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# WHAT TO WATCH AT AFRICA'S FIRST CLIMATE SUMMIT

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

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August 31, 2023 05:07 pm | Updated 05:07 pm IST

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Financing and Africa's negotiating position in upcoming global talks will dominate the continent's first climate summit in Kenya next week. | Photo Credit: Ramesh Susarla/The Hindu

Financing and Africa's negotiating position in upcoming global talks will dominate the continent's first [climate](#) summit in Kenya next week.

The following are some of the expected outcomes and themes expected to be in focus at the September 4-6 summit.

The declaration, to be issued at the end of the event, will outline Africa's position on issues ahead of the COP28 U.N. climate summit in Dubai beginning at the end of November.

Summit organisers say the document will emphasise Africa's ability to provide climate solutions through its carbon sinks, including the Congo Basin, its availability of arable land, immense renewable energy potential and stocks of battery minerals.

Summit organisers say they expect deals worth hundreds of millions of dollars to be announced or signed in Nairobi.

The transactions, which are expected to involve private and public sector investors, will include debt-for-nature swaps, regular debt, equity and carbon credits, the organisers said.

Investments in renewable energy, green technology and sustainable food farming are also likely to be unveiled.

According to the summit's agenda, a deal will be announced that involves the ACMI and the United Arab Emirates.

The ACMI was launched at the COP27 summit last year to boost Africa's production of carbon credits, which allow polluters to offset emissions by financing green activity, 19-fold by 2030.

The initiative is a point of contention between African governments and some activist groups.

Governments see the offsets as a growing industry that can generate revenues, while the

activist see them as an excuse for richer countries to keep polluting and say the lack of a binding cap on global emissions keeps prices artificially low.

[Also Read | A new chapter in India-Africa ties can be written](#)

Kenya's environment minister said the summit would propose a new international financing model that allows heavily indebted African nations to service their obligations while putting cash aside for climate action.

African countries are also expected to press rich world donors to fulfil previous financial commitments to help the continent navigate the climate crisis.

African states could unveil proposals for what are known as green and blue walls, or multi-country initiatives to protect forest and coastline resources that would be presented as single investable projects, organisers of the summit said.

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# GREEN HUMOUR BY ROHAN CHAKRAVARTY ON STATE OF INDIA'S BIRDS 2023 REPORT

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

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Green Humour | Photo Credit: Rohan Chakravarty

August 31, 2023 05:00 pm | Updated 05:00 pm IST

Rohan Chakravarty is a cartoonist and illustrator from Nagpur. His series, 'Green Humour', consists of cartoons and comics on wildlife, nature conservation, environmental issues, sustainability and all things green.

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# SEVEN YEARS ON, MISSION TO CLEAN THE GANGA REMAINS A WORK IN PROGRESS

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September 01, 2023 06:35 pm | Updated September 02, 2023 12:19 am IST - NEW DELHI

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The government unveiled its ambitious 20,000 crore National Mission for Clean Ganga | representative images | Photo Credit: DEEPAK K.R.

In the seven years since the government unveiled its ambitious 20,000 crore National Mission for Clean Ganga (NMCG), it has installed treatment plants capable of treating just 20% of the sewage estimated to be generated in the five major States that lie along the river. This is expected to increase to about 33% by 2024; and according to the latest projections by senior officials in the NMCG, treatment plants will be capable of treating 60% of sewage by December 2026.

These calculations are premised on sewage to the tune of 11,765 million litres per day (MLD) being generated in the five States – Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal – through which the river courses. This figure derives from a report submitted to the National Green Tribunal earlier this year. However, the NMCG plans on setting up sewage treatment plants (STPs) capable of treating about 7,000 MLD of sewage by 2026; States are expected to set up the remaining capacity, both on their own, and drawing on separate initiatives by other arms of the Union government.

“The main objective of the Namami Ganga mission is to ensure that no untreated sewage flows into the river. The estimate of 11,765 MLD is dynamic and also includes sewage that is generated within the State, but which doesn’t necessarily flow into the river. It also isn’t exact and is a projection based on expected population trends,” NMCG director general G. Asok Kumar told *The Hindu*. “Other States are also working on their own in setting up plants and we work with them. By our projections, if we are able to set up capacity worth 7,000 MLD, it should suffice, for now, to ensure no untreated sewage flows in the main stem of the river.”

Projects to set up STPs and sewerage networks are at the heart of the Namami Ganga mission, and account for about 80% of the overall project outlay. As of July 2023, STPs capable of treating 2,665 MLD have actually been commissioned, and are now functional. From 2014, when the mission was first announced, to 2021, only 811 MLD of capacity was completed. In the last financial year 2022-23, however, 1,455 MLD capacity was completed.

Several plants took time to be commissioned as there were problems with land acquisition. In many instances, the Detailed Project Reports — which prescribe all the steps necessary to

execute a project, and the roles of agencies, Centre, State and the private contractors — needed revision, said Mr. Kumar. “States were under the impression that building treatment plants was entirely the Centre’s responsibility. We had to work to correct that and now most of the sanctioned projects are progressing well,” he added.

So far the maximum number of plants have been set up — or upgraded in the case of older plants — in Uttarakhand (36), followed by Uttar Pradesh (35), and West Bengal (11). Though NMCG is a 20,000 crore mission, the government has so far given in-principle approval for projects worth 37,396 crore, of which only 14,745 crore has been released to States for infrastructure work, as of June 2023.

The river’s water quality is now within “prescribed limits of notified primary bathing water quality,” an NMCG fact-sheet, viewed by *The Hindu*, notes.

Mr. Kumar said that a conspicuous sign of the improvement in water quality along the Ganga was a rise in the dolphin population — both adult and juvenile — from 2,000 to about 4,000. “We are also seeing the presence of dolphins in new stretches of the river as well as in tributaries [of the Ganga]. Fishermen are also reporting the increased presence of Indian carp [a fish species] that only thrives in clean water. So we have nature’s verdict on river improvement,” he added.

The typical parameters used by the Central Pollution Control Board — such as the levels of dissolved oxygen, biochemical oxygen demand, and faecal coliform — vary widely along various stretches of the river. The NMCG is now working to develop a water quality index, on the lines of the air quality index, to be able to better communicate about river-water quality, he added.

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# OPERATION GAJA SHINES SPOTLIGHT ON CHITTOOR'S KUMKIS

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

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September 03, 2023 02:14 am | Updated 02:15 am IST - CHITTOOR

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*Kumkis* Jayanth and Vinayak with a wild elephant at 190-Ramapuram village in Chittoor. Photo: Special Arrangement

190-Ramapuram is a nondescript village in the Gudipala mandal of Andhra Pradesh's Chittoor district, close to the border with Tamil Nadu. It made headlines on the dawn of August 30, when a lone elephant in *musth* trampled a farmer couple to death, critically injured three other villagers, and killed about ten head of cattle.

A few hours before it was captured on August 31, the wild elephant trampled a woman farmer at Bodinettam village near Katpadi in Tamil Nadu, before re-entering Chittoor district.

The raging bull continued to wreak terror in a dozen villages on the Chittoor-Tamil Nadu border till the evening of August 31.

The lone elephant, considered "very dangerous" by the Forest Department, had made its way to the thin forest range of Gudipala mandal, straying from its habitat in the Maharaja Kadai forests of Tamil Nadu 140 km away, criss-crossing jungle patches and fields along the way.

Venkatesh (65) and Selvi (55), impoverished agriculture labourers, were engrossed in removing weeds at a mango orchard when the lone elephant attacked and killed them before throwing them into an adjoining sugarcane field. The bull also critically injured three other villagers when they rushed to the couple's rescue. While escaping from the mob, it fatally attacked ten cattle.

Upon hearing from villagers, a team of forest officials from Chittoor rushed to Ramapuram village. About 100 personnel, including watchers, animal trackers and beat officers from six ranges in Chittoor and Tirupati districts were deployed for 'Operation Gaja' to subdue the lone elephant on rampage.

*Kumkis* (trained elephants) Jayanth and Vinayak from the Naniyala Forest Camp at Ramakuppam in the Kuppam forest range were brought in special vehicles. The search for the lone elephant continued from morning till late at night on Wednesday, but without success. By daybreak on Thursday, rumours had spread like wildfire that an elephant had killed a woman farmer at Bodinettam village, a few kilometres away, in Tamil Nadu, confirming its location to somewhere within a radius of five kilometres. Forest Department officials then deployed a drone



camera from Tirupati. After a five-hour-long aerial survey, the bull elephant was located in the middle of a sugarcane field, under cover of foliage at the ground level.

The two *kumkis*, led by the highly experienced mahouts, jumped into action. For a couple of hours, the wild jumbo desperately tried to get away from the forest personnel and the pursuing *kumkis*. Finally, when the exhausted elephant was standing under a tree, a tranquilliser arrow was shot at it. In a few minutes, the two *kumkis* had accomplished their task. The sedated bull was captured and its movement controlled with ropes.

Slowly and steadily, with its head bent, the bull elephant followed the *kumkis*. After a medical examination, the captured elephant was loaded onto a truck, which made its way to the S.V. Zoo Park in Tirupati, 80 km away.

Bidding adieu to the forest personnel and trumpeting a call of assurance to villagers, Vinayak and Jayanth boarded their vehicles and returned to their camp. Forest officials and villagers gave full credit to the trained jumbos for their critical role in Operation Gaja.

190-Ramapuram village has since then seen a stream of visitors, including political leaders who handed over *ex-gratia* to the kin of the deceased couple.

Forest officials said there are four lone elephants roaming around different mandals in the Palamaner and Kuppam forest ranges. The Yadamarri and Bangarupalem mandals adjoining the Chittoor Corporation limits are also prone to frequent visits from lone elephants. There have been several instances of lone elephants killing people in rural Chittoor over the past decade.

Meanwhile, the Koundinya elephant sanctuary, spread over 800 sq. km. and flanked by Tamil Nadu and Karnataka, with a population of about 200 wild elephants, both migratory and resident, is coming up at the tri-State junction in Chittoor. There are a number of gaps without solar fencing or trenches surrounding the sanctuary, and vulnerable forest stretches in Tamil Nadu and Karnataka, which remain under threat from human-elephant conflict. Most lone elephants in *musth* have been intruders from neighbouring States.

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# EXPERTS BLAME POOR GOVERNMENT PREPARATION FOR GREEK FIRES' DEVASTATION

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

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September 02, 2023 02:19 pm | Updated 02:19 pm IST

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This photograph taken on September 2, 2023 shows a wildfire in the Dadia-Lefkimi-Soufli Forest National Park, near Alexandroupoli, northern Greece. Described as a "mega-fire" by experts, the forest fire in Dadia, an area protected by the European network Natura 2000, has so far destroyed more than 81,000 hectares, or almost half of the surface affected by fires since the start of the summer in Greece. | Photo Credit: AFP

While the Greek government has been quick to blame global warming for the summer's devastating [wildfires](#), some experts argue that poor planning is at least as much to blame.

The European Commission has said that the blaze in the Dadia national park, which has been burning for two weeks now, is the largest on record in Europe.

That and other deadly fires across Greece were expected to consume more than 150,000 hectares (370,600 acres) of land, Prime Minister Kyriakos Mitsotakis told parliament this week.

And the flames have so far claimed 26 lives.

"Is the climate crisis the alibi for everything?" said Mitsotakis. "No, it is not an alibi -- but it is part of the interpretation," he insisted.

## [Explained | How climate change drives heatwaves and wildfires in Europe](#)

Climate change is a theme the government has touched on repeatedly in the context of the wildfires but, as Mitsotakis appeared to at least implicitly acknowledge, it is not the whole story.

This year's fires are certainly stronger than those of previous years because of climate change, said Alexandros Dimitrakopoulos, head of Forest Protection and the Wildland Fire Science Lab at the Aristotle University of Thessaloniki.

But that does not fully explain the extent of the damage, he told AFP, pointing out that 10% of the country's woodlands had gone up in smoke since 2007.

"Better planning in the fight against fires is needed, as well as better cooperation between the fire services and the specialists in geomorphology of wooded zones," Dimitrakopoulos argued --

geomorphology being the scientific study of the form or shape of the land.

Firefighters from Slovakia man a water canon on top of their fire truck during a wildfire in the Dadia-Lefkimi-Soufli Forest National Park, near Alexandroupoli, northern Greece on September 2, 2023. Described as a "mega-fire" by experts, the forest fire in Dadia, an area protected by the European network Natura 2000, has so far destroyed more than 81,000 hectares, or almost half of the surface affected by fires since the start of the summer in Greece. | Photo Credit: AFP

Kostas Lagouvardos, research director at the National Observatory of Athens, made a similar point, arguing that the emphasis should be on adequate measures to prevent forest fires.

But the recurring problem, he said, was the dysfunctional relationship between the state and scientific bodies.

"The scientific tools exist and can help detect and prepare for difficult climatological conditions," he said -- such as the extreme drought that has struck the Evros region near the border with Turkey and other regions.

Opposition politicians took a similar line during a fierce parliamentary debate Thursday.

They accused the government of having been too slow to put preventative measures in place and of poor coordination between the various government agencies concerned.

Mitsotakis, hitting back, referred to the growing climate crisis, the summer's extended heatwave in Greece and the hot dry winds that had fuelled the fires.

