power than the most efficient conventional cooling solutions. District cooling technologies generate chilled water in a central plant which is then distributed to multiple buildings via underground insulated pipes. This brings down the cost for providing cooling to

individual buildings. Apart from this, guidelines for implementation of local and city-wide urban cooling measures such as cool-roofs should also be considered.

To minimise rising food and pharmaceutical wastage during transport due to higher temperatures, the report recommends fixing gaps in cold chain distribution networks. Investing in pre-cooling and refrigerated transport can help decrease food loss by about 76% and reduce carbon emissions by 16%.

Improvements in servicing, maintenance and disposal of equipment that uses hydrochlorofluorocarbons, alongside a shift to alternative options with a lower global warming footprint, are also recommended. This can create two million jobs for trained technicians over the next two decades and reduce the demand for refrigerants by around 31%.

“India’s cooling strategy can help save lives and livelihoods, reduce carbon emissions and simultaneously position India as a global hub for green cooling manufacturing,” said Auguste Tano Kouamé, the World Bank’s Country Director in India.

“The right set of policy actions and public investments can help leverage large scale private investment in this sector,” said the authors of the report, Abhas K. Jha, Practice Manager, Climate and Disaster Risk Management, South Asia and Mehul Jain, Climate Change Specialist, World Bank. “We recommend that these moves be accelerated by creating a flagship government mission to address the challenges and opportunities from rising temperatures in India,” they added.

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NITI AAYOG PROPOSES DECARBONISING OF INDUSTRIAL EMISSIONS

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

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Qatar World Cup 2022 England vs Wales LIVE: Foden, Rashford in starting lineup as match kicks off

November 29, 2022 09:39 pm | Updated November 30, 2022 01:32 am IST - New Delhi

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Carbon Capture Utilisation and Storage (CCUS), the technology for decarbonising carbon dioxide (CO₂) from high polluting sectors such as steel, cement, oil, gas, petrochemicals, chemicals and fertilisers, has a critical role to play for the country to halve CO₂ emissions by 2050, says a report on the policy framework of the CCUS prepared by the Niti Aayog and MN Dastur & Company. The report, released here on Tuesday by Niti Aayog Vice-Chairman Suman K. Bery, also said the CCUS technology would help in promoting the low carbon-hydrogen economy and in removal of the CO₂ stock from the atmosphere.

Mr. Bery said the key challenge would be to reduce the cost of the mechanisms to implement the technology. "Niti Aayog will try to develop a consensus with other Ministries on the matter," he said. He added in his message to the report that India's per capita CO₂ emissions were about 1.9 tonnes per annum, which was less than 40% of the global average and about one-fourth of that of China. "We need a sustainable solution for the decarbonisation of sectors that contribute to 70% of emission. CCUS has an important and critical role to play in it, especially for India to accomplish net-zero by 2070," he said.

Mr. Bery said CCUS could enable the production of clean products while utilising rich endowments of coal, reducing imports and thus leading to a self-reliant India economy. "CCUS also has an important role to play in enabling sunrise sectors such as coal gasification and the nascent hydrogen economy in India," he added.

Power Secretary Alok Kumar said the focus should be on research and development, particularly on cutting edge technologies. "NTPC has taken some R&D projects. Ministry has supported it," he said.

Niti Aayog Member V.K. Saraswat said that through the technology, CO₂ coming from various thermal power plants or industrial plants would be captured. "Using CCUS technology we will be able to make some valorisation of the CO₂. There will be an impact on the economy if we able to get value-added products such as green methanol, green ammonia can be produced from this

captured CO₂. We have huge potential for storage of CO₂,” Dr. Saraswat said.

The report added that the key to a successful CCUS implementation in India was to enact a policy framework that supported the creation of sustainable and viable markets for CCUS projects. “The private sector is unlikely to invest in CCUS unless there are sufficient incentives or unless it can benefit from the sale of CO₂ or gain credits for emissions avoided under carbon pricing regimes,” the report said.

On the policy framework, the report suggested that in the near term, CCUS policy should be carbon credits or incentives based, to seed and promote the CCUS sector in India through tax and cash credits. “Over time (probably beyond 2050), the policy should transition to carbon taxes, to enable reaching India’s net zero goals by 2070. The policy should establish early stage financing and funding mechanisms for CCUS projects,” the report said.

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LAGOON DRIES UP AS DROUGHT GRIPS PERU'S SOUTHERN ANDES

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Qatar World Cup 2022 The controversial Japan goal that eliminated Germany

December 02, 2022 03:31 pm | Updated 03:31 pm IST

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The rainy season in this part of South America should have started in September, but the area is experiencing its driest period in almost a half century. | Photo Credit: AP

From her home under the baking sun of Peru's southern Andes, Vilma Huamaní can see the small Cconchaccota lagoon, the axis of her community's life. It has been a source of trout, fun for children eager to swim, beauty as flamingos flew from over the mountains and water for thirsty sheep.

Nowadays, all Huamaní sees of the lagoon 4,100 meters (13,120 feet) above sea level is a plain of cracked and broken soil surrounded by yellow grass.

"It has totally dried up," she said.

The rainy season in this part of South America should have started in September, but the area is experiencing its driest period in almost a half century, affecting more than 3,000 communities in the central and southern Andes of Peru.

A light rain last week — only the second in almost eight months — prompted residents to set bowls outdoors to collect some water. The drops lifted dust as they hit the ground, and by the next morning, the sun had evaporated the scant moisture.

Dead sheep and lambs so weak they can barely stand can be found among sparse yellow grass. The planting of potatoes, which is the only crop that grows in Huamaní's village, has been delayed, leading many to expect food shortages in the coming months because people are already feeding themselves from their dehydrated potato reserves.

"Every day, I ask — I hope — the rain falls ... when there is rain the grasses grow, the potatoes (grow)," said Huamaní, 38, who moved with her four children from Peru's capital, Lima, to Cconchaccota in 2020 in an effort to flee the coronavirus pandemic.

The absence of rain in part of the Andes occurs as a result of the La Niña phenomenon, present in 2022 for the third consecutive year, according to the United Nations' meteorological agency.

The drought is also hitting parts of Bolivia, Paraguay and Argentina.

Dry earth crusts on the bed of the Cconchaccota lagoon in the Apurimac region of Peru. For climate experts the lagoon could have dried up because it was less than a meter deep, depended exclusively on rainwater and was under strong solar radiation. | Photo Credit: AP

Yuri Escajadillo, a climatologist with Peru's National Meteorology and Hydrology Service, said an index used to measure droughts qualified the region as "extremely dry."

"It is a record value," Escajadillo said.

In Cconchaccota, there is no drinking water, sewage or telephone service. People drink water they get from a nearby spring, though it sometimes dries up, too.

Residents say their appeals to local authorities for help went unanswered for more than two months.

So, Grisaldo Challanca, a young farmer, used his cellphone to record videos and prepare a report about the drought. He posted it on a Facebook page after he climbed to about 4,500 meters above sea level to get an internet connection.

The long-delayed response from the regional authorities arrived last week with the delivery of packages of fodder oats for the surviving sheep, cattle, alpacas and llamas.

"The animals are all bone," said John Franklin Challanca, a 12-year-old shepherd, whose family has lost 50 sheep.

[Also Read | The UN report that highlights India's vulnerability to drought](#)

The Andes is one of the world's most sensitive regions to climate migrations because of droughts, tropical storms and hurricanes, heavy rains and floods, according to the latest report by the United Nations' Intergovernmental Panel on Climate Change.

"Global warming has caused glacier loss in the Andes from 30% to more than 50% of their area since the 1980s. Glacier retreat, temperature increase and precipitation variability, together with land use changes, have affected ecosystems, water resources and livelihoods through landslides and flood disasters," the report says, adding that summer rainfall appears to be decreasing in the southern Andes.

Small farmers in various parts of the Andes in Peru and Bolivia are praying for rain. Prayers are held on the shores of Lake Titicaca, which is shared by both countries, and on mountains that Indigenous communities consider gods.

In the only evangelical church in Cconchaccota, Rossy Challanca said the drought was a punishment "for the sins of man" and a clear sign that the end of the world is soon to come.

But for climate experts, the lagoon could have dried up because it was less than a meter (3 feet) deep, depended exclusively on rainwater and was under strong solar radiation.

Wilson Suárez, professor of mountain hydrology and glaciology at Peru's La Molina National Agrarian University, said those factors constitute "an ideal cocktail" for the small lagoons in the high Andean areas to dry up.

“This has to put them on notice that times are changing,” Suárez said of area residents who have long depended on the lagoons for watering their livestock. “A drought is not easy to handle ... the climate is changing.”

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INDIAN ZOOS: SEEDS OF WILDLIFE CONSERVATION

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

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Qatar World Cup 2022 FIFA World Cup 2022 Highlights | Japan vs Spain; Costa Rica vs Germany

December 02, 2022 10:23 am | Updated 11:47 am IST

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Children feed animals at The Madras Crocodile Bank Trust and Centre for Herpetology. | Photo Credit: Special Arrangement

I'll start with a quote from my bestie [Jane Goodall](#) (whom I've never met, of course). Her message for the anti-zoo brigade was that in these on-the-brink times it is important, more than ever, to sensitise children to the importance of wildlife. And nothing, not even the best TV shows and films, can match the experience of seeing "a happy animal in a good enclosure" and "look them in the eye".

Also read: [Indian zoos: the good, bad and ugly](#)

This sensitisation is now an important part of the work of the zoo educator; a career that is growing all over the world. Many significant conservationists started their careers in a zoo: as visitors, volunteers, interns and part-time assistants.

Also read: [Indian zoos: just a stamp collection?](#)

In fact, one of them is visiting The Madras Crocodile Bank Trust and Centre for Herpetology (MCBT) at the moment — Karthikeyan Vasudevan of Hyderabad's Laboratory for the Conservation of Endangered Species. His volunteer stint here, some 25 years ago, helped to germinate the seeds of his interest in wildlife conservation.

Vasudevan says in a recent mail, 'The opportunity I had to work at MCBT and other captive animal facilities has helped me understand the gaps in knowledge and challenges in conservation-breeding of endangered species'. His work has primarily focused on mobilising scientific data that would specifically help amphibians and reptiles. 'Through a coordinated effort involving a team of scientists and zoo professionals, a population of Indian chevrotain from a founder population of seven animals in the Nehru Zoo [Hyderabad] was captive-bred and enhanced to 260 animals.' Later, nearly 85 of them were successfully re-introduced into the wild in five different protected areas in Telangana State.

Going back to Goodall, she had also said that there are good zoos and bad zoos, and specific problems related to them are still to be fully addressed, such as the fact that some animals, like

dolphins, shouldn't be in a zoo at all. The answer to these concerns is not to throw the baby out with the bathwater, but to fix the problems.

With 80 million annual visitors in India, zoos play an increasingly important role as centres of learning, entertainment and inspiration. Interpretation centres are also becoming more innovative, such as our own at MCBT, where VR (virtual reality) equipment is being used to bring reptiles 'up close and cosy'. It is entertaining to watch the watchers, as they squeal and squirm and clutch each other when a large mugger or salty seems to be running at them.

Children take part in awareness activities at The Madras Crocodile Bank Trust and Centre for Herpetology. | Photo Credit: Special Arrangement

And today, post-pandemic, it is more important than ever to eyeball one of the most important benefits of zoos because green, quiet places are an acknowledged tonic for mental health. Zoos provide an opportunity for economically weaker sections of society to experience this, which is hard to come by in noisy, crowded, urban environments. Some of us have access to gardens and parks, and can travel to sanctuaries and national parks; but we are a tiny, lucky percentage of our population. I have described in *Chicken Soup for the Indian Spiritual Soul*, how nature helped me recover from the painful loss of my sister. Indeed, it is a common theme in literature and art.

Incidentally, the Central Zoo Authority (CZA), which oversees the development and evaluation of our zoos, requires a certain ratio of greenery in every zoo.

The CZA assures plenty of comfortable visitor space, by requiring every zoo to maintain a 30% green belt and natural vegetation; also, the area for animal housing should not exceed 30%. Trees are to be labelled to enhance scientific information.

Another big fist-bump for zoos is the role they play in the conservation of endangered and threatened species. Being based at the MCBT, I can mention several reptiles that would probably be extinct if it hadn't been for captive breeding programmes... the gharial for one, the iconic long-snouted crocodilian, which numbered only some 200 in the '70s. 'Ex situ' breeding programmes for endangered mammals include the red panda, snow leopard, thamin, rhinoceros, the sangai deer and many more. Some of the zoos playing an active role in the conservation of these species are the Padmaja Naidu Himalayan Zoological Park, Darjeeling (red panda and snow leopard), Manipur Zoological Garden (thamin), and Assam State Zoo (rhinoceros).

Behaviour and biological studies at zoos, such as the Mysore Zoo, help guide conservation policies for the animal in the wild. And, speaking of conservation, the role of zoos in human-animal conflict mitigation has become more and more important with time. 'Rescues' need to be placed in spaces with know-how and experience, which allow them to have as near a natural life as possible and not simply be kept alive. Recently, a video did the rounds of a rescued python being apparently moved to the Veermata Jijabai Bhosale Udyan in Mumbai. It may well have been an abandoned pet or a trafficked animal; when small snakes and tortoises grow too big, they are (not so lovingly) abandoned in public places, with hopes that someone will rescue them.

Conservation initiatives like breeding endangered species and education programmes are now so much a part of zoo activities and expectations, that seeing beautiful, exotic animals is just a small part of the zoo experience in India. Nandankanan in Odisha, the Mysore Zoo and the Arignar Anna Zoological Park in Chennai are some that do this very well. Zoos have become important centres for environmental education, and a 'zoo educator' is often listed as an option in wildlife careers. Gone are the days when a rusty old signboard was one's only source of

information; the need for meaningful environmental education at zoos is being addressed both by the CZA as well as zoos themselves, because the response from visitors is heart-warming and the interest in wildlife and its conservation is growing

Many zoos organise special programmes on the environment and its conservation, and climate change is increasingly a part of this. They are the ideal partners for the government to take this all-important message to different communities, from students to decision-makers. The International Zoo Educators Association, of which many Indian zoos are members, offers useful advice and information on how to enrich and expand these programmes.

Today, our zoos have free guided tours and programmes. The responsibility to do this is a serious one in these times of the coronavirus. Zoos are helping to create a battalion of our future nature guardians, an act of self-perseveration. Because as per the thoughts of many scientists, the present pandemic may, in times to come, look like a tiddler.

We should be proud of our zoos. It is a network that discusses husbandry, conservation and education plans, and shares information and ideas. They are spaces increasingly open to women; there are a number of women zoo directors and veterinarians. It is also a space where visitors can pay 40 per ticket and spend hours wandering in a 1,300 acres (Arignar Anna Zoological Park, Chennai) or 250 acres (Mysore Zoo) space.

The writer is one of the founders of the Madras Crocodile Bank, and currently its managing trustee.

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INDIAN ZOOS: THE GOOD, BAD AND UGLY

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Qatar World Cup 2022 FIFA World Cup, Portugal vs. South Korea: Horta, Kim Young-Gwan score in first half, 1-1

December 02, 2022 10:22 am | Updated 09:25 pm IST

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Humboldt penguins at the Mumbai zoo. | Photo Credit: Emmanuel Yogini

Jaguars, hybrid lions and orangutans, among 600 species of mammals, birds, and reptiles from around the globe, will soon be displayed at 'one of the world's biggest zoos' in Gujarat's Jamnagar city. This is reportedly the 'pet project' of Anant Ambani, the son of India's richest man, the owner of Reliance Industries, Mukesh Ambani.

Also read | [Indian zoos: just a stamp collection?](#)

A little over a year since the project was announced, the 288-acre Greens Zoological Rescue and Rehabilitation Kingdom has already courted a fair bit of controversy. The latest involved a reported transfer of seized exotic animals from the Assam State Zoo to the Jamnagar facility, which sparked criticism from the Aam Admi Party and the Assam Trinamool Congress — they wanted the animals brought back. Meanwhile, in South India, the VOC Park and Zoo in Coimbatore was in the news for the wrong reasons: the Central Zoo Authority (CZA) cancelled the recognition of the facility for not following norms: there was a lack of access to fresh food and water, and no basic facilities such as treatment rooms.

Also read | [Indian zoos: seeds of wildlife conservation](#)

The VOC Park and Zoo in Coimbatore, which lost its licence recently. | Photo Credit: M. Periasamy

India's 149 recognised zoos attract millions of visitors every year. While there are naysayers, the narrative may be changing. The CZA states that 'although the initial purpose was entertainment, over the decades, zoos have transformed into centres for wildlife conservation and environmental education'.

There is indeed some commendable work being done by individual zoos. For instance, the [Padmaja Naidu Himalayan Zoological Park in Darjeeling](#), the country's largest high-altitude zoo, was judged India's best zoo by the CZA this year: it is recognised worldwide for its conservation breeding programmes for endangered species such as the red panda. At second place was the Arignar Anna Zoological Park in Chennai, which conducts eco-awareness programmes such as

a 'zoo school' that offers classes to students on a regular basis.

The Padmaja Naidu Himalayan Zoological Park in Darjeeling was judged India's best zoo by the CZA this year. | Photo Credit: Getty Images

But these examples apart, how are the majority of Indian zoos faring? Do they meet the salient objectives of conservation and education set out for them?

There have been some worrying reports from across the country. In 2017, a group of researchers published a study of tigers and leopards in six Indian zoos in the scientific journal *PLOS One*. Of the 41 tigers and 21 leopards studied, they found that 83% of the tigers and 62% of leopards showed 'stereotypic behaviour' — an indication of stress, manifested in repetitive pacing, head rotation, chewing paws and snapping. The paper suggested that tigers in captivity should have access to larger enclosures with a pool and stones; and leopards needed dense tree cover, a pool, stones and a den. Both species also needed 'positive keeper attitude'.

"I don't know if anything has been done to follow up on our recommendations," says one of the authors of the paper, Nagarajan Baskaran, assistant professor, Department of Zoology and Wildlife Biology, A.V.C. College, Tamil Nadu. "Zoos often do not follow CZA guidelines and I find that space appears to be the biggest constraint in several, undermining the welfare of free-ranging animals such as carnivores. In future, zoos should be established on the outskirts of cities where there is access to space."

A leopard at the Ramnabagan Mini Zoo in West Bengal. | Photo Credit: PTI

Zoos are in a constant process of evolution, says Sanjay Kumar Shukla, member secretary, CZA. The number of recognised zoos in India changes each year depending on annual evaluation reports. Last year, for instance, six were closed down. "In one instance, there was a lion safari that did not comply with the minimum area prescribed for carnivore safaris. Another was shut down because of the poor upkeep of animals," he says. The CZA is in the process of upgrading zoos and some 15 zoos are now also in the process of collaborating with international zoos for knowledge transfer. This includes an MoU between Vanvihar National Park & Zoo, Bhopal, and the Zurich Zoo, Switzerland.

Historically, zoos were 'collections' of captive animals, open to the public to establish the legitimacy of rulers, empires and powerful people, says Mahesh Rangarajan, an environmental historian with Ashoka University. "The London zoo, established in 1826, for instance, showcased animals from across the Empire. Later, zoos aided research and public education; primatologist Frans de Waal has famously studied the behaviour of great apes in the Amsterdam zoo" he says.

In India, while some zoos have helped in the conservation of species, there is still an ambiguity about the rationale, says Rangarajan. "We need to ask if zoos are primarily spaces for entertainment and recreation. Do they serve conservation and education meaningfully?"

We bring you the opinions of experts who weigh in on the benefits and drawbacks of contemporary zoos across India.

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DROUGHT IN PERU ANDES PROVES FATAL FOR ALPACAS, POTATO CROPS

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Qatar World Cup 2022 FIFA World Cup, December 4: Which Round of 16 matches happening in Qatar today?

December 04, 2022 02:00 pm | Updated 02:00 pm IST

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The harsh drought in the Peruvian Andes has caused the death of animals such as alpacas and affected crops and the economy of local communities. | Photo Credit: AFP

A drought in the Peruvian Andes has ravaged alpaca flocks and withered potato crops, forcing the government to declare a state of emergency on Saturday for 60 days in more than 100 districts.

Hardest hit are rural communities in the Arequipa and Puno departments in Peru's southern region, where the government decreed a state of emergency "due to imminent danger from water shortage."

The national weather service, Senamhi, described the drought as one of the worst in the past half century, exacerbated by the offshore La Nina weather phenomenon in the central Pacific Ocean.

"November 2022 was one of the driest (months) in the last 58 years in various weather stations in the Andean region," Senamhi reported.

Andean hamlets for Quechua- and Aymara-speaking indigenous groups have faced critical losses of crops and livestock herds.

The drought has forced the Peruvian government to declare a 60-day emergency in 111 districts of the region. | Photo Credit: AFP

"For lack of forage and water, the alpacas are dying. My alpacas have died," Isabel Bellido, an alpaca farmer, told AFP from her mountain home in Lagunillas near Puno, a regional capital at 4,200 meters (12,550 feet) in elevation some 850 kilometers (530 miles) southeast of Lima.

Carlos Pacheco, a veterinarian and expert in llamas and alpacas, said a worst-case scenario would be for the drought to endure.

"The animals are already underweight, and there is no pasture," he said.

