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# UNEP-MANAGED CITES DATABASE REVEALS RED SANDERS SMUGGLING

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

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February 02, 2023 07:41 pm | Updated February 03, 2023 12:25 am IST - KOLKATA

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“Red Sanders is under severe pressure from illegal logging and harvesting.” File image for representation. | Photo Credit: C. Venkatachalapathy

The [CITES trade database](#) has recorded 28 incidents of Red Sanders confiscation, seizure, and specimen from the wild being exported from India, a factsheet prepared by TRAFFIC, a global wildlife trade monitoring organisation has revealed. CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments, whose aim is to ensure that international trade in specimen of wild animals and plants, does not threaten the survival of the species.

“These consignments were exported to China (53.5%), Hong Kong (25.0%), Singapore (17.8%) and the United States of America (3.5%) from 2016 to 2020,” the factsheet said. Red Sanders *Pterocarpus santalinus*, or red sandalwood, is an endemic tree species with distribution restricted to the Eastern Ghats of India. The species found in Andhra Pradesh and growing up to a height of 10 to 15 metres, is reported to be one of India’s most exploited tree species, and is under severe pressure from illegal logging and harvesting. Under the foreign trade policy of India, the import of Red Sanders is prohibited, while export is restricted.

“India reported an export of more than 19,049 tonnes of logs. In comparison, the importing countries reported about 4,610 tonnes of logs, 127 tonnes of sawn wood, 20 tonnes of transformed wood and 980 kg of wood products, clearly indicating a discrepancy in reporting of Red Sander trade,” the factsheet said.

According to the recently released communiqué titled “RED SANDERS: Factsheet on India’s Red Sanders in illegal wildlife trade”, China remains the largest importer with more than 13,618 tonnes of the products, followed by Hong Kong (5,215 tonnes) and Singapore (216 tonnes).

“Red Sanders is under severe pressure from illegal logging and harvesting. Its heartwood is in demand in both domestic and international markets and is used to make furniture and handicrafts, while the red dye obtained from the wood is used as a colouring agent in textiles and medicines. Rampant illegal logging has been reported across its range State,” said Merwyn Fernandes, coordinator of TRAFFIC’s India office.

Listed under Schedule IV of The Wildlife Protection Act and Endangered as per IUCN Red List,

Red Sanders is a very slow-growing tree species that attains maturity in natural forests after 25-40 years.

The document also highlighted the conservation efforts of the species and pointed out that in 2016 the Andhra Pradesh Forest Act, was amended via A.P. Act No.15 of 2016, to give special status of protection to Red Sanders. Red Sanders offences were made cognisable and non-bailable, and the punishments related to it were enhanced.

The publication called declaring the Red Sanders harbouring forests within the species' geographical range as 'High Conservation Areas', to provide an adequate legal framework for protecting the species and its habitat. "Enforcement agencies such as the Forest Departments, Customs, Railways, Police, DRI (Directorate of Revenue Intelligence), and Coast Guards must coordinate efforts to curb the Red Sanders trafficking by sharing information on hotspots and transit routes and real-time intelligence related to the Red Sanders smuggling," the factsheet pointed out.

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# INDIA IS PART OF THE SOLUTION AND IS DOING MORE THAN ITS FAIR SHARE TO ADDRESS CLIMATE CHANGE

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

Minister of State for Environment, Forest and Climate Change, Shri Ashwini Kumar Choubey in a written reply to a question in Rajya Sabha today informed that Climate change is a global collective action problem. India with more than 17% of the global population has contributed only about 4% of the global cumulative greenhouse gas emissions between 1850 and 2019. Reports from various sources, including Intergovernmental Panel on Climate Change, highlight that the challenges faced due to global warming are mainly due to cumulative historical and current greenhouse gas emissions of the developed countries. Even though, we are not part of the problem, India is part of the solution and is doing more than its fair share.

India is a Party to the United Nations Framework Convention on Climate Change, its Kyoto Protocol and Paris Agreement. Under the Paris Agreement in 2015, India had submitted its Nationally Determined Contribution (NDC) balancing the concerns and priorities of climate change, sustainable development including poverty eradication, and economic growth of the country. In August 2022, India updated its NDC according to which India has an enhanced target to reduce emissions intensity of its GDP by 45 percent by 2030 from 2005 level, achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. Further, in November 2022, India has submitted its Long-Term Low-Carbon Development Strategy. India's long term strategy rests on seven key transitions to low-carbon development pathways. One of these transitions will focus on promoting Adaptation in Urban Design, Energy and Material-Efficiency in Buildings, and Sustainable Urbanisation.

Shri Choubey said that Government of India is implementing several programmes and schemes including the National Action Plan on Climate Change (NAPCC) which comprises missions in specific areas of solar energy, energy efficiency, water, sustainable agriculture, Himalayan ecosystem, sustainable habitat, green India, and strategic knowledge for climate change. Thirty-four States /Union Territories (UTs) have prepared and some have updated their State Action Plan on Climate Change (SAPCC) in line with NAPCC taking into account the State-specific issues relating to climate change. These SAPCCs outline sector-specific and cross-sectoral priority actions, including adaptation and climate resilient infrastructure.

The National Adaptation Fund for Climate Change (NAFCC) was established to support adaptation activities in the States and Union Territories (UTs) of India that are vulnerable to the adverse effects of climate change. NAFCC is implemented in project mode and till date, 30 projects have been sanctioned in 27 States and UTs. As a result of various actions undertaken, India has achieved reduction of 24% in emission intensity of its GDP between 2005 and 2016.

Apart from resolutely addressing climate change domestically, India has launched international coalitions such as International Solar Alliance (ISA) and Coalition for Disaster Resilient Infrastructure (CDRI). At COP26 in Glasgow in November 2021, new initiatives under CDRI and ISA, viz, Infrastructure for Resilient Island States (IRIS) and Green Grids Initiative—One Sun One World One Grid (GGI-OSOWOG) were also launched. Along with Sweden, India co-leads the Leadership Group for Industry Transition (LeadIT) for voluntary low carbon transition of hard to abate sectors

Further, the National Disaster Management Authority (NDMA) has issued several disaster

specific guidelines for managing extreme weather-related disasters such as cyclones, floods and heat wave. National Disaster Management Plan (NDMP) has been formulated to assist all stakeholders including State Governments in disaster risk management of various hazards including hazards related to climate change. Furthermore, advance and early warning systems are being implemented by Indian Meteorological Department to facilitate timely evacuation in the event of floods/cyclones and prevent the loss of lives. Government of India has implemented Integrated Coastal Zone Management project (ICZMP) that has contributed, inter-alia, mapping of hazard line, Eco-sensitive Area, Sediment cell for the entire coastline of India. The hazard line is indicative of the shoreline changes, including the sea level rise due to climate change and is a projection of impact due to sea level rise, and shoreline changes over a long period of time viz. over 100 years. This line is required to be used by the Coastal State agencies concerned as a tool for Disaster Management for the coastal environment, including planning of adaptive and mitigation measures.

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# EXPLAINED

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

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February 05, 2023 03:35 am | Updated 03:35 am IST

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Mangroves are salt-tolerant plant communities found in tropical and subtropical intertidal regions. [File](#) | [Photo Credit: The Hindu](#)

**The story so far:** The [Union Budget for 2023-24](#) announced [an initiative for mangrove plantation](#) along the coastline and on salt pan lands, under MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes).

Mangroves are salt-tolerant plant communities found in tropical and subtropical intertidal regions. They are important refuges of coastal biodiversity and also act as bio-shields against extreme climatic events. With the threat of climate change and frequent tropical storms looming large, planting more mangroves is a welcome development for India which has a coastline of about 7,500 km.

The 'State of World Mangroves 2022' report by the Global Mangrove Alliance puts the total mangrove cover of the world at 1,47,000 sq km (14.7 million hectares). India has about 4,992 sq km (0.49 million hectares) of mangroves, according to the Indian State of Forest Report (IFSR) 2021. Mangroves in India are distributed across nine States and three Union Territories with West Bengal having the highest mangrove cover of 2,114 sq km. The IFSR report also points out that there has been an increase in the mangrove cover from 4,046 sq km in 1987 to 4,992 sq km in 2021. However, like most other countries, in India too the mangrove ecosystem faces constant pressure due to increasing population in coastal areas and the rising demand for land, timber, fodder, fuel-wood and other non-wood forest products like fisheries. The tree species that form a mangrove forest or ecosystem are broadly classified as true mangroves and mangrove associates. True mangroves are the ones which display morphological adaptations for a high saline mangrove ecosystem such as pneumatophores, vivipary or crypto vivipary germination and salt-secreting cells. Botanists put the number of true mangrove species in India at about 42 and mangrove associates at 68. A stable and resilient mangrove ecosystem requires a number of species to exist side by side. Experts believe that trial and testing with field experience and monitoring for years may be required to create a new mangrove ecosystem along the coastline.

Mangrove forests are formed when there is intertidal flow and where adequate sediments are available for the trees to set down roots. Experts say aquaculture or fisheries along the coast obstructing tidal flow is one of the biggest threats to the mangrove ecosystem. In the Sundarbans, the largest mangrove forest in the country, several instances of clearing mangroves for fisheries have come to light. Along the country's coastline, land reclamation for

agriculture, aquaculture and industrial activities have occurred in areas which are under the Coastal Regulation Zone. Restoration of the land and allowing intertidal flow is crucial for plantation and survival of mangrove forests.

The Budget states that MISHTI will be implemented through convergence between the MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme), CAMPA (Compensatory Afforestation Fund Management and Planning Authority) Fund and other sources. Organisations that have been involved in mangrove plantation say that the initiative requires extensive work with local communities. The survival rate of mangrove seed plantation is 50% and of saplings is about 60% and it takes three years for a new plant to stabilise. A contract-based one-time plantation under MGNREGS and CAMPA may not work unless the local communities take ownership of the forests. Discharge of untreated domestic and industrial effluents into the rivers impede the natural inter-tidal flow along the coast and the mixing of freshwater and saline water which help in gradual formation of the mangrove forest.

The 'State of World Mangroves 2022' points out that mangroves are estimated to hold up to four times the amount of carbon as some other ecosystems. "The loss of even 1% of remaining mangroves could lead to the loss of 0.23 gigatons of CO<sub>2</sub> equivalent, equating to over 520 million barrels of oil," the report states. An initiative like MISHTI is in line with India's Nationally Determined Contributions announced by the Ministry of Environment, Forest and Climate Change to create an additional carbon sink of 2.5-3 billion tonnes of carbon dioxide (CO<sub>2</sub>) equivalent, through additional more forest and tree cover by 2030. India joined the Mangrove Alliance for Climate, at the 27th session of the Conference of the Parties in Egypt.

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# DEER MAY SERVE AS A RESERVOIR FOR OLD SARS-COV-2 VARIANTS

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

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February 04, 2023 07:30 pm | Updated February 05, 2023 12:23 am IST

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Viral sequences recovered from white-tailed deer were “highly divergent from SARS-CoV-2 sequences recovered from humans”. File | Photo Credit: AFP

A study has found widespread infection of white-tailed deer with SARS-CoV-2 virus across the U.S. State of New York. The RNA of the virus was detected in 17 of the 2,700 samples (0.6%) collected during September to December 2020, and in 583 of the 2,762 samples (21.1%) collected during September to December 2021. The researchers found cocirculation of the Alpha, Delta, and Gamma variants in the white-tailed deer, months after they were last detected in humans. Of particular concern is the fact that the viral sequences recovered from white-tailed deer were “highly divergent from SARS-CoV-2 sequences recovered from humans”. This implies rapid adaptation of the virus in white-tailed deer.

The study found multiple spillover events from humans to deer of the Alpha and Delta lineages, and subsequent transmission among white-tailed deer and adaptation of the viruses in the deer.

While the precise implication of these mutations in enabling the virus to quickly and easily spread between white-tailed deer and from the animals to humans is yet to be determined, the very presence of SARS-CoV-2 variants that is no longer in circulation among humans arises the real possibility of the white-tailed deer serving as reservoir for variant SARS-CoV-2 strains that no longer circulate in the human population. The virus is likely to have jumped from humans to white-tailed deer during feeding or targeted baiting of hunting prey. The results of the study were published in the journal Proceedings of the National Academy of Sciences.

It was already known that the ACE2 of white-tailed deer (WTD) share a high similarity to the human ACE2 receptors and this similarity, it was predicted, will allow the virus to bind and enter the cells of deer. If silico predictions too showed the animals to be highly susceptible to infection by SARS-CoV-2 virus, intranasal inoculation of the virus in white-tailed deer led to infection, replication and shedding of the virus, and eventual transmission from one deer to another. That white-tailed deer is broadly distributed in North America with an estimated 30 million population is a concern if the animal turns out to be a reservoir for the virus.

The researchers confirmed that the virus collected from the deer during 2021 was infectious and active virus replication was proven in laboratory studies. While the Delta variant was found in human samples and coincided with the detection in deer, the Alpha and Gamma variants were

rarely in circulation among humans between September and December 2021.

The Alpha and Gamma variants in the deer had numerous mutations (about 50-80) in comparison to the ancestral Wuhan strain. The Delta variant in the animals revealed similar genetic divergence from the human Delta sequences but the number of mutations accumulated in deer sequences was lower (40-65).

“These observations highlight the need to establish continuous surveillance programs to monitor the circulation, distribution, and evolution of SARS-CoV-2 in White-tailed deer populations and to establish measures to minimise additional virus introductions in animals that may lead to spillback of deer-adapted SARS-CoV-2 variants to humans,” they write.

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# ENDANGERED MONARCH BUTTERFLIES FACE PERILOUS STORM ALONG CALIFORNIA'S COAST

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

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February 04, 2023 04:10 pm | Updated 04:10 pm IST

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Monarch butterflies are seen as they overwinter in a protected area inside Natural Bridges State Beach in Santa Cruz, California on January 26, 2023. | Photo Credit: AFP

As devastating storms pounded California, nature lovers feared for endangered monarch butterflies that winter there as part of a seemingly magical migration pattern.

The colourfully winged insects that travel vast distances over the course of generations have been closely watched in the US state since they neared extinction just three years ago.