And he pointed out that Greece was far from being the only country to suffer such massive wildfires, pointing to similar disasters this summer in Canada, Spain and the United States.

"Even those countries that have a greater financial capacity than Greece" were unable to cope with the fires, he argued.

He also announced he would be recruiting more firefighters and buying equipment such as drones to help monitor such disasters.

He had sharp words too for "certain scientists" who, he said, saw fit to publish their data on the wildfires in the news media -- such as the extent of the terrain burnt -- when the research that might have put the figures in context had not been completed.

But the National Observatory of Athens was having none of that, hitting back in a statement issued Friday.

"In a democracy and in the era of published data at the European and international level, science and the national research centres are obliged to inform society of the results of their activities and the natural conditions that affect the lives of citizens," it said.

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# CUBAN SCIENTISTS HUNT FOR CLUES TO SAVE CORAL REEFS AS OCEAN TEMPERATURES SOAR

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

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September 02, 2023 01:43 pm | Updated 01:44 pm IST

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A member of the "Bojeo a Cuba" study releases a camera trap to photograph sharks near the coast of Cienfuegos, Cuba, August 31, 2023. | Photo Credit: Reuters

Cuban marine biologist Ariandy Gonzalez emerges uneasy from the sun-speckled Caribbean sea off a remote stretch of Cuba's south coast. Something is not right.

The sea floor, once a mosaic of colourful corals, is now marred by [patchy white splotches](#). That is evidence of heat-related coral bleaching, where stressed corals expel their colorful algae symbionts, leaving them pale and vulnerable.

"I think this is the worst bleaching we've seen yet," Gonzalez told five fellow scientists, hoisting himself into a small diveboat that heaved in churning seas.

Gonzalez is among 18 scientists and crew members who for nearly two months have circumnavigated Cuba in the M/V Oceans for Youth ship to hunt for clues that could help researchers across the globe protect reefs in the face of warming waters, over-fishing, pollution and other threats.

The ongoing "Bojeo a Cuba" study is a snapshot in time of the health of Cuba's reef, fish and sea life, the first of its kind across such a large area of the island's waters, said Dr. Fabian Pina, a Cuban marine biologist and expedition co-leader who initiated the project nearly two years ago.

The project has received funding from the Cuban government and international partners, Pina said.

Preliminary observations - the voyage is still about a week from completion - suggest both good and bad news, the scientists told Reuters in interviews at sea.

The water here, off the island's little developed south-central coast, is a sweltering 90F (32°C), and elsewhere even warmer, the scientists said.

Sea surface temperatures globally have broken records this year. In Florida, just 90 miles (145 km) from Cuba, temperatures soared to hot tub levels, prompting U.S. scientists to warn of the

potential for catastrophic bleaching.

### [Also Read | Low human activity helps corals despite warm ocean](#)

Pina said the expedition's scientists were also disappointed to find few larger specimens of fish like grouper, snapper and sharks even on Cuban reefs that appeared otherwise healthy.

Communist-run Cuba, which faces ongoing food shortages, has struggled to regulate its fisheries, leading to declines in many species and the 2019 passage of a law to bring order to its fishing industry.

But Pina said there was plenty of good news, too.

"We are finding natural wonders almost everywhere we go," the biologist said, noting that many of Cuba's keys and mangrove forests are far more intact than in Florida and some Caribbean neighbors.

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

That could give Cuba's reefs, some of which are thought by scientists to be among the world's most pristine and resilient, an advantage in a changing climate.

"It's still an open question," Pina said. "But the expedition now provides a baseline, so we can come back and check on these reefs and see, for example, if they have recovered from the bleaching they are experiencing."

The team faced challenges - scarce internet, intense heat and a hurricane at sea - but also, glimmers of hope along the 3,541-mile (5,700 km) circumnavigation of the island.

Expedition divers observed an unusually large school of exotically-colored triggerfish in eastern Cuba, and a kaleidoscope of vibrant corals along the ocean floor near the densely-developed tourist destination of Varadero.

And off Guanahacabibes national park in far western Cuba, scientists used camera traps to photograph big, ocean-going sharks, mostly absent across hundreds of miles of coastline the team had already traveled, said Dorka Cobian, an expedition biologist and a researcher at the park.

### [Also Read | Scientists freeze Great Barrier Reef coral in world-first trial](#)

Cobian said she held hope that the peninsula's reefs would bounce back from the recent bleaching, which she said had affected 60-80% of corals in the area.

"This reef is very resilient," she said. "We've suffered many bleaching events, and in general, they have recovered."

Expedition leader Pina said it was still too early to draw anything but preliminary conclusions from the reams of data, video footage and observations collected by the team.

But the biggest lesson was already lying in plain sight, he said.

"Our ecosystems are in general well conserved," he said, struggling to choose a favourite site among so much splendour. "We must find a way to take advantage of the enormous opportunity

that provides."

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# DEARTH OF FACILITIES TO KEEP CAPTURED TIGERS PUTS WILDLIFE MANAGERS IN WAYANAD IN A FIX

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

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September 03, 2023 11:43 pm | Updated 11:50 pm IST - KALPETTA

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Forest officials setting up a cage in a coffee plantation to capture a tiger on the prowl in Panavally area under the North Wayanad Forest Division on September 1, 2023. Photo: Special Arrangement

With big cats on the prowl in human habitats, Forest officials are frequently called upon to capture the animals. But the dearth of facilities to keep the captured big cats often puts wildlife managers in Wayanad in a fix.

In 2022, the Forest department had set up [an animal hospice and a palliative care unit for big cats](#) in the Wayanad Wildlife Sanctuary, home to more than half the number of tigers in the State.

The project was envisaged at treating aged, injured or diseased animals after capturing them from the wild. They would either be rehabilitated in zoos or released into the wild after treatment, depending on the health condition of the animal.

The unit has the capacity to accommodate four animals at a time, but all the slots are filled with captured tigers, according to sanctuary sources. Earlier, wounded and aged captured tigers from the forest in the district used to be shifted to zoos, but the zoo authorities were not willing to receive them due to dearth of space, the sources added.

On September 1, the [Forest department set up two cages](#) to capture two tigers on the prowl at Eralottu Kunnu under the sanctuary and Panavally in the North Wayanad Forest Division in the district after residents raised protests.

Though the department had submitted a proposal to set up one more palliative care unit for captured big cats, it was yet to be approved, said the sources.

Often, wounded or aged tigers enter human habitats in search of easy prey. If a tiger was relocated to a suitable environment in the wild after its capture, it would either survive or die naturally, said N. Badusha, president, Wayanad Prakruthi Samrakshana Samithi. But, if the animal was relocated to the territory of another big cat, it would either be killed or further injured in a territorial fight and become a problematic tiger. Such an animal entered human habitats again for easy prey and became a threat to the public, he added.

A similar incident occurred in Wayanad in 2012 and finally, the captured tiger was shot dead, he said. Hence, it was better to set up a wildlife orphanage for them in degraded forest areas in the district, known for recurring man-animal conflicts, said Mr. Badusha.

A decade ago, a proposal was put forth by the department for the project near the forest area around the Chethalayam waterfalls inside the sanctuary. However, it was yet to turn a reality, he added.

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# OLDEST YET FOSSILS OF A PLANT-EATING DINOSAUR FOUND IN RAJASTHAN

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

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September 03, 2023 10:30 am | Updated 10:30 am IST

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Fossils associated with the backbone of *Tharosaurus indicus*. | Photo Credit: Pragya Pandey

In a [paper published](#) recently in *Scientific Reports*, scientists from IIT Roorkee have characterised dinosaur fossils from the Middle Jurassic period, found in the Thar desert near the Jaisalmer Basin by the Geological Survey of India. They discovered that they had uncovered remains of a sauropod dinosaur, which is the same clade as the long-necked herbivores in *Jurassic Park* – only these happened to be the oldest known fossils of this particular kind of sauropod.

Belonging to the family *Dicraeosauridae* and from the superfamily *Diplodocoidea*, these fossils are the first dicraeosaurid sauropods to have been found in India. And at 167 million years old, they are the oldest known diplodocoid fossils in the world. The scientists named the dinosaur *Tharosaurus indicus*, with *Tharo* deriving from the Thar desert; *saurus* from the Greek ‘sauros’, or lizard; and *indicus* from its Indian origin. The fossils were found by Triparna Ghosh, Pragya Pandey, and Krishna Kumar from the Geological Survey of India.

“The most fascinating feature about sauropods is their size,” said Debajit Datta, a postdoctoral researcher in Sunil Bajpai’s group at IIT Roorkee and one of the lead authors of the paper. “They can grow more than a hundred feet. There are many sauropod groups that are even longer than the blue whale.”

However, members of the *Dicraeosauridae* family of sauropods – to which *Tharasaurus* belongs – were not nearly as large. This family was unique: its members were smaller and had shorter necks and tails compared to the other long-necked sauropods.

Sauropods first appeared on the earth during the Jurassic period, about 200 million years ago. They were one of the most dominant clades of dinosaurs, surviving until the late Cretaceous period 65 million years ago, when the dinosaurs went extinct.

But strangely, in India, while sauropod fossils from the Early Jurassic and the Late Cretaceous period have been found, very few have from the Middle or Late Jurassic period, which would be about 160-180 million years ago.

“The Middle Jurassic remains somewhat of an enigma,” said Advait Jukar, a palaeontologist at

the University of Arizona. “Part of the reason is that we don’t have as many exposed rocks from this time period. We also haven’t put in a lot of effort into exploring these rocks in places where they are exposed, like in India.”

India has also been home to a few early, more primitive sauropods, like *Kotasaurus* and *Barapasaurus*. They were both discovered in the Kota Formation, a geological rock unit in Telangana, from the Early Jurassic period. “We have extremely primitive sauropods, and now we have a dicraeosaur, which is more evolved,” Dr. Datta said. “When we see this in conjunction with the arrangement of the continents in the Middle Jurassic, things start to get interesting.”

Some 167 million years ago when *Tharosaurus* lived, India was not where it is now; it was part of a group of continents in the southern hemisphere with Africa, South America, Madagascar, and Antarctica, together called Gondwanaland. “Considering the fact that we already have more primitive sauropods in India and now the oldest diplodocoid, it is highly likely that India was the site of radiation of these diplodocoid dinosaurs to other parts of the world,” Dr. Datta said.

The scientists reasoned that these diplodocoid sauropods could have originated in India during the Middle Jurassic period and used the land connections at the time to migrate to Madagascar, Africa, and South America. After that they could have made their way to North America and the rest of the world.

Another piece of evidence that supports their theory was that diplodocoid fossils in other continents like Africa, the Americas, and Asia come from a younger geological interval. This increases the possibility that the Indian landmass was the site for the *Tharosaurus*’ early radiation.

That along with the fact that archaic sauropod fossils from during the start of the Jurassic period – like of *Kotasaurus* and *Barapasaurus* – were also found in India suggests that this diplodocoid group of sauropods could have evolved and originated in India.

“This discovery of a new dinosaur from the Middle Jurassic in Rajasthan should not be seen in isolation; it must be looked at in conjunction with previously discovered dinosaurs in India,” Dr. Bajpai said. “Together, the record from India suggests that the Indian landmass was one of the most important places for the early evolutionary history of sauropod dinosaurs.”

Dr. Bajpai cautioned, however, that this was only the beginning. They didn’t find the whole skeleton but parts of the backbone of the dinosaur. “A lot more needs to be discovered. Our science is such that with each new discovery, ideas change, and sometimes even identifications change.”

A palaeogeographic distribution of diplodocoids with taxa of different ages plotted together in a simplified Middle Jurassic (170 Ma) map to show their spatio-temporal distribution across Pangea. Silhouettes indicate the type of diplodocoid and fossil occurrences. Numbers adjoining sauropod silhouettes indicate age of the fossils as follows: 1—Middle Jurassic (early–middle Bathonian); 2—Late Jurassic; 3—Cretaceous; 4—Middle Jurassic. | Photo Credit: Bajpai, S., Datta, D., Pandey, P. et al. Fossils of the oldest diplodocoid dinosaur suggest India was a major centre for neosauropod radiation. *Sci Rep*13, 12680 (2023).

“In the Middle Jurassic, when *Tharosaurus* lived, the continents were beginning to split apart from the supercontinent Pangea, and as these dinosaurs spread, they evolved into new forms,” said Dr. Jukar. “A caveat here is that the fossil record of Middle Jurassic diplodocoids is comparatively poor, and that will heavily influence how we view their evolution and spread. For example, if we find one that’s even older than *Tharosaurus* in, say, Russia, we’ll have to re-

evaluate our geographic hypotheses.”

Dr. Jukar is impressed with the finding, but like Dr. Bajpai, believes that more fossils need to be found. More fossils of different parts of the *Tharosaurus* skeleton or of other related skeletons will help us better understand endemic sauropod evolution in India and global sauropod evolution and biogeography.

“I think *Tharosaurus* is a remarkable find, but it is very fragmentary,” according to Dr. Jukar. “It’s only once we have a better fossil record, not only geographically, but also in terms of fossil completeness, that we can start to get a clear picture of what sauropod evolution was doing during this crucial time in earth history.”