At high altitude in the Andes, temperatures can drop to minus 20 degrees Celsius (minus four degrees Fahrenheit), and cause mass deaths of sheep and alpacas, vital to the subsistence of dwellers in mountain hamlets.

In the winter of 2015, an estimated 170,000 alpacas died from extreme cold and drought in Peru.

Local press reports say hundreds of alpaca crias, or babies, and lambs have already died this year.

Shallow lakes have dried up, leaving only scattered puddles, as in the case of the Parihuanas Lagoon near Lagunillas.

In the neighboring Santa Lucia district, the Collpacocha Lagoon has completely disappeared, leaving only a cracked mud lake bed.

Near Lake Titicaca, the highest navigable inland sea in the world at 3,812 meters in elevation, the inhabitants of the Aymara-speaking village of Ichu appeal to a higher authority to end the drought.

[Also Read | The UN report that highlights India's vulnerability to drought](#)

They have taken out the venerated Catholic figure of Our Lady of the Cloud in a procession through the fields to plead for the first time in years for holy intervention to bring rain.

"We've planted our crops in the customary way but the potatoes aren't sprouting because of the intense heat. It is worrisome," said Daniel Ccama, a community leader in Ichu.

"Let the rains come Father Jesus. Don't punish us father," the procession participants chanted in their native Aymara.

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December 04, 2022 03:21 am | Updated 11:07 am IST

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The Great Indian Bustard | Photo Credit: Special Arrangement

The story so far: On November 30, [the Supreme Court asked the Government, whether a focussed approach, something like Project Tiger, can be taken up for saving the critically endangered Great Indian Bustard](#) (GIB).

Hearing petitions highlighting deaths of the GIBs due to power transmission lines, a special bench of the apex court led by Chief Justice D.Y. Chandrachud directed Chief Secretaries of Gujarat and Rajasthan to undertake and complete a comprehensive exercise within four weeks to find out the total length of transmission lines in question and the number of bird diverters required. This is not the first time that the Supreme Court had intervened in the conservation of the GIB. In an earlier order in April 2021, the Supreme Court had directed the authorities to convert the overhead cables into underground power lines, (where feasible) within a period of one year and that till such time diverters would have to be hung from existing power lines.

There are several threats that have led to the decline of the GIB populations; however, power lines seem to be the most significant. There have been studies in different parts of the world where bustard populations have shown high mortality because of power lines such as Denham's bustards in South Africa and the Great Bustard in Spain. Like other species of bustards, the GIBs are large birds standing about one metre tall and weighing about 15 to 18 kgs. The GIBs are not great fliers and have wide sideways vision to maximise predator detection but the species' frontal vision is narrow. These birds cannot detect power lines from far and since they are heavy fliers, they fail to manoeuvre across power lines within close distances. The combination of these traits makes them vulnerable to collision with power lines. In most cases, death is due to collision rather than electrocution. A study by the Wildlife Institute of India (WII) in 2020 recorded six cases of GIB mortality due to power-line collisions in Thar from 2017-20.

Listed in Schedule I of the [Indian Wildlife \(Protection\) Act, 1972](#), in Appendix I of CITES, as Critically Endangered on the IUCN Red List, the GIBs enjoy the highest protection both in India and globally. The earliest estimates show the population was about 1,260 in 1969, but has declined by 75% in the last 30 years.

Historically, the GIB population was distributed among 11 States in western India but today the

population is confined mostly to Rajasthan and Gujarat. Small populations are found in Maharashtra, Karnataka and Andhra Pradesh. The overall population of the GIB totals 150 across the country, which includes about 128 birds in Rajasthan. Along with the attempts to mitigate impacts of power transmission lines on the GIB, steps have been taken for conservation breeding of the species. A total of 16 GIB chicks, artificially hatched from eggs collected from the wild, are being reared in the satellite conservation breeding facility at Sam in Jaisalmer, Rajasthan. The objective of 'Habitat Improvement and Conservation Breeding of Great Indian Bustard-an integrated approach' is to build the captive population of the GIBs and to release the chicks in the wild. The initiative is likely to take 20 to 25 years. Experts, including scientists from the WII, have called for removing all overhead powerlines passing through the GIB priority/critical areas in Rajasthan; the Ministry of Environment, Forest and Climate Change too has constituted a task force. Questions, however, are being raised on the slow pace of implementation.

According to scientists, the GIBs are slow breeders and they build their nests on the ground. The species have also been subjected to hunting and egg collection in the past. There also has been a decline in prevailing habitat loss as dry grasslands have been diverted for other use. Experts also warn of pesticide contamination and increase of populations of free-ranging dogs and pigs along with native predators (fox, mongoose, and cat), putting pressure on nests and chicks. While most of the population of the species is confined to the Jaisalmer Desert National Park (DNP), wildlife enthusiasts believe that more areas outside the protected area must be made suitable for the species. A conservation effort like 'Project Tiger' may not work for a large bird of an arid region that can always fly out of the protected area. Experts are calling for community-centric conservation of the critically endangered species.

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A cheetah after being released inside a special enclosure of the Kuno National Park in Madhya Pradesh on September 17. | Photo Credit: PTI

The story so far: This year marked [the arrival of Namibian cheetahs to India](#), the first intercontinental transfer of wild cats into the country since independence. Eight cheetahs were flown into the Kuno National Park (KNP), Madhya Pradesh, from Namibia on September 17 as part of an ambitious [project to introduce the big cat into the country](#). They were released into the quarantine zone at the KNP [by Prime Minister Narendra Modi](#). In February, the government went public with a plan to import a cohort of animals that could live in India, setting up a task force to implement the programme.

The cheetahs — five females and three males — were flown into India following several weeks of medical supervision in Namibia. They will be released into the wild gradually so that they have enough time to adapt to Indian conditions, are at reduced risk of contracting and spreading infection and have honed the skills to hunt Indian prey. The eight cheetahs were housed in six 'bomas' (enclosures) and initially provided with buffalo meat. So far, three of the animals have been released into a larger enclosure outside of the 'bomas' after two of them — Freddie and Elton — successfully killed chital for prey in November. The third animal, Oban, was also released mid-November and all the animals are expected to be moved inside larger enclosures in weeks. The cheetahs are radio-collared and their movements will be tracked. Each animal has a dedicated tracking team. A team of wildlife scientists, biologists, and Laurie Marker, a renowned zoologist and founder of the Cheetah Conservation Fund, is monitoring the initiative.

Cheetahs were once widespread in India as well as in many parts of the world until they were hunted to extinction. Only around 8,000 of them survived, and overwhelmingly in Namibia and South Africa. A different species, called the Asiatic cheetah, once abundant in India, is found in Iran. As part of improving their odds of long-term survival, young animals are being reared as part of conservation efforts in Namibia and then sent to different parts of the world, including India. While it is still early days for the cheetah, [experts have raised concerns](#) that the KNP has limited space for the cheetah to co-exist with other predators such as tigers and lions, for which the KNP was originally prepared.

Every four years, India carries out a census of the tiger population across India. The latest

estimate put the tiger population at 2,967. Tigers were reportedly increasing at a rate of about 6% per annum and the area that they occupied was roughly stable, at about 89,000 square km since 2014. These numbers are estimated using a sophisticated system that involves photographing animals via camera traps as well as mathematical analysis. In 2006, India had 1,411 tigers. This rose to 1,706 in 2010 and 2,226 in 2014 on the back of improved conservation measures and new estimation methods.

The consistent implementation of Project Tiger since 1973, whereby dedicated tiger reserves were established in India, as well as anti-poaching measures have played a significant role in tiger conservation. India has 53 tiger reserves with the latest being added early this year. However, rising tiger numbers have meant that nearly half the tigers are now outside designated protected zones that lead to increasing instances of human-animal conflict.

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December 04, 2022 02:40 am | Updated 12:51 pm IST

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A one-horned rhinoceros at the Kaziranga national park in Assam on October 10. | Photo Credit: AP

The story so far: Greens worldwide called the Kaziranga National Park the greatest conservation success story in 2005 when it completed a century. Much of it is attributed to a rhino protection force that shoots alleged poachers at sight; more than 55 armed men have been killed within the boundary of the 1,300 sq. km tiger reserve for unauthorised entry since 2012-13.

The population of the one-horned rhino was about a dozen when Kaziranga became a protected area in 1905. According to the State of Rhino Report 2022, the poor-sighted herbivore's number in Kaziranga is an estimated 2,613, more than 65% of its total population of 4,014 across 11 habitats in India and Nepal. A decade ago, the rhino's population in these domains was 2,454. A section of conservationists say the focus is too much on the rhino but agree this has made other animals in its domains a beneficiary. The number of tigers, for instance, has increased in Assam at a rate higher than elsewhere in India. A 2010 count said Kaziranga has the highest density of tigers — 32.64 per 100 sq. km — in the world.

According to Assam-based rhino expert Bibhab Kumar Talukdar, the strengthening of the anti-poaching mechanism in India and Nepal with more manpower, capacity-building of frontline staff and equipping forest guards with better fighting gears have helped protect the rhino. The sentiments of local people attached to the rhino have also been a factor in the sharp drop in the number of rhinos killed, from 54 in 2013 and 2014 to one each in 2021 and 2022. The threat from poachers cannot be wished away because of the illegal wildlife trade in next-door Myanmar and beyond in Southeast Asia, he said. "While poaching remains a major threat to rhinos, alien invasive plant species grabbing key grassland habitats in rhino-bearing areas in the past decade has emerged as a bigger threat to the animal in India and Nepal," Mr. Talukdar, also a senior member of the Asian Rhino Specialist Group, said.

India is home to nearly 60% Asian elephants and the last count of the species in 2017 had put the number at 29,964. While the number of elephants in India has increased in the past few years, the species is listed as 'Endangered' on the IUCN Red List of threatened species and Schedule I of The Wildlife Protection Act.

The largest land-dwelling mammal is under continuous threat of poaching and conflict with humans. While incidents of poaching for ivory have come down, the human-elephant conflict has been increasing. On average, about 500 humans and 100 elephants are killed every year across the country in such confrontations. The elephant population is not evenly distributed in the country. The south Indian States of Karnataka, Kerala, Andhra Pradesh, and Tamil Nadu is home to nearly 44% of India's elephant population. The fragmentation of elephant habitats and the construction of linear (railways and roads) and power infrastructure have led to many elephant deaths. The change in land use, particularly bringing erstwhile forested areas under agriculture, has aggravated the conflict. The Ministry of Environment, Forest and Climate Change launched Project Elephant in 1992 to ensure the long-term survival of elephants in their natural habitats. The number of elephant reserves in India is 32 with the latest addition being the Agasthyamalai Elephant Reserve in 2022. Elephant corridors and linear narrow habitat linkages which allow elephants to move between secure habitats are crucial for conservation. So far, about 101 elephant corridors have been identified in the country which need to be secured for conservation of elephants.

Also Read | [Elephant corridors in India threatened, says study](#)

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AMAZON LOSES 10% OF ITS VEGETATION IN NEARLY FOUR DECADES

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The Amazon region has lost 10% of its native vegetation, mostly tropical rainforest, in almost four decades, an area roughly the size of Texas, a new report says. | Photo Credit: AP

The Amazon region has lost 10% of its native vegetation, mostly tropical rainforest, in almost four decades, an area roughly the size of Texas, a new report says.

From 1985 to 2021, the deforested area surged from 490,000 square kilometers (190,000 square miles) to 1,250,000 square kilometers (482,000 square miles), unprecedented destruction in the Amazon, according to the Amazon Network of Georeferenced Socio-Environmental Information, or Raisg.

The numbers are calculated from an annual satellite monitoring since 1985 from Bolivia, Peru, Ecuador, Colombia, Brazil, Venezuela, Suriname, Guyana and French Guiana. The report is a collaboration between Raisg and MapBiomas, a network of Brazilian nonprofits, universities and technology startups.

"The losses have been enormous, virtually irreversible and with no expectation of a turnaround," said a statement Friday by Raisg, a consortium of civil society organizations from the region's countries. "The data signals a yellow light and gives a sense of urgency to the need for a coordinated, decisive and compelling international action."

Also Read | [What needs to happen for zero deforestation in the Amazon Rainforest](#)

Brazil, which holds about two-thirds of the Amazon, also leads the destruction. In almost four decades, 19% of its rainforest has been destroyed, due mainly to cattle ranching expansion supported by the opening of roads. The country accounted for 84% of all forest destruction in the period.

Almost half of Brazil's carbon emissions comes from deforestation. The destruction is so vast that the eastern Amazon has ceased to be a carbon sink, or absorber, for the Earth and has become a carbon source, according to a study published in 2021 in the journal Nature.

As of 2021, the Amazon had 74% of its area covered by tropical rainforests and 9% of other natural vegetation types. The region, with 8.5 million square kilometers, holds a population of 47 million people, according to Raisg estimates.

“At least some 75 billion metric tons of carbon are stored across the Amazon,” Woods Hole Research Center researcher Wayne Walker said during a press conference Friday in Lima, Peru. “If all that carbon ended up immediately in the atmosphere, that would be about seven times global annual emissions.”

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DELHI CHOKING, BUT DO NOT BLAME STUBBLE BURNING ALONE

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'We need to take more comprehensive, long-term measures throughout the year and not just in the days and weeks when it begins to make news'. The picture is of Delhi's air | Photo Credit: AP

Every year around Deepavali, and like clockwork, Delhi's air quality makes it to the headlines. But there is a problem. You would have noticed that the noise on TV channels and even newspapers over the issue dies down after one 'strong wind speed day' and blows the debate away. Next winter we are back to expressing outrage again. As firefighters we are doing well, but as planners doing very little. While nature will not change, emissions can be reduced.

Increasingly polluted air is a hazard and a health crisis in the making. In fact, it is already one. India now reports 2.5 million air pollution-related deaths annually. Pollution not only makes our throats and eyes burn but is much more insidious. Some pollutants are so small that they are able to enter the bloodstream with ease, impacting almost every organ in the body and leading to the onset of health issues such as stroke, heart diseases, respiratory diseases and cancer, to name just a few serious health problems. It is not just about good air. It is about life.

While a lot has been written and said about Delhi's air quality, the question that still has to be answered is this: why is nothing changing after all these years?

A principal reason is that year after year, we are doing the same things to try and address the problem without actually trying to evaluate why those measures are not effective. The Government formed the Commission for Air Quality Management, which, unfortunately, did not offer anything new. This body essentially issued the same orders the Ministry and the Environment Pollution (Prevention and Control) Authority used to, with just a slight change in the language used. Every year schools are closed, people are advised to stay indoors, or carpool and work from home, bans on firecrackers are reinforced, construction stopped, trucks and cars not allowed to enter the city, and industries running on fuel shut. These measures, and several others, are akin to dressing a bullet wound with bandaid. Stopping people from going about their regular work is plain bad governance.

As the haze descends over Delhi, the blamegame begins — with stubble burning in the

neighbouring States being identified as the main culprit. However, the reality is that Delhi's air is bad even when stubble is not being burnt. The burning of biomass in and around Delhi, if audited properly, would be the same as stubble burning in other States. Unfortunately none of the bodies, be it the municipal body or the government's Public Works Department, is willing to take responsibility for this or address and find a solution to the problem. This is not to say that stubble burning is not a problem. Some solutions have been tried out over the years, but with little success. What is required is a fundamental shift in agricultural patterns, which needs someone to make a bold political call. Unless farmers are adequately compensated, the problem is unlikely to go away. The 'Happy Seeder'-based solution has sadly not been a happy experience. We need to acknowledge that the problem is not just Delhi-centric. For some strange reason we all talk about the airshed approach but do not spend the rest of the year trying to solve the problem. Delhi chokes on its own dust and industrial activities. Who is ensuring compliance with the rules relating to the handling of construction and demolition waste? Delhi started with much enthusiasm about roadside greening and cover. But is anyone monitoring this? Everyone seems to be looking at the data of PNG in industry, but is anyone looking at the unauthorised industries, which are a large emitter? Vehicles are another source of pollution in the city and we need to introspect why, despite an expanding fleet of public transport, citizens who primarily use two-wheelers have not moved to using the public transport system — buses and the metro. I feel the reasons for this include last-mile connectivity, the problem of crowding in buses and metros, and the inability to reach and navigate narrow lanes that two-wheelers can. The state of maintenance of buses could be another reason as well.

We have to be creative and look beyond the measures that have already been tried and proved they are at best a short-term solution to a recurring, long-term problem. Even then a core issue that needs to be addressed is the governance system. There needs to be a single entity that takes responsibility for air quality management. We cannot operate in silos where one system of governance is responsible for thinking, a second issues orders and a third is responsible for implementation. Without an efficient system that works in a coordinated way, we will find ourselves to be in the same position years later.

The reality also is that Delhi is not the sole offender. There are many other cities in India where safe levels of air quality are breached regularly. Air quality is a problem on most days but becomes an issue around Deepavali and when stubble is being burnt. We need to take more comprehensive, long-term measures throughout the year and not just in the days and weeks when it begins to make news.

C.K. Mishra is a former Secretary, Ministry of Environment, Forest and Climate Change and founder, Partnerships for Impact

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RAJYA SABHA CLEARS WILDLIFE BILL, MINISTER PROMISES TO PROTECT ELEPHANTS

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December 08, 2022 10:34 pm | Updated December 09, 2022 12:18 am IST

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Union Minister for Environment Bhupender Yadav speaks in the Rajya Sabha on December 8, 2022. | Photo Credit: PTI

Rajya Sabha passed the [Wildlife \(Protection\) Amendment Bill, 2022](#) on Thursday. Environment Minister Bhupender Yadav assured that elephants will be protected and conserved according to the provisions of the Act.

The Bill, which had undergone scrutiny of a parliamentary panel, seeks to conserve and protect wildlife through better management of protected areas and rationalise schedules which list out species under the Wildlife (Protection) Act, 1972. [Lok Sabha had cleared the legislation in August](#) during the Monsoon Session.

The Bill seeks better management of protected areas and provides for certain permitted activities like grazing or movement of livestock and bona fide use of drinking and household water by local communities.

Meanwhile, Sushmita Dev of Trinamool Congress said the amendment has given huge discretion for the transportation of live elephants and expressed concern on protecting the animal. She said the amendment contravenes Section 27 of the Act.

Congress member Jairam Ramesh opposed the Bill in its current form. He said the Minister has accepted recommendations of the Standing Committee but deviated from an important suggestion. "The elephant is a national heritage animal for India. The Standing Committee accepted the religious significance of the elephant, but the Minister has also included the words 'any other purpose'. What are these words supposed to stand for?" Mr. Ramesh asked.

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UNION MINISTER OF RURAL DEVELOPMENT, SHRI GIRIRAJ SINGH HOLDS A MEETING ON 'CACTUS PLANTATION AND ITS ECONOMIC USAGE'

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

Union Minister of Rural Development and Panchayati Raj Shri Giriraj Singh, convened a consultation meeting on 'Cactus Plantation and its Economic Usage' today in New Delhi. The meeting was attended by Ambassador of Chile, Mr. Juan Angulo M; Deputy Head of Mission, Embassy of Morocco, Mr. Errachid Alaoui Mrani; Head of Energy Division, Embassy of Brazil, Mrs. Carolina Saito; Agricultural Attache, Embassy of Brazil, Mr. Angelo Mauricio. Indian Ambassadors of these countries also attended the meeting through VC.



Fourteen experts of various countries like, Chile, Mexico, Brazil, Morocco, Tunisia, Italy, South Africa and India also attended the meeting through VC. Secretaries of Department of Land Resources (DoLR), Ministry of External Affairs, Department of Rural Development, and representatives of Food and Agriculture Organisation (FAO), Indian Oil Corporation Limited, Indian Council of Agricultural Research (ICAR) & International Center for Agricultural Research in the Dry Areas (ICARDA) and other senior officials were also present.



India has approximately 30% of its geographical area under the category of degraded land. DoLR has been mandated to restore degraded lands through its Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY). Plantations of various kinds constitute one of the activities which help in restoration of degraded lands. Union Minister of Rural Development Shri Singh desired that various options for taking up Cactus plantation on degraded land should be explored for realising the benefits of its usage for bio-fuel, food, fodder and bio-fertiliser production for the larger benefit of the country. The Minister is of the view that bio-fuel production will reduce the fuel import burden of the country apart from contributing towards employment and income generation for the poor farmers of these areas.

Indian Council of Agricultural Research (ICAR) and International Center for Agricultural Research in the Dry Land Areas (ICARDA) are being roped in for setting up a pilot project in Amlaha Farm of ICARDA in Madhya Pradesh. Ministry of Petroleum has been requested to provide necessary technical assistance in this venture.



Cactus is a Xerophytic Plant which though grows relatively at a slower pace has an immense potential as stated above. Moreover, it will help in achieving Nationally Determined Contributions (NDC) and Sustainable Development Goals (SDGs) for the country as well. The Department is of the view that cactus plantation will be picked up by the farmers of degraded land areas, if the benefits outweigh their existing level of incomes. Experiences of countries like Chile, Mexico, Brazil, Morocco and various others are being explored which will be of great help for realisation of the objective.

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December 10, 2022 08:10 pm | Updated 08:10 pm IST

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Natural-growth rainforest are most suited for hornbill populations. | Photo Credit: Getty Images

The logo for India's upcoming G20 presidency was officially unveiled recently at the Hornbill festival in Nagaland. This popular festival showcases the art, culture and cuisine of Nagaland. It also brings attention to a family of some of the largest, most magnificent birds in our country.