As the sun rose one January morning, volunteers began counting monarch butterflies, finding them clustered atop cypress and eucalyptus trees in various sites along the California coast.

The butterflies huddled in clusters of grey colonies until one spread its wings to reveal the orange spots for which they are known.

The sight provided a bit of reassurance for Stephanie Turcotte Edenholm, who counted more than a thousand monarchs at a sanctuary in the California coastal town of Pacific Grove.

The educator spent much of the morning explaining the lives of the butterflies to young school students. They got to watch as dozens of butterflies took flight, believing -- mistakenly -- that the mild temperature signalled the end of winter.

"It's too early for them to get so agitated, they're using up their fat reserves," Edenholm fretted.

As devastating storms pounded California, nature lovers feared for fragile, endangered monarch butterflies that winter here as part of a seemingly magical migration pattern. | Photo Credit: AFP

She worried, too, that they would mate and the females would fly off in search of milkweed plants to lay eggs on. Milkweed is all that baby caterpillars eat once the eggs hatch, but it was too early in winter for the plants to be growing.

Volunteers counted more than 330,000 "western monarch" butterflies at the end of November, according to the Xerces Society conservation group.

That number came as a relief compared to the 2,000 butterflies counted at the end of 2020, and an encouraging step up from the 250,000 or so butterflies tallied in 2021.

But the ranks of butterflies were far from the millions observed in the 1980s, due to threats including habitat loss, pesticides and climate change, according to Xerces.

The monarch was added last year to the International Union for Conservation of Nature's Red List of threatened species and Xerces has asked the US Fish and Wildlife Service to place monarchs on its endangered list.

Such a designation would help monarch defenders fight real estate developers out to raze trees or build on terrain needed by migrating butterflies.

The question of whether to protect monarchs is a philosophical one, since the insects are known more for incredible migrations than being crucial for pollinating crops or flowers, according to Xerces biologist Emma Pelton.

"We wouldn't lose human crops or wild plants in particular if the monarchs disappeared," Pelton said.

But the world would lose butterflies "that perform a really incredible migration, and that people are very attached to, emotionally and culturally, throughout North America."

Some species of monarchs travel thousands of miles, from Canada to Mexico, while the lifespan of any single butterfly is typically measured in weeks.

Bill Henry remembers a childhood here filled with butterflies.

"It was kind of a magical thing to be immersed in the abundance of the natural world," said Henry, now director of Groundswell Coastal Ecology group in Santa Cruz, not far from Pacific Grove.

"It paints a picture, it's something that dreams are made out of."

Flourishing monarchs are also a sign of enough milkweed and habitat along the long migration corridor, Henry said.

"Milkweed is linked to healthy landscapes, and it's linked to healthy floodplains, which means that our rivers are doing well," he told *AFP*.

"It also means that there aren't a lot of impasses to their migration, such as swaths where the pesticides that kill them are being used."

In 2020, the near absence of monarchs on the west Coast was a rallying cry for nature lovers, from gardeners who planted milkweed to hobbyists who raised butterflies in their homes despite the practice being illegal due.

But finding the right balance to protect nature has challenges. For example, monarchs love water-guzzling eucalyptus trees that are not native to drought-prone California.

Clearing vegetation or trees to reduce the risk of wildfires can eliminate butterfly habitats.

Monarchs being gone from our world would "suck too much," said Santa Cruz teenager Brody

Robbins, who skipped school to photograph butterflies "way cooler than Civil War classes."

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# GREENPEACE INDIA DEMANDS REVISION OF NATIONAL AIR QUALITY STANDARDS

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

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February 04, 2023 02:39 pm | Updated 02:39 pm IST

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India's annual concentration standards for pollutants continue to be 40 g/m<sup>3</sup> for PM<sub>2.5</sub> and NO<sub>2</sub> – a figure eight times higher than WHO's standards of 5 g/m<sup>3</sup> for particulate matter and 10 g/m<sup>3</sup> for NO<sub>2</sub>. | Photo Credit: Verma Sushil Kumar

A group of people along with Greenpeace India activists gathered at the CPCB office here on Friday to demand immediate revision of the national air quality standards, saying they do not reflect the impact of air pollution on human health.

Holding placards and banners that read "Air Pollution Se Azadi" (freedom from air pollution), "Raise Your Standards" and "Clean Air is a Fundamental Right", the protesters gathered to direct attention of policymakers about the limitations of existing National Ambient Air Quality Standards (NAAQS), a statement said.

They also demanded transparency and accountability from the Central Pollution Control Board in its decision-making processes, it added.

Over the past week, Greenpeace India volunteers visited many of Delhi's iconic locations wearing Hazmat suits and gas masks to raise concerns about the capital's hazardous air quality, it said.

India's annual concentration standards for pollutants continue to be 40 g/m<sup>3</sup> for PM<sub>2.5</sub> and NO<sub>2</sub> – a figure eight times higher than WHO's standards of 5 g/m<sup>3</sup> for particulate matter and 10 g/m<sup>3</sup> for NO<sub>2</sub>, it said.

The participants have also been garnering support for the ongoing petition addressed to Chief Minister Arvind Kejriwal, demanding better transportation systems for cleaner air, it said.

Amruta S Nair, Climate and Energy Campaigner at Greenpeace India, said, "Air pollution has emerged as a major health crisis in India, and a financial disaster affecting millions of people.

"The current standards do not reflect the latest science on the impacts of air pollution on human health, especially on vulnerable groups such as children, senior citizens, women, daily wage labourers - especially outdoor labourers, sexual minorities and more."

Nair said air pollution is becoming a huge factor in out-of-pocket expenditures, which is aggravating inequalities in society.

"Unfortunately, the existing standards offer politicians and policymakers leeway to ignore such a big health emergency," she said.

Avinash Chanchal, campaign manager at Greenpeace India, said, "The CPCB has accepted our open letter and assured us that they will be updating the air quality standards shortly.

"We are going to continue reminding them regularly until it is done."

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# LOCALS, ENVIRONMENTALISTS CONCERNED OVER DEPLETING SNOW COVER, RISING TEMPERATURES IN SHIMLA

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

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February 05, 2023 12:50 pm | Updated 02:19 pm IST

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Shimla: Snow-covered Himalayas mountain range, seen from Shimla, Thursday, February 2, 2023. | Photo Credit: PTI

Harsh winters with heavy snowfalls beginning in December itself, covering Shimla in a white mantle of snow till March-end or even early April have become a thing of the past now.

The Himachal Pradesh capital, which used to be draped in white and attract tourists from all over, now mostly presents a brownish look with dry grass covering the hills.

There is growing concern among environmentalists and locals over the rising temperatures and depleting snow cover that the snow line is moving upwards and the "Queen of Hills" gradually losing her winter charm. Its effect now is more visible than ever in the hill city's dwindling winter tourist inflow and drying water sources.

According to climate experts, the snow line is receding and Shimla's adjoining tourist towns Kufri and Narkanda, popular skiing destinations, too are experiencing scanty snowfall.

The state capital's tourism industry is taking a hit due to the falling numbers and there is a dire need to find more tourist spots and activities in and around the city, Tourism Industry Stakeholders Association president M K Seth said.

Tourism contributes about 7.5% of the hill state's GDP.

Snow also plays a vital role in replenishing the city's perennial sources of water such as springs, streams and rivulets. Scanty snowfall means the water sources dry up and the towns face scarcity.

In 2018, the problem of water shortage had risen to such alarming levels that water supply had to be restricted to every fifth or sixth day, severely denting the inflow of tourists during the peak summer season.

As per meteorological department data, the snowfall from November to March in Shimla in 1989-

90 was 556.7 cm while the figure stood at just 105.2 cm in the corresponding period of 2008-09.

Old-timers recall that a record snowfall of 360 cm to 450 cm was witnessed in 1945 in Shimla in a single spell, which had brought normal life to a standstill and even the railway station had collapsed under heavy snow.

"There is an erratic pattern of precipitation as climate change is being witnessed due to global warming. Extreme weather events are being witnessed and a gradual decrease is being seen in the number of snow days," the director of the local meteorological office in Shimla Surender Paul told PTI.

Recalling his experience during winters, octogenarian O P Sood said, "Plaintive monkeys used to wail down the trees in search of food and raid houses and shops with more than usual daring, and most of the residents used to migrate to the plains during winters. But things have changed now."

Reckless cutting of hills, construction of multi-storey concrete buildings, manifold increase in population and increasing human activity have become the bane of Shimla and the town is now warmer than plains during winters, climate experts said.

A joint study by the State Centre on Climate Change (SCCC), Himachal Pradesh, and the Ahmedabad-based Space Applications Centre of ISRO using Advanced Wide Field Sensor (AWiFS) satellite data map revealed that the state witnessed 18.5% decrease in snow cover in 2020-21.

As per the SCCC, the rise in temperature in the north western Himalayan region was about 1.6 degrees Celsius in the last century but the warming rate of Shimla was higher than Leh and Srinagar during 1991-2002 as compared to the earlier decades. The gross rise in the mean air temperature during 1980-2002 in the north western Himalayas as a whole was about 2.2 degrees, it showed.

Apple growers in the upper Shimla region are now deprived of "white manure" (snow), and are adopting new varieties and techniques to sustain.

"Temperatures are low in December and January but adequate moisture is not available due to scanty snowfall. As a result, the cropping pattern is changing with apple growers taking to high density apple plantation," Special Secretary, Horticulture, Sudesh Mokta said.

The apple economy in the state is worth around Rs 5,000 crore.

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## SHRI BHUPENDER YADAV LAUNCHES 'SAVE WETLANDS CAMPAIGN' AS A "WHOLE OF SOCIETY" APPROACH FOR WETLANDS CONSERVATION

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

Shri Bhupender Yadav, Union Minister for Environment, Forest and Climate Change launched the 'Save Wetlands Campaign' in the presence of Chief Minister of Goa. This campaign is structured on a "whole of society" approach for wetlands conservation, enabling affirmative actions for wetlands conservation at all levels of the society and involving all strata of the society. This campaign over next one year will include sensitizing people of the value of wetlands, increasing the coverage of wetland mitras and building citizen partnerships for wetlands conservation.



Two publications were also released during the occasion, 'India's 75 Amrit Dharohar- India's Ramsar Sites Factbook' and 'Managing Climate Risks in Wetlands - A Practitioner's Guide'. The factbook is a one-stop resource of information on our 75 Ramsar Sites, including their values, threats they face and management arrangements. The practitioner's Guide on Climate Risk Assessment provides step-wise guidance on assessing the site-level climate risks and integration of adaptation and mitigation responses into the wetland management plan.





Shri Yadav interacted with wetlands managers of states and heard their experiences about achievements and challenges. In his address, the Union Minister highlighted the critical role played by the wetland ecosystem in securing the ecological, economic and climate security. He also mentioned about various green initiatives taken by the Government in the budget 2023 under the leadership of Prime Minister, Shri Narendra Modi including Amrit Dharohar, MISHTI, PM PRANAM, Green credit and Green Growth aligned with Mission LiFE. Shri Yadav also highlighted the achievements of the country in last about 9 years under the leadership of Prime Minister, Shri Narendra Modi during which country has not only developed economically but also with ecological balance. The Minister also emphasised on the importance of strengthening communication, education, awareness and participation for the conservation of the wetlands.

Shri Yadav also said that Prime Minister Shri Narendra Modi in his Mann ki Baat of January 29, 2023 highlighted the invaluable role played by local communities in conservation of Ramsar Sites.

The national celebrations of World Wetlands Day which concluded today saw the Union Minister of Environment, Forest and Climate Change, Shri Bhupender Yadav, Chief Minister of Goa, dignitaries from Ministry of Environment Forest and Climate Change and Government of Goa visit Nanda Lake, Goa's first Ramsar Site to oversee the conservation and management efforts. On this occasion the Union Environment Minister unfurled the National Flag and unveiled the signboard of Nanda Lake.





Chief Minister of Goa, Dr. Pramod Savant congratulated Government of India for the achievement of 75 Ramsar Sites in 75th year of independence and realising the dream of the Prime Minister. He also thanked Government of India for supporting the State in designation of Nanda Lake as a Ramsar site and he also thanked for giving Goa the opportunity to organise the event. He assured that Goa will continue to work towards achieving the goal of sustainable development.

In line with emphasis on participatory management of wetlands by Prime Minister Shri Narendra Modi and the mission and vision of Sahbhagita Mission, based on advisory issued by Ministry, State Governments and UT administrations celebrated World Wetlands Day enthusiastically at all 75 Ramsar sites this year with over 200 events with hoisting of flag at the Ramsar Sites and organising over 50 activities with student engagement in which drawing competition, quiz

competition, exposure activities, and bird watching were organized. The wetland pledge was administered during these events.

The site level celebrations was followed by a Regional Consultative Workshop for Restoration and Integrated Management of Wetlands held at Goa on February 3, 2023 which saw participation of 48 representatives from 7 states namely Gujarat, Haryana, Punjab, Goa, Maharashtra, Rajasthan and Uttar Pradesh. This workshop, organised under Mission Sahbhagita, is a platform for sharing wetland management experiences, success stories, best practices as well challenges. Three roundtable discussions on mainstreaming LiFE Mission in wetland management, restoration and integrated management of wetlands, and youth engagement and outreach, were included in deliberations.

### **About World Wetlands Day**

World Wetlands Day is observed on 2nd February every year worldwide to commemorate the signing of the Ramsar Convention on Wetlands of International Importance in 1971. India is a party to the Convention since 1982 and has so far declared 75 wetlands as Ramsar sites covering 23 states and Union Territories.

The 2023 theme for World Wetlands Day is 'Wetland Restoration' which highlights the urgent need to prioritize wetland restoration. It is a call on an entire generation to take proactive action for wetlands, by investing financial, human and political capital to save the wetlands from disappearing and to revive and restore those that have been degraded.

India has the largest network of Ramsar Sites in Asia, making these sites a critical ecological network for the conservation of global biological diversity and supporting human well-being. The Ministry of Environment, Forest and Climate Change (MoEFCC) launched Mission Sahbhagita in 2022 with a mission of 'a healthy and effectively managed network of 75 wetlands of national and international significance which support water and food security; buffer from floods, droughts, cyclones and other extreme events; employment generation; conservation of species of local, national and international significance; climate change mitigation and adaptation actions; and recognition, conservation and celebration of cultural heritage.'