In 2006, an Indo-German team [found](#) another middle Jurassic sauropod dinosaur fossil in the Kutch basin of Gujarat, named *Camarasaurus supremus*, which was also the oldest fossil of that group found at the time. There have been [subsequent finds](#) of extremely old sauropod fossils in the region by the same team since.

Dr. Bajpai said that more work and more expeditions will need to be undertaken in the Jaisalmer area. “This is a potentially important area for the Middle Jurassic dinosaurs in India.”

“Indian dinosaurs are extremely rare,” said Dr. Jukar. “It’s not because they didn’t exist; it’s because we haven’t had the same level of palaeontological interest and investment that we’ve seen in other countries like the U.S., Canada, or China.”

Dr. Bajpai echoed this sentiment, emphasising the need for more attention on paleontological discoveries, specifically given the lack of natural history museums. “We definitely need not one but many natural history museums ... given the vast fossil wealth of our country.”

*Rohini Subrahmanyam is a freelance journalist.*

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# EMERGING COUNTRIES NEED WOMEN-LED CLIMATE ACTION

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

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September 05, 2023 12:08 am | Updated 12:08 am IST

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'Climate change impacts can particularly exacerbate poverty and socioeconomic vulnerabilities among women' | Photo Credit: RITU RAJ KONWAR

"Gender equality and environmental goals are mutually reinforcing and create a virtuous circle that will help accelerate the achievement of the SDGs [Sustainable Development Goals]" (Organisation for Economic Co-operation and Development, 2021)

The impact of climate change is one that has profound consequences for humans and has emerged as one of the biggest global challenges in recent decades. The effects of climate change vary according to location, socioeconomic status, and gender. An International Labour Organization study (2019) said that "...in 2030, 2.2 percent of total working hours worldwide will be lost to high temperatures, a productivity loss equivalent to 80 million full-time jobs". The United Nations (2009) highlighted that across genders, women are considered to be highly vulnerable and disproportionately affected by climate change than men to the impact of climate change.

In addition, women across the world face severe risks to their health, safety, and quality of life. However, women in developing and less developed countries (especially in low-income areas) are more vulnerable to climate change because of their dependence on natural resources and labour-intensive work for their livelihood. Women are more likely to live in poverty than men, which is just one of several social, economic, and cultural variables that makes them more susceptible to the effects of climate change. Women from low-income households are more at risk because they are more responsible for food, water, and other homely unpaid work.

Due to the climate crisis, more time and effort are needed to obtain basic necessities. Rural women often shoulder the burden of ensuring access to clean water, adequate cooking fuel, and nutritious food for their families. Women may be at increased risk for health and safety because they must travel long distances every day to collect water and fuel. This is why climate change has a disproportionate effect on rural women. Women in low-income countries (predominantly South Asia and sub-Saharan Africa) engage in climate-vulnerable occupations such as farming and other labour-intensive work. According to the ILO, over 60% of working women in southern Asia and sub-Saharan Africa are still in agriculture, where they are often underpaid and overworked. Despite being the backbone of the food production system, women own only about 10% of the land used for farming. A McAllister (2023) study has highlighted how there could be



1.2 billion climate refugees by 2050.

According to a UN study, most (80%) of those displaced by climate-related disasters are women and girls. Women, especially those from vulnerable communities, face particular difficulties during and after natural disasters. When women are uprooted, they are more susceptible to prejudice and exploitation. For instance, after the earthquake in Nepal in 2015, the United Nations Population Fund (UNFPA) found women were more exposed to trafficking and exploitation. Separation from social networks, a higher risk of gender-based violence, and decreased access to employment, education, and essential health services, such as sexual and reproductive health care and psychosocial support, are just some gender-specific issues women face.

Women make up a disproportionately large portion of the agricultural workforce in emerging countries. Climate change impacts agricultural productivity negatively and significantly. Heat stress affects workers a lot in this sector, especially in South Asia and Africa. Changing precipitation patterns and more frequent extreme weather events are just the beginning of the problems. Their effects on crop production and food security fall disproportionately on these people, who already face significant challenges in obtaining resources, expertise, and technology. Women engaged in agriculture do not have access to quality inputs and possess low education and technical knowledge. Thus, women farmers and labourers are vulnerable and seriously impacted. Various studies also reflect how flooding has increased water scarcity and also violence against and the exploitation of women.

Climate change impacts can particularly exacerbate poverty and socioeconomic vulnerabilities among women. Climate change is also linked to women's inequality. According to estimates, 130 million people could be pushed into poverty by 2050 due to climate change risks, natural disasters, and food inflation, impacting women's inequality. When it comes to adjusting to a changing climate, women have a lot to offer. Investments in women's education, training, and access to resources are essential if we are to be resilient to the impact of climate change. Reduce the negative impacts of climate change on people's living standards by teaching them how to practise sustainable agriculture, water management, and energy generation. For example, in India, the Self-Employed Women's Association (SEWA) teaches women farmers how to respond to shifting climate patterns to support themselves better financially. Therefore, it is essential to support groups that educate the public, train people to adapt to climate change and invest in women's education and training in environmentally-friendly farming methods.

Women's participation in climate policy decision-making at all levels is crucial for effective climate change mitigation and adaptation strategies as well as getting decent employment. As women face greater risks in climate change, gender parity in decision-making bodies is essential. One such programme in South Asia is the Gender and Climate Change Development Programme, which aims to increase women's influence in policymaking by providing them with a stronger voice. Globally, similar efforts are required for efficient climate change adaptation and mitigation. We can say that developing and emerging countries urgently need women-led climate action.

Ishawar Choudhary is pursuing PhD in Economics in the Department of Economics and Finance at BITS Pilani, Rajasthan. Balakrushna Padhi is Assistant Professor in the Department of Economics and Finance at BITS Pilani, Rajasthan campus. The views expressed are personal

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# TIME TO DECIDE: ON THE HIMALAYAN REGION, ITS CARRYING CAPACITY

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

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September 06, 2023 12:20 am | Updated 08:28 am IST

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The destruction wreaked by the floods in north India in August has evoked concern at the highest levels. Last month, a Bench headed by [Chief Justice of India D.Y. Chandrachud](#) had [suggested that an expert committee](#) conduct a “complete and comprehensive” study on the carrying capacity of the Himalayan region. Following this, the Centre has proposed setting up a 13-member technical committee. “Carrying capacity” is a concept derived from population-biology and generally refers to the quantity of a species that can thrive sustainably in a defined ecosystem. Generally, population exceeding capacity will lead to a natural decline in numbers, as witnessed when grasslands or overgrazed or invasive species throttle existing biome. Applying these ideas in the context of hill-stations and Himalayan States — the challenge is between balancing rising population, infrastructural needs and the precarious geography — is bound to be a challenging enterprise. Going by recent history, it is unlikely that a disinterested scientific opinion will be palatable to every stakeholder in the Himalayan States. Following the devastating floods in Uttarakhand in 2013, the Supreme Court had appointed a committee of experts to evaluate the role of hydropower projects in the State. While the committee’s reports did influence a reduction in the proposed hydro projects, they failed to restrict road-widening projects and the carving up of mountainsides in ways that were deemed unsuitable for the topography.

The latest proposal by the Centre is not new; as far back as 2020, it had circulated, among the 13 Himalayan States, guidelines to assess the carrying capacity of their hill stations, cities and eco-sensitive zones. The Environment Ministry had in May reminded all the States to undertake such a study and submit them “as early as possible”. The crisis of land subsidence experienced in Joshimath, Uttarakhand, in January had also sparked a debate on the conflict between infrastructural development and ecology, but in a matter of months, Himachal Pradesh saw an unexpected deluge washing away roads and highways built on denuding mountains. More committees and reports will not change the reality that infrastructure development in the hills cannot be executed as in the plains. Either States must bear the higher cost that comes from building more sustainably and minimising the risk to denizens, or designate regions as no-go zones. The latter has for decades provided fertile ground for political opportunism. As unequivocal scientific evidence concludes, the option to kick the proverbial can down the road no longer exists.

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# INDIA WAS A TREE PLANTING LABORATORY FOR 200 YEARS – HERE ARE THE RESULTS

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

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September 05, 2023 09:33 pm | Updated 09:34 pm IST

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Allowing forests to regenerate on their own has been championed as a strategy for reducing planet-heating carbon in the atmosphere while also boosting biodiversity, the benefits ecosystems offer and even the fruitfulness of livelihoods. | Photo Credit: Velankanni Raj B/The Hindu

Allowing [forests](#) to regenerate on their own has been championed as a strategy for reducing planet-heating carbon in the atmosphere while also boosting biodiversity, the benefits ecosystems offer and even the fruitfulness of livelihoods.

But efforts to increase global tree cover to limit climate change have [skewed](#) towards erecting plantations of fast-growing trees. The reasons are obvious: planting trees can demonstrate results a lot quicker than natural forest restoration. This is helpful if the objective is generating a lot of timber quickly or certifying carbon credits which people and firms buy to supposedly offset their emissions.

While plantations on farms and barren land can provide firewood and timber, easing the pressure on natural forests and so aiding their regeneration, ill-advised tree planting can unleash invasive species and even dispossess people of their land.

[Explained | Global tropical primary forest cover continued decline in 2022: study](#)

For more than 200 years India has experimented with tree plantations, offering important lessons about the consequences different approaches to restoring forests have on local communities and the wider environment. This rare long-term perspective should be heeded by foresters today to prevent past mistakes being repeated.

Britain extended its influence over India and controlled much of its affairs via the East India Company from the mid-18th century onwards. Between 1857 and 1947, the Crown ruled the country directly and turned its attention to the country's forests.

Britain needed great quantities of timber to lay railway sleepers and build ships in order to transport the cotton, rubber and tea it took from India. Through the Indian Forest Act of 1865, forests with high-yielding timber trees such as teak, sal and deodar became state property.

To maximise how much timber these forests yielded, British colonial authorities restricted the rights of local people to harvest much beyond grass and bamboo. Even cattle grazing was restricted. Indian communities [retaliated](#) by burning down some of the forests.

Meanwhile, plantations of teak (*Tectona grandis*), a species well adapted to India's hot and humid climate and a source of durable and attractive timber, spread aggressively. Pristine grasslands and open scrub forest gave way to teak monocultures.

### [Also Read | Green washing: On amendments and the Forest \(Conservation\) Amendment Bill, 2023](#)

Eucalyptus and other exotic trees which hadn't evolved in India were introduced from around 1790. British foresters planted pines from Europe and North America in extensive plantations in the Himalayan region as a source of resin and introduced acacia trees from Australia for timber, fodder and fuel. One of these species, wattle (*Acacia mearnsii*), first introduced in 1861 with a few hundred thousand saplings, was planted in the Nilgiris district of the Western Ghats.

This area is what scientists call a biodiversity hotspot – a globally rare ecosystem replete with species. Wattle has since become [invasive](#) and taken over much of the region's mountainous grasslands.

Similarly, pine has spread over much of the Himalayas and [displaced native oak trees](#) while teak has [replaced sal](#), a native hardwood, in central India. Both oak and sal are valued for fuel, fodder, fertiliser, medicine and oil. Their loss, and [the loss of grazing land](#), impoverished many.

### [Why It Matters | India lost 668,400 ha of forest cover in the last 30 years](#)

India has [pledged](#) to restore about 21 million hectares of forest by 2030 under the Bonn Challenge. [A progress report](#) released by the government of India and the International Union for Conservation of Nature (IUCN) in 2018 claimed around 10 million hectares was under restoration.

This focus on increasing the area of land covered with trees is reflected in India's national forest policy, which aims for trees on 33% of the country's area. Schemes under this policy include plantations consisting of a single species such as eucalyptus or bamboo which grow fast and can increase tree cover quickly, demonstrating success according to this dubious measure.

Sometimes these trees are planted in grasslands and other ecosystems where tree cover is naturally low. The [result](#) is that afforestation harms rural and indigenous people who depend on these ecosystems for grazing and produce. The continued planting of exotic trees risks new invasive species, in a similar way to wattle 200 years ago.

There are positive case studies too. The Forest Rights Act of 2006 empowered village assemblies to manage forest areas which had once been in traditional use. Several assemblies (known as *Gram Sabhas*) in the Gadchiroli district of central India have restored degraded forests and managed them as a sustainable source of [tendu leaves](#), which are used to wrap bidi (Indian tobacco). In the Kachchh grasslands of western India communities were able to restore grasslands by removing the invasive *gando bawal* (meaning "mad tree") first introduced by British foresters in the late 19th century.

The success of forest restoration efforts cannot be measured by tree cover alone. The Indian government's definition of "forest" still encompasses plantations of a single tree species, orchards and even bamboo, which actually belongs to the grass family.

This means that biennial forest surveys cannot quantify how much natural forest has been restored, or convey the consequences of displacing native trees with competitive plantation species or identify if these exotic trees have invaded natural grasslands which have then been falsely recorded as restored forests.

Natural forest regeneration and plantations for timber and fuel should both be encouraged, but with due consideration of how other ecosystems and people will be affected. This includes carefully choosing plantation species to ensure they don't become invasive.

The objective of increasing tree cover should be assessed in terms of its implications for forest rights, local livelihoods, biodiversity and carbon storage. Some of the best practices on restoration through communities such as Gadchiroli should be studied and scaled up.