The Great Hornbill is found in the Himalayan foothills, the Northeast and the Western Ghats. It is the state bird of Arunachal Pradesh and Kerala. With a wingspan of five feet, it presents an awesome (and noisy) spectacle while landing on a perch. The wreathed hornbill, the brown hornbill and the rufous-necked hornbill are slightly smaller, and only found in Northeast India. A great place to spot the oriental pied hornbill is the Rajaji National Park, Uttarakhand. The Malabar grey hornbill's loud 'laugh' echoes in the Western Ghats. The smallest of the group, the Indian grey hornbill is found all over (except the Thar Desert), and is often spotted in urban settings such as Theosophical Society gardens in Chennai.

Their large, heavy beaks pose some limitations — for balance, the first two vertebrae are fused. Hornbills can move their heads as in 'yes', but have difficulty in saying 'no'. Large beaks are also seen in toucans from Central and South America — an example of convergent evolution — as both birds have the same feeding ecology.

Hornbills prefer tall trees for their nests (breast height being 1.5 metres or more). There is a mutualism between these birds and the trees where they nest. As large fruit-eating birds, hornbills play a vital role in dispersing the seeds of about 80 rainforest trees. Some trees, such as the cup-calyx white cedar suffer a 90% decline in seed dispersal beyond the parent tree when hornbill populations decline, negatively impacting the biodiversity of forests.

The towering Tualang tree of Southeast Asia is so entwined in folklore that it is considered a taboo to fell this tree. It is the preferred habitat of the helmeted hornbill. The fruiting season coincides with the birds' reproductive cycle. Traditional ecological knowledge stresses the value of hornbills in dispersing the seeds, which are expectorated from the throats of the birds. "When the seeds sprout, the hornbills hatch", a saying goes.

Unfortunately, tall trees are the first targets of illegal logging, and so there has been a slow

decline in hornbill numbers, as reflected in bird counts. Slow, because these birds are long lived (up to 40 years). Their large size makes them prone to being hunted. The helmeted hornbill of Sumatra and Borneo is critically endangered because its helmet-like casque (a horny outgrowth over the skull), called red ivory, is highly prized. Luckily, the casque of the Great Hornbill is not suitable for carving.

Hornbill populations appear to be faring better in South India, The Nature Conservation Foundation, Mysuru, has collected data to show that forest plantations are not as suited for hornbill populations as natural-growth rainforest, although nests are sometimes built in non-native silver oaks.

The adaptable nature of hornbills is also seen in their feeding on the fruits of the African Umbrella tree, which has been introduced as a shade tree in our coffee plantations.

(The article was written in collaboration with Sushil Chandani who works in molecular modelling. sushilchandani@gmail.com)

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ANDAMAN SMOOTHHOUND, HIMALAYAN FRITILLARY AMONG 29 NEW THREATENED SPECIES IN INDIA: IUCN

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

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December 10, 2022 07:24 pm | Updated 07:31 pm IST - Montreal

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International Union for Conservation of Nature. Photo: Twitter/@IUCN

White-cheeked Dancing Frog, Andaman Smoothhound shark and Yellow Himalayan Fritillary are among 29 [new species assessed in India that are under threat](#), according to the latest update to the International Union for Conservation of Nature's (IUCN) Red List unveiled during the COP15 biodiversity conference here in Canada.

The latest update warns that a barrage of threats including illegal and unsustainable fishing, pollution, climate change and diseases is destroying sea species such as the Andaman Smoothhound shark.

The IUCN Red List unveiled on Friday is a critical indicator of the health of the state of the world's biodiversity. It provides information about the global extinction risk status of species—and is a key tool to help define and inform conservation targets.

Over 15,000 scientists and experts from around the world are part of the IUCN Commission. They found 1,355 of over 9,472 species of plants, animals, and fungi across India's land, freshwater, and seas assessed for the Red List are considered to be under threat, classed as critically endangered, endangered, or vulnerable to extinction.

According to the data shared by IUCN, 239 new species analysed in India have entered the list. Of these, 29 are threatened.

"Today's IUCN Red List update reveals a perfect storm of unsustainable human activity decimating marine life around the globe. As the world looks to the ongoing UN biodiversity conference to set the course for nature recovery, we simply cannot afford to fail," said Bruno Oberle, IUCN Director General, at the 15th Conference of Parties to the Convention of Biological Diversity (CBD COP15).

Delegates from 196 countries, including India, have gathered here in Montreal, Canada for a two-week conference from December 7-19, to adopt the post-2020 Global Biodiversity Framework, a landmark agreement to halt and reverse nature loss by 2030.

“We urgently need to address the linked climate and biodiversity crises, with profound changes to our economic systems, or we risk losing the crucial benefits the oceans provide us with,” Bruno said during a press conference here.

According to IUCN, the white-cheeked Dancing Frog (*Micrixalus candidus*), which has entered the Red List as endangered, is only known from a small range with an extent of occurrence of 167 square kilometers (km²) in the Western Ghats of Karnataka, a biodiversity hotspot.

“It is considered to be uncommon. Its habitat is threatened by the conversion of forest to areca nut and coffee plantations,” it said.

“As per the published research papers and reports, 30 per cent of dancing frogs are found to live in the regions that are not protected by the government,” said Dr Sumit Dookia, Wildlife Biologist & Faculty, GGS Indraprastha University, New Delhi.

“They are endangered with extinction due to loss of their habitat, pollution, changes in temperature, diseases, pests, invasive species among others,” Dr. Dookia told *PTI*.

The Andaman Smoothhound (*Mustelus andamanensis*) has been included in the Red List as Vulnerable. This recently described shark is found in the Andaman Sea in the Eastern Indian Ocean off the coast of Myanmar, Thailand, and the Andaman and Nicobar Islands.

It is subject to fishing pressure across its spatial and depth range. It is taken as a bycatch in industrial and artisanal fisheries with multiple fishing gears including trawl, longline, and gillnet, IUCN said.

“A small fish, discovered in April 2021 as new to science —Andaman Smoothhound—is facing the risk of extinction due to overfishing,” said Dr. Dookia.

“Growing demand for fish and fish meat is a major reason. This new species is currently only known from the Andaman Sea and endemic to India,” he added.

The Yellow Himalayan Fritillary plant (*Fritillaria cirrhosa*), which has been included in the Red List as Vulnerable, is mostly found in the Himalayas. It occurs in Bhutan, China, India, Myanmar, Nepal and Pakistan.

In the Indian Himalayas, the species is threatened due to unorganised harvest, over-extraction, unsustainable and premature harvesting of bulbs, coupled with illegal hidden markets, according to the data.

Dr. Dookia noted that over the last few years, a rapid decline has been reported and raised high conservation concerns on the rapid population decline of *Fritillaria cirrhosa* in the Western Himalayas.

“Harvested and traded with a new trade name i.e., ‘Jangli lehsun’ probably to disguise common *Allium* species, the species is facing tremendous decline in wild populations due to its illegal harvesting and trade in Himachal Pradesh,” he said.

Climate change modelling predicts a future decline in the species' geographic distribution, IUCN

said.

Dr. Dookia said all three species found in three unique ecosystems are pushed towards the extinction risk category due to over-harvesting and climatic events in the last few decades.

“As of now, the government does not have any policy to conserve these species. The recent IUCN’s assessment will alarm the bells and hopefully, attention of global and national policymakers will be attracted to formulate the conservation plans,” he added.

The IUCN Red List now includes 150,388 species, of which 42,108 are threatened with extinction. Over 1,550 of the 17,903 marine animals and plants assessed are at risk of extinction, with climate change impacting at least 41% of threatened marine species, according to the IUCN statement.

For instance, globally, populations of dugongs—large herbivorous marine mammals—and 44% of all abalone shellfish species have entered the IUCN Red List as threatened with extinction.

Data shows the pillar coral has deteriorated to Critically Endangered due to accumulated pressures.

“The awful status of these species should shock us and engage us for urgent action,” said Professor Amanda Vincent, Chair of the IUCN SSC Marine Conservation Committee.

“These magical marine species are treasured wildlife, from the wonderful abalone to the charismatic dugong and the glorious pillar coral, and we should safeguard them accordingly. It is vital that we manage fisheries properly, constrain climate change and reverse habitat degradation,” Ms. Vincent added.

In October this year, the findings from WWF’s Living Planet Report (LPR) were equally grim. It found that wildlife populations have seen a devastating 69% drop on average since 1970—a biodiversity crisis that experts classify as the sixth mass extinction.

The report warned governments, businesses and the public to take urgent and transformative action to reverse the destruction of biodiversity.

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THREE HIMALAYAN MEDICINAL PLANTS ENTER IUCN RED LIST

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

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December 10, 2022 12:57 am | Updated 12:18 pm IST - Kolkata

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Under threat: *Dactylorhiza hatagirea* has been assessed as 'endangered'. | Photo Credit: Special Arrangement

Three medicinal plant species found in the Himalayas have made it to IUCN Red List of Threatened Species following a recent assessment. *Meizotropis pellita* has been assessed as 'critically endangered', *Fritillaria cirrhosa* as 'vulnerable', and *Dactylorhiza hatagirea* as 'endangered'.

Meizotropis pellita, commonly known as Patwa, is a perennial shrub with restricted distribution that is endemic to Uttarakhand. "The species is listed as 'critically endangered' based on its limited area of occupancy (less than 10 sq. km)," the study stated. The species is threatened by deforestation, habitat fragmentation and forest fires.

"The essential oil extracted from the leaves of the species possesses strong antioxidants and can be a promising natural substitute for synthetic antioxidants in pharmaceutical industries," the assessment said.

Meizotropis pellita has been categorised as 'critically endangered'. | Photo Credit: Special Arrangement

Fritillaria cirrhosa (Himalayan fritillary) is a perennial bulbous herb. "It is reasonable to conclude a decline of at least 30% of its population over the assessment period (22 to 26 years). Considering the rate of decline, long generation length, poor germination potential, high trade value, extensive harvesting pressure and illegal trade, the species is listed as 'vulnerable,'" it said.

In China, the species is used for the treatment of bronchial disorders and pneumonia. The plant is also a strong cough suppressant and source of expectorant drugs in traditional Chinese medicine, the IUCN assessment said.

The third listed species, *Dactylorhiza hatagirea* (Salampanja), is threatened by habitat loss, livestock grazing, deforestation, and climate change. It is extensively used in Ayurveda, Siddha,

Unani and other alternative systems of medicine to cure dysentery, gastritis, chronic fever, cough and stomach aches. It is a perennial tuberous species endemic to the Hindu Kush and Himalayan ranges of Afghanistan, Bhutan, China, India, Nepal, and Pakistan.

“The Himalayan region is a biodiversity hotspot but there is lack of data on many species here. The assessment of these plants will set our conservation priorities and help protect the species,” said Harsh Kumar Chauhan, member, IUCN Species Survival Commission, Medicinal Plant Specialist Group.

Earlier, Dr. Chauhan, who is associated with Kumaun University, had assessed six species with medicinal values, including Himalayan *Trillium govaniatum* (Himalayan Trillium) and *Trillium tschonoskii* (Keun-yeon-yeong-cho), which have been marked as ‘endangered’. He said the the Himalayas are a rich repository of medicinal plants and studies carried out in 1998 had pointed out that the number of such species in the region stands at 1,748.

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CLIMATE CHANGE LIKELY TO INCREASE ROUGH WAVE DAYS IN INDIAN OCEAN, NORTHERN SECTOR OF ARABIAN SEA, & CENTRAL BAY OF BENGAL

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

A recent study of extreme wave events shows that Indian Ocean, northern sector of Arabian Sea, and central Bay of Bengal are likely to experience an increase in rough wave days in the near future. It could help timely warning and planning to prevent major impacts on life and property, especially in coastal areas.

In a changing climate, extreme wave events that have been recorded quite frequently during recent times can pose a tremendous impact on the livelihoods of the coastal population, infrastructure, and ocean-related activities. Observed variability and changes in extreme wave events, along with shifting storm intensity and tracks, can play a crucial role in shoreline changes, erosion rates, flooding episodes, and other related coastal hazards. Extreme waves due to climate change and its consequences continue to emerge at both regional and global scales. Hence, a better understanding of the future projected changes in the amplitude of high-frequency extreme wave events is necessary for timely warning and coastal planning and management.

A team of scientists from the Department of Applied Sciences, National Institute of Technology Delhi; Indian Institute of Technology Kharagpur; and Indian National Centre for Ocean Information Services, Hyderabad, projected the likely future changes in extreme wave height indices over the Indian Ocean. Their research published in the journal 'Climate Dynamics', Springer recently used COWCLIP2.0 datasets' to show that large-scale distribution in future wave climate can vary significantly from the present.

Future projections by the scientists Divya Sardana and Prashant Kumar from the Department of Applied Sciences, NIT Delhi, Prasad K. Bhaskaran from Department of Ocean Engineering & Naval Architecture, IIT Kharagpur, and T. M. Balakrishnan Nair from ESSO-INCOIS Hyderabad indicate that under the climate scenario RCP4.5 (medium representative concentration pathway of greenhouse gases), the regions over eastern tropical Indian Ocean, northern sector of Arabian Sea, and central Bay of Bengal showed a strong positive increase in rough wave days. However, under high-emission scenario corresponding to RCP8.5, a decreasing trend in rough wave days is likely over most of the regions in the Indian Ocean, with exception for regions in the north Arabian Sea and extra-tropical regions beyond 48° S in the Southern Indian Ocean sector.

Changes in high wave days are projected to intensify over South Indian Ocean under both RCP 4.5 and 8.5 scenarios, and the wave-spell-storm duration is found to strengthen over the northern Arabian Sea and Bay of Bengal, southeast Indian Ocean and South Indian Ocean under RCP8.5 forcing scenario.

The study indicates that projected changes in the amplitude of high-frequency extreme wave events in the Southern hemisphere are driven by changes in a sea-level pressure gradient that is consistent with the projections of SAM (Southern Annular Mode) for the twenty-first century period.

The research supported by the Science Research and Engineering Board (SERB), an attached institution of the Department of Science & Technology (DST), Government of India, can be

immensely useful to policymakers and decision-making authorities for both short and long-term planning that can benefit the coastal population.

Publication link: DOI: 10.1007/s00382-022-06579-5

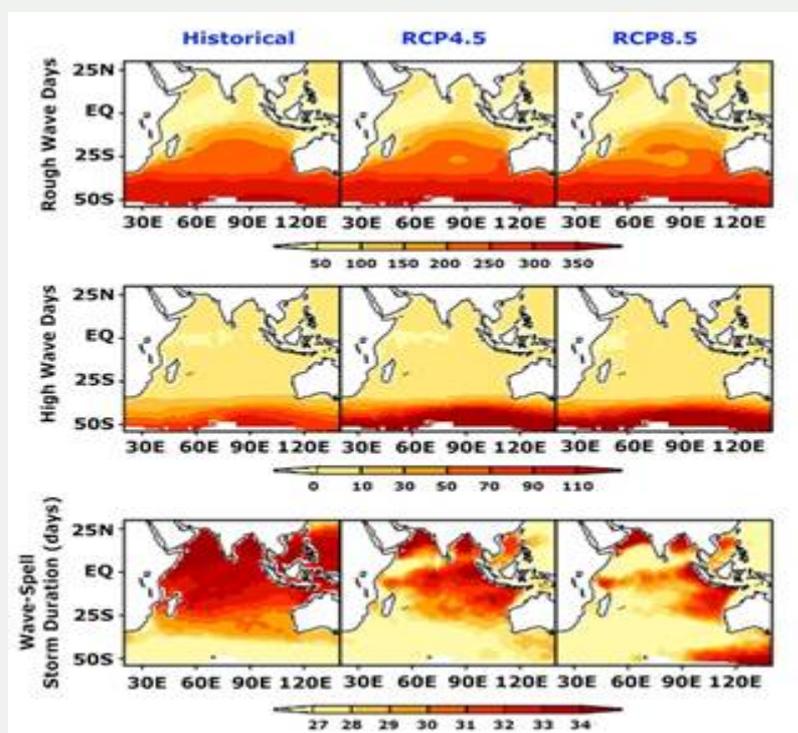


Figure: Climatology of extreme wave indices over the present-day period (1979–2004) and future time period (2081–2100) under RCP4.5 and RCP8.5 scenario

SNC / RR

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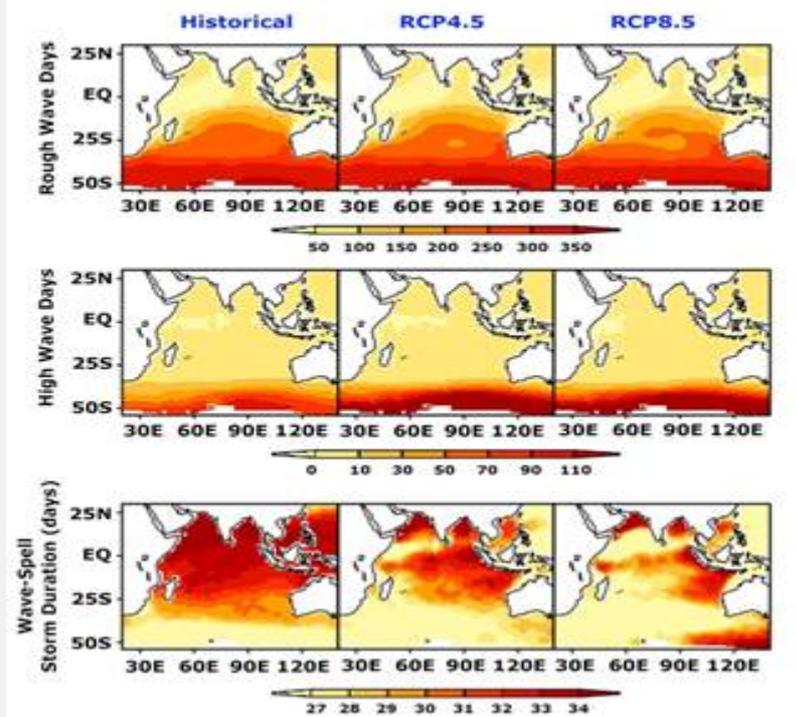


Figure: Climatology of extreme wave indices over the present-day period (1979–2004) and future time period (2081–2100) under RCP4.5 and RCP8.5 scenario

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BAN ON SINGLE USE PLASTICS

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

The Plastic Waste Management Rules, 2016, as amended, provide the statutory framework and the prescribed authorities for enforcement of the rules, including ban on identified single use plastic items. The following identified single use plastic items, which have low utility and high littering potential, have been prohibited, with effect from 1st July, 2022, vide Plastic Waste Management Amendment Rules, 2021:

The notification also prohibits manufacture, import, stocking, distribution, sale and use of plastic carry bags having thickness less than seventy-five microns with effect from 30th September 2021, and having thickness less than thickness of one hundred and twenty microns with effect from the 31st December, 2022

The following steps have been taken to strengthen implementation of Plastic Waste Management Rules, 2016 and to implement ban on identified single use plastic items:

All thirty-six States/UTs have constituted the Special Task Force under the chairpersonship of the Chief Secretary / Administrator for elimination of identified single use plastic items and effective plastic waste management. A National Level Taskforce has also been constituted by the Ministry for taking coordinated efforts to eliminate identified single use plastic items and effective implementation of Plastic Waste Management Rules, 2016. Three meetings of the National Task Force have been held. The State /UT Governments and concerned Central Ministries/Departments have also been asked to develop a comprehensive action plan for elimination of single use plastic and implement it in a time bound manner.

Directions have been issued under Section 5 of the Environment (Protection) Act, 1986 to the following:

For effective monitoring of ban on identified single use plastic items and plastic waste management in the country the following online platforms are in operation (a) National Dashboard on for monitoring of comprehensive action plan implementation, (b) CPCB Monitoring Module for Compliance on Elimination of Single Use Plastic, and (c) CPCB Grievance Redressal App.

A one month long pan India enforcement campaign was undertaken for implementation of ban on identified single use plastic items from 1st to 31st July 2022. Further, States and Union territories have been asked to undertake regular enforcement drives to implement ban.

This information was given by the Union Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav in a reply in Lok Sabha today.

on identified single use plastic items and on plastic carry bags having thickness less than seventy five microns, covering fruit and vegetable markets, wholesale markets, local markets, flower vendors, units manufacturing plastic carry bags etc. States and UTs have also been asked to undertake random checking at border checkpoints to stop inter-state movement of banned single use plastic items. Special pan India enforcement drives have been undertaken in months of October and November, by Central Pollution Control Board, State Pollution Control Boards and Pollution Control Committees.

Rapid penetration of alternatives is a key for successful implementation of the ban on

identified single use plastic items. In order to provide assistance to MSME enterprises transitioning away from single use plastic items to eco-alternatives, Ministry of Micro, Small and Medium Enterprises has made provisions in their ongoing schemes. A National Expo on eco-alternatives to banned single use plastics items and Conference of Startups - 2022 was organized jointly with Government of Tamil Nadu in Chennai on 26-27th September 2022 to raise awareness on alternatives. Awareness generation and capacity building programmes have been organized for elimination of single use plastics.