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### **MJPS/SSV**

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# INDIA STANDS COMMITTED TO REDUCING EMISSIONS INTENSITY OF GDP BY 45% BY 2030 AND REACH TO NET-ZERO BY 2070, WHILE DEVELOPING SUSTAINABLY: SHRI BHUPENDER YADAV

Relevant for: Environment | Topic: null

Union Minister of Environment, Forest and Climate Change, Shri Bhupender Yadav today addressed the Ministerial Session on 'Adapting to an Uncertain Future: Reshaping of Global Partnerships' at India Energy Week in Bengaluru. Her Excellency Magna Mudyiwa, Deputy Minister of Energy and Power Development, Zimbabwe was also present.



Speaking on this occasion Shri Bhupender Yadav said that under the able leadership of Prime Minister Shri Narendra Modi, India has emerged as one of the global forerunners with the ability to show concrete and collective resolve to ensure harmony and energy security in the world at a time when global energy supply chains are in troublesome state, a crisis of essentials is present all over the world. He also said that to reshape the global partnership, India has adopted a “whole-of-society” approach with governments engaging at national, sub-national and local

governments levels, including the private sector, civil society organizations, local communities, and people in vulnerable situations.

Addressed the Ministerial Session on Adapting to an Uncertain Future: Reshaping of Global Partnerships at [#IndiaEnergyWeek](#) in Bengaluru.

Under PM Shri [@narendramodi](#) ji, India has emerged as a global forerunner, showing resolve to ensure harmony and energy security in the world. [pic.twitter.com/K4ow2NQVCF](https://pic.twitter.com/K4ow2NQVCF)

Shri Yadav said that today, India is one of the fastest growing emerging market economies with a young population and burgeoning innovation and business ecosystem. With Nominal GDP for 2023/24, estimated to grow 10.5% year-on-year to 301.75 trillion rupees (USD 3.69 trillion) in 2023/24, India strives to become a USD 5 trillion economy by 2025.

Noting that India is at the centre of the energy transition, combining economic and energy demand growth with rapid decarbonisation, Shri Yadav said that India stands committed to reduce emissions intensity of our GDP by 45% by 2030 and subsequently reach to net-zero by 2070. In this context he also said that India's commitment to the sustainable and carbon neutral future is being guided by its enhanced National Determined Contribution (NDC) and Long-Term Low Carbon Development Strategy which call for clean and efficient energy systems, disaster resilient infrastructure, and planned eco-restoration. India's net zero goal entails a five-decade long journey and India's strategy must therefore be evolutionary and flexible, accommodating new developments in technology, the global economy and international cooperation, he said.



Shri Yadav also said that India's long-term low-carbon development strategy to reach net-zero by 2070 notes, inter-alia, that alongside the imperative of development, and need to ensure the country's energy security, based both on the expansion of non-fossil fuel sources for power generation and rational utilization of fossil fuel resources. India's long-term low-carbon development strategy therefore rests on seven key transitions to low-carbon development pathways. In the context of energy security, the Strategy calls for low-carbon development of electricity systems consistent with development; development of an integrated, efficient and

inclusive transport system; promotion of energy and material efficiency in buildings, and sustainable urbanization; and economy-wide decoupling of growth from emissions and development of an efficient, innovative low-emission industrial system.



The Union Environment Minister highlighted that in the Union Budget 2023-24 greening the economy is one of top seven priorities (Saptarishi). He said that India has launched, and is nurturing many programs for green fuel, green energy, green mobility, green buildings, and green equipment, and policies for efficient use of energy across various economic sectors. Ethanol blending with petrol, the National Green Hydrogen mission, promotion of electric vehicles and tremendous push on the renewable energy front are some of the significant initiatives that India is pursuing towards a clean and green energy future. These initiatives are playing important role in India's Energy transitions and to provide for large-scale green job opportunities, he said.

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Highlighting the primary characteristics of Union Budget 2023-24, Shri Yadav said that, it reflects the Government's nonstop commitment towards India's Energy Transition. Some of the important initiatives of the Union Budget are:

The Union Environment Minister said that these initiatives must also be viewed as the opportunities to enhance India's collaboration with various stakeholders to reshape global partnership in the energy sector and to better adapt to uncertain future.

In his concluding remarks, Shri Yadav quoted Prime Minister Shri Narendra Modi, who in his address at the G-20 Summit in Bali, Session I: Food and Energy Security, said,

*"India's energy-security is also important for global growth, as it is the world's fastest growing economy. We must not promote any restrictions on the supply of energy and stability in the energy market should be ensured. India is committed to clean energy and environment. By 2030, half of our electricity will be generated from renewable sources. Time-bound and affordable finance and sustainable supply of technology to developing countries is essential for inclusive energy transition."*

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# AS WE FIGHT TO PROTECT SPECIES ON THE BRINK OF EXTINCTION, LET'S NOT FORGET THE FAMILIAR ONES

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

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February 09, 2023 05:55 pm | Updated 05:55 pm IST

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The last surviving male northern white rhino named 'Sudan' grazes at the Ol Pejeta Conservancy in Laikipia national park, Kenya June 14, 2015. (File Photo) | Photo Credit: Reuters

Nothing commands attention like rarity. In the natural world, rarity is most starkly represented by the last members of a declining species. These scarce plants and animals are infinitely valuable; they represent the final hope for averting extinction.

Some of these lone individuals — [Sudan, the last male northern white rhinoceros](#); [Martha, the last passenger pigeon](#) and [George, the last Hawaiian tree snail of his kind](#) — may even be remembered by name. Extinction is most poignant when it's personal.

The efforts toward conserving rare species have made an immense difference. In the past few decades, declines of many endangered plants and animals have been reversed. Dozens of unique living forms have been [saved from extinction](#). But a preoccupation with scarcity could come at the expense of overlooking the ordinary.

Commonness is often associated with the bland and mundane, even worthless. It invites complacency. As [observed by writer Aldous Huxley](#), "Most human beings have an absolute and infinite capacity for taking things for granted." But if we are to conserve nature — and its myriad benefits to people — we must maintain our focus on the familiar.

In the 19th century, some of the most distinguished minds in biology, Jean Baptiste de Lamarck and Thomas Huxley, deemed [extinction at sea impossible](#), given the reproductive capacity of marine organisms and the impracticality of overfishing.

In my home province of Ontario, early settlers assumed fish and wildlife were [inexhaustible](#). In the early 20th century, the U.S. Bureau of Soils confidently declared that "soil is the one indestructible, immutable asset that the nation possesses. It is the one resource that [cannot be exhausted](#)."

Such notions of limitless nature carry great risk. The lessons have been hard; the upheaval has

been ecological and economic. In North America, they include the extinction of the passenger pigeon, which was once the [most numerous bird in the world](#); the decimation of northern cod, which at one time was so thick in numbers that they [slowed the passage of ships](#); the [destruction of plains bison](#), the rapid demise of American chestnut and the decline of [eastern white pine](#).

These species were once regarded as super-abundant, their decline and disappearance [inconceivable](#).

Abundance provides only a [partial buffer against extinction](#). Common species, even those in seemingly limitless numbers, are not immune to decimation. Increasingly, conservation is turning its sights in this direction — to safeguard what is common, not just what is rare.

There are good reasons to consider the common. Abundant species can serve as the proverbial canaries in a coal mine. A [study of North American birds](#) uncovered that we have lost three billion birds on this continent within the past two generations.

These declines include species once deemed widespread and secure, like the common redpoll, whose numbers are down by 29 million, the common grackle, down by 83 million and the common nighthawk, down by 26 million. The staggering losses are a reminder that the mark of a species in trouble is not rarity, but [rate of decline](#).

Notably, the shifts in abundance of common species can translate into sizeable shifts in [ecosystem functioning](#). Birds, despite their diminutive stature, throw their aggregate weight around, owing to the innumerable insects they eat, the flowers they pollinate and the seeds they disperse.

One [caribou herd](#), numbering in the hundreds of thousands, removes millions of kilograms of forage every year and returns nutrients to the soil in the form of millions of kilograms of fecal pellets.

The value of common species is not just ecological and economic, but psychological. Study after study demonstrates that encounters with the natural world [improve our mental state](#). Losing familiar species — whether birds in our backyard or butterflies on our doorstep — is likely to shrink such opportunities for engagement.

By their sheer numbers, common species can be a force of nature. Well before the finality of extinction, however, such ecological roles can be diminished.

Rarity will always occupy a prominent place in conservation. But in our quest for a sustainable and biodiverse future, we must avoid "[the extinction of commonness](#)." The ingredients for success are at hand: Monitor nature closely, guard against complacency and invest for the long term.

Protecting common creatures is likely to bring immense benefits — to our environment, our economy and our psyche.

[James Schaefer](#), Professor of Biology, [Trent University](#)

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# NORWAY STUDY HIGHLIGHTS WHALE EXCREMENT'S ROLE IN ECOSYSTEM

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

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February 10, 2023 02:16 pm | Updated 02:16 pm IST

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Minke whale excrement is "worth its weight in gold" as it plays an important role in fertilising phytoplankton and thereby reducing the cetacean's carbon footprint, according to a Norwegian study. | Photo Credit: AP

Minke whale excrement is "worth its weight in gold" as it plays an important role in fertilising phytoplankton and thereby reducing the cetacean's carbon footprint, according to a Norwegian study.

For the first time, researchers from the Norwegian Institute for Marine Research have studied the concentration of nutrients in whale excrement before it is dissolved in seawater.

"It can sound disgusting, but for the ecosystem it's worth its weight in gold," researchers said in a statement Thursday.

"The idea is simply that the faeces fertilize the sea in the same way that cows and sheep do on land," they continued.

The researchers analysed the excrement of minke whales harpooned by whalers -- as Norway is one of few countries allowing the commercial hunting of these cetaceans.

The some 15,000 whales that migrate each summer to the Norwegian archipelago of Svalbard in the Arctic release some 600 tonnes of excrement on the surface of the water each day, at a rate of about 40 kilograms (88 pounds) per animal.

According to the study, the daily excrement releases about 10 tonnes of phosphorus and 7 tonnes of nitrogen into the oceans, nutrients that are essential for the growth of phytoplankton -- microscopic algae that absorb carbon dioxide through photosynthesis and convert it into oxygen.

The scientists concluded that the minke whale excrement contributed to between 0.2 and 4% of daily phytoplankton production in the Arctic Svalbard region.

"The real contribution of whales is probably higher because these estimates do not include urine, which is very rich in nitrogen," research leader Kjell Gundersen told AFP.

Each minke whale -- an animal weighing 40-50 tonnes as an adult that feeds by filtering large quantities of water -- releases "several hundred litres of urine" per day.

"If there are fewer whales, there is a risk that there will be less fertilisation of the ocean," Gundersen said.

"More phytoplankton production also means more CO<sub>2</sub> is absorbed," he added.

"This is positive for the climate," he noted, "but we don't know the net balance of whales in terms of greenhouse gases" because cetaceans also emit methane when they breathe.

This question, which is still largely unexplored, will be the subject of a European study that will start in June and last four years.

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# GOOGLE BARD

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

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February 12, 2023 12:47 am | Updated 12:47 am IST

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In the fall of 2021, Blake Lemoine, a senior software engineer at Google, was assigned to help the company on a particular AI ethics effort. While working on it, he stumbled upon a tangentially related but separate AI issue. He flagged it to his manager and suggested him to escalate it to the leadership. But his claim was dismissed citing limited evidence.

Mr. Lemoine, turned to Margaret Mitchell, a former co-lead of Ethical AI at Google, for help. With Ms. Mitchell's support, he gathered evidence and presented it to the leadership. After that, things got rocky for him. In a June 7, 2022 blog titled, 'May be Fired Soon for Doing AI Ethics Work', he noted that Google had placed him on "administrative paid leave" in connection with the AI concerns he raised. Two weeks later, the search giant fired Mr. Lemoine for violating the company's data security policies.

The concerns that had cost Mr. Lemoine his job were centred around the Language Model for Dialogue Applications (LaMDA). Based on his interaction with LaMDA, he claimed the large language model (LLM) to be sentient. Mr. Lemoine was not the only Google AI researcher who raised questions about LaMDA. Other engineers who raised concerns about different aspects of Google AI also lost their jobs. And Google went ahead building its BARD AI service on this language model.

LaMDA, like BERT and GPT-3, is an LLM built on Transformer, a neural network architecture developed by Google and open-sourced in 2017. But Google's LaMDA was different from the rest of the LLMs available at that time. It was trained on dialogues as input. That made it notice nuances and distinguish open-ended conversations from other forms of language.

Google's Bard, launched to compete against OpenAI's ChatGPT, is anything but poetic. In the launch blog, CEO Sundar Pichai did not describe the bot for its poetic or programme-writing skills. Instead, Mr. Pichai claimed Bard to be an outlet for creativity, and a launchpad for curiosity, "helping you to explain new discoveries from NASA's James Webb Space Telescope (JWST) to a 9-year-old." To show what Bard can do, he attached a GIF video in the same blog that had three suggested answers to the JWST question.

But the GIF video had an inaccurate information. In one of its responses, Bard suggested that JWST was used to take the very first pictures of an exoplanet. However, those were taken by the European Southern Observatory's Very Large Telescope (VLT) in 2004. NASA has confirmed this information.

This gaffe was reported by Reuters just before Google started to live-stream its presentation from Paris on Wednesday. To make things worse, Prabhakar Raghavan, a senior vice president at Google, in-charge for Search, made an underwhelming presentation on what Bard can offer its users. He largely restated what was already known about the conversational AI service. His presentation also lacked any ground-breaking update that could intensify the competition between Bard and Microsoft-backed ChatGPT.

The incorrect answer on the promotional GIF and the underwhelming presentation in Paris had cost Google's parent dearly. Alphabet Inc.'s stock tumbled nearly 7% on Wednesday, wiping out \$100 billion from its market value, while Microsoft's shares rose 3% on the same day. And just a day earlier, the Windows software maker announced it had released a version of Bing search with ChatGPT functionality.