Planting trees does not necessarily mean a forest is being restored. And reviving ecosystems in which trees are scarce is important too. Determining whether local people and the environment are benefiting is [a more helpful](#) measure of success than simply scanning a forest canopy from above.

[Dhanapal Govindarajulu](#), Postgraduate Researcher, Global Development Institute, [University of Manchester](#)

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# BOTANICAL SURVEY OF INDIA GETS PATENT FOR BAMBOO BASED REUSABLE STRAW

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

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September 07, 2023 01:23 am | Updated 02:16 am IST - Kolkata

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BSI Scientist Lal Ji Singh working on reusable straw and its manufacturing. | Photo Credit: Special Arrangement

The patent office of Government of India has granted a patent to Botanical Survey of India for 'reusable straw and its manufacturing'. The reusable straw is developed from a species of endemic bamboo plant which is found in the Andamans and Nicobar Islands.

The bamboo species *Schizostachyum andamanicum* was discovered on the island about three decades ago and now its economic potential has received a boost with the granting of the patent for reusable straw and its manufacture.

Lal Ji Singh, regional head and scientist at BSI's Andaman and Nicobar Regional Centre in Port Blair said that this species of bamboo is characterized by a thin large hollow erect culm (stem) with long internodes and has potential for developing into a straw.

"It is a novel way to replace plastic straws with an organic alternative. This is a future technology to enhance the economy of farmers and bamboo growers of the island, if they cultivate this endemic bamboo species at a commercial level," Dr. Singh, who is the behind the invention said.

The bamboo straw which has received the patent. | Photo Credit: Special Arrangement

Work on the bamboo straw started at Dhanikhari Experimental Garden-cum-Arboretum, at the BSI Regional Centre in 2011. The application for patent was made in 2018 and the patent was granted earlier in the year 2023, Dr. Singh said. The scientist said that during studies he found that morpho-anatomical structure of culm internodes of the endemic bamboo were identical to modern synthetic drinking straws which led to the idea for this novel invention.

"The germplasm of the bamboo species is only found in some forested areas of Andamans and large-scale production of the straw will be dependent on commercial cultivation of the species," the scientist said.

Director of BSI A.A. Mao said that the patent for the reusable straw is a welcome development for the organisation. Dr. Mao, however, added that straws made from the Bamboo are already



being used in India, giving credit to the BSI for the invention.

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# THIS SUMMER WAS A GLOBAL RECORD BREAKER FOR THE HIGHEST HEAT EVER MEASURED, METEOROLOGISTS SAY

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

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September 07, 2023 01:47 am | Updated 01:47 am IST - GENEVA

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The world's oceans — more than 70% of the Earth's surface — were the hottest ever recorded. File. | Photo Credit: Getty Images

Earth has sweltered through its hottest Northern Hemisphere summer ever measured, with a record warm August capping a [season of brutal and deadly temperatures](#), according to the World Meteorological Organization.

Last month was not only the hottest August scientists ever recorded by far with modern equipment, it was also the second hottest month measured, [behind only July 2023](#), WMO and the European climate service Copernicus announced Wednesday.

August was about 1.5 degrees Celsius (2.7 degrees Fahrenheit) warmer than pre-industrial averages. That is the threshold that the world is trying not to pass, though scientists are more concerned about rises in temperatures over decades, not merely a blip over a month's time.

**Editorial | [Mercury rising: On an 'era of global boiling'](#)**

The world's oceans — more than 70% of the Earth's surface — were the hottest ever recorded, nearly 21 C (69.8 F), and have set high temperature marks for three consecutive months, the WMO and Copernicus said.

“The dog days of summer are not just barking, they are biting,” United Nations Secretary-General Antonio Guterres said in a statement. “Climate breakdown has begun.”

So far, 2023 is the second hottest year on record, behind 2016, according to Copernicus.

Scientists blame ever warming human-caused climate change from the burning of coal, oil and natural gas with an extra push from a natural El Niño, which is a temporary warming of parts of the Pacific Ocean that changes weather worldwide. Usually an El Niño, which started earlier this year, adds extra heat to global temperatures but more so in its second year.

Climatologist Andrew Weaver said the numbers announced by WMO and Copernicus come as

no surprise, bemoaning how governments have not appeared to take the issue of global warming seriously enough. He expressed concern that the public will just forget the issue when temperatures fall again.

“It’s time for global leaders to start telling the truth,” said Weaver, a professor at the School of Earth and Ocean Sciences at the University of Victoria in Canada. “We will not limit warming to 1.5 C; we will not limit warming to 2.0 C. It’s all hands on deck now to prevent 3.0 C global warming — a level of warming that will wreak havoc worldwide.”

Copernicus, a division of the European Union’s space program, has records going back to 1940, but in the United Kingdom and the United States, global records go back to the mid 1800s and those weather and science agencies are expected to soon report that the summer was a record-breaker.

“What we are observing, not only new extremes but the persistence of these record-breaking conditions, and the impacts these have on both people and planet, are a clear consequence of the warming of the climate system,” Copernicus Climate Change Service Director Carlo Buontempo said.

Scientists have used tree rings, ice cores and other proxies to estimate that temperatures are now warmer than they have been in about 120,000 years. The world has been warmer before, but that was prior to human civilization, seas were much higher and the poles were not icy.

So far, daily September temperatures are higher than what has been recorded before for this time of year, according to the University of Maine’s Climate Reanalyzer.

While the world’s air and oceans were setting records for heat, Antarctica continued to set records for low amounts of sea ice, the WMO said.

“Antarctic sea ice extent was literally off the charts, and the global sea surface temperature was once again at a new record,” WMO’s secretary-general, Petteri Taalas, said in a statement released to the media. “It is worth noting that this is happening BEFORE we see the full warming impact of the El Nino event, which typically plays out in the second year after it develops.”

A strong El Nino coincided with the all-time high temperatures in 2016. The U.N. weather agency earlier this year rolled out predictions that suggest Earth would within the next five years have a year that averages 1.5 degrees Celsius warmer than in the mid 19th century. Each year at or near 1.5 matters.

It also predicted 98% chance of breaking the 2016 record between now and 2027.

The new readings on high global temperatures came as WMO released Wednesday its latest bulletin on air quality and climate, noting that extreme heat, compounded by wildfires and desert dust, has had a measurable impact on air quality, human health and the environment.

WMO scientific adviser Lorenzo Labrador lamented the deteriorating air quality around the globe and cited “record-breaking wildfire season” in many parts of the world, including western Canada and Europe.

“If heat waves increase as a result of El Nino, we may probably expect a further degradation in air quality as a whole,” he said.

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# HIGH HOPES FOR CLIMATE AND ENERGY OUTCOMES AT SUMMIT AS INDIA TAKES LEAD

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

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September 08, 2023 01:02 am | Updated 01:02 am IST - New Delhi

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Municipal workers clean a side walk near a billboard featuring Prime Minister Narendra Modi ahead of this week's summit of the Group of 20 nations, in New Delhi, on Sept. 7, 2023. | Photo Credit: AP

As leaders gather for G-20 Summit in New Delhi, experts on Thursday said securing consensus on multilateral development bank (MDB) reforms and adopting rigorous language regarding the phasing down of unabated fossil fuels could enhance India's leadership role.

The G-20 countries — responsible for 85% of the world's GDP and 80% of the emissions — failed to [reach consensus](#) at the Energy and Climate Ministers' meetings in July on the phasing down of unabated use of fossil fuels, tripling renewable energy capacity to 11 terawatts by 2030 and providing low-cost financing to developing countries — issues critical to limiting global average temperature rise to 1.5 degrees Celsius. Despite the complexity of discussions and uncertainties surrounding energy transition and MDB reforms, there is optimism that the summit's leaders can find a minimum consensus to demonstrate unity.

India hopes to get the governments to agree on a fossil phase down. However, if this doesn't find place in the final text, there's a risk of backsliding on the coal phase-down agreed upon at the Bali summit in the previous year.

At the G-20 energy ministerial, Saudi Arabia led opposition to fossil fuel phase-down efforts, while the G-7 nations had earlier committed to accelerating the phase-out of fossil fuels. Sultan Al Jaber, the President of the next UN climate talks, has stressed that the phase-down of fossil fuels is "inevitable" but contingent upon a substantial increase in renewable energy capacity worldwide. Experts, however, anticipate limited progress on fossil fuel discussions at the G-20.

R.R. Rashmi, Distinguished Fellow and Programme Director at The Energy and Resources Institute, said, "On the issue of fossil fuels, it is unlikely that there will be any language additional to what was agreed in Bali due to lack of global advancement and concrete action, despite India's push, on technology, hydrogen, blue economy, and circular economy."

T. Jayaraman, Senior Fellow (Climate Change) at the M.S. Swaminathan Research Foundation, said that considering the vast diversity within the bloc, spanning from the lowest emitter, India, to the highest emitter, the U.S., any global targets set at the G-20 must account for this

differentiation and acknowledge varied national circumstances explicitly in terms of actual numbers.

At 2.4 tCO<sub>2</sub>e (tonne carbon dioxide equivalent), India's per capita greenhouse gas emission is far below the global average of 6.3 tCO<sub>2</sub>e.

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# U.N. SAYS MORE NEEDED 'ON ALL FRONTS' TO MEET CLIMATE GOALS

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

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September 09, 2023 02:18 am | Updated 02:18 am IST

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A view of the United Nations Climate Change Conference flags held in Bonn, Germany in June 2023. | Photo Credit: Reuters

The world is not on target to curb global warming and more action is needed on all fronts, the United Nations warned on Friday, in the run-up to crucial international talks aimed at stemming the climate crisis.

The Global Stocktake report, the latest warning from the U.N. about environmental perils, will form the basis of the COP28 talks in Dubai at the end of the year and follows months of wildfires and soaring temperatures.

The report, culminating a two-year evaluation of the 2015 Paris climate agreement goals, distils thousands of submissions from experts, governments and campaigners and will lay the groundwork for the global stock-take discussion at COP28.

"The Paris Agreement has driven near-universal climate action by setting goals and sending signals to the world regarding the urgency of responding to the climate crisis," it said. "While action is proceeding, much more is needed now on all fronts."

Nearly 200 countries agreed in 2015 in Paris to limit warming to no more than 2 Celsius above pre-industrial levels, and to strive to keep the increase to 1.5 C.

While each country is responsible for deciding its own climate actions, they also agreed to submit to a progress report by 2023 to see what more should be done.

The U.N. said existing national pledges to cut emissions were insufficient to keep temperatures within the 1.5 C threshold. More than 20 gigatonnes of further CO2 reductions were needed this decade - and global net zero by 2050 - in order to meet the goals, the U.N. assessment said.

In Friday some of the world's most climate vulnerable countries said the report should spur action from global leaders.

"With leaders gathering this month for the United Nations Secretary General's Climate Ambition Summit ahead of COP28, the findings and recommendations of this Report need to be a wake-



up call and a trigger for cogent commitments," said Pa'olelei Luteru, chair of the Association of Small Island States.

The report urged countries to cut the use of "unabated" coal power by 67-92% by 2030 versus 2019 levels and to virtually eliminate it as a source of electricity by 2050.

Low and zero-carbon electricity should account for as much as 99% of the global total by mid-century, while technological challenges holding back carbon capture must be resolved.

The report also called for funding to be unlocked to support low-carbon development, noting that billions of dollars were still being invested in fossil fuels.

"It serves up a bold to-do list for governments to limit warming to 1.5C and protect people everywhere from climate devastation," said Tom Evans, policy advisor on climate diplomacy at British climate think tank E3G.

Commitment is needed to phase out fossil fuels, set 2030 targets for renewable energy expansion, ensure the financial system funds climate action, and raise funds for adaptation and damage, he said.

"Anything less will fall short on the necessary steps laid out in this report."

Sultan Al Jaber, who will preside over the Nov. 30-Dec. 12 summit in the United Arab Emirates (UAE), told *Reuters* the stock take gave good direction, and urged states and private sector leaders to come to COP28 with real commitments.

Also on Friday, U.N. Secretary-General Antonio Guterres told G20 bloc leaders that they have the power to reset a climate crisis that is "spinning out of control".

A Brazilian climate official told Reuters: "What we need is an unprecedented mobilization both in terms of scale and speed of all of humanity's financial, technology, and capacity building resources to be channeled towards sustainable development."

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# EXPOSURE TO AIR POLLUTION LINKED WITH LOWER BIRTH WEIGHT IN BABIES: STUDY

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

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September 08, 2023 06:28 pm | Updated 07:40 pm IST

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There is a need to reduce air pollution and make towns and cities greener to help protect babies and their developing lungs from potential harm, a new research said. | Photo Credit: AP

Exposure to [air pollution](#), even at relatively low levels, is associated with women giving birth to smaller babies, according to a study.

The research, to be presented at the European Respiratory Society International Congress in Milan, Italy from September 9-13, also shows that women living in greener areas give birth to bigger babies and this may help counteract the effects of pollution.

There is a strong relationship between birthweight and lung health, with low birthweight children facing a higher risk of asthma and higher rates of chronic obstructive pulmonary diseases (COPD) as they grow older, the researchers said.