During the enforcement campaign, non-compliance of the ban on identified single use plastic has been found in commercial establishments and manufacturing units including in small shops in local markets. Actions have been taken on the deviations, which include seizure of banned single use plastic items and levy of penalty. As per available information, the penalty levied during the enforcement campaigns is approximately Rs. 5,81,78,001/- and 775,577 kg. material was seized. Further the Producers/Importers/Brand owners engaged in producing / importing / using banned single use plastic items have not been granted registration on the centralized EPR portal for plastic packaging.

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A CONSERVATION BILL THAT ENDANGERS FOREST RIGHTS

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

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December 14, 2022 12:08 am | Updated 02:18 am IST

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In Kandhamal district, Odisha | Photo Credit: BISWARANJAN ROUT

The expeditious [passage](#) of the [Wild Life \(Protection\) Amendment Bill, 2021](#) in the Rajya Sabha this winter session — this followed its passing in the Lok Sabha during the monsoon session — needs comment. The Wildlife Protection Act (WPA), 1972 has safeguarded numerous species of wild animals and plants by prohibiting all forms of hunting and, more importantly, creating inviolate areas where wildlife conservation may be carried out. The amendment further invests in this conception of protected areas and species by bringing in newer species to be protected, augmenting the penal repercussions. While the aspects of protecting species from the wildlife trade, in line with international standards, have received thoughtful scrutiny by civil society, Members of Parliament and the Parliamentary Standing Committee, the impact of the criminal legal framework adopted by the WPA is less known.

The need for criminal laws to assist wildlife conservation has remained unchallenged since its conception. From regulated hunting to complete prohibition and the creation of 'Protected Areas (PA)' where conservation can be undertaken without the interference of local forest-dwelling communities, State and Forest Department control over forests and the casteist underpinnings of conservation would not have been possible without criminal law. In this context, pitting wildlife species against communities as human-animal conflict has eluded the true cost of criminalisation under the WPA.

The recent move to increase penalties by four times for general violations (from 25,000 to 1,00,000) and from 10,000 to 25,000 for animals receiving the most protection should raise questions about the nature of policing that the WPA engenders.

A study by the [Criminal Justice and Police Accountability Project](#) (the CPA Project examined arrest records, first information reports (FIRs), offence records of the police and Forest Department in Madhya Pradesh) found that persons from oppressed caste communities such as Scheduled Tribes and other forest-dwelling communities form the majority of accused persons in wildlife-related crimes. The Forest Department was found to use the threat of criminalisation to force cooperation, apart from devising a system of using community members as informants and

drawing on their loyalty by employing them on a daily wage basis. Cases that were filed under the WPA did not pertain solely to the comparatively serious offence of hunting; collecting wood, honey, and even mushrooms formed the bulk of prosecution in PAs. Over 95% of the cases filed by the Forest Department are still pending.

Hunting offences that were primarily filed against Schedule III and IV animals (wild boars) which have lesser protection than tigers and elephants formed over 17.47% of the animals 'hunted' between 2016-20. Among the animals hunted the highest, only one in top five belonged to Schedule I (peacock). Surprisingly, fish (only certain species relegated to Schedule I) formed over 8% of the cases filed. A whopping 133 cases pertaining to fishing (incorrectly classified as Schedule V species) were filed in the last decade in Madhya Pradesh.

Forest rights, individual and collective, as part of the Forest Rights Act (FRA) were put in place to correct the injustice meted out by forest governance laws in recognising forest-dependent livelihoods. The natural overlap of recognising forest rights in intended-as-inviolable PAs was quickly resolved by making the FRA subservient to the WPA, thereby impeding its implementation.

In the field work carried out, it was noticed that while individual forest rights in buffer zones of the Kanha National Park of Madhya Pradesh were recognised, the same cannot be said of collective rights over usage of forest resources, fishing, and protecting forest resources. Fishing, which forms an important part of subsistence for tribal communities, has come to be regularly criminalised as part of the WPA. In cases recorded by the Forest Department, as noted above, the very fact that these occurred in PAs led to the offence becoming punishable by three to seven years.

In a case from 2016 documented by the CPA Project, five men were apprehended by a range officer and beat guards as they sat across a fire with fish they had caught from the river nearby. The catch weighed less than 500 grams, yet the accused were charged with causing damage to a wildlife habitat under a host of WPA provisions. The case continues to remain pending in trial court.

Criminal cases filed by the department are rarely compounded since they are meant to create a 'deterrent effect' by instilling fear in communities. Fear is a crucial way in which the department mediates governance in protected areas, and its officials are rarely checked for their power. Unchecked discretionary policing allowed by the WPA and other forest legislations have stunted the emancipatory potential of the FRA. Any further amendments must take stock of wrongful cases (as in the case of fishing) and resultant criminalisation of rights and lives of forest dwelling communities.

Saakshi Samant is Communications Intern, Criminal Justice and Police Accountability Project in Bhopal. Mrinalini Ravindranath is Research Head, Criminal Justice and Police Accountability Project in Bhopal

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NATURE GUARDIANS: WHY INDIGENOUS PEOPLE ARE VITAL FOR SAVING BIODIVERSITY

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

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Qatar World Cup 2022 Attacking stats: Messi, Mbappe lead the way ahead of semifinals

December 13, 2022 03:06 pm | Updated 08:38 pm IST

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Canada's Indigenous people relied on caribou both as a source of subsistence and as an integral part of their cultural practices. | Photo Credit: AP

For countless generations prior to European colonisation, Canada's Indigenous people relied on caribou both as a source of subsistence and as an integral part of their cultural practices.

Hunting and butchering the animal in frigid temperatures was long seen as a rite of passage, and members of the First Nations were the first to detect their serious decline.

"Fundamentally we are people of caribou," Valerie Courtois, director of Canada's Indigenous Leadership Initiative and a member of the Innu nation, told AFP.

"Caribou is what has really enabled us to survive, and to be who we are."

Today the species, which is known as reindeer outside North America, is endangered across much of Canada as a result of widespread habitat destruction from logging, roadbuilding, construction of transmission lines and more.

But an innovative pilot program led by Indigenous people might show a path to wider recovery.

As delegates from across the world meet in COP15 in Montreal this week to hammer out a new deal for nature, the case highlights the value of Indigenous stewardship in protecting ecosystems that benefit all humanity.

[Also Read | Northern Plains tribes bring back their wild 'relatives'](#)

As detailed in a March 2022 paper in *Ecological Applications*, the Klinse-Za subpopulation of caribou in British Columbia were once so plentiful they were described as "bugs on the landscape" but by 2013 had dwindled to just 38 animals.

That year, the First Nations of West Moberly and Saulteau devised a plan that saw them first cull wolves to reduce caribou predation, then added a maternal pen-fenced enclosures for females

to birth and raise calves.

Their efforts saw the number of caribou of the herd triple in the area from 38 to 114.

With the threat of localised extinction averted, the two nations signed an agreement in 2020 with the governments of British Columbia and Canada to secure 7,900 square kilometers (3,050 square miles) of land for caribou, hoping to eventually revive their traditional hunt.

"When you protect caribou, a lot of animals come along for the ride," Ronnie Drever, a conservation scientist with nonprofit Nature United, told AFP.

"Good caribou conservation is also climate action," he added, because the old-growth forests and peatlands they live on are invaluable carbon sinks.

Globally, Indigenous people own or use a quarter of the world's land, but safeguard 80% of remaining biodiversity -- testament to centuries of sustainable practices that modern science is only just starting to understand.

A paper published this October in *Current Biology* looked at tropical forests across Asia, Africa, and the Americas, finding those located on protected Indigenous lands were the "healthiest, highest functioning, most diverse, and most ecologically resilient."

A 2019 paper in *Environmental Science & Policy* analysed more than 15,000 areas in Canada, Brazil and Australia.

It found that the total number of birds, mammals, amphibians and reptiles were highest on lands managed or co-managed by Indigenous communities.

[Also Read | Biodiversity conservation, need of the hour](#)

Protected areas like parks and wildlife reserves had the second highest levels of biodiversity, followed by areas that were not protected.

"This suggests that it's the land-management practices of many Indigenous communities that are keeping species numbers high," said lead author Richard Schuster, in a statement.

Jennifer Tauli Corpuz, of the Kankana-ey Igorot people of the Philippines, who is a lawyer and biodiversity expert with the International Indigenous Forum on Biodiversity, stressed that collaborative efforts were crucial.

"Conservation does not have a good history with Indigenous peoples, it's resulted in displacement," she told AFP.

National parks established on Euro-American notions that the land was once pristine "wilderness" typically prohibited Indigenous peoples from exercising their customary land uses, and forcibly displaced many from their ancestral homes.

Instead, she says, the rights of Indigenous groups need to be woven into the fabric of the new global biodiversity deal -- including a cornerstone pledge to protect 30% of land and water by 2030.

Indigenous groups say they should have greater autonomy to take the lead as managers of protected areas, arguing their successful record demonstrates they can pursue economic

activity sustainably.

"The current biodiversity crisis is often depicted as a struggle to preserve untouched habitats," said a study published last year in the *Proceedings of the National Academy of Sciences*, which found that areas untouched by people were almost as rare 12,000 years ago as they are today.

"Current biodiversity losses are caused not by human conversion or degradation of untouched ecosystems, but rather by the appropriation, colonization, and intensification of use in lands inhabited and used by prior societies," it concluded.

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BALI'S WATER CRISIS THREATENS LOCAL CULTURE, UNESCO SITES

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Qatar World Cup 2022 Who are the goal-scorers in FIFA World Cup semifinals before Qatar 2022?

December 13, 2022 12:07 pm | Updated 12:07 pm IST

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A man washes his face from water in Munduk, Bali, Indonesia, Sunday, April 17, 2022. In less than a decade, Bali's water table has decreased over 50 meters (164 feet) in some areas, raising concerns that it could lead to worsening water crisis on the tropical tourist destination. | Photo Credit: AP

Far from Bali's beaches and hotels, farmer I Ketut Jata stands on a mountainside, staring at terraced land that is too dry to grow the rice his family has long relied on for food and income.

"It is no longer possible to work in the fields as a farmer," he says.

Bali's water crisis is worsening from tourism development, population growth and water mismanagement, experts and environmental groups warn. Water shortages already are affecting UNESCO sites, wells, food production and Balinese culture and experts say the situation will deteriorate further if existing water control policies are not enforced across the island.

A tropical, volcanic island in the center of Indonesia's archipelago, Bali relies on water from three main sources: crater lakes, rivers and shallow groundwater. A unique traditional irrigation system, called the "subak," distributes water through a network of canals, dams and tunnels.

The subak, made a UNESCO site in 2012, is central to Balinese culture, representing the Balinese Hindu philosophy of "Tri Hita Karana"—harmony between people, nature and the spiritual realm.

"This is one of the very special cases of living landscapes in Asia," said Feng Jing, who works with UNESCO in Bangkok.

[Also Read | India's growing water crisis, the seen and the unseen](#)

Pressures are severely straining the subak and other water resources, says Putu Bawa, project manager for the Bali Water Protection program, led by a Bali-based nongovernment

organization, the IDEP Foundation.

The island's population jumped more than 70% from 1980 to 2020, to 4.3 million people, according to government census data. Tourism growth has been even more explosive: Less than 140,000 foreign visitors came to the island in 1980. By 2019, there were more than 6.2 million foreign and 10.5 million domestic tourists.

With the tourism boom, Bali's economy has prospered — at a cost. Rice fields the subak once coursed through have been turned into golf courses and water parks, while forests that naturally collect water and are vital to the subak have been felled for new villas and hotels, Bawa said.

Stroma Cole of the University of Westminster, who has researched tourism's impact on Bali's water supplies, says another issue is that the water table is dropping because of Bali's residents and businesses rely on unregulated wells or boreholes for clean water, instead of government-owned piped supplies.

"At the moment, it is the cheapest source of water for people to use," Cole said. "So why wouldn't you use that?"

In less than a decade, Bali's water table has sunk more than 50 meters (164 feet) in some areas, according to data provided by IDEP. Wells are running dry or have been fouled with salt water, particularly in the island's south.

Bali does have regulations — such as water licenses and taxes on water used — that are meant to manage the island's water supplies, but there's no enforcement, Cole said.

"The rules which exist are excellent rules, but they are not enforced" she said.

[Also Read | Water Governance: Blueprint To Tackle Water crisis](#)

Bali's municipal water agency and Bali's department of public works did not respond to requests for comment.

The dire impact of the water crisis can be seen in Jatiluwih, in northwestern Bali, where farmers tend to the island's largest rice terraces.

For generations lush green rice terraces have relied on the subak system for irrigation. But in the past decade, farmers have had to import and pump water through white plastic pipes to irrigate the fields.

Back in central Bali, Jata said he tried planting cloves, which require less water. But the land — which is ideal for rice — and a lack of subak water thwarted that plan.

"In the past, when the subak was active, the water was still good," Jata said. "But so far there have been no results ... all the cloves are dead."

Other Bali farmers say they can only get one rice harvest instead of two or three a year due to water disruptions, according to Cole's research. That could reduce food production on the island.

When Indonesia closed its borders at the height of the pandemic, Bali's tourism dropped drastically. Environmentalists hoped the closure would allow the island's wells to recharge. IDEP is currently installing sensors in wells across the island to better research monitor water levels.

But development across the island has continued, including a new government-backed toll road that activists say will further disrupt the subak system. New hotels, villas and other businesses are adding to demand.

Tourism is key to Bali but there also should be better enforcement and increased monitoring to protect the island's water resources, Bawa said. "We need to do this together for the sake of the survival of the island."

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BUILDING CLIMATE RESILIENCE COLLECTIVELY

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Qatar World Cup 2022 France beat Morocco 2-0 to set up World Cup final against Argentina

December 15, 2022 12:08 am | Updated 02:32 am IST

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In Jaipur | Photo Credit: ROHIT JAIN PARAS

[India unveiled its long-term climate action plan](#) at the [27th Conference of the Parties to the United Nations Framework Convention on Climate Change \(COP27\)](#), held in Sharm el-Sheikh, Egypt, in November. While the document titled '[Long-Term Low-Carbon Development Strategy \(LT-LCDS\)](#)' has multi-sectoral measures to reach a net-zero emissions status, climate-resilient urbanisation forms a cornerstone of the Government of India's strategy under the Paris Agreement.

This three-pronged and long-term plan for urban areas focuses on adaptation and resource efficiency in urban planning, climate-responsive and climate-resilient buildings, and municipal service delivery.

There are several flagship missions championed by the Ministry of Housing and Urban Affairs as well, which target specific objectives towards creating a smart, sustainable and resilient urban India. To facilitate implementation of the LT-LCDS and other missions, and enable their integration, a data-driven approach may be useful. Demonstrating urban planning strategies aimed at climate resilience through specific actions and interventions (backed by sound data) and linking them to various finance streams accessible to the urban local bodies is important.

Cities need effective and efficient planning instruments that translate master plans into transformative business-ready investment projects.

For instance, the Urban Sustainability Assessment Framework (USAF), a decision support tool of UN-Habitat for municipal commissioners and urban practitioners, supports the sustainable and resilient urban planning and management of Indian cities. It enables cities to regularly capture inter-sectoral data and corresponding analysis on urban metrics, thereby helping in monitoring the performance of a city in static and dynamic contexts. Cities can enhance vertical integration by pulling together the missions' objectives at the central level, State policies and projects, and local implementation through city-specific strategic actions linked to capital investment planning.

The urban transport sector is among the key contributors to greenhouse gas (GHG) emissions.

In the case of Bhopal (Madhya Pradesh), for example, they make up for 19% of the city's GHG emissions. Bhopal favours non-motorised transport (NMT) with a 43% NMT modal share but provides access to public bike docking stops to only 24% of its population; only half of its streets have footpaths. By designing 'shared streets' for personal vehicles, public transport, NMT and pedestrians, and linking them with future economic activity zones and underserved areas, the city has immense potential to reduce its carbon footprint. These streets can also be conduits for native plant species and groundwater recharge by integrating water-sensitive urban design features with a potential of reducing GHG emissions of up to 15 tCO₂/annum per kilometre. In Bhopal, the Smart Cities Mission has made significant investments in NMT, though the use of this infrastructure has been sub-optimal. There are opportunities for improvement and increased usage of the NMT network through better land-use integration. Spatial analyses can inform decision-making towards co-location of investments and projects from various missions for cumulative community impact and enhanced urban value.

Editorial | [Incremental win: On 'Loss and Damage' fund commitment at COP27](#)

Nature-based solutions provide a range of solutions for climate change adaptation over hard grey infrastructure. As seen in Jaipur (Rajasthan), with only 1.42 sq.m per capita of open space against a benchmark of 12 sq.m per person, the desert capital also experiences various hazards that include heat waves, droughts and urban flooding. Residential areas with at least 10% of land area under open space and parks were found to be at least 1.25°C cooler than neighbourhoods with less green pockets. In industrial pockets, the urban heat island impact was greater with temperatures higher by 1.1°C. There are several macro and micro options available to Jaipur such as planting shade trees, urban forests, installing cool roofs, planning cool islands and investing in city scale blue green infrastructure to improve the micro-climate and environmental conditions.

Jaipur has also witnessed a significant decline in porous surfaces (by 50%) in the last three decades and a corresponding sharp increase in surface stormwater run-off (156%) which the city struggles to accommodate leading to regular urban flooding. Simple yet effective solutions that can increase Jaipur's resilience include community recharge pits in neighbourhood parks, and increasing permeable spaces along mobility corridors to decrease the run-off by a sizeable fraction. Such interventions find consonance with the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) mandates and allows for cities to integrate them with their capital investment plans.

The suggested planning approach merits a comprehensive stakeholder participation towards building climate resilience. Active involvement from various tiers of government, non-governmental, community-based organisations, and academic institutions is desirable at each step — from building a sustainability profile to arriving at very specific interventions. Movements on the city performance indicators communicate the impact of these interventions to the decision-makers and the community at large. In addition, cumulative benefits and efficient use of public resources from various central and State missions, and on-ground convergence are possible by identifying neighbourhoods/wards to co-locate investments for holistic and integrated city-level transformations. This evidence-based approach aims at making cities sustainable, resilient and inclusive with no one and no place left behind.

All this is in the spirit of the Sharm el-Sheikh Implementation Plan which affirms that "sustainable and just solutions to the climate crisis must be founded on meaningful and effective social dialogue and participation of all stakeholders". Therefore, India's long-term strategy must accommodate the most vulnerable of its people in its low-emissions pathways to achieve sustainable economic growth and poverty eradication.

Mansi Sachdev is Senior Urban Planner, UN-Habitat India. Pushkal Shivam is Urban Planner, Un-Habitat India

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U.N. RECOGNISES GANGA PROJECT AMONG 10 INITIATIVES RESTORING NATURAL WORLD

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December 14, 2022 03:23 pm | Updated 08:43 pm IST - Montreal

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View of Ganga ghats in Varanasi. File | Photo Credit: PTI

An ambitious project that aims to improve the [health of the Ganga](#) is among 10 "ground-breaking" efforts recognised from around the globe by the United Nations for their [role in restoring the natural world](#).

According to a report unveiled during the U.N. Biodiversity Conference (COP15) in Montreal on Tuesday, climate change, population growth, industrialisation and irrigation have [degraded the Ganga](#) along its arcing 2,525-km course from the Himalayas to the Bay of Bengal.

Restoring the health of the Ganga is the focus of a major push to cut pollution, rebuild forest cover and bring a wide range of benefits to the 520 million people living around its vast basin.

The initiatives were declared World Restoration Flagships and are eligible to receive U.N.-backed promotion, advice or funding.

Also Read | [Why Clean Ganga project has a long way to go](#)

They were selected under the banner of the United Nations Decade on Ecosystem Restoration, a global movement coordinated by the U.N. Environment Programme (UNEP) and the U.N. Food and Agriculture Organisation (FAO).

It is designed to prevent and reverse the degradation of natural spaces across the planet, the U.N. said.

Together, the 10 flagships aim to restore more than 68 million hectares — an area bigger than Myanmar, France or Somalia — and create nearly 15 million jobs, the U.N. said.

“Transforming our relationship with nature is the key to reversing the triple planetary crisis of climate change, nature and biodiversity loss, pollution and waste,” said UNEP Executive Director Inger Andersen.

“These 10 inaugural World Restoration Flagships show that with political will, science and collaboration across borders, we can achieve the goals of the U.N. Decade of Ecosystem Restoration and forge a more sustainable future not only for the planet but also for those of us who call it home,” Mr. Andersen said in Montreal.

The [government-led Namami Gange initiative](#) is rejuvenating, protecting and conserving the Ganga and its tributaries, reforesting parts of the Ganga basin and promoting sustainable farming, according to the statement.

The project also aims to revive key wildlife species, including river dolphins, softshell turtles, otters, and the hilsa shad fish.

The initiative, with an investment of up to \$4.25 billion so far, has the involvement of 230 organisations, with 1,500 km of river restored to date.

Additionally, there have been 30,000 hectares of afforestation so far, with a 2030 goal of 134,000 hectares, according to the U.N.

The other inaugural World Restoration Flagships include the Trilateral Atlantic Forest Pact, which aims to protect and restore the forest in Brazil, Paraguay and Argentina, and the Abu Dhabi Marine Restoration project which is safeguarding the world’s second-largest dugong population in Abu Dhabi.