At the heart of Bard's unpoetic rendition is the LaMDA. Google's own Ethical AI researchers have raised questions about it. But a part of that large language model carved out to provide a specific service has failed to enthuse investors and users. The answer to what is Bard's true capability is somewhere between these two vantage points. And until Google makes the LLM publicly accessible, LaMDA and its carve-out Bard will remain an enigma.

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# DID YOU KNOW THE BLACK-TAILED GODWIT IS AT RISK?

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

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February 11, 2023 10:20 pm | Updated 10:20 pm IST

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Black-tailed godwits foraging for food at the Perumbakkam wetland, which is part of the Pallikaranai Marsh, on February 10, 2021 | Photo Credit: PRINCE FREDERICK

Peck down to the soul of any cliché and you would be probing into the soft tissue of an universal truth. Having sufficiently prepared the reader for this overworked saying, one can safely spout it: A thing is better-appreciated after it is well and truly gone.

One would like to wear rose-coloured glasses and peer into a future in which this hackneyed line is not mouthed for the black-tailed godwit (*limosa limosa*), bemoaning its loss.

The numbers of this species have dwindled on account of stressors in its breeding grounds.

As distant as 2006, BirdLife International sounded a note of warning, placing this species in the near-threatened category on the basis of a striking drop in its numbers over a 15-year period immediately preceding the time of study.

In the wetlands in and around Chennai, the black-tailed godwit is somewhat like Alfred Noyes' Highwayman, evocative of a persistence mirrored in the line — "I'll come to thee by moonlight, though hell should bar the way".

For example, during the winter migratory season, the species shows up in impressive numbers at the Perumbakkam wetland, which is actually a stage and a showcase for the birds, both migratory and resident, of the Pallikaranai marsh. According to information currently available about the black-tailed godwit, habitat loss in its breeding grounds is noticeable and so is the corresponding decline in its number. The afore-typed line may suggest the issue is far from our borders and we just have to sit twiddling our thumbs, a prayer on our lips, and hope for the best outcome. Any loss of feeding grounds can exacerbate a species' difficult situation back home where it breeds.

All cross-border groups formed for the protection of migratory species at risk emphasise this inter-connectedness. The black-tailed godwit is covered by the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).

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# FOUR-DAY GREAT BACKYARD BIRD COUNT INDIA STARTS ON FEBRUARY 17

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

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February 11, 2023 08:24 pm | Updated 09:47 pm IST - CHENNAI

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The observations flagged in the eBird website and app will be reviewed by over 150 volunteer editors. | Photo Credit: R. RAGU

The Indian edition of the Great Backyard Bird Count (GBBC) 2023, a four-day bird watching event, is scheduled to be held from February 17 to 20.

GBBC India is coordinated by the Bird Count India (BCI), a collective of groups and organisations interested in nature. The BCI has been associated with the GBBC for 10 years. Mittal Gala, project coordinator, BCI said the number of participants grew from 200 in 2013 to over 3,500 in 2022.

Nearly 3,782 birders uploaded over 40,000 checklists and recorded 1,017 species, as per BCI. "From February 17 to 20, participants can watch and count birds for a minimum of 15 minutes. They could participate in this activity on any one or all of the dates and upload their bird lists to the eBird website or app," Ms. Gala said.

The observations flagged in eBird are reviewed by over 150 volunteer editors. "The GBBC is designed to be a fun and educational experience that engages people of all ages in observing birds. The event helps introduce new people to the hobby and encourages them to explore the natural world," Ms. Gala added.

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## EXPLAINED

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

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February 14, 2023 11:22 pm | Updated February 15, 2023 08:07 am IST

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The Geological Survey of India has found lithium deposits in Salal village, Reasi district, February 12, 2023. | Photo Credit: PTI

**The story so far:** News of the discovery of “5.9 million tonnes inferred resources of lithium” in the Salal-Haimana area of Reasi district, Jammu & Kashmir, by the Geological Survey of India [has been received as a game-changer](#) in India’s impending transition to a green economy. The term ‘inferred’ refers to the ‘preliminary exploration stage’, the second of a four-step process, according to the Mines and Minerals (Development and Exploration) Act 1957.

Lithium-ion batteries are used in wind turbines, solar panels, and electric vehicles, all of which are crucial in a green economy.

A World Bank study suggests that the demand for critical metals such as lithium (Li) and cobalt is expected to rise by nearly 500% by 2050. While “the global electric vehicle market is projected to reach \$823.75 billion by 2030, registering a Compounded Annual Growth Rate (CAGR) of [18.2% from 2021 to 2030](#),” India’s market is projected to register a [CAGR of 23.76% by 2028](#). India is seeking to secure its critical mineral supplies and build self-sufficiency in this sector.

As India currently imports all of its Li from Australia and Argentina and 70% of its Li-ion cell requirement from China and Hong Kong, the lithium reserves in J&K could boost the domestic battery-manufacturing industry. If the perceived size of the mineral reserves in J&K is borne out by further exploration, India could jump ahead of China vis-à-vis its Li stockpile.

The J&K reserves will [also help advance](#) the Indian government’s ambitious plan of “30% EV penetration in private cars, 70% for commercial vehicles, and 80% for two and three-wheelers by 2030 for the automobile industry.” They will strengthen India’s National Mission on Transformative Mobility and Battery Storage as well.

Critical mineral dependencies constitute a [major geostrategic concern](#) in the transition to net-zero carbon energy systems. In the present scenario, as countries seek to avoid dependencies and vulnerabilities related to critical minerals, the latter are likely to be [at least as important](#) as oil and gas in the near future. A high level of dependence on China for Li and other crucial metals and their derivatives are also [perceived to be sources](#) of energy security risks.

China currently controls 77% of the global lithium-ion battery manufacturing capacity and is home to [six of the world’s 10](#) manufacturing companies. As a result, the E.U., the U.S., Canada,

India, and other major economies [have been trying to leverage](#) alternative supplies that can challenge China's geopolitical dominance in this area. For example, responding to perceived national security concerns, the Canadian government [has asked Chinese companies](#) to divest from Canadian lithium-mining companies.

The growing geopolitical rivalry with China makes India's security considerations more immediate as well, especially also in light of the longstanding, and recently escalating, territorial and border disputes. To reduce dependence on China, the Indian government and industry are pushing for a '[Rare Earths Mission](#)' to exploit the country's critical mineral reserves, which account for 6% of the world's rare-earths' reserves prior to the discovery of Li in J&K.

The new discovery has more geostrategic implications considering the geopolitical sensitivity of its wider location. Although Reasi is in the relatively more stable Jammu region, the Union territory of J&K (previously a state) has been the site of historical cross-border tensions between India and Pakistan, domestic insurgency, and terrorism. If the local populace isn't meaningfully engaged in the impending Li extraction project, the resulting tension could introduce new frontiers of socio-environmental conflict.

The applications of Li in renewable energy infrastructure often obscures its significant environmental consequences, which vary according to the source. Extracting Li from hard rock mines, similar to what has already been proposed in J&K, entails open-pit-mining followed by roasting the ore using fossil fuels. [Industry estimates suggest](#) that this process consumes 170 cubic metres of water and releases 15 tonnes of CO<sub>2</sub> for every tonne of Li extracted.

Open-pit-mining, refining, and waste disposal from these processes [substantially degrades](#) the environment, including depletes and contaminates waterways and groundwater, diminishes biodiversity, and releases considerable air pollution. This said, the geological context of mining in J&K differs from Australia, which has the largest Li stock in hard rock mines, in one major way.

GSI has said that 5.9 tonnes of lithium deposits have been "inferred" in Reasi district. | Photo Credit: Anna Usova/Getty Images/iStockphoto

In Australia, Li-bearing pegmatite deposits are found in the ancient geological regions of Pilbara and Yilgarn cratons, whose continental rocks have been stable for over a billion years. The Himalaya on the other hand is the youngest mountain range in the world and is much more unstable (as evidenced by the ongoing tragedy in Joshimath). Incidents of land sinking have [also been reported](#) from a village in Doda district in Chenab valley, which extends to some parts of Reasi.

In the densely populated context of India, the socio-environmental effects of mining are likely to be far worse than they have been in Australia and likely comparable to lithium extraction in South America.

As India embarks on this new journey, it could learn from the experiences of South American countries, especially the 'lithium triangle' of Bolivia, Chile, and Argentina, which contain roughly half the world's known Li. In Bolivia and Chile, Li extraction has been either in the hands of the state or requires mining companies to enter into a contract with state-owned companies.

In April 2022, [Mexican lawmakers introduced reforms](#) to create a state-owned entity to extract, process and sell Li and outlaw all direct private investment and production in the Li sector. Even so, Li mining has had adverse socio-environmental consequences in the region, testing its laws meant to protect Indigenous peoples.

In 2019, Chile's environmental regulators approved a \$25-million compliance plan for Li miner SQM, charged with overdrawing Li-rich brine from the Salar de Atacama salt flat. However, the company failed to satisfy authorities, who reversed their decision in 2020. In September 2021, the Atacama Indigenous Council appealed to regulators citing "constant danger" and [called for the "temporary suspension"](#) of SQM's environmental approvals.

In August 2022, Chilean regulators approved an [updated compliance plan](#) worth \$52 million, in which SQM proposed to work with both the regulator and local communities to address environmental infractions.

Indigenous resistance and increased awareness of the environmental impact of Li-mining [has prompted](#) global carmakers, including Mercedes-Benz and Volkswagen, to look for Li mined with the lowest socio-ecological impact. Other corporations are making similar amends. Battery Mineral Resources Corp. recently signed an agreement with the Comunidad Agrícola Potrerillos Alto and the Comunidad Agrícola Punitaqui. Another mining giant, Monumental Minerals, [signed an agreement](#) with the Ayquina-Turi Indigenous Community in Chile for 40 exploration concessions totaling 8,500 hectares at the Salar de Turi Li project.

While such comparisons must account for inter-regional differences, these developments point to the importance of a strong regulatory apparatus that can address both the environmental and the social consequences of Li mining.

State government officials in J&K [have said](#) plans for Li exploration will involve local communities, who will also be prioritised for jobs in exploration and mine development. Yet employment in mining may not fully offset the consequences on local agriculture, animal husbandry, and tourism.

In recognition of the local effects of mining, in 2015, Lok Sabha amended the Mines and Minerals (Development and Regulation) Act 1957 to establish the 'District Mineral Foundation' (DMF). The DMF is a non-profit statutory 'trust' for every Indian district affected by mining-related operations that should "work for the interest and benefit of persons, and areas affected by mining-related operations". In practice, the DMFs have become sites of centralised bureaucratic control, without meaningful public participation or accountability.

For example, a CAG audit in May 2022 noted that the district collectors of Bokaro, Dhanbad, and Ranchi incurred an [expense of 1568.04 crore](#) from DMF funds, without identifying the areas affected by mining or a list of affected people. Ironically, the auditors were denied access to documents related to the functioning of the State-Level Monitoring Committee.

The general failure of DMFs adds to concerns expressed by environmentalists and concerned citizens about the [recent history of weakening](#) of the environmental impact assessment framework.

The geostrategic importance of Li exploration and extraction makes it even more important that the exploration and extraction of resources should be done in the public interest, and must preempt any serious environmental and social problems. Equally importantly, the most effective use of Li reserves should be for the most important parts of the renewable-energy transition, which would also aid the goals of addressing energy poverty and sustainable development.

To these ends, reducing luxury consumption and promoting public transport should also be an important part of the agenda of a just transition.

**Prakash Kashwan** is an associate professor of Environmental Studies and affiliated faculty at

*the Heller School at Brandeis University, Waltham, USA, and the editor of Climate Justice in India (Cambridge University Press, 2022). **Dhanasree Jayaram**, PhD is an assistant professor, Department of Geopolitics and International Relations, and co-coordinator, Centre for Climate Studies, Manipal Academy of Higher Education, Karnataka.*

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# AUSTRALIA'S ENDANGERED WILDLIFE GETS LIFELINE FROM INVENTION THAT HOLLOWES TREES

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

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February 14, 2023 12:29 pm | Updated 12:29 pm IST

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Conservation Biologist Matt Stephens stands holding the Hollow Hog, a tool he invented that aims to save hollow-dependant wildlife by creating tree hollows, at his Sun Valley property in the Blue Mountains region, New South Wales, Australia February 6, 2023. | Photo Credit: Reuters

In the forested Sun Valley an hour west of the centre of Sydney, conservation biologist Matt Stephens looks into a tree hollow carved using the Hollowhog, a tool he invented to create new homes for Australia's endangered wildlife.

Australia's fauna is grappling with the loss of habitat created by logging and bushfires, including hundreds of threatened animal species that live in the hollows of trees.

While nest boxes can provide a temporary solution, a hole carved by the tungsten blade of a Hollowhog can create a hollow in less than an hour that can last for hundreds of years, growing in size with the tree.

"I can see the hollow going in and know that long after I'm gone, maybe three hundred years into the future that the hollow that we carved...it will still be there," Stephens said.

"I just think it's a really exciting thing."

To date, thousands of hollows carved by Hollowhog tools have been installed around Australia, with the technology in use by state and federal government agencies, as well as land care groups.

According to Stephens, a natural hollow takes a minimum of 70 to 120 years to start forming.

The Wilderness Society, a conservation group, estimates that in Australia, 303 native wildlife species rely on hollows to nest and shelter, including 31% of native mammals and 15% of native birds.

Though a camera installed at one of the hollows, Stephens has seen various animals use it, including parrots like Rainbow Lorikeets and Rosellas, marsupials like Antechinus or gliders and even a Lace Monitor lizard taking a peek inside.

Eamon Dempsey, an arborist, or person who cultivates and manages trees, has carved more than a thousand hollows using the tool.

"It really filled me with hope that my career doesn't have to be all about cutting trees down and that there is actually potential have a more positive environmental impact." he said.

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# PELICANS NEST ON PALM TREES AT KOONTHANKULAM BIRD SANCTUARY IN TIRUNELVELI

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

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February 15, 2023 04:18 pm | Updated 05:56 pm IST

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Pelicans have occupied 17 palm trees in Koonthankulam | Photo Credit: Sasikumar Samikan

The pelicans have arrived at Koonthankulam. They usually find a cosy spot on shrubs near the lake to build their nests for the breeding season. But this time, they have chosen to nest atop palm trees in the region. "This is the first time they are doing so in my 55 years of observing and documenting birds in Tirunelveli," says 68-year-old S Balpandi, a resident bird expert. Balpandi is from Koonthankulam, that was declared a bird sanctuary in 1994, and spends most of his days at the wetlands of Tirunelveli.