There is a need to reduce air pollution and make towns and cities greener to help protect babies and their developing lungs from potential harm, they said.

**Also Read | [For an expanse of blue, with air so clean](#)**

The study was based on data from the Respiratory Health in Northern Europe (RHINE) study and presented by Robin Mzati Sinsamala, a researcher at the University of Bergen (UiB), Norway.

It included 4,286 children and their mothers living in five European countries -- Denmark, Norway, Sweden, Iceland and Estonia.

The researchers gauged the greenness of the areas where the women were living during pregnancy by measuring the density of vegetation on satellite images. This vegetation includes forests and farmland as well as parks in urban areas.

They also used data on five pollutants: nitrogen dioxide (NO<sub>2</sub>), ozone, black carbon, and two types of particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>).

The average levels of air pollution were within European Union standards.

**Explained | [Is air pollution driving the rise of antibiotic resistance?](#)**

Researchers compared this information with the babies' birthweights, taking account of factors that are known to affect birthweight, such as mother's age, whether the mothers smoked or had any other health conditions.

They found that higher levels of air pollution were linked with lower birthweights, with small particulate matter PM2.5, relatively bigger pollution particles PM10, NO2 and black carbon associated with average reductions in birth weight of 56, 46, 48 and 48 grammes, respectively.

When researchers took greenness into account, the effect of air pollution on birthweight was reduced. Women who lived in greener areas had babies with slightly higher birth weight -- 27 grammes heavier on average -- than mothers living in less green areas.

"The time when babies are growing in the womb is critical for lung development. We know that babies with lower birthweight are susceptible to chest infections, and this can lead on to problems like asthma and COPD later on," Sinsamala said.

"Our results suggest that pregnant women exposed to air pollution, even at relatively low levels, give birth to smaller babies. They also suggest that living in a greener area could help counteract this effect," the researcher added.

The team noted that it could be that green areas tend to have lower traffic or that plants help to clear the air of pollution, or green areas may mean it is easier for pregnant women to be physically active.

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# CLIMATE CHANGE PUSHES BORDEAUX WINEMAKERS TO HARVEST AT NIGHT

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

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September 08, 2023 05:45 pm | Updated 05:45 pm IST

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A worker drives a tractor during a grape harvesting before sunrise at the Tutiac vineyards in Val-de-Livenne, southwestern France, on September 6, 2023. Better for the mechanics, better for the picker and better for the rosé: the harvest is carried out at night to preserve the freshness of the grapes, a practice that is becoming more widespread in the face of global warming. | Photo Credit: AFP

In France's southern Bordeaux region, the grape harvest is often now done at night to ensure the peak freshness required to obtain the best wine but this is also a response to climate change.

With the country sweltering in a late heatwave, it is 20 degrees Celsius (68 degrees Fahrenheit) at five in the morning as a harvester crawls along a row of vines, powerful headlights helping guide its way through the darkness.

"Harvesting at night is done for the quality of the grapes, their freshness and taste," said the driver, Loic Malherbe, who has been at it for three hours already.

[Also Read | Rising living expenses, climate inaction spark protest in France](#)

"It isn't bad, it's just life at a different rhythm... It's better for the equipment and for people."

It is already a common practice in several winemaking countries with hot summers but one that is likely to become even more common as climate change accelerates.

Harvesting at night can also help financially strapped growers save money, according to Kees Van Leeuwen, a professor of viticulture at Bordeaux Sciences Agro university.

It means they can skip refrigerating grapes while they are being hauled to be pressed, he explained.

Red grapes are seen in a truck as a machine harvesting grapes drives through a vineyard during a night harvest in Valvigneres in the Ardeche department, France, August 23, 2023. | Photo Credit: Reuters

"If harvesting is done at night the temperature of the grapes is lower, especially compared to the very hot days we've had this week," he said.

"There is a huge saving in energy use."

The harvester dumps the merlot grapes into bins which the vineyard's owner Stephane Heraud hitches to his tractor to haul to the cooperative.

"It's been 15 years that we've harvested the whites and the roses at night, and maybe one day we'll do that for the reds as well," said Heraud, who also heads the cooperative Vignerons de Tutiac.

"If we harvested at night, we'd have wine that is more oxidised, which in terms of taste is not nearly as nice."

Heraud climbs up onto his tractor and spreads dry ice (-80C, -112F) onto the grapes.

This not only helps keep the grapes cool but reduces the oxygen level in the bins as he drives to the cooperative, which is the largest in one of France's protected designation regions with 500 growers.

Tutiac has specialised in roses and accounts for nearly a third of the total produced in the Bordeaux region.

Its pesticide-free rose caused a stir at a blind tasting conducted by the French wine magazine La Revue des vins de France, being placed fourth among roses from the Provence region which traditionally take top marks in the category.

That night, growers were expected to dump some 500 tonnes of grapes into the various stainless-steel tanks at the wine press, enough to make half a million bottles of wine.

Tutiac's chief oenologist Paul Oui said consumers like roses that are light coloured and clear.

To achieve that "you have to limit the transfer of the colour from the skin to the juice and the earlier and cooler we harvest the more we can limit the transfer", he said.

Night harvesting is already common in Australia and California due to the heat, and the practice is spreading in the Bordeaux region according to Van Leeuwen.

[Also Read | Exploring the blue in the India-France partnership](#)

"For whites and roses, one can imagine that it will become common practice," said the specialist.

Nor did he exclude that it might one day concern grapes for red wine, which account for 85 percent of Bordeaux's production.

Rising temperatures make grapes mature faster and push the harvest sooner and into warmer periods, and Heraud confirmed that harvests were indeed happening sooner and sooner.

"I remember when I was small watching my parents harvesting in November," he said.

"Last year, we were finished on September 30..." he added.

"Anyone who says climate change isn't real isn't a Bordeaux winemaker."

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## EXPLAINED

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

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September 10, 2023 04:50 am | Updated 04:50 am IST

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E-waste management is largely informal in India, as in the case of recycling. | Photo Credit: Getty Images/iStockphoto

**The story so far:** The Indian Cellular and Electronics Association (ICEA) on August 28 released a report on 'Pathways to Circular Economy in Indian Electronics Sector,' following a government effort with NITI Aayog to explore opportunities to harness e-waste. The report talks about changing the outlook on e-waste management to build a system where discarded electronics can have a new life, either by themselves, or by reintroducing components and precious metals into new hardware. There could be an additional \$7 billion market opportunity in harnessing e-waste, the report said.

[E-waste management](#) is largely informal in India, as in the case of recycling. "Roughly 90% of collection and 70% of the recycling are managed by a very competitive informal sector," the ICEA report says. The informal sector is good at salvaging older devices for parts and profiting from repairs with them. Then there are almost industrial hubs like Moradabad, where printed circuit boards (PCBs) arrive in the tonnes to have gold and silver melted out of them and sold.

The Union Government notified the E-Waste (Management) Rules, 2022 last November in order to digitise the process and provide more visibility to the movement of e-waste in the economy. The level of e-waste may grow, too, as phones get cheaper and people use them more on the back of cheaper data plans. "There has been a significant increase" in people damaging their phones (as opposed to the devices simply getting too old to keep working), Kunal Mahipal, the founder of repair firm Onsitego, said.

The informal sector relies on a number of tools and techniques to stay competitive. For instance, the report's authors speak of 'cannibalisation,' a euphemism for repair shops buying whole devices and breaking them down to serve as spare parts for repair. As tariffs for finished products are sometimes lower than they are for parts, this works out in the repair shop's favour.

Demand for electronics is growing across all price segments, even as the production of these devices entails the use of scarce elements and high emissions. Instead of merely salvaging these parts, a circular economy seeks to bring them back into the electronics ecosystem. "Every material as it's produced on earth is a resource and not waste," Alkesh Kumar Sharma, until recently the Union IT Secretary, said during the ICEA report's launch. "It's wealth. We have to create more wealth."



Sandip Chatterjee, a senior director at the IT Ministry who has focused on e-waste related issues, said that there needed to be a policy push to encourage manufacturers to reuse old components. “By 2019, China ensured that 5% of their secondary raw material went into manufacturing of new products,” Dr. Chatterjee said. “By 2030, they are targeting 35%.”

The ICEA report suggests public-private partnerships to distribute the costs of setting up a sprawling “reverse supply chain,” an expensive prospect that envisages collecting devices from users, wiping them clean of personal data, and passing them along for further processing and recycling. It also suggests launching an auditable database of materials collected through this process, and creating geographical clusters where these devices come together and are broken apart. A key recommendation is to incentivise so-called ‘high yield’ recycling centres. Facilities that recycle are generally not equipped to extract the full potential value of the products they handle, for instance extracting minute but precious amounts of rare earth metals in semiconductors. The IT Ministry launched a scheme last April to cover 25% of the capital expenditure on such facilities.

Simply encouraging repair and making products last longer — perhaps by supporting a right to repair by users — is also a policy recommendation that may reduce the environmental burden of electronic waste.

Beyond the large informal sector that is hard to track or hold to environmental norms, there are basic challenges. For instance, a whopping 200 million devices are estimated to be lying at consumers’ homes, who don’t hand them in for recycling after they stop using them. Sundeep Singh, an Accenture executive who worked on the ICEA report, said that many people are concerned about what may happen to the personal data on their devices if they hand them in for recycling.

Building recycling plants on a large scale also requires more than the initial capital costs. “Material is a real challenge for our economic growth,” Dr. Chatterjee pointed out. “Where is the material? ... Two big firms came to us, interested in investing in recycling plants. But they don’t have material. They’re not asking for an import licence — they [just] want their plants stabilised.” And the materials to stabilise these plants are ‘scattered,’ he said.

**Also read | [Smartphones contribute to 12% of global e-waste, report says](#)**

Making a circular economy out of e-waste is tempting, especially given the unpredictable supply chains for electronics components. Extracting the full value of electronics is capital intensive, and will require better clustering of materials, and a viable business model. The challenge is to be able to replicate the success of the informal sector in a formalised and reliable way. But a shrinking availability of ‘virgin’ components may not be a prospect that can be ignored for too long, Mr. Mahipal said. “It is only a matter of time before the country has to focus on how to give a second life not just to products but also to parts,” he warned.

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## EXPLAINED

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

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September 10, 2023 04:35 am | Updated 09:07 am IST

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The Organised Crime and Corruption Reporting Project found evidence that Vedanta has been an important donor to BJP. Two entities linked to a Vedanta subsidiary gave 43.5 crore to the party between 2016 and 2020. File | Photo Credit: The Hindu

**The story so far:** In early 2022, the [Union Environment Ministry relaxed regulations](#) to allow mining companies to increase production by up to 50% without needing to hold public hearings, which was a key requirement for the environmental clearance process. [According to a report by the Organised Crime and Corruption Reporting Project \(OCCRP\)](#), the move followed extensive lobbying by the Vedanta group in 2021 when the world and India was in the grip of the COVID-19 pandemic.

The Ministry of Environment, Forest and Climate Change eased regulations to allow mining companies to increase production by up to 50% without needing to hold public hearings. Public consultations are where local people raise their concerns about how an expansion would impact their lives and livelihoods. Many in the industry considered this the most “onerous” requirement of the clearance process.

The Environment Ministry also published an amendment to the country’s Environmental Impact Assessment (EIA) law in early 2020 that exempted oil and gas exploration projects from having to hold public hearings. The change also downgraded the risk ratings of these projects, meaning they only had to be given the green light by State authorities, rather than by experts in the Environment Ministry. The recent amendments to the forest conservation law too ensure that explorers will get prompt access to thousands of square kilometres of deemed forest areas for seismic surveys by obviating the need for time-consuming permits.

The [OCCRP report](#) claims that the restrictions were removed following lobbying by mining giant Vedanta group whose chairperson Anil Agarwal in a letter to then Environment Minister Prakash Javadekar in January 2021, said the government could add “impetus” to India’s “rapid” economic recovery by allowing mining companies to boost production by up to 50% without having to secure new environmental clearances. The mining industry had already spent years before the pandemic trying to scrap regulations that required new environmental approvals when companies increased production.

Loosening environmental regulations for miners wasn’t the company’s only successful lobbying campaign. One of the company’s subsidiaries, Cairn Oil & Gas, also started lobbying to scrap public hearings for oil exploration projects. As with mining, the government quietly amended the

law with no public consultation. Since then, at least six of Cairn's oil projects in the northern deserts of Rajasthan have been approved for development.

Environmental experts claim the government approved the changes without public consultation. The environment ministry changed the mining regulations by publishing an office memo — meant to be used for inter-office communication — on its website. By modifying important regulations using instruments like office memos, without any public debate, the government may have skirted the law, according to a study of pandemic-era regulatory changes by the Vidhi Centre for Legal Policy.

Though the head of a major industry lobby group and India's mining secretary also pressed for the rules to be loosened, internal documents and government sources suggest Vedanta's lobbying was key, the report says.

OCCRP found evidence that Vedanta has been an important donor to the Bharatiya Janata Party (BJP). Two entities linked to a Vedanta subsidiary gave 43.5 crore to the party between 2016 and 2020, according to contribution reports filed with the Election Commission by the BJP and one of the entities. The donations from just one of these trusts, Bhadram Janhit Shalika, put it in the top 10 donors to the BJP between the fiscal years 2016-2017 and 2021-22, according to data compiled by the Association for Democratic Reforms. The amount could be more because Vedanta has also made political donations through electoral bonds.