The Great Green Wall for Restoration and Peace initiative to restore savannas, grasslands and farmlands across Africa, the Multi-Country Mountain Initiative based in Serbia, Kyrgyzstan, Uganda and Rwanda, and the Small Island Developing States Restoration Drive focused on three small island developing states – Vanuatu, St Lucia and Comoros were also recognised.

The Altyn Dala Conservation Initiative in Kazakhstan to restore the steppe, semi-desert and desert ecosystems, the Central American Dry Corridor, and Shan-Shui Initiative in China were the other projects on the list.

In revealing the World Restoration Flagships, the U.N. Decade seeks to honour the best examples of large-scale and long-term ecosystem restoration, embodying the 10 Restoration Principles of the U.N. Decade on Ecosystem Restoration.

The U.N. Decade acknowledges the time needed for restoration efforts to deliver results. Until 2030, regular calls for World Restoration Flagships will be launched.

In expectation of increased funding to the U.N. Decade’s Multi-Partner Trust Fund (MPTF), additional submissions are being considered, including restoration drives from Pakistan, Peru, and an initiative focusing on Somalia and other drought-affected countries.

Leaders and negotiators from 196 countries, including India are here in Canada for a two-week conference expected to adopt a landmark agreement to halt and reverse nature loss by 2030.

During the U.N. Biodiversity Conference (COP15) being held from December 7 to 19, about 20,000 delegates from across the world will negotiate an eight-year plan to preserve and restore biodiversity.

They will do so through the Convention on Biological Diversity, a treaty adopted for the conservation and sustainable use of biological diversity and related issues.

COP15 aims to achieve a historic agreement to halt and reverse nature loss, on par with the [2015 Paris Climate Agreement](#).

What is adopted in Montreal will essentially be a global blueprint to save the planet's dwindling biodiversity.

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COP15

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Qatar World Cup 2022 From Alvarez to Weghorst, here are the top 10 goals of the World Cup so far

December 16, 2022 11:36 am | Updated 11:36 am IST - Montreal

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Actor and activist James Cromwell called on world leaders to “Stop the Human Asteroid” in the talks at COP15 in Montreal, Quebec, Canada on December 15, 2022. | Photo Credit: AP

As countries iron out a deal to protect nature at the COP15 biodiversity conference here, a petition backed by 3.2 million citizens worldwide has called for a more ambitious target of at least 50% conservation and protection of lands and oceans by 2030.

Most of the 196 countries meeting in Montreal, including India, have backed a 30% figure for protecting lands and oceans. However, a final agreement is due to be completed on December 19.

“We are already well beyond 30 per cent conservation of the planet, if only our governments recognise the rights of Indigenous peoples and local communities over their territories, lands and waters,” Oscar Soria, Campaign Director, Avaaz said in a press briefing here.

“They are de facto the ones conserving biodiversity. Now's the time to strive for a higher target, of half the Earth. Any other number will put vital forests in jeopardy, and are clearly not enough to kickstart the necessary revolution to rebuild our relationship with nature,” Mr. Soria said.

However, Basile van Havre, Co-Chair for the Convention on Biological Diversity's (CBD) Post-2020 Open Ended Working Group, believes that the Parties should not give themselves goals that are not achievable.

“Definitely the science is pretty clear, 30 per cent (target) is a minimum so the way I am looking at it, this will take a massive effort from where we are to reach 30 per cent. Let us not give ourselves goals that we can not achieve in 8 years,” Mr. van Havre said.

Advocates of the science-based Half target, led by prominent biodiversity NGOs, argue that the 30 by 30 target, conceived in the drafting negotiation process between 2019 and early 2020, is now an outdated figure based on the latest understanding of science and technology.

They warn that the national pledges from countries to protect 30% of their own territories by 2030 are now opening a “vulnerability policy loop” in the negotiations which would allow

catastrophic destruction in biodiversity-rich nations.

The petition has been backed by NGOs including Wild, One Earth, and Grounded.

A group of award-winning international artistes has also endorsed the petition calling to protect half the planet and make it a safe space for biodiversity.

Among the group of signatories are William Shatner, Olivia Colman, Sophie Turner, Jack Black, Joaquin Phoenix, Andie MacDowell, Frances Fisher, and James Cromwell.

“Human activities have been driving the proliferation of threats such as climate change, habitat loss, pollution, over-exploitation, and epidemics,” Cromwell, American actor and activist, said.

“As a result of our own actions, the accelerated biodiversity loss is not only causing species to become extinct faster than at any time,” he added.

Early reports indicate a cumbersome and contentious process at COP15, bogged down by disagreement, reflected in hundreds of items in square brackets — i.e. yet to be agreed.

The Post-2020 Global Biodiversity Framework will be the first global framework on biodiversity adopted since the Aichi Biodiversity Targets in 2010.

In 2010 at COP10 in Nagoya, Japan, the governments set out to meet the 20 Aichi Biodiversity Targets by 2020, including that natural habitat loss would be halved and plans for sustainable consumption and production would be implemented.

According to a 2020 CBD report, none of these targets have been fully met.

The planet is experiencing its largest loss of life since the dinosaur era ended: one million plant and animal species are now threatened with extinction, according to a U.N. report.

Most countries in Asia have failed to achieve a global minimum target of protecting at least 17% of land by 2020, according to a recent study based on data from 40 countries.

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INDIA PUSHES FOR NEW BIODIVERSITY FUND

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Qatar World Cup 2022
Messi vs Maradona: A statistical comparison of their careers with Argentina

December 18, 2022 11:35 am | Updated December 19, 2022 02:26 am IST - New Delhi

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Union Environment Minister addressing the stocktaking plenary at the UN Biodiversity Conference, COP15 in Montreal, Canada on December 18, 2022. Photo: Twitter/@byadavbjp

There is an urgent need to create a new and dedicated fund to help developing countries successfully implement a post-2020 global framework to halt and reverse biodiversity loss, [India has said at the U.N. biodiversity conference](#) in Canada's Montreal.

It has also said that conservation of biodiversity must also be based on 'Common but Differentiated Responsibilities and Respective Capabilities' (CBDR) as climate change also impacts nature. As the 196 parties to the Convention on Biological Diversity (CBD) finalise negotiations for a post-2020 Global Biodiversity Framework (GBF)—a new set of goals and targets to halt and reverse biodiversity loss—there have been repeated calls for the inclusion of the CBDR principle in finance-related targets.

Addressing the stocktaking plenary at CBD COP15, Union Environment Minister Bhupender Yadav said the successful implementation of a post-2020 GBF will depend on the "ways and means we put in place for an equally ambitious 'Resource Mobilisation Mechanism'".

"There is a need to create a new and dedicated mechanism for the provision of financial resources to developing-country parties. Such a fund should be operationalised at the earliest to ensure effective implementation of the post-2020 GBF by all countries," the Minister said.

So far, the Global Environment Facility which caters to multiple conventions, including the UNFCCC and UN Convention to Combat Desertification, remains the only source of funding for biodiversity conservation.

At CBD COP15, developing countries have been demanding a new and dedicated biodiversity fund, saying the existing multilateral sources are not up to the task of meeting the requirements of the GBF. Differences with rich countries on the matter had prompted representatives from developing nations to walk out of crucial financing talks last week. India said the developing countries bear most of the burden of implementing the targets for conservation of biodiversity and, therefore, require adequate funds and technology transfer for this purpose.

"The most important challenge is the resources needed for implementation of the GBF. Greater ambition means greater cost and the burden of this cost falls disproportionately on the countries that can least afford them," Mr. Yadav said.

The Minister underlined India's stand that the goals and targets set in the GBF should not only be ambitious, but also realistic and practical.

"Conservation of biodiversity must also be based on Common but Differentiated Responsibilities and Respective Capabilities as climate change also has an impact on biodiversity," he said.

Established as the seventh principle of the Rio Declaration adopted at the Earth Summit in 1992, CBDR is defined as states have common but differentiated responsibilities in view of the different contributions to global environmental degradation.

However, applying the CBDR principle to biodiversity conservation has not been straightforward as compared to climate negotiations, and there have been repeated disagreements between the global north and south on the issue.

At CBD COP15, the parties are also trying to achieve a consensus on eliminating subsidies that are harmful to the environment, such as subsidies for fossil fuel production, agriculture, forestry and fisheries, by at least \$500 billion (one billion = 100 crore) annually and using this money for biodiversity conservation.

However, Mr. Yadav said, India does not agree on reducing the agriculture-related subsidy and redirecting the savings for biodiversity conservation, as there are many other national priorities.

For the developing nations, agriculture is a paramount economic driver for rural communities, and the critical support provided to these sectors cannot be redirected, he said.

Majority of the rural population in India is dependent on agriculture and allied sectors and the government provides a variety of subsidies, including seed, fertilizer, irrigation, power, export, credit, agriculture equipment, agriculture infrastructure for supporting the livelihoods of farmers mainly, small and marginal.

When food security is of utmost importance for developing countries, prescribing numerical targets in pesticide reductions is unnecessary and must be left to countries to decide, based on national circumstances, priorities and capabilities, India has said.

Some of the measurable targets in the draft GBF include reduction of pesticides by two thirds.

Mr. Yadav stressed that biodiversity conservation requires ecosystems to be conserved and restored holistically and in an integrated manner. It is in this context that ecosystem approaches for conservation of biodiversity need to be adopted rather than going for nature-based solutions, he said.

Delivering the national statement on Friday, the Minister had said the GBF must be framed considering science and equity and the sovereign right of countries over their resources.

He had also said the GBF must recognise the responsibility of the developing countries towards poverty eradication and sustainable development.

COP15, the [most important gathering on biodiversity](#) in a decade, started on December 7 and is scheduled to close on Tuesday (IST).

It aims at achieving a historic deal to halt and reverse biodiversity loss on par with the [2015 Paris Agreement on climate change](#), when all countries agreed to holding the increase in the global average temperature to well below 2 degrees Celsius above the pre-industrial level.

The draft GBF, set to replace the Aichi Biodiversity Targets, comprises 22 targets and four goals proposed for 2030—a stepping stone to the 2050 goal of Living in Harmony with Nature.

The GBF targets include reducing pollution, pesticides, subsidies harmful to nature and the rate of introduction of invasive alien species among others.

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RAJASTHAN'S TAL CHHAPAR SANCTUARY GETS PROTECTION FROM PLAN TO REDUCE ITS SIZE

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A blackbuck and a raptor, steppe eagle, observing each other at Tal Chhapar sanctuary in Churu district of Rajasthan. Photo: Special Arrangement

The famous Tal Chhapar blackbuck sanctuary in Rajasthan's Churu district has received a protective cover against a proposed move of the State government to reduce the size of its eco-sensitive zone. The World Wildlife Fund for Nature (WWF) has also taken up a major project for the conservation of raptors in the sanctuary, spread in an area measuring 7.19 sq. km.

The Rajasthan High Court has intervened through a *suo motu* public interest litigation to protect the sanctuary, taking cognisance of reports that its area was going to be reduced to three sq. km. under pressure from mine owners and stone crusher operators. The court recently ordered a "complete prohibition" on any action to reduce the wildlife sanctuary's area.

A raptor, black-winged kite, looking for a prey at Tal Chhapar sanctuary in Churu district of Rajasthan. Photo: Special Arrangement

The sanctuary is host to about 4,000 blackbucks and other wild animals, over 40 species of raptors and more than 300 species of resident and migratory birds. The raptors, which include predators and scavengers, are on top of the food chain and control the populations of small mammals, birds and reptiles as well as insects.

A Division Bench at the High Court's principal seat in Jodhpur noted that some exotic species of animals seemed to have been destroyed or relocated to other areas suitable for their survival, following an increase in human population around the sanctuary, and unplanned and rampant construction activities. The court directed the authorities concerned to complete the formalities for declaration of the eco-sensitive zone surrounding Tal Chhapar at the earliest.

The sanctuary earlier had a large population of desert foxes and similar burrowing animals, while the large colonies of the only herbivorous lizard, the spiny-tailed lizard, exist as the prey base for raptors. The issues confronting the sanctuary include hyper-aridity, grazing pressure, the invasive weed *Prosopis juliflora*, and salt mines in the vicinity. The sanctuary's area is

insufficient for its large blackbuck population.

Tal Chhapar sanctuary is host to about 4,000 blackbucks and other wild animals, over 40 species of raptors and more than 300 species of resident and migratory birds. File | Photo Credit: The Hindu

The court struck down an order of September 30 renotifying a 2.7-km-long road, forming part of the Nokha-Sikar highway, passing through the sanctuary, and ordered its denotification keeping in view the presence of an alternative road existing adjacent to the protected forest area.

Tal Chhapar's Range Forest Officer Umesh Bagotia told *The Hindu* that the grassland for blackbucks was being continuously developed in the sanctuary and attempts were being made for the expansion of a prey base for the raptors. "Some of the rare species of birds of prey have been sighted here. Migratory birds arrive here for their winter sojourn, while several others make a stopover during their migration to southern States," Mr. Bagotia said.

As Tal Chhapar attracts a large number of raptor species for their habitation, the WWF has started monitoring them to understand their status and distribution in the sanctuary. WWF-India's manager (Raptor Conservation Programme) Rinkita Gurav said that recording the numbers of birds of prey and their population trends, behaviour and feeding habits would give an insight on how they were thriving or declining.

"Their presence in the specific habitats makes it vital to monitor them. We will record their interaction with other animals as well. WWF-India will provide insights after understanding them and if any threats are observed, it will be shared with the Rajasthan Government's Forest Department," Ms. Gurav said.

The forest authorities are also examining a proposal to develop the Jaswantgarh forest block in Nagaur district, situated at a short distance from Tal Chhapar, for the shifting of the excess population of blackbucks facing shortage of territory and grazing resources. The High Court has suggested the creation of a corridor for free movement of animals through an underpass across the railway line passing between the two areas.

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GLOBAL TARGET FOR PESTICIDE REDUCTION UNNECESSARY: BHUPENDER YADAV AT COP15

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December 17, 2022 04:19 pm | Updated December 18, 2022 04:16 pm IST - Montreal

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Union Environment Minister Bhupender Yadav presenting India's National Statement at the UN Biodiversity Conference, COP15 on December 17, 2022. Photo: Twitter/@byadavbjp

A numerical global target for pesticide reduction in the agriculture sector is unnecessary and must be left for countries to decide, India has said at the U.N. biodiversity conference here in Canada.

Speaking during a high-level segment of the [15th Conference of Parties \(COP15\)](#) to the Convention on Biological Diversity (CBD), Union Environment Minister Bhupender Yadav said that the agriculture sector in India, like other developing countries, is the source of "life, livelihoods, and culture for hundreds of millions," and support to it cannot be targeted for elimination.

Currently, more than 40% of India's total workforce is employed in agriculture, according to the World Bank data released till 2019.

"Our agriculture, as for other developing countries, is the source of life, livelihoods, and culture for hundreds of millions. Such essential support to vulnerable sections cannot be called subsidies, and targeted for elimination," Mr. Yadav said on Friday.

"While they are being rationalised, biodiversity must be promoted through positive investment," he said.

"Similarly, a numerical global target for pesticide reduction is unnecessary and must be left to countries to decide," the Minister added.

The Target 7 of the Global Biodiversity Framework (GBF) includes the reduction of pesticides by at least two-thirds by 2030.

A report by Pesticide Action Network (PAN) India released in February reveals serious problems of pesticide usage in India and points to poor regulation of hazardous agrochemicals.

The current use pattern is implicated in widespread unauthorised uses of pesticides in India, posing threat to food safety and environmental contamination, it said.

Proponents of the target state that redirecting harmful subsidies towards biodiversity financing would go a long way towards bridging the funding gap of around \$700 billion a year.

Currently, India alone spends about \$30 billion (about 2.2 lakh crore) subsidising agricultural inputs, including pesticides.

The Minister acknowledged that credible action is the source of strength and optimism in facing all global challenges including biodiversity.

He said despite India being home to 17% of the global population, but only 2.4% of the land area and only 4% of its water resources, the country is forging ahead in its efforts to protect biodiversity.

“Our forest and tree cover is steadily rising together with our wildlife population. Definitive steps are being taken to return the iconic cheetah to Indian habitats,” he added.

“India has taken a quantum jump in the number of declared Ramsar sites to the current figure of 75. As a large developing country, our forest policy is challenging to implement, but our forest surveys are testimony to its success,” said Mr. Yadav.

The Ramsar Convention on Wetlands is an international treaty for the conservation and sustainable use of wetlands, signed in Iran in 1971.

The Minister said that India’s balance sheet in implementing the Aichi Targets (laid out in 2010) is proactive and forward-looking and the country is on track to meet its commitments.

To counter the global biodiversity crisis, at the 2010 UN CBD COP10, almost 200 countries pledged to protect at least 17 per cent of their terrestrial environments and inland water, and 10 per cent of coastal and marine areas by 2020 (known as part of the Aichi Targets).

Mr. Yadav also said that India has taken numerous steps to keep invasive alien species at bay, but a numerical target is not feasible without the necessary baselines and relevant scientific evidence.

“The Global Biodiversity Framework must be framed in the light of science and equity and the sovereign right of nations over their resources, as provided for in the Convention on Biodiversity,” the Minister said.

“If the climate is profoundly linked to biodiversity, then the principle of equity and common but differentiated responsibilities and respective capabilities must equally apply to biodiversity,” he added.

Mr. Yadav said when nature itself is under stress because of the historical disproportionate and inequities in greenhouse gas (GHG) emissions of the developed countries, the nature-based solutions to global warming and other environmental challenges are not an answer without resolute action by developed countries to measure up to their historical and current responsibilities.

However, this principle, while accepted in the U.N. climate talks, has been a point of contention at the biodiversity summit.

“Nature cannot protect if it is not itself protected; nature is a victim of global warming and its protective features can do little against unchecked temperature rise,” he added.

Touching on the finance gap for biodiversity conservation, Mr. Yadav said added the provisions of the means of implementation must match ambition.

“Our only source of funding remains the Global Environment Facility (GEF) that caters to multiple conventions,” he pointed out.

“The value of biodiversity to humankind also lies in its economic dimension alongside the cultural and socially sustainable use and access and benefit sharing are key to promoting biodiversity alongside the efforts to conserve protect and restore,” he added.

“What is needed today is mindful and deliberate utilisation instead of mindless and destructive consumption,” he added.

During COP15, being held here from December 7 to 19 (or longer, if parties fail to come to an agreement on schedule), about 20,000 delegates from 196 countries across the world are negotiating an eight-year plan to halt biodiversity loss by 2030 and restore nature by 2050.

The highlight of this COP would be the adoption of four goals and 22 targets as part of the Post-2020 Global Biodiversity Framework which will set the platform for biodiversity conservation.

The Indian delegation is led by Mr. Yadav, and a team of negotiators comprising senior officials from the Government of India.

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December 17, 2022 02:55 pm | Updated December 18, 2022 08:27 am IST

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Police officers walk past a sign as they patrol outside the Palais de Congres, during the opening of COP15, the two-week U.N. biodiversity summit in Montreal, Quebec, Canada December 6, 2022. | Photo Credit: Reuters

Tangled expanses of Amazon rainforest, high mountains of the Himalayas, and cloud-shrouded forests are just some of the unique landscapes contained within the world's most nature-rich nations. And protecting these ecosystems, experts say, could help save the planet.

Governments are trying to work out a new global agreement to guide conservation and wildlife protection through 2030 at a U.N. summit in Montreal this week. Of the nearly 200 countries assembled, five are considered to be among the world's most biodiverse nations — measured in the number of unique species.

Brazil, China, Indonesia, Mexico, and Colombia boast more than 131,000 plant species, around 6,000 birds, and nearly 3,000 mammals between them, according to data compiled from the International Union for the Conservation of Nature, BirdLife International and the U.N. Environment Programme. That's more than a third of all the world's flowering plants, and more than half of all bird and mammal species on Earth.

Still, that's not necessarily enough to garner them any special treatment in the talks, experts said, which run on a consensus basis meaning all parties must agree.

"Biodiversity in every country matters, so we don't want to say that Brazil's biodiversity is worth more than, say, Mongolia," said Alfred DeGemmis, an international policy expert with the Wildlife Conservation Society.

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However, "there is a need to listen to those countries who will have significant responsibilities when it comes to biodiversity in the finance space," he said, noting that countries with a lot of nature are the ones that will have to implement any new deal.

Here's what some of the world's most nature-rich nations want to happen at the talks.

Some 60% of the world's largest rainforest – the Amazon – falls within Brazil's borders, containing unique and charismatic critters such as the giant anteater, two-toed sloth, and poison dart frog.

Around half of the entire Amazon Basin is currently under some form of protection, and to keep it that way, Brazil has championed financing in the U.N. talks.

Developing countries are asking that a fund be set up to support their conservation efforts, with \$100 billion per year, or 1% of global GDP, flowing from wealthy nations to the developing world until 2030.

Any deal "must be accompanied by approval of a commensurately robust package on resource mobilization," the Brazilian delegation said during a meeting on December 10.

Brazil has more than a third of its land under some level of protection, but has not yet formally supported a global pact to protect 30% of land and sea by 2030, known as 30-by-30.

China holds the presidency of this year's summit, and the talks were initially scheduled to be held in Kunming — a city in Yunnan province featuring towering karst cliffs and deep mountain gorges.

As president of the negotiations, China has to strike a balance and find an agreement among all parties if they want a successful outcome.