"Spot-billed pelicans arrived late last year expecting the lake to fill up with rains in December," points out Balpandi. "But we have not had good rains in our region and hence our wetlands are not full." As a result, the pelicans flew away, and stopped one kilometre from the nearby Arumaneri wetland to nest on tall palm trees.

Each tree has three to four nests that the birds have fashioned out of twigs on spread out tender palm leaves | Photo Credit: Sasikumar Samikan

"Pelicans usually live in groups and have occupied 17 palm trees," Balpandi says, adding: "Each tree has three to four nests that the birds have fashioned out of twigs on spread-out, tender palm leaves." The nests have around three eggs each. This adds up to 10 to 15 birds on each tree, making them quite crowded.

"People from our village petitioned the District Collector to help, and with support from the District Forest Officer, water was released into Koonthankulam for two days from the Manimuthar dam in the district," Balpandi explains. This eased the situation a little, and Balpandi reports cormorants, darters, black-headed and glossy ibises nesting at Koonthankulam. "It will do our birds good if more water is released," he adds.

But the pelicans continue to nest on palm trees. Armed with his notebook and field glasses, Balpandi travels to see them almost every other day on his two-wheeler.

According to S Balachandran, who is in charge of Bombay Natural History Society's Bird Migration Study Centre at Point Calimere, this behaviour is being observed for the first time in Tamil Nadu. "However, pelicans are adaptable, and can even nest on man-made stands," he

adds.

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# WARM WATER MELTS WEAK SPOTS ON ANTARCTICA'S 'DOOMSDAY GLACIER'

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

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February 17, 2023 01:26 pm | Updated 01:26 pm IST

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This undated handout photo provided by NASA shows the Thwaites Glacier in West Antarctic. Two new studies indicate that part of the huge West Antarctic ice sheet is starting a slow collapse in an unstoppable way. Alarmed scientists say that means even more sea level rise than they figured. | Photo Credit: AP

Scientists studying Antarctica's vast Thwaites Glacier - nicknamed the Doomsday Glacier - say warm water is seeping into its weak spots, worsening melting caused by rising temperatures, two papers published in *Nature* journal showed on Wednesday.

Thwaites, which is roughly the size of Florida, represents more than half a meter (1.6 feet) of global sea level rise potential, and could destabilise neighbouring glaciers that have the potential to cause a further three-meter (9.8-foot) rise.

As part of the International Thwaites Glacier collaboration - the biggest field campaign ever attempted in Antarctica - a team of 13 U.S. and British scientists spent about six weeks on the glacier in late 2019 and early 2020.

Using an underwater robot vehicle known as Icefin, mooring data and sensors, they monitored the glacier's grounding line, where ice slides off the glacier and meets the ocean for the first time.

In [one of the papers](#), led by Cornell University-based scientist Britney Schmidt, researchers found that warmer water was making its way into crevasses and other openings known as terraces, causing sideways melt of 30 meters (98 feet) or more per year.

"Warm water is getting into the weakest parts of the glacier and making it worse," Schmidt told Reuters.

"That is the kind of thing we should all be very concerned about," she said about the findings which underscored how climate change is reaching isolated Antarctica.

The [other paper's findings](#), which Schmidt also worked on, showed about five meters (16 feet) per year of melt near the glacier's grounding line - less than what the most aggressive thinning models previously predicted.

But she said the melting was still of grave concern.

"If we observe less melting... that doesn't change the fact that it's retreating," Schmidt said.

Scientists have previously depended on satellite images to show the behaviour of the ice, making it difficult to get granular details. The papers represent the first time a team has been to the grounding line of a major glacier, providing a look right where "the action begins," Schmidt said.

The findings will help in the development of climate change models, said Paul Cutler, program director of Antarctic Sciences at the National Science Foundation. He reviewed the papers, but was not involved in the research.

"These things can now be taken on board in the models that will predict the future behaviour, and that was exactly the goal of this work," he said.

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# OVER 1,000 PANGOLINS POACHED AND TRAFFICKED IN INDIA BETWEEN 2018 AND 2022

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

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February 17, 2023 11:56 pm | Updated February 18, 2023 02:31 am IST - Kolkata

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Indian Pangolin (*Manis crassicaudata*) at Kanha Tiger Reserve, Madhya Pradesh, India. | Photo Credit: Dr. Sanjay K. Shukla

## Kolkata

On the eve of World Pangolin Day observed on February 18, a not-for-profit organisation working on the international trade of animals and plants, has brought out a fact sheet reporting that 1,203 pangolins have been found in illegal wildlife trade in India from 2018 to 2022.

Up to 24 States and one Union Territory saw seizures of pangolins and their derivatives.

Odisha reported the maximum number of incidents, with 154 pangolins in 74 seizures. It was followed by Maharashtra with 135 pangolins in 47 seizure incidents. The publication, titled 'India's Pangolins Buried in Illegal Wildlife Trade', has tracked 342 total incidents during this time period. Eight incidents of online trading were also recorded.

Merwyn Fernandes, coordinator of TRAFFIC's India office, said in the organisation's fact sheet that up to 50% of seizures included live pangolins and 40% involved pangolin scales. "India reports a significant number of pangolin trafficking incidents reflected by seizures across the country. They are poached mainly for international markets in China and southeast Asia for their scales, which are used as an ingredient in traditional medicines. Pangolin meat is also considered a delicacy and consumed for its alleged medicinal properties," he was quoted as saying.

Pangolins are among the most trafficked wild mammals globally. India is home to two species: the Indian Pangolin, found across the subcontinent; and the Chinese Pangolin, found across a larger area in south Asia. Bihar, West Bengal, and Assam see the presence of both. Both species are included under India's Schedule I of the Wildlife Protection Act that could result in a jail term for those hunting animals listed here. They are also in Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), meaning they are most endangered. The Indian Pangolin has been classified as 'Endangered' and the Chinese Pangolin as 'Critically Endangered' by the International Union for Conservation of Nature's Red List of Threatened Species.

There is limited information of population status and distribution of the scaly anteater, as it is called. What is known is that it acts as both predator and prey, feeding on insects and also preyed upon by other animals. Other than regulating the population of insects, the pangolin is an 'ecosystem engineer' that builds burrows that help circulate soil organic matter, increase soil moisture and aeration, and affect plant community succession.

"There is an imperative need to focus on pangolins, strengthen their protection and conservation for their future survival," Ravi Singh, secretary general and CEO, WWF-India, said in a statement. The organisation released the report in partnership with TRAFFIC.

An earlier analysis of illegal pangolin trade in India by TRAFFIC in 2018 reported poaching of nearly 6,000 pangolins between 2009 and 2017.

The publication calls for "cooperation and collaboration" for protection and conservation of the species, through DNA-based technologies and information sharing, for better coordination and commitment.

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# RHODODENDRONS CARPET DARJEELING, SIKKIM HIMALAYAS

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

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February 19, 2023 03:26 am | Updated 03:26 am IST - Kolkata

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Rhododendrons found in Sikkim and Darjeeling. Photo: Special Arrangement

Darjeeling and Sikkim Himalayas are home to more than one-third of all types of rhododendrons found in India, reveals the latest publication of the Botanical Survey of India (BSI). The publication titled '*Rhododendrons of Sikkim and Darjeeling Himalaya- An Illustrated Account*' lists 45 taxa of rhododendrons (36 species, 1 subspecies, 1 variety, and 7 natural hybrids).

There are 132 taxa (80 species, 25 subspecies and 27 varieties) of rhododendrons found in India. Of the 45 taxa recorded in the publication, 24 are found in the Darjeeling Himalayas and 44 in the Sikkim Himalayas.

The Botanical Survey of India in 2017 published *Rhododendron of North East India: A Pictorial Handbook*, suggesting that there are 132 taxa (80 species, 25 subspecies and 27 varieties). Photo: Special Arrangement

"Darjeeling and Sikkim Himalayas comprise only 0.3% of India's geographical area but the region is home to one-third (34%) of all Rhododendron types. This highlights the ecological significance of the region as far as an indicator species like Rhododendron is concerned," Rajib Gogoi, scientist and Regional Head of BSI in Sikkim and the lead author of the publication, told *The Hindu*.

Of the 45 taxa documented by BSI, five are facing a high threat due to anthropological pressures and climate change, according to scientists. The *Rhododendron edgeworthii*, with white campanulate flowers, recorded a huge habitat decline in both Darjeeling and Sikkim. *Rhododendron niveum*, with big purple flowers, found in Lachung area of north Sikkim is facing threats due to rampant constructions. *Rhododendron baileyi*, *Rhododendron lindleyi* and *Rhododendron maddenii* are also threatened.

Rhododendron, meaning rose tree in Greek, is considered an indicator species for climate change. The BSI in 2017 published *Rhododendron of North East India: A Pictorial Handbook*, suggesting that there are 132 taxa (80 species, 25 subspecies and 27 varieties). According to A. A. Mao, Director of BSI and fellow author of the publication, the flowering season for rhododendrons starts in March and continues till May. However, recently, flowering was found to begin as early as in January for some species. "This is an indication that those

areas are getting warmer and the phenology of rhododendrons can be an important indicator of climate change,” he added.

The first Rhododendron species from northeast India — *Rhododendron dalhousiae* — was reported from Sikkim by Joseph D. Hooker in 1848 in his book *The Rhododendrons of Sikkim Himalaya*. Photo: Special Arrangement

It also has a prominent place in the country’s botanical history. Rhododendrons were first recorded by Captain Hardwick in Jammu and Kashmir in 1776 where he spotted the *Rhododendron arboreum*. However, it was a visit by the British botanist Joseph D. Hooker to Sikkim between 1848 and 1850 that revealed the rhododendron wealth of the Sikkim and Darjeeling Himalayas.

“Joseph D. Hooker during his expedition to Darjeeling and Sikkim discovered 22 species of Rhododendrons. During that period paintings of Rhododendrons were commissioned to identify these species. Where these publications came before the western world, not only were botanists amazed by the beauty and variety of these flowering plants but the phenomenon led to a boost in botanical exploration in the country,” Mr. Gogoi said.

Mr. Mao added that the first species of Rhododendron from northeast India — *Rhododendron dalhousiae* — was reported from Sikkim by Hooker in 1848 in his book *The Rhododendrons of Sikkim Himalaya*. This publication almost 160 years ago made these flowers very popular in the western world and resulted in horticulture boom in Europe.

Of the 45 taxa of Rhododendrons documented by Botanical Survey of India, five are facing a high threat due to anthropological pressures and climate change, according to scientists. Photo: Special Arrangement

“The publication has a number of historical references to the contribution of British botanists Joseph D. Hooker and David G. Long as well Indian botanists and researchers S.T. Lachungpa, U.C. Pradhan and K.C. Pradhan among others. These people played a crucial role in discovery and identification of Rhododendrons in Sikkim and Darjeeling Himalayas,” he said.

Mr. Mao pointed out that the publication has a number of pictorial references of rhododendron habitats through the years. The other authors of the publication include scientists and researchers Norbu Sherpa, Samuel Rai and Subrata Gupta.

British botanists Joseph D. Hooker and David G. Long as well Indian botanists and researchers S.T. Lachungpa, U.C. Pradhan and K.C. Pradhan played a crucial role in discovery and identification of Rhododendrons in Sikkim and Darjeeling Himalayas. Photo: Special Arrangement

The authors are working on a book on rhododendron, with which they hope to reach not just researchers but the common man too, in an attempt to promote eco-tourism from a conservative perspective.

The publication lists seven natural hybrids in the region and the authors said their presence is a reminder that Sikkim Himalayan region is a living laboratory of evolution and speciation as far as rhododendrons are concerned.

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# UNDERWATER NOISE EMISSIONS BY SHIPS POSE THREAT TO MARINE SPECIES, SAYS STUDY

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

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February 19, 2023 12:02 am | Updated 12:02 am IST - VISAKHAPATNAM

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Photo: [fisheries.noaa.gov](http://fisheries.noaa.gov)

The rising man-made (anthropogenic) underwater noise emissions (UNE) from ships in the Indian waters are posing a threat to the life of marine mammals like Bottlenose Dolphin, Manatees, Pilot Whale, Seal and Sperm Whale.

The main form of energy for multiple behavioural activities of marine mammals, which include mating, communal interaction, feeding, cluster cohesion and foraging, is based on sound.

However, the sound that radiates from ships on a long-term basis affects them and results in internal injuries, loss of hearing ability, change in behavioural responses, masking, and stress. There are Acute and Chronic noise categories in the emissions.

The UNE or underwater sound pressure levels in the Indian waters are 102-115 decibels, relative to one microPascal (dB re 1 $\mu$  Pa). The East Coast level is slightly higher than that of the West. There is an increase by a significant value of about 20 dB re 1 $\mu$ Pa.

Continuous shipping movement is identified to be a major contributor to the increase in the global ocean noise level, according to a new study titled "Measuring Underwater Noise Levels Radiated by Ships in Indian Waters" at the Visakhapatnam Port (for the East) and Goa's Mormugao port (for the West) by Andhra University's marine engineering research scholar G.V.V. Pavan Kumar under the guidance of Prof. V.V.S. Prasad.

"The frequencies of ships' underwater self-noise and machinery vibration levels are overlapping the marine species' communication frequencies in the low frequency range of less than 500 Hz. This is called masking, which could have led to a change in the migration route of the marine species to the shallow regions and also making it difficult for them to go back to the deeper water," Mr. Pavan Kumar tells *The Hindu*.

The measurement of the ambient noise levels was carried out by deploying a hydrophone autonomous system around 30 nautical miles from the Goa coastline. The depth of deployment of the sensor was 11 metres in a water depth of 22 metres. The single-channel hydrophone was deployed at different locations with in-water depth of 18 metres with a deployment depth of 3 and 5 metres off Visakhapatnam port.