India is the world's third-largest emitter of greenhouse gasses, and its ability to regulate its heavy industries is crucial to the global effort to combat climate change. The EIA is an important part of the mitigation hierarchy, a tool used to limit the amount of damage an action, such as a development of a new mine, will have on the environment.

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## 67 SPECIES OF REPTILES, 59 AMPHIBIANS RECORDED IN WAYANAD FOREST SURVEY

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

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September 09, 2023 07:52 pm | Updated September 10, 2023 02:30 am IST - KALPETTA

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The rare species of reptiles and amphibians identified in the first comprehensive herpetofaunal survey in the South Wayanad forest division . 1) Nilgiri-Spiny-Lizard | Photo Credit: SPECIAL ARRANGEMENT

As many as 67 species of reptiles and 59 species of amphibians were identified in the first herpetofaunal survey that concluded recently in the South Wayanad Forest Division.

Of these, four amphibians and three reptiles were spotted for the first time at the forest division. Of the 126 species identified, 48 amphibians and 21 reptiles are endemic to the Western Ghats.

Wayanad Shieldtail Snake | Photo Credit: SPECIAL ARRANGEMENT

Nilgiri Forest Lizard | Photo Credit: SPECIAL ARRANGEMENT

Starry Night Frog | Photo Credit: SPECIAL ARRANGEMENT

Red Stream Toad | Photo Credit: SPECIAL ARRANGEMENT

Malabar Torrent Toad | Photo Credit: SPECIAL ARRANGEMENT

More than 100 volunteers from institutions across the State and nearly 70 frontline forest staff took part in the survey, which envisaged drafting new strategies to conserve small animals like amphibians and reptiles.

Sandeep Das, National Post-Doctoral Fellow, Department of Zoology, University of Calicut; K.P. Rajkumar, Wildlife Biologist, Shola National Park; and Nitin Divakar Research Scholar, Kerala Forest Research Institute, Peechi, led the survey.

The important amphibian species recorded during the survey include Starry Night Frog, bearing a constellation of blue dots on its obsidian body; Miniature Night Frog, the tiniest frog in the country; and endangered species such as Malabar Torrent Toad and Red Stream Toad.

The Naked Dancing Frog, previously associated only with areas in the Wayanad Wildlife Sanctuary, was also sighted during the survey. The survey commenced with the recording of the

Green Tree Frog and culminated with a compendium of 59 amphibians, of which over 80% are uniquely found in the Western Ghats. Of the 67 reptile species sighted, 21 are unique to the Western Ghats, says Dr. Das.

Species like the Wayanad Dravidogecko, Nilgiri Spiny Lizard, and the Nilgiri Forest Lizard added depth to the survey's significance. The presence of Shieldtail snake, predominantly from Wayanad, brought forth the region's crucial role in global conservation discussions, Dr. Rajkumar said.

Dr. Das emphasised the pressing need for studies on these amphibian and reptilian species which are mostly neglected. He advocated a broader outreach, addressing myths and fears, to ensure that these ecological treasure troves are protected. Mr. Divakar lauded the South Wayanad Forest Division for its biodiversity, which surpassed even well-known sanctuaries due to its diverse habitats.

The five-day programme was organised jointly by the Forest department, South Wayanad Forest Development Agency, and Aranyakam Nature Foundation. Wildlife photographer Dhritiman Mukherjee handled a session on nature photography and its pivotal role in conservation. South Wayanad divisional forest officer A. Sajna coordinated the programme.

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## G-20 SUMMIT

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

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September 09, 2023 11:10 pm | Updated September 10, 2023 08:29 am IST - New Delhi

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The G-20 declaration adopted here accepted the disproportionate impact of climate change on all women and girls. Representational file image. | Photo Credit: PTI

The [G-20 nations](#) on September 9 resolved to increase women's participation and leadership in [climate change mitigation](#) and adaptation, and support gender-responsive solutions to build resilience to the impact of climate change.

The [G-20 declaration adopted](#) here accepted the disproportionate impact of climate change on all women and girls, and decided to accelerate climate action with gender equality at its core.

"To this end, we will support and increase women's participation, partnership, decision-making and leadership in climate change mitigation and adaptation, and disaster risk reduction strategies and policy frameworks on environmental issues, support gender-responsive and environment-resilient solutions, including water, sanitation and hygiene (WASH) solutions, to build resilience to the impact of climate change and environmental degradation," [the declaration](#) said.

The document further agreed to establish a new Working Group on Empowerment of Women in order to further empower women and promote gender equality. The working group will hold its inaugural meeting during the Brazilian G-20 Presidency

"We commit to close gender gaps, promote full, equal, effective women's participation in the economy as decision-makers," the declaration said, outlining a comprehensive plan to translate these commitments into tangible actions.

This includes bridging the labour force gap, promoting STEM education for girls, advancing women in the workforce, strengthening social protection, eliminating gender-based violence, promoting financial inclusion, challenging gender stereotypes, and bridging the digital gender divide.

The G-20 leaders have also set the ambitious goal of halving the digital gender gap by 2030, emphasising the importance of gender-responsive policies in the digital economy.

The declaration also focussed on risks encountered from increased digitisation, and said nations will also identify and eliminate all potential risks from it, including all forms of online and offline abuse, by encouraging the adoption of safety-by-design approaches in digital tools and



technologies.

“Promote and implement gender-responsive policies to create an enabling, inclusive, and non-discriminatory digital economy for women-led and -owned businesses, including MSMEs [micro, small and medium enterprises]. Encourage and support initiatives by identifying, funding, and accelerating proven solutions, thereby improving women’s livelihoods and income security,” it said.

The G-20 has also pledged to encourage investments in inclusive, sustainable, and resilient agriculture and food systems to address the critical issue of women’s food security and nutrition.

The declaration also committed to support gender-responsive and age-sensitive nutrition and food system interventions by leveraging innovative financing instruments and social protection systems in ending hunger and malnutrition.

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# WHAT ARE THE PREDICTED EFFECTS OF RISING SEA LEVEL ON COASTAL HABITATS?

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

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September 09, 2023 09:20 pm | Updated 09:20 pm IST

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A recent study (*Nature*) has reported how ancient coastal habitats adapted as the last glacial period ended more than 10,000 years ago and projected how they are likely to change with this century's predicted sea level rise. By examining the ocean sediments of ancient shorelines from a time when oceans rose rapidly, mainly because of melting ice sheets in the Northern Hemisphere, researchers inferred how ancient coastal habitats changed and formed the basis of improved predictions about the present. The study predicted higher global temperatures will provoke sea level rises that will lead to instability and profound changes to coastal ecosystems, including tidal marshes, mangrove forests, coral reefs and coral islands. Mangroves and tidal marshes act as a buffer between the ocean and the land and absorb the impact of wave action, prevent erosion and are crucial for biodiversity of fisheries and coastal plants. Under worst-case scenarios, these coastal habitats, buffeted by rising sea levels, will shrink and, in some cases, wash away, as they have in the distant past.

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# REDOUBLE EFFORTS TO REDUCE DISASTER RISKS

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

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September 11, 2023 01:55 am | Updated 01:55 am IST

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A man rides a scooter through mud and debris after heavy rainfall flooded Tangxia town in Dongguan, Guangdong province, China. | Photo Credit: Reuters

As [leaders underscored at the G-20 summit in New Delhi](#) on September 10, ahead of the [United Nations General Assembly SDG \(Sustainable Development Goals\) summit](#) in New York next week, the [world stands at a critical juncture](#). Risks are being created faster than they are being reduced. The aftershocks of the COVID-19 pandemic, combined with a polycrisis of war, debt, and food insecurity, are putting our collective ability to cope to the test. And all against the backdrop of the climate crisis, driving the extreme weather events that are occurring more frequently and with greater intensity.

**Editorial | [Stocktaking the calamity: On climate crisis and the U.N. Global Stocktake report](#)**

The rise in disasters is a trend, not an aberration. Headlines this year alone have brought a relentless wave of bad news across the world, from severe flooding in China to destructive wildfires in Europe and Hawaii to the hottest month ever on record in July. This is set to become the new normal if more action isn't taken.

And perversely, it is the most vulnerable countries and communities which are paying the greatest price despite having contributed least to the problem. The majority of the 50 countries most vulnerable to climate change also suffer from severe debt issues.

India, already among the world's most disaster-prone countries, is experiencing this new reality acutely. In 2022, the country was battered by disasters or extreme weather nearly every day, while this year's severe monsoon has caused widespread loss of livelihood and lives.

Yet, there is also good news. First, we have the solutions for both adaptation and mitigation at hand. The SDGs remain our best blueprint for peace and prosperity, together with commitments made in Paris to limit global warming to 1.5°C, and the global framework for reducing disaster risks — the Sendai Framework for Disaster Risk Reduction. Eight years into the implementation of the Sendai Framework, progress is severely lacking. However, in May this year, UN member states committed to accelerate resilience building with renewed urgency.

Many lessons are being learned from the COVID-19 pandemic, including on the importance of systems-wide disaster risk reduction, resilience, and adaptation. The crisis not only revealed our

vulnerability to risk, but also forged new ways of working together, including through digital innovations, such as computer modelling and India's CoWIN digital vaccine system.

Another reason for optimism is India's stewardship on disaster risk reduction. All the 28 States have prepared their own disaster management plans in recent years. Accordingly, mortality from extreme weather events has fallen drastically in recent years. India's early warning system for cyclones covers the entire coastline and has helped reduce cyclone-related mortality by 90% over the last 15 years, while heat wave action plans at the local level have reduced heat wave deaths by over 90%. The recent zero death toll of Cyclone Biparjoy in Gujarat demonstrates what can be achieved through effective preparedness, response, and early warning and action systems. In fact, there were rays of joy amidst the disaster, as hundreds of babies were reported to have been born to women who had been transported to hospitals and shelters for safe delivery by the government before the cyclone.

The 15th Finance Commission in India introduced significant reforms to disaster risk financing. With a total allocation of \$28.6 billion at the national and State levels for a period of five years, the Government of India has provided sufficient resources for disaster preparedness, response, recovery, and capacity development.

On the international stage, India is promoting disaster resilience and sustainability, including through the Coalition for Disaster Resilient Infrastructure, a global partnership for building resilience in infrastructure. India's National Disaster Response Force responds to domestic disasters and is also regularly deployed to disaster zones around the world.

Importantly, India's ongoing G-20 presidency established the first-ever work stream on disaster risk reduction. The Disaster Risk Reduction Working Group is aligned with the SDGs and reflects many of our shared priorities.

Disaster risk must be integrated at all levels, into how we build, how we invest, and how we live. One of the most cost-effective risk-reduction methods is early warning systems for all, spearheaded by the UN, with India's support. Just a 24-hour warning of a coming storm can reduce the damage caused by 30%. Yet, over a third of the world's population, mostly in least developed countries and Small Island Developing States, do not have access to such systems. The ultimate goal is a global multi-risk warning system for all kinds of hazards, whether biological, tectonic, or technological.

Improving global data capabilities will help us predict and respond to the risks we are facing. We commend India's G-20 presidency for its progress on knowledge sharing, joint data infrastructure, and risk analysis.

Finally, we need to ensure that no one is left behind. We must enhance international cooperation in disaster prevention, response, and recovery, especially for the countries of the Global South.

### **Explained | [What is heat index and why is it important to measure?](#)**

The G-20 summit and the outcomes of the Disaster Risk Reduction Working Group are an opportunity to design a future where we are equipped to withstand disaster risk. As UN Secretary-General António Guterres said, "Extreme weather events will happen. But they do not need to become deadly disasters."

***Mami Mizutori is Head of the United Nations Office for Disaster Risk Reduction and Special Representative of the UN Secretary-General for Disaster Risk Reduction; Kamal Kishore is Member Secretary and Head of the Department, National Disaster Management***

**Authority; Shombi Sharp is UN Resident Coordinator in India**

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# STOCKTAKING THE CALAMITY: THE HINDU EDITORIAL ON CLIMATE CRISIS AND THE U.N. GLOBAL STOCKTAKE REPORT

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

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September 11, 2023 12:20 am | Updated 12:20 am IST

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The [climate crisis intricately wove itself into the G-20 summit](#) in Delhi, particularly during the discussions on clean energy, sustainable development and the collective responsibility necessary to avert it. The [United Nations' Global Stocktake, a report that was released just ahead of the G-20 meet](#), set out the scope of challenges that awaited the major economies of the world even as it presented little beyond what is already known. This stocktake is to serve as a template to guide discussion ahead of the [28th Conference of Parties scheduled in Dubai](#) this November and is meant to be an official reckoning of the work actually done by countries since 2015, in stemming greenhouse gas (GHG) emissions. That year, signatories to the UN convention on climate change agreed in Paris to keep global emissions from rising beyond 2°C and, as far as possible, limit it to 1.5°C. Though it acknowledges “some” headway, the world, as of now, is emitting gases in a manner that will certainly overshoot the Paris-agreed limit. The report unequivocally states that “much more ambition in action and support” is necessary for implementing domestic mitigation measures to reduce global GHG emissions by 43% by 2030, 60% by 2035 and reach net zero CO<sub>2</sub> emissions by 2050 globally. Based on current information submitted by countries, the emissions gap consistent with 1.5°C in 2030 is estimated to be 20.3 billion tonnes–23.9 billion tonnes of CO<sub>2</sub>. These are gaps unlikely to be filled without a rapid upscaling of renewable energy resources and an eschewal of fossil fuel sources such as coal, oil and natural gas. However despite several acknowledgements by world leaders, most recently at the G-20, of the magnitude of the crisis, little has been achieved in terms of energy transition. G-20 countries account for 93% of global operating coal power plants and 88% of prospective ones.