"Because they are president, frankly, they want to be ... a little bit back from being too loud on issues," said Norway's Minister of Climate and Environment Espen Barth Eide.

Last year, Chinese President Xi Jinping announced the launch of a \$237.47 million fund to support nature protection in developing countries.

China has designated 25% of its land as "ecological conservation" areas. But it has not yet supported 30-by-30.

Scientists are still mapping out the full extent of Colombia's biodiversity, after much of the country's jungles were off limits to field research due to decades-long civil conflicts.

Since a 2016 peace deal with the Revolutionary Armed Forces of Colombia (FARC), scientists have discovered many new plant species in the country's forests.

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Colombia is arguably the most ambitious and most biodiverse nation at the talks. The government supports the 30-by-30 goal and is advocating strongly for the inclusion of indigenous people and local communities in the final deal.

"The least we can do — the minimum for the survival of species — is to protect at least 30%, based on science," said Colombia's Minister of Environment and Sustainable Development Susana Muhamad during a meeting on Friday. "It should be 50%."

This North American country contains a diverse landscape that ranges from dry desert to mangrove swamps to cloud forest to jungle.

The Mexican delegation has taken a fairly progressive approach to the talks, and supports the 30-by-30 goal, with around 15% of lands currently protected. Negotiators say they also want to see numerical targets for the phase out of pesticides — a divisive goal which has drawn pushback from Brazil and China.

However, Mexico has been less keen to address reducing the footprint of consumption.

An archipelago of more than 10,000 islands, this forest nation has made a fortune on palm oil — often at the expense of the country's critically endangered orangutans, scientists say.

Habitat destruction from palm oil plantations, logging and mining, along with hunting, halved the orangutan population on the island of Borneo — shared between Indonesia, Malaysia, and Brunei — from 1999 to 2015, according to a 2018 study in the journal *Current Biology*.

But Indonesia has so far remained relatively unengaged in the talks, observers told Reuters.

The country has said it will put around 10% of its territorial waters under protection by the end of this decade, and it's the only large forest nation where deforestation is currently declining.

"Indonesia supports voluntary commitments with appropriate flexibility based on national circumstances," said Indonesian Deputy Environment and Forestry Minister Alue Dohong at talks on Friday.

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CALIFORNIA APPROVES ROADMAP FOR CARBON NEUTRALITY BY 2045

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December 20, 2022 05:11 am | Updated 05:11 am IST - SACRAMENTO

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California air regulators voted unanimously on Thursday to approve an ambitious plan to drastically cut reliance on fossil fuels by changing practices in the energy, transportation and agriculture sectors, but critics say it doesn't go far enough to combat climate change.

The plan sets out to achieve so-called carbon neutrality by 2045, meaning the state will remove as many carbon emissions from the atmosphere as it emits. It aims to do so in part by reducing fossil fuel demand by 86% within that time frame.

California had previously set this carbon neutrality target, but Gov. Gavin Newsom signed legislation making it a mandate earlier this year. The Democrat has said drastic changes are needed to position California as a global climate leader.

"We are making history here in California," Newsom said in a statement Thursday.

But the plan's road to approval by the California Air Resources Board was not without criticism. Capturing large amounts of carbon and storing it underground is one of the most controversial elements of the proposal. Critics say it gives the state's biggest emitters reason to not do enough on their part to mitigate climate change.

In a meeting that lasted several hours, activists, residents and experts used their last chance to weigh in on the plan ahead of the board's vote. Many said the latest version, while not perfect, was an improvement from earlier drafts, committing the state to do more to curb planet-warming emissions.

Davina Hurt, a board member, said she was proud California is moving closer to its carbon neutrality goal.

"I'm glad that this plan is bold and aggressive," Hurt said.

The plan does not commit the state to taking any particular actions but sets out a broad roadmap for how California can achieve its goals. Here are the highlights:

The implementation of the plan hinges on the state's ability to transition away from fossil fuels and rely more on renewable resources for energy. It calls for the state to cut liquid petroleum fuel demand by 94% by 2045, and quadruple solar and wind capacity along that same timeframe.

Another goal would mean new residential and commercial buildings will be powered by electric appliances before the next decade.

The calls for dramatically lowering reliance on oil and gas come as public officials continue to grapple with how to avoid blackouts when record-breaking heat waves push Californians to crank up their air conditioning.

And the Western States Petroleum Association took issue with the plan's timeline.

"CARB's latest draft of the Scoping Plan has acknowledged what dozens of studies have confirmed — that a complete phase-out of oil and gas is unrealistic," said Catherine Reheis-Boyd, the group's president, in a statement. "A plan that isn't realistic isn't really a plan at all."

At the beginning of Thursday's meeting, California Air Resources Board Chair Liane Randolph touted the latest version of the plan as the most ambitious to date. It underwent changes after public comments earlier this year.

"Ultimately, achieving carbon neutrality requires deploying all tools available to us to reduce emissions and store carbon," Randolph said.

Officials hope a move away from gas-powered cars and trucks reduces greenhouse gas emissions while limiting the public health impact of chemicals these vehicles release.

In a July letter to the air board, Newsom requested that the agency approve aggressive cuts to emissions from planes. This would accompany other reductions in the transportation sector as the state transitions to all zero-emission vehicle sales by 2035.

The plan's targets include having 20% of aviation fuel demand come from electric or hydrogen sources by 2045 and ensuring all medium-duty vehicles sold are zero-emission by 2040. The board has already passed a policy to ban the sale of new cars powered solely by gasoline in the state starting in 2035.

The plan refers to carbon capture as a "necessary tool" to implement in the state alongside other strategies to mitigate climate change. It calls for the state to capture 100 million metric tons of carbon dioxide equivalent and store it underground by 2045.

Connie Cho, an attorney for environmental justice group Communities for a Better Environment, called the plan's goal of phasing down oil refining "a huge step forward" to mitigate climate change and protect public health.

"Our communities have been suffering from chronic disease and dying at disproportionate rates for far too long because of the legacy of environmental racism in this country," Cho said.

But Cho criticized its carbon capture targets, arguing they give a pathway for refineries to continue polluting as the state cuts emissions in other areas.

One of the goals is to achieve a 66% reduction in methane emissions from the agriculture sector by 2045. Cattle are a significant source for releasing methane — a potent, planet-warming gas.

The plan's implementation would also mean less reliance by the agriculture sector on fossil fuels as an energy source.

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In a race to protect existing biodiversity: A scene from the Kaziranga national park in Assam in September 2021. | Photo Credit: RITU RAJ KONWAR

The story so far: The Convention on Biological Diversity (CBD), the United Nations agreement to conserve and sustainably use earth's biodiversity, got a boost at a conference held in Montreal recently, when 188 of 196 member governments agreed on a new framework to halt the sharp and steady loss of biological species. These governments, supported by the U.S. and the Vatican, who are not party to the Convention, adopted the Kunming-Montreal Global Biodiversity Framework (GBF) that sets out four goals for 2050, and 23 targets for 2030, to save existing biodiversity and ensure that 30% of degraded terrestrial, inland water, coastal and marine ecosystems come under effective restoration.

Often called the web of life, biodiversity signifies the variety of species on earth, which are all connected and sustain the balance of ecosystems, enabling humans to coexist. They interact with the environment to perform a host of functions. The CBD states that only about 1.75 million species have so far been identified, including numerous insects, while there may be some 13 million species.

Some familiar ecosystem services rendered by diverse living forms, of which plants and animals are the most visible, include providing humans with food, fuel, fibre, shelter, building materials, air and water purification, stabilisation of climate, pollination of plants including those used in agriculture, and moderating the effects of flood, drought, extreme temperatures and wind. A disruption of these produces severe impacts such as failed agriculture, aberrant climate patterns and cascading losses of species that accelerate the degradation of earth.

According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), a quarter of the plants and animals it assessed for the 2019 Global Biodiversity Outlook are threatened, which translates to about one million species facing extinction. Similarly, a review on the economics of biodiversity by Cambridge professor Partha Dasgupta commissioned by the U. K. government reported that the current model of economic growth would require 1.6 earths to maintain current lifestyles.

The agreement to implement the GBF was pushed through on December 18 by the Chinese conference presidency and host Canada in the face of objections from some African countries such as the Democratic Republic of Congo, Cameroon and Uganda. It sets out targets for 2030 on protection for degraded areas, resource mobilisation for conservation, compensation for

countries that preserve biodiversity, halting human activity linked to species extinction, reducing by half the spread of invasive alien species (introduced plants and animals that affect endemic biodiversity), cutting pollution to non-harmful levels and minimising climate change impact and ocean acidification, among others.

The GBF goals and targets do not prohibit the use of biodiversity, but call for sustainable use, and a sharing of benefits from genetic resources. Target five specifically states that the use, harvesting and trade in wild species should be “sustainable, safe and legal, preventing overexploitation, minimising impacts on non-target species and ecosystems...and reducing the risk of pathogen spillover...” The GBF emphasises respect for the rights of indigenous communities that traditionally protect forests and biodiversity, and their involvement in conservation efforts. It advocates similar roles for women and local communities.

Agricultural practices also find a strong focus. Besides emphasising sustainable practices in agriculture, aquaculture, fisheries and forestry, the agreement calls upon members to adopt biodiversity-supporting methods such as agroecology and sustainable intensification. This acquires significance, since growing Genetically Modified (GM) crops is not favoured by agroecologists as they could contaminate nearby wild species of the same plants.

One target also looks at turning cities into hosts of biodiversity, by expanding the area of and improving the quality and access to urban green and blue spaces. Urban planning should also be biodiversity-inclusive, “enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature.”

Earlier, the CBD had launched the Aichi biodiversity targets for 2020, which included safeguarding of all ecosystems that provide services for humanity’s survival, and the Nagoya Protocol which went into effect in 2014 to ensure sharing of biodiversity access and benefits.

The key aspects of the four GBF goals for 2050 deal with maintaining ecosystem integrity and health to halt extinctions, measuring and valuing ecosystem services provided by biodiversity, sharing monetary and non-monetary gains from genetic resources and digital sequencing of genetic resources with indigenous people and local communities, and raising resources for all countries to close a biodiversity finance gap of an estimated \$700 billion.

Recognising the challenging nature of the goals and targets, the GBF has specific provisions on implementing and monitoring. Member nations need to submit a revised and updated national biodiversity strategy and action plan in the conference to be held in 2024. Further, the parties to the CBD should submit national reports in 2026 and 2029 to help prepare global reviews. High level discussions on the progress reviews should be held in 2024 and 2026.

Countries would have to review existing laws relating to not just the environment, but areas such as industry, agriculture and land use, to ensure that the national strategy and action plan adequately protects biodiversity. For instance, business and industry, including transnational corporations would have to assess, monitor and report the risks and impacts of their operations and portfolios. They must provide information for sustainable consumption and comply with the rules on benefit-sharing. Perverse incentives that affect biodiversity should be eliminated.

Indigenous people, local communities, sub-national governments, cities and local authorities, intergovernmental organisations, multilateral environmental agreements, non-governmental organisations, women, youth, research organisations and the business and finance community have been invited to voluntarily participate in national biodiversity protection plans. There are specific indicators for countries to report their progress, as part of a transparency and reporting arrangement.

By 2030, the GBF hopes to see at least \$200 billion raised per year from all sources — domestic, international, public and private — towards implementation of the national action plans. In terms of international funding, developing countries should get at least \$20 billion a year by 2025 and at least \$30 billion by 2030 through contributions from developed countries. The Global Environment Facility (GEF), a multilateral body that partners countries and agencies, has been asked to establish in 2023, and until 2030, a Special Trust Fund to support the implementation of the GBF. Complementing this, the GBF envisages that there will be access to justice and information related to biodiversity for indigenous peoples and local communities, respecting their cultures and rights over lands, territories, resources, and traditional knowledge, as well as by women, children and youth, and persons with disabilities, and ensure the full protection of environmental human rights defenders. The GBF is aligned with UN Sustainable Development Goals, three of which directly deal with the environment and thus with biodiversity: Goal 13 on climate action, Goal 14 on life below water and Goal 15 on life on land.

The major challenge to protecting and expanding biodiversity conservation, says Prof. Partha Dasgupta, is the use of GDP as the chief determinant of development. The economist says in the Dasgupta Review report that GDP is based on a faulty application of economics that excludes “depreciation of assets” like nature which is degraded by relentless extraction of resources. He calls for appreciation of nature, and measuring “inclusive wealth”, which captures not just financial and produced capital but also human, social and natural capital.

The UN’s effort to measure wealth more broadly through its “Inclusive Wealth” (IW) report showed in 2018 that although 135 countries did better on inclusive wealth in 2014 compared to 1990, the global GDP growth rate considerably outpaced IW: an average of 1.8% per year for IW compared to 3.4% for GDP per year during the period.

The writer is a Chennai-based journalist

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YEAR END REVIEW: MINISTRY OF ENVIRONMENT FOREST AND CLIMATE CHANGE

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

The year 2022 saw the launch of Mission LiFE by Prime Minister Shri Narendra Modi, a flagship programme to promote sustainable lifestyle across the globe. The central elements of Mission LiFE i.e., sustainable lifestyle and sustainable patterns of consumption to address climate change were mentioned in the cover decision of Sharm El Sheikh Implementation Plan of COP 27. Cheetah reintroduction in India by the Prime Minister was another important milestone in the global conservation efforts of the species. The major achievements during the year 2022 are as follows: -

Lifestyle for Environment - LiFE

A Global call for Mission LiFE (Lifestyle for Environment) was given by Prime Minister of India, Shri Narendra Modi, while delivering India's National Statement, at CoP26, held at Glasgow in October-November, 2021. Subsequently, Mission LiFE was launched at Ekta Nagar by Prime Minister of India, on 20 October 2022, in the presence of United Nations Secretary General, Mr Antonio Guterres.

India participated in COP 27, with focus on mainstreaming the theme of LiFE - Lifestyle for Environment. The Indian Pavilion at COP 27 highlighted the theme of LiFE in various ways – models, audio visual displays, activities and 49 side events with participation of various central government ministries, state governments, UN and multilateral organizations, public sector undertakings, think tanks, private sector, international organizations and civil society organizations.

India invited all countries to join the LiFE movement which is a pro-people and pro-planet effort, seeking to shift the world from mindless and wasteful consumption to mindful and deliberate utilization of natural resources.

The cover decision of UNFCCC COP27, titled the 'Sharm Al Sheikh Implementation Plan', notes the 'importance of transition to sustainable lifestyles and sustainable patterns of consumption and production for efforts to address climate change'. It also notes the 'importance of pursuing an approach to education that promotes a shift in lifestyles while fostering patterns of development and sustainability based on care, community and cooperation'.

INDIA @ CoP27 on LiFE

At COP 27, India set up a Pavilion on the theme of LiFE – Lifestyle for Environment. A number of events, based on LiFE, were organised with the objective of spreading the message of LiFE.

14th November 2022 was dedicated to LiFE events. One such event was: "Understanding the Concept of LiFE" hosted by MoEFCC and United Nations (UN in India). The event had the presence of Shri Bhupender Yadav, Minister, EFCC (HMEFCC); Ms. Inger Andersen, Executive Secretary, United Nations Environment Programme (UNEP); Mr. Ovais Sarmad, Deputy Executive Secretary, UNFCCC; Lord Nicholas Stern, IG Patel Chair of Economics and Government, London School of Economics; and Ms. Usha Rao-Monari, Associate Administrator, UNDP and other dignitaries from across the world. During the event, MoEFCC-UNDP Compendium 'Prayas Se Prabhaav Tak' was launched.

On the same day, HMEFCC launched India's Long-Term Low-Carbon Development Strategy. With the submission of this document to UNFCCC, India joined the select group of fewer than 60 countries in the world to do so.

The National Museum of Natural History (NMNH), under the MoEFCC and UNDP, jointly launched "In Our LiFEtime" campaign to encourage youth between the ages of 18 to 23 years to become message bearers of sustainable lifestyles. This campaign envisioned recognizing youth from around the world taking climate action initiatives that resonate with the concept of LiFE.

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Ministry of New & Renewable Energy (MNRE) in conjunction with Ministry of Power; IREDA; Solar Energy Corporation of India (SECI); and Council on Energy, Environment and Water (CEEW) organized a side event on November 8, 2022, during which discussions were held on linking India's numerous initiatives on energy access, transition, and efficiency with the principles of LiFE in the run-up to India's G20 Presidency.

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A panel discussion at India Pavilion presented by Government of Himachal Pradesh on November 10, 2022 shed light on the process and methodology adopted for scaling up villages and developmental plans towards Climate Resilient Lifestyles for Environment (LiFE). ASSOCHAM's event on November 11, 2022 made LiFE principles the basis for inclusive growth pathways and solutions in net-zero urban development.

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Promoting Circular Economy - Waste-to-Wealth

Prime Minister, Shri Narendra Modi, in his address to the nation on the occasion of 75th Independence Day on 15.08.2021, highlighted India's action on 'Mission Circular Economy'. NITI

Aayog constituted 11 Committees for development of circular economy (CE) action plans for different categories of wastes.

Circular Economy Action Plans for 10 waste categories (Lithium-ion batteries; E-waste; Toxic and hazardous industrial waste; Scrap metal (ferrous and non-ferrous); Tyre and Rubber; End of Life Vehicles; Gypsum, Used Oil, Solar Panels and Municipal Solid Waste have been finalized, and are under implementation. Respective Nodal Ministries are coordinating on progress of implementation of these action plans. Ministry of Environment, Forest and Climate Change is the Nodal Ministry for Circular Economy Action Plan for Tyre and Rubber and stakeholder ministry in other CE Action Plans.

Regulations on market based Extended Producer Responsibility (EPR) principle have been notified for four categories of wastes i.e. plastic packaging waste, battery waste, e-waste and waste tyre.

In EPR for Plastic Packaging, targets for minimum recycling, minimum use of recycled content and use of rigid plastic packaging in identified sizes have been mandated. In rules incorporating EPR principle that have been notified/amended this year, different targets of minimum recycling, minimum recovery percentage and minimum use of recycled content have been given lead times to start with. The optimum level will be reached over a period of time. This has been done to provide time to the industry as well as recyclers for the development of systems and recycling infrastructure. Regulations to bring in EPR for end-of-life vehicles is under development.

The Waste-to-Wealth Mission/ Mission Circular Economy is bound to create new business models as well as new employment opportunities. This will also result in integration of informal sector. Participation of industry is of critical importance to make the Waste-to-Wealth Mission a success. This will result in moving away from mindless consumption to mindful utilisation and will help achieve the vision of Mission LiFE - Lifestyle for Environment given by Prime Minister Shri Narendra Modi.

National Clean Air Programme (NCAP)

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has been implementing since 10th January, 2019, a National Clean Air Programme (NCAP) as a national-level strategy outlining the actions for reducing the levels of air pollution at city and regional scales in India. Rs 7100 crore have been released to 131 cities till date under NCAP & XVFC for implementing actions stipulated under city action plan. Fixed city wise year wise targets for improvement in air quality for FY 2021-22 to 2025-26 for this MoUs have been signed with NCAP cities between CPCB, SPCB and ULB and 42 MPCs between the MoEF&CC, State government and Urban local bodies under XVFC.

The national level plan: a comprehensive action plan has been prepared from 7 line ministries under NCAP which includes the action plans of different Ministries/ Departments of Government of India. This includes convergence of schemes/ programmes of different Ministries/ Departments.

State Action Plans are under process and received from 10 States/ UTs so far. City Action Plans are prepared by cities for implementation of activities which assists in air quality improvement. 88 Institute of Reputes (IoRs) are assigned to 131 NACs for capacity building and for effective implementation of City action plans.

MoEF&CC conducted regional workshops for sensitization, knowledge sharing and capacity building of the stakeholders in the State (3 regional workshops have been conducted so far and

a National Conference on VAYU in Odisha).

MoEF&CC has also launched “PRANA” a portal for monitoring implementation of NCAP on the occasion of International day of clean air for blue skies on 7th September 2021 and in 2022 released brochures/ booklets on Guidelines for Capacity Building & Public Outreach.

Guidelines for release of funds under NCAP, Operational Guidelines for release of grants under Fifteenth Finance Commission along with that released booklets on best practices undertaken by various cities in sectors for abatement of emissions from waste and biomass dumping and burning, for abatement of vehicular emissions, Road dust and construction & demolition waste management, capacity building & monitoring network etc.

The Swachh Vayu Survekshan guidelines for Ranking of cities under NCAP has been issued to cities- 9 cities are awarded with a cash prize of 5 crores under 3 categories on 3rd December 2022 during VAYU conference in Bhubaneswar, Odisha.

An overall improvement in ambient air quality has been observed in 95 cities during 2021-22 as compared to 2017. 18 cities were found to be within the prescribed National Ambient Air Quality Standard (PM10 less than 60^µg/m³) in 2019-20 which has increased to 20 in year 2021-22.

HC of Delhi appreciates efforts for Climate Action in India and India’s leadership role

The Union of India has filed a detailed exhaustive report and also brought to the notice of the Court that the Cabinet has approved India’s updated Nationally Determined Contribution which is a step towards achieving India’s long-term goal of reaching net-zero by 2070.