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# AUSTRALIAN HUMPBACK WHALES ARE SINGING LESS AND FIGHTING MORE

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February 18, 2023 05:30 pm | Updated 05:39 pm IST

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As eastern Australian humpback whale populations have recovered over the years, males are singing less and fighting more as the whale population balloons. | Photo Credit: AP

As eastern Australian humpback whale populations have recovered over the years, males have adapted their mating strategy in a highly strategic way, new research finds.

I analysed 123 days' worth of data on Australian humpbacks (*Megaptera novaeangliae*), collected from 1997 to 2015, and found male humpbacks sang less and fought more as the whale population ballooned.

We think this shift in behaviour is a result of not wanting to attract other males to a potential mate, as we explain in [research published](#) today in Communications Biology.

Humpbacks have recovered magnificently since 1965, when the species became [globally protected](#).

One population off Australia's east coast grew from less than 500 in the 1960s and is estimated to contain at least 30,000 today. This population has provided experts a rich dataset. The males in particular are great subjects thanks to their striking song broadcasts.

Carrying on work started by University of Queensland Professor [Michael Noad](#) in the '90s, we set out to investigate exactly how the eastern humpbacks have adapted to the growth numbers.

Luckily for us these whales migrate close to the coastline, so we were able to establish a land-based observation station at Peregrine Beach, a small coastal town on the Sunshine Coast.

Volunteers onshore helped us track individual whales as they moved down the coast, while an acoustic array moored offshore recorded the whales' song and tracked singing whales. This method (which Professor Noad first established) allowed us to pinpoint the exact location of a particular whale in real time.

A trend emerged when our data were coupled with those collected by Professor Noad's team. As the eastern humpback population grew, males weren't singing as much as they used to. Instead they were increasingly opting to quietly find a female to mate with, or fighting off other

male competition.

Specifically, the proportion of singing males decreased from two in ten in 2003–2004, to only one in ten by 2014–2015. Data from 2003–2004 also show males were less likely to sing when they had a higher proportion of males in their social circle.

And it seems the change in tactics led to a change in results. In 1997 singing males were almost twice as likely as their counterparts to be seen joining with a female and escorting her, likely to attempt to mate. But by 2014–2015, non-singing males were almost five times more likely to be seen joining a group with a female.

That said, we can't say for sure when joining a group actually results in mating with the female and fathering a calf. That's another piece of this puzzle: how many of the males that join groups (singing or otherwise) actually end up mating and then fathering a calf?

A species will carry out a behaviour for as long as the benefits outweigh the costs. If something changes, and the costs start to outweigh the benefits, they will stop. It's a basic principle, but it goes a long way towards explaining our findings.

In the early years of data collection, when there were fewer whales around, a male could sing and broadcast himself to nearby females quite comfortably – not having to worry about hordes of other males wanting his neck.

Now, with a more than burgeoning population, the same tactic attracts the risk of being interrupted by other males. As a male humpback, you're better off spending the breeding season quietly seeking a female to mate with and not attracting the attention of other males.

Or, if you fancy yourself a big, tough guy, you might take the chance to fight other males to become the "primary escort" of a group. And this relates to one of our working theories about why singing among the eastern humpbacks has diminished through time, and fighting has increased.

Until it was banned, whaling was likely [targeting larger](#) mature adults. This could have left an immature population, full of young whales less equipped to fight. Coupled with a sudden decrease in competition overall, this may help explain why whales in the early years preferred singing as a mating tactic.

By the same token, once these same males started to mature and grow large in later years, they may have tended more towards fighting off competition.

We have observed some of these bigger and more assertive whales, the "primary escorts", on the breeding grounds. They move from group to group, displacing other males – always maintaining their alpha status.

Despite what our research has observed, we don't think whales are at risk of losing their song. The eastern humpback whales have simply changed their behaviour to improve their chances of mating. As researchers working out in the field, we still hear whales singing, so we're not worried.

But we do have questions moving forward.

For one thing, we don't know how the population dynamics in the eastern humpback may have changed in the past seven years. The dataset used in our study ended in 2015 (and the

population has since grown). It would be interesting to know if the trend we observed from 1997 to 2015 is ongoing or has stabilised.

We also want to better understand the factors that drive a male whale's choice to sing. Is it age, or size, a combination of both, or something else?

Until then, we can safely conclude one thing: whales are incredibly socially complex creatures – and our findings indicate they can adapt remarkably to the social pressures around them.

By the same logic, however, any species under threat that can't adapt to changing population dynamics stands to lose out. Humpbacks have managed to bounce back, but what about the other precious animals in the world?

[Rebecca Dunlop](#), Senior Lecturer in Physiology, [The University of Queensland](#)

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# 'FEEDBACK LOOPS' WORSENING CLIMATE CRISIS

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

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February 18, 2023 02:34 pm | Updated 02:34 pm IST

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Global warming melts sea ice, which leads to further warming because water absorbs more heat than ice, creating what scientists call a "climate feedback loop." | Photo Credit: Reuters

Global warming melts sea ice, which leads to further warming because water absorbs more heat than ice, creating what scientists call a "climate feedback loop."

A report released Friday contains what researchers believe is the most comprehensive list of feedback loops ever compiled and a stark warning that climate models may be underestimating their impact.

"Many feedback loops significantly increase warming due to greenhouse gas emissions," the researchers from Oregon State University (OSU), University of Exeter and other institutions said in the [report](#) published in the journal *One Earth*.

"However, not all of these feedbacks are fully accounted for in climate models."

Co-authors William Ripple and Christopher Wolf of OSU said an "immediate and massive" boost in research about feedback loops was needed to help guide world leaders in making climate policy.

They urged UN experts with the Intergovernmental Panel on Climate Change to produce a special report on the effects of feedback loops and their potential "severe consequences."

The researchers identified 41 climate feedback loops in their report, 27 of which accentuate warming, seven of which have a dampening effect and seven that are uncertain.

Wolf compared a feedback loop to a run on a bank.

People withdraw money because they are concerned about a bank defaulting, raising the risk of it defaulting, which causes more people to withdraw money, and so on.

Among the biological feedback loops they cited were thawing permafrost, forest dieback, loss of soil carbon, and drying and smoldering peatlands.

In the permafrost example, rising temperatures lead to thawing, producing carbon dioxide and methane emissions which lead to further increasing temperatures.

The report warned that interacting feedback loops may result in a sequence of catastrophic climate "tipping points," where changes to climate systems become self-sustaining.

"Some feedback loops may be associated with key tipping points that could profoundly disrupt the global climate system and biosphere once critical thresholds are crossed," it said.

"Once sufficient warming has occurred, feedbacks could ultimately cause the Greenland ice sheet to collapse, which is a result of exceeding a tipping point," Wolf said.

The report noted that most nations have signed on to the Paris Accord, which calls for limiting global warming to 2.0 degrees Celsius, and ideally 1.5C, but they said more drastic action is needed to reduce emissions.

"Waiting until 2050 to achieve net-zero carbon emissions might be far too late," the authors said. "Time is running out to avoid the worst effects of climate change."

In the short-term, a failure to dramatically reduce emissions could result in ongoing and intensifying climate impacts, they said.

"In the worst-case long-term scenario, interactions among feedback loops could result in an irreversible drift away from the current state of Earth's climate to a state that threatens habitability for humans and other life forms," they added.

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# CLIMATE CHANGE-LINKED HEAT WORSENER ARGENTINA DROUGHT IMPACT

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February 18, 2023 11:34 am | Updated 12:32 pm IST

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The Paso Lucero bridge is pictured as the Corriente river below is seen affected by a prolonged drought, in Corrientes, Argentina February 13, 2023. | Photo Credit: Reuters

Extreme high temperatures in Argentina linked to climate change exacerbated the impact of a historic drought that has hit the South American country's farm regions since last year, scientists said in a report on Thursday.

Scientists affiliated with the World Weather Attribution (WWA) group said that a rapid analysis showed climate change did not reduce rainfall directly, but that high temperatures likely reduced water availability and worsened the impacts of drought.

The drought has hammered soy, corn and wheat crops in the country, the world's top exporter of soy oil and meal and the No. 3 for corn, leading to sharp cuts in harvest forecasts. Drought has also hit smaller neighbour Uruguay.

The lack of rain is linked to the presence of the La Niña climate phenomenon, a cooling of the equatorial Pacific that cuts rainfall in parts of Argentina. WWA scientists however said that the extreme temperatures are a product of global warming.

"The region is also experiencing intense heatwaves, which climate change has increased in frequency, intensity and duration," the WWA said in a report.

Last week much of Argentina's agricultural area suffered a new heat wave that lasted several days and quickly consumed precipitation that had fallen in late January and February in areas that desperately need water after hot weather last year.

"Higher temperatures in the region in late 2022, which have been attributed to climate change, decreased water availability in the models," the WWA said.

"(This indicates) climate change probably reduced water availability over this period, increasing agricultural drought, although the study could not quantify this effect."

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# AN EFFORT TO GO GREEN

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February 20, 2023 12:25 am | Updated 01:07 am IST

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The Miyawaki forest in Shamshabad. Photo: Special Arrangement

Can urban growth and expansion of green cover take place at the same time? Can new roads be laid in old neighbourhoods without uprooting avenue trees and roadside gardens?

Plenty of examples can be cited from the country to argue that this is improbable. However, the Telangana government claims it is not. Over the past two years, Hyderabad, which has emerged as a powerhouse of infrastructure growth in Telangana, has [won multiple awards for being a green city](#) with an improving forest cover. Speaking on the floor of the Assembly last Monday while presenting the annual Budget, Finance Minister T. Harish Rao listed these awards and achievements.

The State government has provided impressive numbers of tree plantations to show the state of the forest. An afforestation programme called Telangana Ku Haritha Hram (the green garland of Telangana) is the key green initiative of the Telangana government. With a funding of 10,417 crore over nine years, the programme has covered a vast area of land with trees and plants. The State government allocated 1,471 crore to the Forest Department and Haritha Haaram in 2023-24, and 198 crore for compensatory afforestation. According to Mr. Rao's budgetary speech last year, the government has replanted 9.65 lakh acres and developed 109 urban forests. This year, 13 lakh acres of forest have been "rejuvenated" with a funding of 1,500 crore, he said.

However, environmental advocates are puzzled by the numbers. They say they have seen the steady loss of tree cover. Further, reports regularly cite instances of fully grown trees being cut down for construction. More than 20 full grown trees were axed on the VST-Indira Park stretch to make way for the elevated corridor as part of the Strategic Road Development Plan project in 2022. Over the past few months, the pruning, cutting and translocation of trees for the Hyderabad E-Prix has also illustrated the conflict between green initiatives and so-called development. Citizens are campaigning to save nearly 900 banyan trees that are about 100 years old each, on the road to Chevella on the outskirts of Hyderabad.

Questions have also been raised about the awards. It is the administrators who nominate the city for the Arbor Day Foundation's 'Tree City of the World' award by providing a certification from the Mayor on the number of trees. There is no external auditing to establish the truthfulness of the information. When the Mayor was asked about the certification, she did not respond.

Similarly, in a competition involving cities such as Paris, Bogota, Montreal, and Mexico City,

Hyderabad emerged the winner and was named 'World Green City' by the International Association of Horticulture Producers (IAHP). The IAHP is a 75-year-old global organisation. Its members include traders of flowers and ornamental plants. The IAHP also gave Hyderabad the award in the 'Living Green for Economic Recovery and Inclusive Growth' category. The awards were given based on statistics filed by city officials and a field visit to locations with avenue plantations, including the 158-km Outer Ring Road that girdles the city.

Nevertheless, while the green initiatives have gained recognition, the State faces the challenge of encroachments into forest lands by the indigenous people. The right for permanent settlement in areas that were once considered forest has been a divisive issue and could impact voting patterns. Of the 119 constituencies in the State Legislature, nine are reserved for Scheduled Tribes. According to the 2011 Census, STs form 9.3% of the State's population. Recently, a forest official was killed while trying to mark boundaries in the forest. Speaking on the floor of the Assembly, Chief Minister K. Chandrasekhar Rao promised distribution of 'pattas' (documents of ownership of land) to STs. He added a caveat. The land distribution, he said, is among the last efforts to regularise ownership of land and more encroachments into forests will not be allowed.

Will this dual approach of protecting forests and doing plantation drives pay dividends? It is too early to say. But it is clear that the Telangana government, with its initiatives, has its eyes set on becoming a 'green State'. While the counting of trees planted in a park may not be a barometer of change, it is a step in the right direction. It creates awareness about the environment, which was sorely missing until a few years ago.

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## MORE ANIMALS, LESS FOREST COVER

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February 21, 2023 12:15 am | Updated 12:15 am IST

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Villagers mourn the killing of a young boy by a leopard near Kutta in Kodagu district of Karnataka. | Photo Credit: SPECIAL ARRANGEMENT

In recent years, Karnataka has been grappling with an increase in man-animal conflicts, which have brought wildlife and forest conservation issues to the fore and led to questions about the State's response to them. Earlier this month, a 70-year-old man belonging to the Jenu Kuruba community and his 12-year-old grandson were killed in separate tiger attacks on the boundary of the Nagarahole National Park near Kutta in Kodagu district.

According to the Forest Department, during 2020-21, there were 24,740 cases related to crop damage by wild animals; 3,019 cases of cattle kill; and 36 human deaths in the State. The compensation paid in all the cases put together was 21.64 crore. In 2021-22, cases of crop damage caused by wild animals increased to 31,225; the number of cattle kill went up to 4,052; and 40 human deaths were reported. The compensation paid exceeded 27.4 crore. In the current year, over 20 crore has already been paid by way of compensation. And once the pending applications are processed, this figure is expected to cross 40 crore.

The cost of the conflict, both in terms of deaths and crop damage, is being borne by the people living on the forest fringes and in villages. This means there could be less local support for wildlife conservation. To address this, the authorities have thought of mitigatory plans to reduce conflicts. These include fencing villages abutting forest boundaries with discarded rail fences, and relocating elephants and tigers from conflict zones.