The [G-20 Leader's Declaration formally recognised](#) the need for “...\$5.8-5.9 trillion in the pre-2030 period required for developing countries ...as well as \$4 trillion per year for clean energy technologies by 2030 to reach net zero by 2050”. The report also dwells on the need to reverse deforestation and the adoption of electric vehicles as vital prongs to a clean energy economy; however, it does not single out individual countries or provide a more granular analysis of where the existing shortcomings are in the approach adopted by countries to curtail emissions. The Stocktake report however must not be dismissed as yet another technical document. During the upcoming climate talks, it must form the basis of negotiations to aid the discovery and adoption of genuine breakthroughs.

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# THE COMPLEX PATH TO BIOFUEL SUSTAINABILITY

Relevant for: Science & Technology | Topic: Biotechnology, Genetics & Health related developments

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September 14, 2023 12:08 am | Updated 01:32 am IST

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'A historic moment for India, demonstrating its commitment to climate action with global cooperation' | Photo Credit: AP

Until a few years ago, working on biofuels called for constant justification in the face of electric vehicles (EVs) taking over the world. Today, while there is no doubt that EV adoption has amplified over the years, there is growing awareness of the fact that no decarbonisation strategy is trade-off-free. For instance, for a transition to EVs, existing internal combustion engine (ICE) vehicles and the supporting infrastructure need to be replaced entirely, which is capital intensive. Further, the required batteries and critical minerals used in them need to be imported, adding to environmental concerns on how these minerals are mined, among other issues. Biofuels, on the other hand, can be used in existing ICE engines and infrastructure with little to no modifications (depending on the blending rates) and offer import independence.

However, 'biofuel' is a blanket term that includes both sustainable and unsustainable fuels, and an understanding of their difference will be essential to drive effective decarbonisation action.

In India, biofuel is synonymous with first-generation (1G) ethanol, which is primarily sourced from food crops. The policy target in India of achieving 20% ethanol blending with petrol (E20) by 2025-26 is expected to be met almost entirely by 1G ethanol made from sugar cane and foodgrains. Second-generation (2G) ethanol, which is made from crop wastes and residues, is unlikely to contribute much to achieving this target due to several challenges related to feedstock supply chain and scaling up.

The groundwater depletion implications of growing sugar cane are well known, but the food security implications of groundwater depletion and of using foodgrains for ethanol production are harder to imagine because India is currently a surplus food producer. But there are several reasons why diverting the surplus produce towards energy or specifically growing a crop for energy may not be a sustainable strategy.

First, India's crop yields have already stagnated, and global warming is expected to reduce yields, which means that the same area under cultivation (arable land) will produce less with time but will need to suffice for a growing population. So, our strategy to meet blending targets cannot depend on surplus crop production.

Second, a recent study led by the University of Michigan projected that the rates of groundwater depletion could triple during 2040-81 compared with the current rate. This is again attributable to

temperature rise and the resultant increase in crop water requirements. With such limited resources, be it groundwater or arable land, food production should be prioritised over fuel.

Third, the agriculture sector is one of the hardest-to-abate in terms of direct greenhouse gas (GHG) emissions. So, increasing GHG emissions from this sector for motor fuel production in order to decrease GHG emissions from the transport sector is an unnecessary balancing loop that would achieve little net benefit.

In India, the ethanol blending policy has been a good strategy to deal with the surplus sugar production. Another good strategy to deal with the surplus sugar production would be to reduce surplus sugar cane cultivation. Increasing farmer income is often waved as a white flag in response to this argument, but sugar cane being a remunerative crop has more to do with government intervention than anything else. This means that any unassuming crop could be made as remunerative as sugar cane if so desired.

'Sustainable' biofuels are produced from crop residues and other wastes, with low water and GHG footprint. The Global Biofuels Alliance that was formed at the G-20 Summit in New Delhi last week is expected to strengthen the development of sustainable biofuels, in addition to promoting ethanol uptake. It is, therefore, a historic moment for India, demonstrating its commitment to climate action with global cooperation.

The Energy Transitions Commission, in its report on 'Bioresources within a Net-Zero Emissions Economy', recommended that biomass should be prioritised for use in sectors where there are limited low-carbon alternatives. Long-haul aviation and road freight segments, wherein complete electrification might take longer to achieve, could make the cut, whereas petrol vehicles (for which ethanol blending is currently being targeted) would probably not.

According to the International Energy Agency, to achieve net-zero emissions by 2050 globally, sustainable biofuel production needs to triple by 2030 to fuel modes that have few other mitigation options. Although 1G ethanol is unlikely to fit the bill, 2G ethanol could be counted as a sustainable fuel, especially if the production is decentralised, i.e., crop residues do not have to be transported large distances to a central manufacturing plant. But this might affect achieving economies of scale for the 2G plant.

Balancing economies of scale with the energy needs (and costs) of biomass collection and transport across large distances is a major challenge. The Global Biofuels Alliance could help drive innovation and technology development in establishing an efficient biomass supply chain and smaller-scale decentralised biofuel production units.

Achieving true sustainability is complex, especially with respect to biofuels. Therefore, any strategy should be carefully examined in the context of the larger ecosystem to avoid unintended negative consequences.

Ramya Natarajan works in the area of climate, environment and sustainability at the Center for Study of Science, Technology and Policy (CSTEP), a research-based think tank

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## EXPLAINED

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

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September 13, 2023 10:33 pm | Updated 10:33 pm IST

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For representative purposes. | Photo Credit: Getty Images

**The story so far:** Ahead of the just concluded G-20 summit, that saw several world leaders converge in New Delhi, the United Nations climate secretariat made public a 'synthesis report' on the results of three meetings held so far to discuss progress achieved by countries in achieving the goals of the Paris Agreement of 2015.

The synthesis report ties into a larger exercise called the 'global stocktake,' that is expected to take place once in five years. In 2015, when countries committed in Paris to keep global temperatures from rising beyond 2 degrees Celsius by the end of the century and "as far as possible" below 1.5 degrees Celsius, they also agreed to periodically review, or take stock of efforts, made by individual countries in containing greenhouse gases and transitioning their fossil-fuel dependent energy systems to renewable sources.

The first report this year is expected to significantly influence discussions in November when country representatives converge in Dubai for the 28th edition of the UN climate Conference of Parties (COP) in November. While countries have laid out their Nationally Determined Contributions (NDC), they are expected to — but not obliged to — increase their ambitions every five years. While the latest NDC were submitted in 2020, a stocktake also aims to push countries to set higher targets before the next NDCs are publicised in 2025.

The 45-page report lays out 17 'key findings' that overall suggests that the world is not on track to achieve Paris Agreement targets, though there was still a "rapidly narrowing" window for countries to get their act together. In terms of new information, the synthesis report isn't a significant update on the UN synthesis report of 2022, released ahead of COP 27 in Egypt, where the NDCs of 166 countries were analysed to conclude that they were inadequate to meet Paris-agreed targets.

The United Nations Emissions Gap Report, also released last year, reported that 23 billion tonnes of CO<sub>2</sub> were required to be cut to keep emissions in line with Paris agreements, whereas current pledges by countries even if fully implemented would only cut 2-3 billion tonnes, leaving an emissions gap of around 20 billion tonnes. This too has been highlighted in the latest synthesis report.

These 17 headline statements say that the Paris Agreement has galvanised countries into setting goals and signalling the urgency of the climate crisis. Governments need to support ways

to transition their economies away from fossil fuel businesses and that states and communities must strengthen efforts. While rapid change could be “disruptive,” countries should work on ensuring that the economic transition be equitable and inclusive. It stated that much more ambition was needed to reduce global greenhouse gas emissions by 43% by 2030 and further by 60% in 2035 and reach net zero CO2 emissions by 2050 globally.

Renewable energy has to be scaled up and all ‘unabated fossil fuels’ (for example, coal plants without carbon capture and storage mechanisms) were to be rapidly eliminated. Deforestation and land-degradation have to be halted and reversed and agricultural practices critical to reducing emissions and conserving and enhancing carbon sinks have to be encouraged. While the world, as a whole, has committed to scale up steps to help adapt to the unfolding and future impacts of climate change, most efforts were “fragmented, incremental, sector-specific and unequally distributed across regions.” Transparent reporting on adaptation could facilitate and enhance understanding, implementation and international cooperation.

Averting, minimising and addressing ‘loss and damage,’ requires urgent action across climate and development policies to manage risks comprehensively and provide support to impacted communities. Support for adaptation and funding arrangements for averting, minimising and addressing loss and damage, from the impact of climate change, needed to be rapidly scaled up from expanded and innovative sources. Financial flows needed to be made consistent with climate-resilient development to meet urgent and increasing needs.

Access to climate finance in developing countries needed to be enhanced. It was “essential” to unlock and redeploy trillions of dollars to meet global investment needs, including by rapidly shifting finance flows globally to support a pathway towards low GHG emissions and climate-resilient development.

While the report is expected to set the template for the forthcoming conference, it did resonate in the G20 Leaders Declaration last week — said to be among the most significant outcomes of the summit. This document for the first time formally recognises the massive jump in finance necessary for the world to transition to a renewable energy economy. The Declaration “...noted the need for USD 5.8-5.9 trillion in the pre-2030 period required for developing countries....as well as USD 4 trillion per year for clean energy technologies by 2030 to reach net zero by 2050.”

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# OVER 95% CHANCE OF EL NINO CONDITIONS FROM JANUARY-MARCH 2024: U.S. FORECASTER

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

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September 15, 2023 01:05 am | Updated 03:25 am IST

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Scientists say by far the biggest cause of the recent extreme warming is human-caused climate change and a natural El Niño. But some say there's got to be something more. [File](#) | [Photo](#)  
Credit: AP

There is a more than 95% chance that the [El Niño weather pattern will continue](#) through the Northern Hemisphere winter from January - March 2024, a U.S. government forecaster said on Thursday, bringing more extreme conditions.

"In August, sea surface temperatures were above average across the equatorial Pacific ocean, with strengthening in the central and east-central Pacific," the Climate Prediction Center (CPC) said.

**Also Read | [Explained | How El Niño could impact the world's weather in 2023-24](#)**

El Niño is a warming of ocean surface temperatures in the eastern and central Pacific, and can provoke extreme weather phenomena from wildfires to tropical cyclones and prolonged droughts.

The naturally occurring phenomenon is already spurring calamities across the globe, with the stakes seen higher for emerging markets more exposed to swings in food and energy prices.

"As El Niño strengthens to strong status, there is a good likelihood it will have an impact on the upcoming growing season for the southern hemisphere crop production areas," said Chris Hyde, a meteorologist at space-tech company Maxar.

**Also Read | [From Western disturbances to El Niño, climate change is affecting India's food security](#)**

"This includes crops in South Africa, Southeast Asia, Australia and Brazil where the weather is typically drier and warmer than normal."

On Tuesday, Australia's weather bureau said that El Niño indicators had strengthened and the weather event would likely develop between September and November, bringing hotter and drier conditions to Australia.



"Despite nearly the same ensemble mean amplitude as last month, the shorter forecast horizon means that the odds of at least a 'strong' El Niño have increased to 71%," CPC said.

**Also Read | [North India more affected by El Nino](#)**

The World Meteorological Organization in July warned that temperatures are expected to soar further across large parts of the world after El Nino emerged in the tropical Pacific for the first time in seven years.

El Nino also threatened global rice supplies, amid a ban on shipments of a crucial variety of the staple from top exporter India, as well as other commodities such as coffee, palm oil, sugar, wheat and chocolate from southeast Asia, Australia and Africa.

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## UNION MINISTER FOR JAL SHAKTI, SHRI GAJENDRA SINGH SHEKHAWAT JOINTLY LAUNCHES SWACHHATA HI SEVA 2023 CAMPAIGN

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

The Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat today launched the pan-India Swachhata Pakhwada - Swachhata Hi Seva (SHS) 2023 campaign virtually from Jaipur, Rajasthan today. The campaign has been launched in line with the vision of 'Swachh Bharat' or Clean India, as envisioned by Prime Minister, Shri Narendra Modi, whose clarion call for Swachhata has rallied the entire nation towards this noble cause. The campaign was launched jointly along with Union Minister of Panchayati Raj & Rural Development, Shri Giriraj Singh and the Union Minister of Housing and Urban Affairs, Shri Hardeep Singh Puri through a virtual program.