It has also been brought to the notice of the Court that the approval of the Cabinet translates Prime Minister “Panchamrit” announced at COP-26 into enhanced climate targets and India is now committed to reduce emissions intensity of its GDP by 45 percent by 2030. Prime Minister of India Narendra Modi’s a one-word movement to the global community proposed at COP-26 - LIFE i.e. Lifestyle for Environment and all efforts are being made in the country for cleaner energy for the period 2021-30 were brought to the notice of the court.

The Court appreciated the sincere efforts made on the part of the Ministry of Environment, Forest, and Climate Change for ensuring implementation of the steps in respect of climate change and for providing a better environment for the generations to come.

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC)

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) in Article 4, paragraph 19, states, “All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.”

In light of above, India launched its long-term low carbon development strategy at the 27th session of Conference of Parties (COP-27) to the UNFCCC. The strategy was launched by Union Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav, who led the Indian delegation to the COP 27 from 6-18 November, 2022. With this release, India joins the select list of less than 60 parties that have submitted their LT LEDES to UNFCCC.

India’s approach is based on the following four key considerations that underpin its long-term

low-carbon development strategy: (i) India has contributed little to global warming, (ii) India's historical contribution to cumulative global GHG emissions is therefore minuscule despite having a share of ~17% of the world's population, (iii) India is committed to pursuing low-carbon strategies for development and is actively pursuing them, as per national circumstances, (iv) India needs to build climate resilience.

The LT-LEDS aims to go beyond India's climate targets or the nationally determined contributions (NDC) announced in August, of achieving 50 percent of India's cumulative electric power installed capacity from non-fossil sources by 2030, and reducing emission intensity of GDP by 45 percent below 2005 levels by 2030 and builds on India's Panchamrit (five nectar elements) pledges at the 26th Conference of Parties (COP26) of the UNFCCC in Glasgow, including the target of [net-zero emissions by 2070](#). The roadmap is a result of a first of its kind inter-ministerial consultation, and a collaborative effort with experts and think-tanks.

In its present form, the LT-LEDS provides roadmap for sectoral transitions needed for India's transition to the 2070 goal. India's LT-LEDS rests on seven key transitions to low-carbon development pathways. These include electricity systems, transport systems, urbanization, industrial systems, CO₂ removal, forestry, economic and financial aspects of low carbon development.

Cheetah Introduction in India

The last cheetahs in the Indian wilderness were recorded in 1947 where three cheetahs were shot in the Sal (*Shorea robusta*) forests of Koriya District, Chhattisgarh State. The main reasons for the extinction of cheetah in India were large scale capture of animals from the wild for coursing, bounty and sport hunting, extensive habitat conversion along with consequent decline in prey base and in 1952 Cheetahs were declared as extinct by the Government.

The Government of India initiated G2G consultative meetings with Republic of Namibia which culminated in the signing of MoU between the two countries on 20th July 2022 for cheetah conservation. Following the signing of MoU, in a historic first wild to wild intercontinental translocation, eight cheetahs were translocated from Namibia to India on 17th September, 2022 and were released into the quarantine bomas by the Prime Minister of India. Post the mandatory quarantine period, the cheetahs have been released into the larger enclosure in phased manner. All the eight individual cheetahs are doing very well in terms of taking of feed, body condition, behaviour, activity and overall fitness.

The goal of Cheetah introduction project in India is to establish viable cheetah meta-population that allows the cheetah to perform its functional role as a top predator and provide space for the expansion of the cheetah within its historic range thereby contributing to its global conservation efforts.

The major objective of the introduction project is restoring open forest and savannah grassland that will benefit biodiversity and ecosystem services from these ecosystems. Further, the project provides opportunity for eco-development and eco-tourism to enhance local community livelihoods.

Modalities of taking the cheetah project forward have already been discussed with South African Authorities and a second batch of 12 cheetahs are likely to be translocated to India during January 2023.

India establishes Asia's largest Ramsar Sites network in the 75th Year of Independence.

On the eve of 76th Independence Day (15th August 2022), India added ten wetlands to the List of Wetlands of International Importance (also called Ramsar Sites) within the framework of the Ramsar Convention, taking the total number of Ramsar Sites in India to incredible 75, the highest in Asia, in the 75th year of its independence.

India ratified the Ramsar Convention in 1982. Keoladeo National Park (in Rajasthan) and Chilika (in Odisha) were the first two sites to be placed on the Ramsar List by the Government of India. Till 1990, only four more sites were added to the list, and another 20 over the following two decades. Since 2014, Ramsar Site designation has received a significant policy push from the MoEFCC, and 49 wetlands have been added to the list. The network of Indian Ramsar Sites currently covers 1.33 million ha, which is approximately 8% of the known wetland extent of the country.

Ramsar Sites form an international network of wetlands which are important for conserving global biological diversity and sustaining human lives through the maintenance of their ecosystem components, processes and services. The international significance of these sites is indicated by their fulfilling at least one of the nine criteria set by the Convention. With 2,455 sites spanning 255.8 million ha, the Ramsar sites represent the world's largest protected area network.

The Ramsar sites in India are highly diverse. The contribution that Ramsar sites make to biological diversity can hardly be over emphasised. A recent compilation of faunal diversity of 42 Indian Ramsar Sites by the Zoological Survey of India enlists 6200 species. For several of the faunal groups, these wetlands represent a significant share of the known diversity (for example, over one-third of recorded mammalian species, one-fifth of reptiles, and about two-thirds of known bird species). While the smallest Ramsar Site is just 19.75 ha in the area (Vembannur), the largest, the Sunderbans, spans 0.42 million ha.

Ramsar Sites are one of the three pillars of the Ramsar Convention, the other two being working towards the wise use of wetlands and cooperating internationally on transboundary wetlands, shared wetlands and shared species. The Ramsar Convention's pillar of wetlands wise use is very well aligned with L.I.F.E., international mass movement launched by Prime Minister Narendra Modi towards "mindful and deliberate utilization, instead of mindless and destructive consumption" to protect and preserve the environment.

Since 1986, the MoEFCC has been implementing a national scheme (presently known as the National Plan for Conservation of Aquatic Ecosystems) to assist state governments in preparing and implementing integrated management plans for Ramsar sites and other priority wetlands. Ramsar sites receive legal protection under Wetlands (Conservation and Management) Rules, 2017. Each Ramsar site needs to have a management plan which outlines the pathway to wise use. A diagnostic approach for developing such management plans has been prescribed by the Ministry. In June 2022, the Ministry also formulated the 'Sahbhagita Guidelines' outlining an "all of society" approach and governance framework for wetlands conservation in the country.

Ban on identified Single Use Plastics from 1 July 2022 and Plastic Waste Management

India has taken resolute steps to reflect its commitment to eliminate single use plastics that are not biodegradable and have an adverse impact on environment. The strategy adopted by the Government to tackle unmanaged and littered plastic waste has two pillars – ban on single use plastic items which have high littering potential and low utility, and implementation of extended producer responsibility on plastic packaging.

The country has taken a defining step to eliminate single use plastics. A ban has been imposed

on identified single use plastic items from 1st July 2022. The ban was notified on 12th August 2021.

Ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene (Thermocol) for decoration; Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 microns, stirrers. Thickness of Plastic carry bags increased to 75 microns (30.9.2021) and to 120 microns (31.12.2022).

The introduction and use of alternatives to banned single use plastic items have led to creation of new employment opportunities, promote innovation and development of new business models. The manufacturing of alternatives with eco-friendly material in the MSME sector will further support development of Atmanirbhar Bharat.

India had piloted a resolution in 2019 for addressing pollution caused by single use plastics which was adopted by the 4th meeting of United Nations Environment Assembly in 2019.

To develop alternatives to single use plastics “India Plastic Challenge – Hackathon 2021” was organized by the Ministry of Environment, Forest and Climate Change, for start-ups and students of colleges and Universities. Two startups in the area of alternatives to single use plastics were awarded. A completely biodegradable alternative to thermocol from paddy straw waste (Parali) has been developed. This innovation will use Parali and also replace thermocol. Packaging material from seaweed has been developed as innovative alternative to single-use plastics.

National Expo on Eco-Alternatives to single use plastic and start up conference 2022 held on 26th and 27th September 2022 in Chennai. More than 150 manufacturers of eco-alternatives from across the country are participating in the Expo. The eco-alternatives included material made from sea-weed, bagasse, rice and wheat bran, rice stubble, plant and agricultural residue, banana and areca leaves, jute and cloth.

Prakriti- Messenger of the Earth was launched as a mascot of sustainability and protection of environment spread awareness amongst general public. A public movement is being built on elimination of single use plastics by NSS, NCC and more than 100,000 eco-clubs in schools and colleges. Puneet Sagar and Swachh Sagar Surakshit Sagar Campaign have showcased the importance of collective action in maintaining clean beaches and coasts.

The Guidelines for Extended Producer Responsibility on plastic packaging are unique and have led to the establishment of world’s biggest framework for EPR implementation on plastic packaging. The implementation of EPR on plastic packaging will lead to reduction in littered and unmanaged plastic waste in the country, promote circular economy of plastic packaging waste promote development of new alternatives to plastics and development of new business models move towards sustainable plastic packaging. The EPR framework is implemented through a centralized online portal ensuring ease of doing business.

The Guidelines for EPR in plastic packaging promote an environmentally conscious lifestyle that focuses on ‘mindful consumption’ through the reuse of rigid plastic packaging and sustainable plastic packaging instead of ‘mindless and destructive consumption’ of single-use plastics. The Guidelines for EPR in plastic packaging give a push for reducing plastic footprint in packaging through the use of recycled plastic content in manufacturing of plastic packaging material.

TX2 International Award to Tiger Reserves of India

The TX2 a Tiger Conservation Excellence award is organized by a consortium of international organisations namely the Conservation Assured | Tiger Standards (CA|TS), Fauna & Flora International, Global Tiger Forum, IUCN Integrated Tiger Habitat Conservation Programme, Panthera, UNDP Lion's Share, Wildlife Conservation Society and WWF's Tigers Alive Initiative. The award is given to tiger reserves that have made significant progress towards doubling the tiger number since 2010 or displayed conservation excellence.

In 2010, the ambitious goal of doubling wild tiger number by 2022 was set by the 13 tiger range countries. The tiger reserves/ tiger conservation sites of range countries can submit the applications for TX2 awards. From India, in 2020, the Pilibhit Tiger Reserve, Uttar Pradesh won the TX2 award and the Manas Tiger Reserve, Assam was selected for Conservation Excellence award for the transboundary conservation partnership.

The TX2 award for the year 2021 was bagged by the Sathyamangalam Tiger Reserve, Tamil Nadu. Declared as tiger reserve in 2013, the Sathyamangalam had a tiger population of 25 individuals in 2011. Sustained management inputs (both technical and financial) by both Central Government and State Government for tiger conservation in Sathyamangalam have resulted increase in tiger numbers to 80 owing to enhanced protection, improved habitat management, scientific monitoring and involvement of local communities.

There are 53 Tiger Reserves covering an area of 75000 Sq Km in the country. India harbours more than 70% of the global tiger population and has honour of the largest tiger range country in the world. Tigers are apex predator in the ecosystem and conserving tigers results in maintaining the balance of the ecosystem, conservation of the entire gamut of the biodiversity and ecosystem services.

MJPS/SSV

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Prime Minister, Shri Narendra Modi, in his address to the nation on the occasion of 75th Independence Day on 15.08.2021, highlighted India’s action on ‘Mission Circular Economy’. NITI Aayog constituted 11 Committees for development of circular economy (CE) action plans for different categories of wastes.

Circular Economy Action Plans for 10 waste categories (Lithium-ion batteries; E-waste; Toxic and hazardous industrial waste; Scrap metal (ferrous and non-ferrous); Tyre and Rubber; End of Life Vehicles; Gypsum, Used Oil, Solar Panels and Municipal Solid Waste have been finalized, and are under implementation. Respective Nodal Ministries are coordinating on progress of implementation of these action plans. Ministry of Environment, Forest and Climate Change is the Nodal Ministry for Circular Economy Action Plan for Tyre and Rubber and stakeholder ministry in other CE Action Plans.

Regulations on market based Extended Producer Responsibility (EPR) principle have been notified for four categories of wastes i.e. plastic packaging waste, battery waste, e-waste and waste tyre.

In EPR for Plastic Packaging, targets for minimum recycling, minimum use of recycled content and use of rigid plastic packaging in identified sizes have been mandated. In rules incorporating EPR principle that have been notified/amended this year, different targets of minimum recycling, minimum recovery percentage and minimum use of recycled content have been given lead times to start with. The optimum level will be reached over a period of time. This has been done to provide time to the industry as well as recyclers for the development of systems and recycling infrastructure. Regulations to bring in EPR for end-of-life vehicles is under development.

The Waste-to-Wealth Mission/ Mission Circular Economy is bound to create new business models as well as new employment opportunities. This will also result in integration of informal sector. Participation of industry is of critical importance to make the Waste-to-Wealth Mission a success. This will result in moving away from mindless consumption to mindful utilisation and will help achieve the vision of Mission LiFE - Lifestyle for Environment given by Prime Minister Shri Narendra Modi.

National Clean Air Programme (NCAP)

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has been implementing since 10th January, 2019, a National Clean Air Programme (NCAP) as a national-level strategy outlining the actions for reducing the levels of air pollution at city and regional scales in India. Rs 7100 crore have been released to 131 cities till date under NCAP & XVFC for implementing actions stipulated under city action plan. Fixed city wise year wise targets for improvement in air quality for FY 2021-22 to 2025-26 for this MoUs have been signed with NCAP cities between CPCB, SPCB and ULB and 42 MPCs between the MoEF&CC, State government and Urban local bodies under XVFC.

The national level plan: a comprehensive action plan has been prepared from 7 line ministries under NCAP which includes the action plans of different Ministries/ Departments of Government of India. This includes convergence of schemes/ programmes of different Ministries/ Departments.

State Action Plans are under process and received from 10 States/ UTs so far. City Action Plans are prepared by cities for implementation of activities which assists in air quality improvement. 88 Institute of Reputes (IoRs) are assigned to 131 NACs for capacity building and for effective implementation of City action plans.

MoEF&CC conducted regional workshops for sensitization, knowledge sharing and capacity building of the stakeholders in the State (3 regional workshops have been conducted so far and a National Conference on VAYU in Odisha).

MoEF&CC has also launched "PRANA" a portal for monitoring implementation of NCAP on the occasion of International day of clean air for blue skies on 7th September 2021 and in 2022 released brochures/ booklets on Guidelines for Capacity Building & Public Outreach.

Guidelines for release of funds under NCAP, Operational Guidelines for release of grants under Fifteenth Finance Commission along with that released booklets on best practices undertaken by various cities in sectors for abatement of emissions from waste and biomass dumping and burning, for abatement of vehicular emissions, Road dust and construction & demolition waste management, capacity building & monitoring network etc.

The Swachh Vayu Survekshan guidelines for Ranking of cities under NCAP has been issued to cities- 9 cities are awarded with a cash prize of 5 crores under 3 categories on 3rd December 2022 during VAYU conference in Bhubaneswar, Odisha.

An overall improvement in ambient air quality has been observed in 95 cities during 2021-22 as compared to 2017. 18 cities were found to be within the prescribed National Ambient Air Quality Standard (PM10 less than 60^µg/m³) in 2019-20 which has increased to 20 in year 2021-22.

HC of Delhi appreciates efforts for Climate Action in India and India's leadership role

The Union of India has filed a detailed exhaustive report and also brought to the notice of the Court that the Cabinet has approved India's updated Nationally Determined Contribution which is a step towards achieving India's long-term goal of reaching net-zero by 2070.

It has also been brought to the notice of the Court that the approval of the Cabinet translates Prime Minister "Panchamrit" announced at COP-26 into enhanced climate targets and India is now committed to reduce emissions intensity of its GDP by 45 percent by 2030. Prime Minister of India Narendra Modi's a one-word movement to the global community proposed at COP-26 -

LIFE i.e. Lifestyle for Environment and all efforts are being made in the country for cleaner energy for the period 2021-30 were brought to the notice of the court.

The Court appreciated the sincere efforts made on the part of the Ministry of Environment, Forest, and Climate Change for ensuring implementation of the steps in respect of climate change and for providing a better environment for the generations to come.

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC)

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) in Article 4, paragraph 19, states, "All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."

In light of above, India launched its long-term low carbon development strategy at the 27th session of Conference of Parties (COP-27) to the UNFCCC. The strategy was launched by Union Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav, who led the Indian delegation to the COP 27 from 6-18 November, 2022. With this release, India joins the select list of less than 60 parties that have submitted their LT LEDES to UNFCCC.

India's approach is based on the following four key considerations that underpin its long-term low-carbon development strategy: (i) India has contributed little to global warming, (ii) India's historical contribution to cumulative global GHG emissions is therefore minuscule despite having a share of ~17% of the world's population, (iii) India is committed to pursuing low-carbon strategies for development and is actively pursuing them, as per national circumstances, (iv) India needs to build climate resilience.

The LT-LEDES aims to go beyond India's climate targets or the nationally determined contributions (NDC) announced in August, of achieving 50 percent of India's cumulative electric power installed capacity from non-fossil sources by 2030, and reducing emission intensity of GDP by 45 percent below 2005 levels by 2030 and builds on India's Panchamrit (five nectar elements) pledges at the 26th Conference of Parties (COP26) of the UNFCCC in Glasgow, including the target of [net-zero emissions by 2070](#). The roadmap is a result of a first of its kind inter-ministerial consultation, and a collaborative effort with experts and think-tanks.

In its present form, the LT-LEDES provides roadmap for sectoral transitions needed for India's transition to the 2070 goal. India's LT-LEDES rests on seven key transitions to low-carbon development pathways. These include electricity systems, transport systems, urbanization, industrial systems, CO2 removal, forestry, economic and financial aspects of low carbon development.

Cheetah Introduction in India

The last cheetahs in the Indian wilderness were recorded in 1947 where three cheetahs were shot in the Sal (*Shorea robusta*) forests of Koriya District, Chhattisgarh State. The main reasons for the extinction of cheetah in India were large scale capture of animals from the wild for coursing, bounty and sport hunting, extensive habitat conversion along with consequent decline in prey base and in 1952 Cheetahs were declared as extinct by the Government.

The Government of India initiated G2G consultative meetings with Republic of Namibia which culminated in the signing of MoU between the two countries on 20th July 2022 for cheetah

conservation. Following the signing of MoU, in a historic first wild to wild intercontinental translocation, eight cheetahs were translocated from Namibia to India on 17th September, 2022 and were released into the quarantine bomas by the Prime Minister of India. Post the mandatory quarantine period, the cheetahs have been released into the larger enclosure in phased manner. All the eight individual cheetahs are doing very well in terms of taking of feed, body condition, behaviour, activity and overall fitness.

The goal of Cheetah introduction project in India is to establish viable cheetah meta-population that allows the cheetah to perform its functional role as a top predator and provide space for the expansion of the cheetah within its historic range thereby contributing to its global conservation efforts.

The major objective of the introduction project is restoring open forest and savannah grassland that will benefit biodiversity and ecosystem services from these ecosystems. Further, the project provides opportunity for eco-development and eco-tourism to enhance local community livelihoods.

Modalities of taking the cheetah project forward have already been discussed with South African Authorities and a second batch of 12 cheetahs are likely to be translocated to India during January 2023.

India establishes Asia's largest Ramsar Sites network in the 75th Year of Independence.

On the eve of 76th Independence Day (15th August 2022), India added ten wetlands to the List of Wetlands of International Importance (also called Ramsar Sites) within the framework of the Ramsar Convention, taking the total number of Ramsar Sites in India to incredible 75, the highest in Asia, in the 75th year of its independence.

India ratified the Ramsar Convention in 1982. Keoladeo National Park (in Rajasthan) and Chilika (in Odisha) were the first two sites to be placed on the Ramsar List by the Government of India. Till 1990, only four more sites were added to the list, and another 20 over the following two decades. Since 2014, Ramsar Site designation has received a significant policy push from the MoEFCC, and 49 wetlands have been added to the list. The network of Indian Ramsar Sites currently covers 1.33 million ha, which is approximately 8% of the known wetland extent of the country.

Ramsar Sites form an international network of wetlands which are important for conserving global biological diversity and sustaining human lives through the maintenance of their ecosystem components, processes and services. The international significance of these sites is indicated by their fulfilling at least one of the nine criteria set by the Convention. With 2,455 sites spanning 255.8 million ha, the Ramsar sites represent the world's largest protected area network.

The Ramsar sites in India are highly diverse. The contribution that Ramsar sites make to biological diversity can hardly be over emphasised. A recent compilation of faunal diversity of 42 Indian Ramsar Sites by the Zoological Survey of India enlists 6200 species. For several of the faunal groups, these wetlands represent a significant share of the known diversity (for example, over one-third of recorded mammalian species, one-fifth of reptiles, and about two-thirds of known bird species). While the smallest Ramsar Site is just 19.75 ha in the area (Vembannur), the largest, the Sunderbans, spans 0.42 million ha.

Ramsar Sites are one of the three pillars of the Ramsar Convention, the other two being working towards the wise use of wetlands and cooperating internationally on transboundary wetlands,

shared wetlands and shared species. The Ramsar Convention's pillar of wetlands wise use is very well aligned with L.I.F.E., international mass movement launched by Prime Minister Narendra Modi towards "mindful and deliberate utilization, instead of mindless and destructive consumption" to protect and preserve the environment.