Following the spike in human-leopard conflicts in south Karnataka, where four human deaths took place over a span of a few months in T. Narasipura taluk of Mysuru district, the Forest Department is now toying with the idea of creating two or three separate enclosures or rescue centres. Each of these will have the capacity to house 250 leopards that have been tranquillised and captured in conflict zones. Nearly 130 leopards have been captured from conflict zones in Karnataka between April 2022 and January this year alone; this figure is only expected to go up.

Studies by conservation biologist Sanjay Gubbi and his team peg the leopard population in the State at around 2,500. They point out that more than 50% of the human-leopard conflict takes place in five districts — Ramanagara, Tumakuru, Mandya, Mysuru and Hassan.

Though mitigatory initiatives are imperative, some believe that they only address the symptoms and not the cause. This is because the increase in conflicts and the rise in human deaths is

perceived to be a direct fallout of the government's conservation measures on the one hand and development policies on the other, which are at odds with each other. As a consequence, the environment gets short shrift.

When the wildlife population was increasing due to protection measures, the area under forest cover should have been expanded by creating buffer zones. Such areas could have acted as sinks to absorb the rise in animal population and provided connectivity for animal migration. But the converse happened in Karnataka. Forests have either shrunk or been disturbed with the government clearing infrastructure projects by diverting forest land for non-forestry purposes.

Between 2020-21 and 2021-22, when human-animal conflict reached a new high, more than 450 hectares of forest land were diverted for as many as 39 projects including mining, road construction, irrigation, windmills and railway lines. The total land area under forest cover in 2012-13 was 43,356.47 sq km, or 22.61% of the State's land area. This has declined to 4,0591.97 sq km, or 21.16% of the land area, in 2021-22.

Conservationists argue that procuring plantations and land abutting forest areas can augment and strengthen the buffer zone and help reduce conflicts. But instead of securing forests, the existing forest land is being diverted for other reasons. The government has also opposed the Union Environment Ministry's notification on Ecologically Sensitive Areas in the Western Ghats that could help protect green cover. Last year, it denotified 6.5 lakh ha of deemed forest. If policies such as these, which are detrimental to the environment, are not reversed, the impact of mitigation measures to reduce conflicts will be neutralised and human-animal conflicts will only escalate in the days ahead.

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# 'NO EXCUSE': IEA TELLS ENERGY FIRMS AS METHANE EMISSIONS RISE

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

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February 21, 2023 06:20 pm | Updated 06:20 pm IST

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IEA Executive Director Fatih Birol delivers his speech at the opening session of the International Energy Agency (IEA) ministerial meeting in Paris on March 23, 2022. The International Energy Agency on Tuesday, February 21, 2023, accused fossil fuel industries of doing too little to curb methane emissions and undermining global climate goals to limit warming. | Photo Credit: AP

The fossil fuel industry is failing to tackle methane emissions despite its pledges to uncover and fix leaking infrastructure, according to a report by the International Energy Agency (IEA) published on Tuesday.

In 2022, the global energy industry released into the atmosphere some 135 million tonnes of methane - a potent greenhouse gas responsible for roughly a third of the rise in global temperatures since the industrial revolution.

Last year's emissions rose above 2020 and 2021 levels, and were only slightly below the record amount released in 2019, despite high energy prices and surging demand for natural gas that provided extra incentives to capture methane, the report said.

Methane is the main component of natural gas, so captured emissions can be sold as fuel.

Although some progress has been made, "emissions are still far too high and not falling fast enough - especially as methane cuts are among the cheapest options to limit near-term global warming," IEA Executive Director Fatih Birol said in a statement. "There is just no excuse."

The energy sector accounts for about 40% of all methane emissions from human activity, second to agriculture.

The IEA said methane emissions from oil and gas alone could be reduced by three-quarters with existing technologies and modest investment of less than 3% of the \$4 trillion windfall income gained by oil and gas companies worldwide last year.

"The economic incentives to make those reductions were huge last year," IEA's Chief Energy Economist Tim Gould said. "We had record natural gas prices in many markets around the world. There was an extremely strong economic incentive to bring methane to market."

But despite this, "2022 was a disappointing year," he said.

More than 150 countries have pledged to cut global methane emissions by at least 30% from 2020 levels by the end of this decade - although major emitters including China and Russia have not. Dozens of oil companies have also voluntarily committed to reduce emissions through the Oil and Gas Methane Partnership, and the Oil and Gas Climate Initiative.

"There are a lot of pledges around, but what you need is a forcing mechanism," said Georges Tijbosch, CEO of MIQ, a methane emissions certification standard.

NOAA physical scientist Lori Bruhwiler said rapid cuts to methane emissions are important, but deep carbon dioxide emission reductions must accompany them if the world is to avoid global warming exceeding 1.5 Celsius (2.7 Fahrenheit) and unleashing more severe impacts.

"Will this make it tougher for us to meet 1.5? Absolutely," she said, of the consequences if countries and companies fail to curb methane.

The IEA report said there were more than 500 super-emitting events from oil and gas operations detected by satellites in 2022. Another 100 were spotted at coal mines. Altogether, the coal industry was responsible for about 40 million tonnes of methane emissions in 2022.

Coal-related methane emissions in China are equivalent to total CO2 emissions from the whole of sub-Saharan Africa," Gould said.

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# GROUND ZERO

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

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February 25, 2023 01:35 am | Updated 07:39 am IST - Chandrapur, Maharashtra

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The Chandrapur Super Thermal Power Station, a hulking seven-unit facility, has been billowing toxic substances for nearly 40 years. | Photo Credit: Nagara Gopal

Every day, when 10-year-old Madhav Mundhada comes back from school tired, he takes at least 45 minutes to finish his meal. He is forced to eat slowly. "Sometimes food triggers his asthma attack," says Dr. Gopal Mundhada, his grandfather, who is a paediatrician and former president of the Chandrapur chapter of the Indian Medical Association.

Madhav has had severe asthma since he was two or three years old. Mundhada says he is convinced it is because of the air pollution in the neighbourhood.

The Mundhadas are an intergenerational household a few stones' throw away from the coal-fired Chandrapur Super Thermal Power Station (CSTPS) in Maharashtra's Chandrapur district. A hulking seven-unit facility with a capacity of 2,920 MW, the plant has been billowing toxic substances for nearly 40 years. The air around the CSTPS smells charred and pungent. It reeks of the smell of continuous combustion of petrol or coal. The radius of the plant is bespattered with trees, and inhabited by the employees of CSTPS, who claim that it is not uncommon to spot a tiger on the premises of the plant.

Chandrapur city is known as 'India's Black Gold City' and is in the Vidarbha region, the coal-rich belt of Maharashtra. It is also one of the most polluted cities in India. The city is an industrial area, home to cement, explosives, paper, and textile factories, in addition to mines.

The CSTPS plant alone releases 7,100 metric tonnes — almost the weight of 18 jumbo jets — of fly ash, a fine particulate by-product of coal combustion that is known to be carcinogenic. It also generates 2,900 metric tonnes of bottom ash, the heavier coal waste that is non-combustible and needs to be stored safely to prevent it from percolating into the groundwater. Both these forms of coal waste are together known as coal ash.

A grey sky envelopes Chandrapur irrespective of the time of the day. | Photo Credit: Nagara Gopal

In 2019, Chandrapur had a very high Comprehensive Environmental Pollution Index (CEPI) score of 76.41. The CEPI is a monitoring scale that assesses the overall environmental quality of industrial areas in India. When scientists installed faux lungs to measure air pollution in the city in November 2021, they turned sooty black in one week. The air became so toxic that the air

quality index reached a dangerous 400 in January 2022.

Mundhada's son, daughter-in-law, and his wife Dr. Bharati Mundhada all suffer from asthma. Bharati says that she started having breathing troubles in 1989, a few years after she moved to Chandrapur following her marriage into the Mundhada family.

According to government stipulations, CSTPS, which is run by the Maharashtra State Power Generation Co. Ltd (MAHAGENCO), a public utility with the second-highest power generation capacity in India (in 2017), is required to install air quality monitoring units in different locations around the thermal plant. In January 2022, the sulphur dioxide (SO<sub>2</sub>) reading from a monitoring system installed at unit 8, a new unit commissioned in 2015, was found to be eight times higher than the standard limit. Nitrogen dioxide (NO<sub>2</sub>) emissions also often show similar deviant trends.

Several studies have shown the effects of this pollution. A June 2020 study showed that among street vendors, 32% of those surveyed by two researchers in Maharashtra had complained of respiratory tract infections. According to a report published in February 2022 by the Centre for Research on Energy and Clean Air (CREA), an independent organisation founded in Helsinki, the operation of units at CSTPS in 2020 could be linked to an estimated 85 premature deaths in Chandrapur and 62 in Nagpur, about 120 km to the north. The study also said that the effects of ambient air pollution from CSTPS resulted in various health illnesses, which led to 34,000 sick leave days in Chandrapur and 30,000 days in Nagpur. MAHAGENCO responded by serving a defamation notice to CREA. It dubbed the study "mischievous", "baseless", "false", "misleading" and "unscientific."

Residents of Chandrapur complain that the air is polluted and has led to respiratory and other health illnesses. | Photo Credit: Nagara Gopal

There are several complaints of respiratory issues in the area around the plant. "Children are falling sick because of pollution. If we go to a public hospital, they ask us to come in, give us medicines and an injection. That's it," says a resident of the city.

"Every family has a story," says pulmonologist Dr. Saurabh Rajurkar, who runs a clinic close to the plant.

Key activists in Chandrapur, including Mundhada, who runs the non-profit Chandrapur Bachao Sangharsh Samiti, have filed a lawsuit against the State government demanding action. They say the CSTPS has been flouting environmental norms. Reports that the activists filed with the National Green Tribunal suggest that all seven operational units at CSTPS released SO<sub>2</sub> beyond permitted limits and that one unit reported a higher concentration of nitrous oxides as well.

Plant officials deny these allegations. "All industries (in Chandrapur) are complying with industrial norms," says Pankaj Sapate, chief engineer of the CSTPS plant.

Around 40 km away from the plant is an ash pond that holds coal waste in the form of slurry. "All the bottom ash [2,900 metric tonnes that is produced daily] is dumped into the ash bund by the CSTPS. Then the ash leaks into rivers, nallahs and people's agricultural land," says Suresh Chopane, an activist in Chandrapur.

In September 2021, the Maharashtra Pollution Control Board (MPCB), which is responsible for overseeing CSTPS' adherence to environmental norms, wrote in a letter to the electric utility saying it had found seven million metric tonnes per annum of ash dumped in the bund and the plant is storing ash in an unscientific manner.

In March last year, a pipe that carried fly ash slurry from the thermal plant to the ash pond reportedly leaked right over the Erai river, a lifeline for the people of Chandrapur. Sapate claims that the quantity of the leaked slurry was very little.

In March last year, a pipe that carried fly ash slurry from the thermal plant to the ash pond reportedly leaked right over the Erai river, a lifeline for the people of Chandrapur. | Photo Credit: Nagara Gopal

Ash was reportedly found along the river bed and accumulated in many places on the road next to the pipe. "There was no such thing witnessed," he says.

Dangerous disasters such as the slurry leak are an all too common in India. There have been 76 such incidents reported in just the last decade, according to the Flyash Watch Group.

"The ash pond is a temporary storage unit," says Sripad Dharmadhikar, a policy researcher at the Manthan Adhyayan Kendra, an organisation that studies various environmental issues such as water privatisation, inland waterways, coal and water, and water policy in India. The latest rules regarding coal ash stipulate that the rate of fly ash generation is supposed to meet the rate of utilisation, which means 100% of the fly ash being generated needs to be recycled. Fly ash utilisation is the process by which waste is recycled for reuse in cement, concrete, mineral filler for asphalt roads, etc. As per the rules, all coal power plants must reuse 100% of their fly ash within three years or face a fine of 1,000 per tonne. However, one in every two coal-based plants flouts these norms, according to a report by the Centre for Science and Environment.

In Koradi and Khaparkhera in Maharashtra, where there are two state-run plants of 2,400 MW and 1,340 MW capacity, respectively, Manthan examined the water quality and found that almost every water sample failed the safe Bureau of Indian Standards' limits for drinking water. There were also heavy metals such as mercury, arsenic, and cadmium, which can cause cancers of the bladder and the liver. Coal ash slurry is rich in these elements as well.

Manthan suspects similar results with Chandrapur, where it undertook a similar water sampling survey in September 2022. The report is due to be published this year.

CSTPS' groundwater monitoring report is not in the public domain. However, it shared its report for June 2022 with *The Hindu*, which reported that the contaminants' concentrations in drinking water were within safety limits.

Despite a variety of problems, the CSTPS has always had a 'consent to operate' from the National Green Tribunal and the Pollution Control Board, and has never shut down due to environmental violations.

"I suggest you... go there [to the ash pond]. You will not find the ash there," Sapate says.

Despite a variety of problems, the plant, seen in the distance in the photo, has always had a 'consent to operate' from the National Green Tribunal and the CPCB, and has never shut down due to environmental violations. | Photo Credit: Nagara Gopal

In a letter dated March 2021, the MPCB wrote that CSTPS was knowingly and willingly damaging its immediate environment. Two other letters dated September and December 2021 used the same words to denounce the plant's operations. But CSTPS hasn't faced further action other than being asked to pay a fine of 5 crore for the slurry leak in March 2022.

India produces almost 180 million metric tonnes of fly ash every year and a significant fraction of

it remains untreated and unrecycled. The Indian government has issued various notifications on fly ash utilisation, demanding beneficial reuse instead of all-out disposal; installation of flue gas desulphurisation (FGD) units; and safe disposal of fly ash. Yet, India has recycled only around half of its fly ash even as it generates more.

### Explained | [What the new Lancet report says about India's pollution problem](#)

In 2020 alone, CSTPS emitted 4,724 tonnes of particulate matter, 1,03,010 tonnes of SO<sub>2</sub> and 28,417 tonnes of NO<sub>2</sub>, according to a recent study by CREA. FGD is a system that can help cut SO<sub>2</sub> emissions by up to 80-90% in some units. This way, “More than 1,300 lives could have been saved in 2020 if the CSTPS [had] installed FGD,” CREA’s report says.

Nearly five years since it first announced the need for a flue gas desulphurisation system, the plant still has no solid plan to install it. A September 2022 update said tendering for FGD systems is “in progress”. | Photo Credit: Nagara Gopal

“It is important to install FGD to meet the current environmental norms. It is compulsory by the authorities,” Sapate says. “We are planning to place FGD as per the guidelines of the Ministry of Environment, Forests and Climate Change.” Seven years since the nationwide announcement for the need of an FGD system, CSTPS still has no solid plan to install it. A September 2022 update said tendering for FGD systems is “in progress”.

As per the latest available data, CSTPS has only utilised 45% of its fly ash; the remaining 80 million tonnes — the weight of 1,500 Titanic ships — is stored in the ash bund. According to a Maharashtra State Pollution Control Board action plan, CSTPS was to have achieved 100% utilisation by 2014.

Also read | [Government says air pollution primarily urban phenomenon; experts disapprove](#)

Dr. Mundhada says this battle isn’t just his own. It’s an arduous struggle to ensure that one of the largest state-run power plants in Maharashtra operates lawfully, keeping in mind the myriad ways in which its operations affect the lives of Chandrapur’s people. “ *Yeh diye aur toofan ki ladayi hai* (it’s a battle between a lamp and a storm),” he says.

*Mrinali Dhembala is a freelance journalist. This story was reported with funding secured from the Pulitzer Center on Crisis Reporting.*

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# MINIMISING HUMAN DISTURBANCE CRUCIAL TO PROTECT BEARS OUTSIDE WILDLIFE RESERVES: STUDY

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

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February 26, 2023 02:15 am | Updated 02:15 am IST - Bengaluru

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The study found that sloth bears avoided areas with high forest fragmentation. | Photo Credit: Kalyan Varma

A new study has found that maintaining forest cover and preventing fragmentation of habitats while minimising human disturbance is crucial for long-term conservation of bears outside protected wildlife reserves across India.

Scientists from Bengaluru-based Centre for Wildlife Studies, the National Centre for Biological Sciences (NCBS)-Tata Institute of Fundamental Research (TIFR), and the University of Florida studied sloth bears in a forest corridor of Madhya Pradesh. They have published their findings in their latest scientific paper titled 'Safe space in the woods: Mechanistic spatial models for predicting risks of human–bear conflicts in India' in the journal *Biotropica*.

The corridor connecting Kanha and Pench Tiger Reserves is among the most important landscapes in India, supporting several threatened species of wildlife and over 350,000 people.

In the recent study, researchers conducted indirect sign surveys (documenting pugmarks and faeces) to understand where sloth bears are found and why. They combined these results with information on bear attacks on people, gathered through interview surveys of local communities.

Mahi Puri, lead author of the study, said that the Kanha-Pench landscape has been a high conservation priority landscape for over two decades, especially for the conservation of tigers. "However, the landscape is also home to several other threatened species, including sloth bears, that frequently come into conflict with people. Their conservation requires active management by taking into account human safety," Dr. Puri said.

Dr. Puri added that their study found that sloth bears avoided areas with high forest fragmentation. "Bear attacks on people were more likely to happen in areas with denser forests, rough terrains and locations with high bear presence. By simultaneously gathering data on bear ecology, their interactions with people and forest resource extraction patterns, we were able to identify locations with the highest risk of human injury or death due to bear attacks," she said.

Arjun Srivathsa, Krithi K. Karanth, Imran Patel and N. Samba Kumar (Centre for Wildlife Studies) are the other authors of the study.

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# INDIA WANTS ENERGY TRANSITION ON ITS OWN TERMS — WITHOUT PHASING OUT COAL AND WITH MORE GRANTS

Relevant for: Indian Economy | Topic: Infrastructure: Energy incl. Renewable & Non-renewable

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February 27, 2023 09:30 am | Updated 09:30 am IST - MUMBAI

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Prime Minister Narendra Modi launches E20 fuel and flags off Green Mobility Rally at the occasion of India Energy Week 2023 in Bengaluru. | Photo Credit: ANI

India is unlikely to sign a deal with richer nations this year for a just energy transition, as international funding rests on India committing to a timeline to phase out coal, an "unviable" proposition for the country, energy analysts said.

The Group of Seven (G7) industrialised nations, together with Norway, Denmark and the European Union, believe a 'just energy transition partnership' (JETP) with India will financially empower it to reduce climate changing emissions from power production.

Similar pacts have been signed with South Africa, Indonesia and Vietnam, but India wants a JETP on its own terms: no phase out of coal and funds for clean energy expansion in the form of grants, not loans.

"The developed world is pushing for a JETP as they want coal out. The JETPs with South Africa and Indonesia are all about coal. But that won't work here," said economist Vaibhav Chaturvedi, a fellow at the Delhi-based Council on Energy, Environment and Water (CEEW).

"Coal is the only stable source of energy in India, which is still a developing economy. India won't talk about coal but (instead about) more renewable energy, which has more achievable and demonstrable targets," Mr. Chaturvedi said in an interview.

The Ministry of External Affairs, which is considering JETP proposals this year as [India helms the G20 presidency](#), did not respond to queries despite repeated emails and phone calls.

But analysts familiar with India's stance said conversation around a JETP is stuck on the financial terms of funding and India's resistance to being "bullied into a partnership".

What India needs is more green jobs and funds to train people for them, said Swati Dsouza, an energy analyst with the Institute for Energy Economics and Financial Analysis.

"The JETP as it currently stands may not be the best model or framework for India given that the country will see an increase in energy demand and possible increase in coal capacity," she said.

In recent months, India has relaxed environmental and public consultations on coal mine expansions, boosted its coal production and cited coal as critical for energy security in global climate dialogues.

But the country still aims to reduce coal from 50% of its energy mix currently to about 30% by 2030, while building 500 gigawatts (GW) of new renewable capacity.

Simultaneously beefing up both coal and renewables points to a messy energy transition for India, including the risk of job losses if some coal mines are abandoned.

Workers unload coal from a supply truck at a yard on the outskirts of Ahmedabad | Photo Credit: Reuters

India's mixed signals, analysts say, indicate the country will phase out coal only when it is sure the transition won't cause power disruptions, with renewable energy storage capacity currently still weak and expensive.

As the world's third largest power consumer, India's power use has doubled since the turn of the century, with over 900 million citizens gaining an electrical connection in less than two decades, according to the International Energy Agency (IEA).

Last year, the country faced one of its worst power crises in six years as a heatwave swept across the nation, pushing up energy demand, triggering power cuts, causing a fuel crisis at overworked power plants and boosting heat-related deaths.

As it tries to meet rising demand for power, coal use will peak in India between 2030 and 2035, the government said - but meantime the country needs to strengthen its renewable grid and infrastructure, for which it wants JETP funding.

"We still want to negotiate with developed countries ... as long as developed countries listen to us," said Santosh Patnaik, program coordinator at Climate Action Network South Asia.

The village of Bhadla in Rajasthan got its first power grid connection five years ago. While electricity arrives less than eight hours each day, it has lit up evenings in a village that earlier used kerosene lamps to help its sheep-herding children study at night.

On January 4, the approved \$2.3 billion funding with an aim to grow various segments of the green hydrogen sector in India, hoping it will abate 50 million metric tons of greenhouse gas emissions. Image for representation | Photo Credit: AP

"All we want is a steady power supply," said Sadar Khan, the village council head who has written to authorities lamenting power cuts that can last in some cases a whole day.

A JETP that focuses only on reducing coal would be looking at India's energy transition too "narrowly", glossing over the growing aspirations of Indians, analysts say.

Many are new consumers of electricity and need affordable power to improve their economic condition, they said.

Households with new electricity connections, many of them in rural areas, are now using

washing machines, refrigerators and laptops, said Gauri Singh, deputy director-general of the International Renewable Energy Agency (IRENA).

India's transition efforts need to be mindful of these aspirations, she said, adding the country's challenge was to ensure clean and affordable energy for all while moving away from fossil fuel.

"The JETP cannot be a broad-brushed partnership but has to look at the context of each country. It is much more complex than retiring thermal plants," Ms. Singh said in a video call.

Last December, the G7 nations announced \$15.5 billion for Vietnam to help it transition away from coal, with only a minor part as grants and most of the money as loans.

India could land a much larger deal, with the United States and Germany at the forefront of negotiations, analysts say.

India may be able to use its position as G20 leader this year to steer discussions on a deal toward scaling renewable capacity and investments in new technologies, said R.R. Rashmi, programme director for earth science and climate change at The Energy and Resources Institute (TERI).

To meet its target of having 500GW of renewable energy capacity by 2030, India will have to invest an average of \$27.9 billion annually up to 2029, research estimates show - but its [budget allocations](#) aren't sufficient for that, economists said.

Beyond scaling up renewables, India also needs to acknowledge that energy shifts now underway will require a just transition for workers.

"This is not the question of our energy sector being decarbonised but also about exit, compensation of coal workers and alternate livelihoods," Mr. Rashmi from TERI said.

"Even if we cannot cut down on coal, we have to prepare for a phase down," he said.

At least five Indian states depend heavily on the country's coal economy. In the absence of a uniform just transition plan for the country, they risk losing their main revenue source.

Coal workers' unions say funding to restore land in areas ravaged by years of mining, creation of new jobs in new industries and training in the skills needed for jobs in clean energy are needed.

"The just transition conversation is dominated by technical and financial issues, ignoring the social aspect of transition, which is the most important," said D.D. Ramanandan, general secretary of the All India Coal Workers Federation.

"Engineers and finance experts are discussing just transition, not us. We are the biggest stakeholders in this. If coal ends, everything ends for us, but we are sidelined. This will be an unjust transition."

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## EXPLAINED

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

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February 26, 2023 10:36 pm | Updated February 27, 2023 09:00 am IST

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A traffic policeman drinks water to quench his thirst during a heat wave, at the Delhi-Gurugram expressway, May 15, 2022. | Photo Credit: PTI

In the week of February 21, the India Meteorological Department (IMD) warned that the maximum temperatures over northwest, west, and central India [would be 3-5° C higher](#) than the long-term average.

On February 21 itself, the national capital recorded its third hottest February day (33.6° C) in more than five decades.

In the week before, the IMD had warned of heat waves in the Kutch and Konkan regions, only to withdraw them after a sea breeze came to the rescue.

If the heat waves had played out, they would have been the earliest these regions would have experienced [this deadly phenomenon](#).

Irrespective of whether these are freak occurrences, heat waves are expected to become more intense, longer, and more frequent over the Indian subcontinent. [According to the IMD](#), a region has a heat wave if its ambient temperature deviates by at least 4.5-6.4° C from the long-term average. There is also a heat wave if the maximum temperature crosses 45° C (or 37° C at a hill-station).

Spring (March-April) in 2022 in India was [already a sign of things to come](#): the heat wave 'season' started early, was more intense than the long-term average, and had more waves.

The 2022 heatwave season was also unusual because the heat waves extended much further south into peninsular India thanks to a north-south pressure pattern set up by the La Niña, a world-affecting weather phenomenon in which a band of cool water spreads east-west across the equatorial Pacific Ocean.

The last three years have been La Niña years, which has served as a precursor to 2023 likely being [an El Niño year](#). (The El Niño is a complementary phenomenon in which warmer water spreads west-east across the equatorial Pacific Ocean.)

As we eagerly await the likely birth of an El Niño this year, we have already had a heat wave occur over northwest India. Heat waves tend to be confined to north and northwest India in El

Niño years.

Why do heat waves occur in the first place?

Heat waves are formed for one of two reasons: because warmer air is flowing in from elsewhere or because something is producing it locally. Air is warmed locally when the air is warmed by higher land surface temperature or because the air sinking down from above is compressed along the way, producing hot air near the surface.

A study [published on February 20, 2023](#), in *Nature Geoscience* offers some clues as to how different processes contribute to the formation of a heat wave. (The following explanation adapts the study's findings to the Indian context.)

1. In spring, India typically has air flowing in from the west-northwest. This direction is bad news for India for several reasons. In the context of climate change, the Middle East is warming faster than other regions in latitudes similarly close to the equator, and serves as a source of the warm air that blows into India.
2. Likewise, air flowing in from the northwest rolls in over the mountains of Afghanistan and Pakistan, so some of the compression also happens on the leeward side of these mountains, entering India with a bristling warmth.
3. The air flowing in over the oceans is expected to bring cooler air, since land warms faster than the oceans (because the heat capacity of land is much lower). Alas, the Arabian Sea is warming faster than most other ocean regions.
4. Next, the strong upper atmospheric westerly winds that come in from the Atlantic Ocean over to India during spring control the near-surface winds. Any time winds flow from the west to the east, we need to remember that the winds are blowing faster than the planet itself, which is also rotating from west to east. The energy to run past the earth near the surface, against the surface friction, can only come from above. This descending air compresses and warms up to generate some heat waves.
5. Finally, the so-called lapse rate – the rate at which temperatures cool from the surface to the upper atmosphere – is declining under global warming. In other words, global warming tends to warm the upper atmosphere faster than the air near the surface. This in turn means that the sinking air is warmer due to global warming, and thus produces heat waves as it sinks and compresses.

Given these are the processes that contribute to the formation of a heat wave, and the ways in which global warming affects them, it must be clear why once-a-decade heat wave events have started to occur once every few years, and are also more intense. The area covered by these heat waves is also influenced by the background pressure patterns set up by El Niño and La Niña events, and of late it has been expanding.

The other factors that affect the formation of heat waves are the age of the air mass and how far it has travelled. The north-northwestern heatwaves are typically formed with air masses that come from 800-1,600 km away and are around two days old. Heat waves over peninsular India on the other hand arrive from the oceans, which are closer (around 200-400 km) and are barely a day old. As a result, they are on average less intense.

In sum, heat waves have a sophisticated anatomy with important implications for how well we can predict them. Nonetheless, early-warning systems can take advantage of the processes,

modes of formation, location, and age of the air mass to improve the quality of warnings and also increase how soon they can be issued. Sizeable investments in human and computational resources [have already increased India's forecast skills](#) in the last decade.

For reasons that we are yet to fully understand, mortality over India due to heat waves are substantially lower than those in other mid-latitude regions (including potentially significant underreporting).

We should also not become complacent, and further improve forecast warnings, issue them as soon as possible, and couple them with city-wide graded [heat action plans](#) to protect the vulnerable.

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