Since 1986, the MoEFCC has been implementing a national scheme (presently known as the National Plan for Conservation of Aquatic Ecosystems) to assist state governments in preparing and implementing integrated management plans for Ramsar sites and other priority wetlands. Ramsar sites receive legal protection under Wetlands (Conservation and Management) Rules, 2017. Each Ramsar site needs to have a management plan which outlines the pathway to wise use. A diagnostic approach for developing such management plans has been prescribed by the Ministry. In June 2022, the Ministry also formulated the 'Sahbhagita Guidelines' outlining an "all of society" approach and governance framework for wetlands conservation in the country.

Ban on identified Single Use Plastics from 1 July 2022 and Plastic Waste Management

India has taken resolute steps to reflect its commitment to eliminate single use plastics that are not biodegradable and have an adverse impact on environment. The strategy adopted by the Government to tackle unmanaged and littered plastic waste has two pillars – ban on single use plastic items which have high littering potential and low utility, and implementation of extended producer responsibility on plastic packaging.

The country has taken a defining step to eliminate single use plastics. A ban has been imposed on identified single use plastic items from 1st July 2022. The ban was notified on 12th August 2021.

Ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene (Thermocol) for decoration; Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 microns, stirrers. Thickness of Plastic carry bags increased to 75 microns (30.9.2021) and to 120 microns (31.12.2022).

The introduction and use of alternatives to banned single use plastic items have led to creation of new employment opportunities, promote innovation and development of new business models. The manufacturing of alternatives with eco-friendly material in the MSME sector will further support development of Atmanirbhar Bharat.

India had piloted a resolution in 2019 for addressing pollution caused by single use plastics which was adopted by the 4th meeting of United Nations Environment Assembly in 2019.

To develop alternatives to single use plastics "India Plastic Challenge – Hackathon 2021" was organized by the Ministry of Environment, Forest and Climate Change, for start-ups and students of colleges and Universities. Two startups in the area of alternatives to single use plastics were awarded. A completely biodegradable alternative to thermocol from paddy straw waste (Parali) has been developed. This innovation will use Parali and also replace thermocol. Packaging material from seaweed has been developed as innovative alternative to single-use plastics.

National Expo on Eco-Alternatives to single use plastic and start up conference 2022 held on 26th and 27th September 2022 in Chennai. More than 150 manufacturers of eco-alternatives from across the country are participating in the Expo. The eco-alternatives included material made from sea-weed, bagasse, rice and wheat bran, rice stubble, plant and agricultural residue, banana and areca leaves, jute and cloth.

Prakriti- Messenger of the Earth was launched as a mascot of sustainability and protection of environment spread awareness amongst general public. A public movement is being built on elimination of single use plastics by NSS, NCC and more than 100,000 eco-clubs in schools and colleges. Puneet Sagar and Swachh Sagar Surakshit Sagar Campaign have showcased the importance of collective action in maintaining clean beaches and coasts.

The Guidelines for Extended Producer Responsibility on plastic packaging are unique and have led to the establishment of world's biggest framework for EPR implementation on plastic packaging. The implementation of EPR on plastic packaging will lead to reduction in littered and unmanaged plastic waste in the country, promote circular economy of plastic packaging waste promote development of new alternatives to plastics and development of new business models move towards sustainable plastic packaging. The EPR framework is implemented through a centralized online portal ensuring ease of doing business.

The Guidelines for EPR in plastic packaging promote an environmentally conscious lifestyle that focuses on 'mindful consumption' through the reuse of rigid plastic packaging and sustainable plastic packaging instead of 'mindless and destructive consumption' of single-use plastics. The Guidelines for EPR in plastic packaging give a push for reducing plastic footprint in packaging through the use of recycled plastic content in manufacturing of plastic packaging material.

TX2 International Award to Tiger Reserves of India

The TX2 a Tiger Conservation Excellence award is organized by a consortium of international organisations namely the Conservation Assured | Tiger Standards (CA|TS), Fauna & Flora International, Global Tiger Forum, IUCN Integrated Tiger Habitat Conservation Programme, Panthera, UNDP Lion's Share, Wildlife Conservation Society and WWF's Tigers Alive Initiative. The award is given to tiger reserves that have made significant progress towards doubling the tiger number since 2010 or displayed conservation excellence.

In 2010, the ambitious goal of doubling wild tiger number by 2022 was set by the 13 tiger range countries. The tiger reserves/ tiger conservation sites of range countries can submit the applications for TX2 awards. From India, in 2020, the Pilibhit Tiger Reserve, Uttar Pradesh won the TX2 award and the Manas Tiger Reserve, Assam was selected for Conservation Excellence award for the transboundary conservation partnership.

The TX2 award for the year 2021 was bagged by the Sathyamangalam Tiger Reserve, Tamil Nadu. Declared as tiger reserve in 2013, the Sathyamangalam had a tiger population of 25 individuals in 2011. Sustained management inputs (both technical and financial) by both Central Government and State Government for tiger conservation in Sathyamangalam have resulted increase in tiger numbers to 80 owing to enhanced protection, improved habitat management, scientific monitoring and involvement of local communities.

There are 53 Tiger Reserves covering an area of 75000 Sq Km in the country. India harbours more than 70% of the global tiger population and has honour of the largest tiger range country in the world. Tigers are apex predator in the ecosystem and conserving tigers results in maintaining the balance of the ecosystem, conservation of the entire gamut of the biodiversity and ecosystem services.

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CONSULT FOREST DWELLERS FIRST

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

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December 26, 2022 12:15 am | Updated 01:42 am IST

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“Primary stakeholders in the gram panchayats located close to the world heritage sites in Karnataka were Scheduled Tribes. Other traditional forest dwellers include Scheduled Castes (SCs), Other Backward Classes, minorities and the general category”. File | Photo Credit: The Hindu

Of the [39 areas declared by UNESCO in 2012](#) as being critical for biodiversity in the Western Ghats, 10 are in Karnataka. Before recognising areas as world heritage sites, UNESCO seeks the opinion of the inhabitants on the implication of the possible declaration on their lives and livelihoods.

This author interacted with different stakeholders in the gram panchayats located close to the world heritage sites in Karnataka. The primary stakeholders were Scheduled Tribes (STs). Other traditional forest dwellers include Scheduled Castes (SCs), Other Backward Classes, minorities and the general category. An overwhelming majority said that they were not aware of the process that leads to the declaration of UNESCO heritage sites.

The majority of the forest dwellers claimed land measuring not more than one acre. It is clear that the claims were nowhere close to the ceiling of four hectares permitted under the [Forest Rights Act](#) (FRA). The rejection rate of the other traditional forest dwellers was two times more than the STs. In the case of the STs, the reasons were attributed to fresh encroachments; the claimants not living on the lands claimed; claimed lands being on ‘*paisari bhoomis*’ (wasteland and forest lands which have not been notified as protected forests or reserved forests) or revenue lands; and multiple applications made in a single family. In the case of other traditional forest dwellers, it was mainly failure to produce evidence of dependency and dwelling on forest land for 75 years.

The officials said the FRA is good law which recognises the rights of the STs because of their overall backwardness. However, most felt there should be a closure to this Act; and that the process cannot go on forever with new claims emerging on a regular basis. Presenting the declaration of the world heritage site in a positive light, they said that illegal tree-felling and poaching have come down following the stringent implementation of rules in the ‘protected areas’. Most forest dwellers acknowledged this fact.

The people in the villages falling under eco-sensitive zones said they had started experiencing severe restrictions on their entry into the forest. Development activities like road repair has been stopped. Farming is not allowed in a normal way, a slight sound is demurred, the use of

fertilizers is banned, and even a small knife is not allowed to be carried into the forest. The people are prohibited from cutting trees falling on their houses to undertake repair work or move the earth. A striking revelation was that these restrictions were in enforcement from the time these areas were declared as protected areas and not necessarily after their declaration as world heritage sites.

The increasing animal insurgency is causing damage to the crops of the farming forest dwellers. Those who don't have recognition over their lands are not given compensation for the loss. Monkeys and snakes released from urban settings into the forests enter their houses. More importantly, the monkeys do not survive in the wild for long.

Owning livestock in the villages close to forests is more challenging than in regular revenue villages. In the areas where irrigation projects have come up, the affected people reported that grazing lands have been taken over by the government to compensate for the forest land lost to such projects.

The respondents were in possession of the lands claimed under the FRA even though their applications were either rejected or were still pending. However, in many places, they were apprehensive that people were accepting the resettlement packages and moving out of 'protected areas' for good. They worried that if half the village population moved away, it would become difficult for the remaining ones to live their normal life.

Most forest dwellers said they were still deprived of basic facilities and other government benefits extended under various schemes and programmes as they don't possess the 'Records of Rights, Tenancy and Crops' that is required along with the title of the land. The government must address this issue in consonance with the rules of the Act.

Half the world heritage sites in Karnataka fall under protected areas (National Park: 1; Wildlife Sanctuaries: 4) and the remaining are reserved forests. The issue becomes complicated when the people refuse to 're-locate' on grounds of their attachment to the land fearing extinction of their culture and religious roots. The gram sabha appears supreme in the Act in deciding the 'proposed resettlement' as it has to give 'free informed consent'. However, this does not happen. Hence, the government must bring more clarity to the Act to avoid conflicts between the government agencies conserving biodiversity and the people living in the forest for over decades and centuries.

Finally, the conservation of biodiversity requires special attention. Yet, forest dwellers willing to live in the forest must be allowed to stay. Many of them comply with the norms of the eco-sensitive zone because they do not depend on modern development needs such as the use of fertilizers and mobile phones. In the same breath, those wanting to experience the fruits of development must be relocated according to their choice of a new place and a suitable package. This can be possible only when the areas declared as 'protected' are arrived at after consultations with the local population. This did not take place in a transparent way at the time of the declaration of world heritage site or earlier, when protected areas were notified.

Madhusudan Bandi is a faculty member with the Gujarat Institute of Development Research, Ahmedabad. Views are personal

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SCIENTISTS FREEZE GREAT BARRIER REEF CORAL IN A WORLD-FIRST TRIAL

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December 24, 2022 08:10 pm | Updated 08:10 pm IST

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Cryogenically, frozen coral can be stored and later reintroduced to the wild. | Photo Credit: Reuters

Scientists working on Australia's Great Barrier Reef have successfully trialled a new method for freezing and storing coral larvae they say could eventually help rewild reefs threatened by climate change.

Scientists are scrambling to protect coral reefs as rising ocean temperatures destabilise delicate ecosystems. The Great Barrier Reef has suffered four bleaching events in the last seven years, including the first-ever bleach during a La Niña phenomenon, which typically brings cooler temperatures.

Cryogenically frozen coral can be stored and later reintroduced to the wild but the current process requires sophisticated equipment including lasers. Scientists say a new lightweight "cryomesh" can be manufactured cheaply and better preserves coral.

In a December lab trial, the world's first with Great Barrier Reef coral, scientists used the cryomesh to freeze coral larvae at the Australian Institute of Marine Sciences (AIMS). The coral had been collected from the reef for the trial, which coincided with the brief annual spawning window.

"If we can secure the biodiversity of coral... then we will have tools for the future to really help restore the reefs and this technology for coral reefs in the future is a real game-changer," said Mary Hagedorn, Senior Research Scientist at the Smithsonian National Zoo and Conservation Biology Institute. told Reuters from the AIMS lab.

The cryomesh was previously trialled on smaller and larger varieties of the Hawaiian corals. A trial on the larger variety failed.

Also Read | [Explained: The Great Barrier Reef's recovery and vulnerability to climate threats](#)

Trials are continuing with larger varieties of Great Barrier Reef coral.

The trials involved scientists from the AIMS, the Smithsonian National Zoo and the Conservation Biology Institute, the Great Barrier Reef Foundation and the Taronga Conservation Society Australia as part of the Reef restoration and adaptation programme.

The mesh technology, which will help store coral larvae at -196°C (-320.8°F), was devised by a team from the University of Minnesota's College of Science and Engineering, including Dr. Zongqi Guo, a postdoctoral associate, and Professor John C. Bischof.

It was first tested on corals by PhD student Nikolas Zuchowicz.

"This new technology that we've got will allow us to do that at a scale that can actually help to support some of the aquaculture and restoration interventions," said Jonathan Daly from the Taronga Conservation Society Australia.

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WHAT IS A TIDAL DISRUPTION EVENT

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

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December 28, 2022 12:27 pm | Updated December 29, 2022 09:21 am IST

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This illustration shows a tidal disruption, which occurs when a passing star gets too close to a black hole and is torn apart into a stream of gas. Some of the gas eventually settles into a structure around the black hole called an accretion disk. | Photo Credit: NASA's Goddard Space Flight Center

(This article forms a part of the Science for All newsletter that takes the jargon out of science and puts the fun in! [Subscribe now!](#))

Telescopes operated by National Aeronautics and Space Administration (NASA) recently observed a massive [black hole devouring a star](#). The incident was the fifth-closest example of a black hole destroying a star and occurred 250 million light-years from the earth, in the centre of another galaxy.

The astronomical phenomenon of the destruction of a star by a black hole is formally called a [tidal disruption event](#) (TDE).

A tidal force is the difference in the strength of gravity between two points. If the tidal force exerted on a body is greater than the intermolecular force that keeps it together, the body will get disrupted.

During a TDE, the tidal force of a black hole disrupts the star in vicinity. While about half of the star's debris continues on its original path, the other half is attracted by the black hole's gravitational pull. The gradual growth of this material bound to the black hole produces a short-lived flare of emission, known as a tidal disruption event.

In the recently-observed example, a dramatic rise in high-energy X-ray light around the black hole was seen once the star was completely ruptured by the black hole's gravity. This indicated the formation of an extremely hot structure above the black hole called a corona. According to a study published in *Astrophysical Journal*, the proximity of the aforementioned TDE provided a spectacular view of the corona's formation and evaluation.

The event is formally called AT2021ehb, and took place in a galaxy with a central black hole about 10 million times the mass of our sun. It was first spotted on March 1, 2021, by the Zwicky Transient Facility in Southern California. Around 300 days later, the Nuclear Spectroscopic Telescopic Array (NuSTAR) – NASA's most sensitive space telescope capable of observing high-energy X-rays – began observing the system. Scientists detected a corona, but they don't

know where the plasma comes from or exactly how it gets so hot. Coronae usually appear with jets of gas that flow in the opposite direction from a black hole. However, with AT2021ehb, there were no jets.

TDEs are attractive to astronomers because of their observability and short duration, and the opportunity to study the impact of black hole's gravity on materials around it. They are also an important tool to learn how black holes influence their environments.

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THEY SURVIVED THE HUNTERS: NOW KING PENGUINS FACE CLIMATE CHANGE

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

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December 29, 2022 02:31 pm | Updated 02:31 pm IST

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The birds spend most of their life at sea, but come breeding time in December half the world's population flock to the islands in the southern Indian Ocean's Crozet archipelago. | Photo Credit: AP

Once hunted to the brink of extinction, the thousands of king penguins that densely congregate on the remote Possession Island each year now face a new threat: climate change.

The birds spend most of their life at sea, but come breeding time in December half the world's population flock to the islands in the southern Indian Ocean's Crozet archipelago, roughly halfway between Antarctica and the southeastern tip of Africa.

Robin Cristofari, a specialist in penguins at Finland's University of Turku, looks out on a colony massed at a bay on Possession Island.

"This species was not very far from extinction" after being massacred by seal hunters from the end of the 19th century to the first half of the 20th, he said.

When the hunters ran out of seals to kill, they used the penguins as fuel, burning them to melt seal blubber in cauldrons, said Cristofari.

For a short time they even made penguin oil, "but it was not good quality", he added.

The king penguin population rebounded in the latter half of the 20th century, but their numbers plateaued around 20 years ago.

"After that first hurdle, the species now faces a second, more insidious one: climate change," Cristofari said.

He was the lead author of a 2018 study that found that global warming was on track to wipe out 70% of the world's king penguins by the end of the century.

King penguins stand just under a metre (three feet) tall and sport black-and-white tuxedos accessorised with bright orange on their necks and beaks.

[Also Read | Indian zoos: seeds of wildlife conservation](#)

They only return to land to breed, and are very picky about where they do so.

It must be a dry place, without winter sea ice around the island, and have a smooth beach of sand or pebbles as well as plentiful, accessible sources of food.

This means breeding spots need to be close to the Antarctic Polar Front, where cold waters from the south converge with warmer northern flows to create an area abundant with fish, squid and other marine food.

In January, the polar front is usually 350 kilometres (about 220 miles) south of the Crozet archipelago.

But during hot years it can be up to 750 kilometres away -- too far for penguins to get food and quickly return to their hungry hatchlings and relieved partner.

"Reproductive success is directly related to the distance from the polar front," Cristofari said.

But with the polar front drifting southwards as human-driven climate change warms the world, the Crozet Islands could soon become uninhabitable for king penguins.

And that would leave the flightless birds with only a handful of islands to the south, many of which cannot sustain large breeding colonies.

"We are not worried about the species, the population will not disappear in the next 50 years," Cristofari said. But their way of life could be seriously disrupted, he said.

King penguins live for about 25 years and have their first chicks aged about six or seven.

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Out of more than a million breeding pairs worldwide, around half breed on the Crozet Islands.

They typically arrive in early November, selecting and mating with the partner with whom they will stay faithful for a year.

The parents share equal responsibilities during the 50-day incubation period and the first month after the chick hatches.

Cristofari said the "playful and curious" birds barge into the gigantic nesting colonies on the islands, carefully waddling with their egg nestled between their feet.

Finding a place among the crowd, the partners take turns using their bellies to warm their precious future offspring, Cristofari said.

The parent not caring for the egg or chick heads out to sea in search of food. Their partner back on land can go a month without eating.

The chicks are well fed until May then fast during the Southern Hemisphere's winter. The parents come back to feed their offspring occasionally until spring.

"The cycle is timed to make it as easy as possible for the chick to start feeding on its own,

ideally during the peak of summer," Cristofari said.

Then, a full year after hatching, the hungry penguins enter the water to catch their own food for the first time.

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WHAT IS THE LINK BETWEEN WINTER STORMS AND GLOBAL WARMING?

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In the United States, a mechanism called “lake-effect snow” occurs around the Great Lakes region on the Canadian border. The city of Buffalo, which sits on the shores of one of the Great Lakes, was hit hard by a lethal snowstorm over Christmas weekend. | Photo Credit: AP

The world is getting warmer, winters included. The United States, however, has experienced severe winter storms in recent years, and experts are taking a closer look at the link between these extreme cold events and climate change.

While the link between global warming and heat waves is very direct, the behaviour of winter storms is governed by complex atmospheric dynamics that are more difficult to study.

Even so, "there are certain aspects of winter storms (...) where the climate change linkages are fairly strong and robust," Michael Mann, a climatologist at the University of Pennsylvania, told AFP.

For example, the warming of bodies of water -- lakes or oceans -- influences the amount of snowfall.

In the United States, a mechanism called "[lake-effect snow](#)" occurs around the Great Lakes region on the Canadian border. The city of Buffalo, which sits on the shores of one of the Great Lakes, was hit hard by a lethal snowstorm over Christmas weekend.

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The collision between cold air from the north with the warmer water of these lakes causes convection, which leads to snowfall.

"The warmer those lake temperatures, the more moisture (is) in the air, and the greater potential for lake-effect snows," Michael Mann wrote in a 2018 paper.

"Not surprisingly, we see a long-term increase in lake effect snowfalls as temperatures have warmed during the last century."

There is, however, no consensus on other mechanisms, such as the effect of climate change on

the polar vortex and jet stream air currents.

The polar vortex is an air mass above the North Pole, located high in the stratosphere. Humans dwell in the troposphere, and the stratosphere is located just above it.

It is surrounded by a band of rotating air, which acts as a barrier between the cold air in the north, and the warmer air in the south. As the polar vortex weakens, this band of air begins to undulate and take on a more oval shape, bringing more cold air southward.

According to a 2021 study, this type of disturbance is occurring more often, and is reflected in the following two weeks lower in the atmosphere, where the jet stream is located.

This air current, which blows from west to east, again following the border between cold and warm air, then meanders in such a way that it allows cold air from the north to intrude at lower latitudes, particularly over the eastern United States.

"Everybody agrees that when the polar vortex becomes perturbed or disrupted, there is an increase in the probability of severe winter weather," Judah Cohen, lead author of the study and climatologist for Atmospheric and Environmental Research (AER), told AFP.

And this "stretched" polar vortex is exactly what was observed just before the storm that hit the United States this December, he pointed out.

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The same phenomenon was seen in February 2021, when a bitter cold snap hit Texas, causing massive power outages.

But the heart of the debate lies elsewhere: What is causing these increased disturbances in the polar vortex?

According to Cohen, they are linked to changes in the Arctic, accelerated by climate change. On the one hand, the rapid melting of sea ice, and on the other, an increase in snow cover in Siberia.

"This is a topic that I have been studying for over 15 years, and I am more confident today in the link than I have ever been in the past," he told AFP.

This last point, however, remains "an active debate within the scientific community," said Mann.

"Climate models are not yet capturing all of the underlying physics that may be relevant to how climate change is impacting the behaviour of the jet stream."

Future studies will still be needed in the coming years to unravel the mystery of these complex chain reactions.

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