The fortnight of activities will galvanize action around swachhata, focusing on mobilizing citizen action through 'shramdaan' and strengthen commitment towards building a 'Garbage Free India' which is the theme of the campaign. The Union Ministers also presided over a Samvaad with Sarpanches, Block Pramukhs, Mayors, CEOs-ZP, DM/DCs and other officials of rural and urban local bodies. The Union Minister also launched a special SHS Portal for monitoring and documentation of the on ground SHS activities. For the first time, the actual man hours of 'shramdaan' will be calculated on the portal, while capturing the number of activities and number of people participating in the activities. The second edition of the Indian Swachhata League was also launched.



The Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat, in his address urged everyone to work towards source segregation of waste, removing legacy waste and increase awareness about Swachhata. Shri Shekhawat said this pakhwada is an opportunity in this direction and to identify and replicate best Swachhata practices from various regions across the

nation. He laid emphasis on quantifying and assessing legacy waste and to set up short and long term goals which can then be addressed in a time bound and result oriented manner. He also urged everyone to pledge to revive various water bodies that may have been choked due to legacy waste and to ensure that these water bodies are rejuvenated both in urban and rural areas. He further said that during the Pakhwada, targeted & result oriented activities should be undertaken and work allocation should be done properly to get the best results.



Shri Shekhawat further stated that the problems of waste management in urban and rural areas can be tackled simultaneously as cities have excess capacity but lack space while rural areas lack capacity but have ample space. Union Minister asked the secretary of the department of Drinking Water and Sanitation to work out a long-term plan in collaboration with the Secretary, MoHUA for ensuring maximum convergence and setting up a robust mechanism to accomplish this objective. He added that he looked forward to active participation and cooperation from all to make this campaign a grand success.



SBM-Grameen and SBM-Urban have both partnered with key Ministries and Departments to amplify participation and community mobilization in SHS 2023 themed Garbage Free India, with a focus on visible cleanliness and the welfare of SafaiMitras, the spirit being that of voluntarism i.e. shramdaan and actual cleaning drive/activities as in the previous years. It is a massive community mobilization drive for cleaning up of legacy waste and activities for solid waste management. As part of this annual campaign, States will organise activities with the objectives of (i) ensuring community mobilization and participation, a “jan andolan” towards Open Defecation Free (ODF) Plus villages (ii) reinforcing the concept of “Sanitation as everyone’s business” and (iii) commemorating Swachh Bharat Diwas (2nd October) at the village level. This paves way for local bodies to conduct Swachhata drives at public places of high footfall such as bus stands, railway stations, beaches, tourist spots, zoos, national parks, Govt offices in both rural and urban areas of the States/UTs. The activities will include removal

of garbage from locations, clearing of legacy waste, repairing, painting, cleaning, and branding of all sanitation assets such as litter bins, public toilets, garbage points, waste transportation vehicles etc.



The second edition of India Swachhata League is all set to take the nation by a storm. Led by the youth, the season 2 of ISL promises to be even more exciting and fun-filled cleanliness league. The ISL aims to mobilize youth groups at scale to take sustained ownership for swachhata across beaches, hills and tourist spots. The swachhata league will act as a catalyst for triggering action by the youth of the city towards the vision of garbage free cities under the Swachh Bharat Mission.

As part of the Swachhata Pakhwada fortnight of celebrations, SafaiMitra Suraksha Shivar will be organized by various cities across the nation 17th September, 2023 onwards. These Shivirs (camps) are aimed at saturating welfare schemes for sanitation workers and their dependents and to improve their well-being and quality of life. The objective of the shivar is to target all sanitation workers in Solid Waste Management (SWM) & Used Water Management (UWM). The key activities will focus on mass awareness, preventive health checkups, yoga shivirs and extending entitlement of various welfare benefits of central & State Schemes in convergence with various ministries.

In her welcome address, Secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, Ms. Vini Mahajan spoke about the objectives of SHS 2023 and urged the State & UT machinery of Swachh Bharat Mission, both Rural & Urban to make joint and concerted effort to make the fortnight a roaring success. She added, "SBMG having achieved nearly 75% ODF Plus villages, through the fortnight is aiming to achieve 90% ODF Plus villages. The SBM Mission Directors have been urged to focus on community mobilization and voluntary efforts for cleaning drives in villages, blocks and districts.

The fortnight of celebrations will culminate on 2<sup>nd</sup> October with Swachhata Diwas. As a part of the massive cleanliness drives, all Government of India Ministries, PSUs and State govt and local bodies will come together to conduct cleanliness at various locations. The planned inter-sectoral activities include cleaning high footfall tourist spots/ pilgrim sites under Tourism Ministry, Har Pathri Saaf Suthari activities by Railways, Dept of higher Education & School Education can involve universities, School students engaging them in SHS activities, Two bins & public toilet cleanliness under the Petroleum & Natural Gas Ministry, Prioritizing cleanliness of zoos/parks under MoEFCC and Cleanliness drives across highways & adjacent areas under MoRTH.

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## **Anubhav Singh**

The Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat today launched the pan-India Swachhata Pakhwada - Swachhata Hi Seva (SHS) 2023 campaign virtually from Jaipur, Rajasthan today. The campaign has been launched in line with the vision of 'Swachh Bharat' or Clean India, as envisioned by Prime Minister, Shri Narendra Modi, whose clarion call for Swachhata has rallied the entire nation towards this noble cause. The campaign was launched jointly along with Union Minister of Panchayati Raj & Rural Development, Shri Giriraj Singh and



the Union Minister of Housing and Urban Affairs, Shri Hardeep Singh Puri through a virtual program.

The fortnight of activities will galvanize action around swachhata, focusing on mobilizing citizen action through 'shramdaan' and strengthen commitment towards building a 'Garbage Free India' which is the theme of the campaign. The Union Ministers also presided over a Samvaad with Sarpanches, Block Pramukhs, Mayors, CEOs-ZP, DM/DCs and other officials of rural and urban local bodies. The Union Minister also launched a special SHS Portal for monitoring and documentation of the on ground SHS activities. For the first time, the actual man hours of 'shramdaan' will be calculated on the portal, while capturing the number of activities and number of people participating in the activities. The second edition of the Indian Swachhata League was also launched.



The Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat, in his address urged everyone to work towards source segregation of waste, removing legacy waste and increase awareness about Swachhata. Shri Shekhawat said this pakhwada is an opportunity in this direction and to identify and replicate best Swachhata practices from various regions across the nation. He laid emphasis on quantifying and assessing legacy waste and to set up short and long term goals which can then be addressed in a time bound and result oriented manner. He also urged everyone to pledge to revive various water bodies that may have been choked due to legacy waste and to ensure that these water bodies are rejuvenated both in urban and rural areas. He further said that during the Pakhwada, targeted & result oriented activities should be undertaken and work allocation should be done properly to get the best results.



Shri Shekhawat further stated that the problems of waste management in urban and rural areas can be tackled simultaneously as cities have excess capacity but lack space while rural areas lack capacity but have ample space. Union Minister asked the secretary of the department of Drinking Water and Sanitation to work out a long-term plan in collaboration with the Secretary, MoHUA for ensuring maximum convergence and setting up a robust mechanism to accomplish this objective. He added that he looked forward to active participation and cooperation from all to make this campaign a grand success.



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**Anubhav Singh**

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# CAN GREEN NUDGES IN ONLINE FOOD DELIVERIES LEAD TO LESSER SINGLE-USE PLASTIC POLLUTION? A STUDY CONDUCTED IN CHINA THINKS SO

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

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September 15, 2023 05:29 pm | Updated 05:30 pm IST

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Person sorts plastic waste for recycling in Dong Xiao Kou village, on the outskirts of Beijing. (2015 file photo) | Photo Credit: AFP/Fred Dufour

**The story so far:** A study conducted in collaboration with an online food delivery platform in China found that making “no disposable cutlery” the default choice for orders and rewarding customers with “green points” led to a 648% increase in the share of no-cutlery orders. This step could have significant benefits for the environment, the study said.

A team of researchers, led by associate professor at the University of Hong Kong Guojun He, collaborated with Eleme, Alibaba’s food delivery platform, to analyse customer-level response to green nudges on the platform — changing the default to “no cutlery”, and setting up a reward system where points can be redeemed for planting trees in China’s deserts.

Green nudges are gentle persuasions to influence environment-friendly behaviour in people. In behavioural economics, nudges are interventions that influence people’s choices to make certain decisions without restricting the choices available to them.

The study with Alibaba used a difference-in-differences model — a statistical technique that compares outcomes over time between the experimental (or treated) group and a control group — and compares food-ordering behaviours of people in control cities versus people in cities where the green nudges were implemented.

The study also revealed features that distinguish the green nudges under it from the already available literature on the concept. Historically, nudges focus on short-term impacts, but the Alibaba study showed its persisting effect through individuals’ ordering behaviour.

Nudges have been criticised in the past for being manipulative: they are not always transparent and can sometimes bank on ignorance or lack of awareness in people to work. But researchers working on the study have said that the green nudges that they implemented are easy to understand and transparent to users. The reasons and underlying conditions of why and when nudges work is a matter of ongoing debate, and the study reportedly presents data to explore the “underlying mechanisms through which the green nudges affect individuals’ behaviours”.

Alibaba's user interface, in cities where the study was conducted, was updated to show a window that required the customer to explicitly choose the number of sets of single-use cutlery (SUC) to be delivered with the order. The default option on this window was set to "no cutlery" and customers had to scroll down the screen to choose a different option. To prevent the window from popping up in future orders, customers could set any of the options as their new device-level default by clicking the "set as default" button.

(A) The old interface, in which the default cutlery option at the check-out page was preset as "with cutlery." (B) The new interface in the treated cities. | Photo Credit: Reducing single-use cutlery with green nudges: Evidence from China's food-delivery industry, by Guojon He, et al.

The no-cutlery option came with "green points" – a non-pecuniary incentive where 16 points were awarded to a user for every order without SUC. These points could be stored and accumulated in Alipay, Alibaba's payments app. Once a user had accumulated 16,000 points, they could redeem them in exchange for a real tree to be planted and named after the customer in a desertified part of China.

However, the study also noted that getting a tree planted through only no-cutlery orders was challenging, and the average number of monthly no-cutlery orders for a consumer was only 0.77 from 2019 to 2020. The Alibaba platform also allowed its users to collect green points through other activities like walking more, taking more public transportation, selling used items, etc.

The green nudges were a result of Chinese regulations that prohibited online food delivery platforms from including SUCs in orders unless explicitly requested. In early 2020, China announced ambitious plans to phase out single-use plastics from the country, beginning with a country-wide ban on single-use straws by the end of the year. The plan noted that plastic bags would first be banned in the major cities, followed by a ban in all cities and towns. China plans to reduce the consumption of single-use plastic items in the restaurant industry by 30%, [The Guardian](#) has reported.

The data analysed in the study included the history of 1,97,062 randomly selected users' monthly food orders and their green points, tree-planting records, and personal characteristics. The study commenced on January 1, 2019, and ended December 31, 2021, in 10 major Chinese cities. All consumers whose data were included placed at least one food delivery order during the period. Out of the ten cities, Shanghai, Beijing, and Tianjin were where the green nudges were introduced on the Alibaba app (the experimental or treated cities), while the other seven — Qingdao, Xi'an, Guangzhou, Nanjing, Hangzhou, Wuhan, and Chengdu — were the control cities.

Researchers working on the study received funding support from the Research Grant Council of Hong Kong and Peking University.

Under the study, the share of no-cutlery orders increased in the cities where it was conducted, but remained relatively unchanged throughout the study period in the control cities.

Trends in share of no-cutlery orders (SNCO). | Photo Credit: Reducing single-use cutlery with green nudges: Evidence from China's food-delivery industry, by Guojon He, et al.

The share of no-cutlery orders before the study was on average 3.1%. Green nudges were believed to have increased the share of no-cutlery orders by 19.3% in Shanghai, 21.2% in Beijing, and 20.4% in Tianjin. On average, they increased an individual's share of no-cutlery orders by 20.1%. This amounted to a 648% increase in the frequency of no-cutlery orders overall.

Before the study was conducted, the share of no-cutlery orders in all cities was almost the same. But once the green nudges were introduced, the share of these orders in Shanghai, Beijing, and Tianjin increased significantly. The study also noted that media and public attention to plastic waste did not change significantly when the city-wide regulations were introduced, suggesting that the findings of the study were actually driven by green nudges on the app.

Around 83% of the individuals in Shanghai, Beijing, and Tianjin also responded positively to the green nudges. Another 6% did not show changes in cutlery choices on the app. The remaining 11% defied the nudges and behaved in the opposite direction to what was encouraged. It was also seen that most defiers had previously placed no-cutlery orders, suggesting that they possibly disliked being nudged.

The study also reported that the green nudges introduced on Alibaba's online food delivery platform did not negatively impact its business. Both the total order amount and the total number of orders followed the same trend in the experimental and control cities, making the impact of green nudges on the platform's business negligible. Note, however, that the total spending and total number of orders substantially dropped in early 2020 in all the cities, due to COVID-19.

An analysis of the study's demographical results concluded that no-cutlery orders placed by women increased by 21.4% after the nudges were introduced, versus an 18.4% increase among men. The share of no-cutlery orders for customers between 18 and 24 years only increased by 11.9%, whereas for the middle-aged and elderly, the increase was around 30-34%.

Some observations have also suggested that affluence was a factor that differentiated how customers responded to green nudges. The share of no-cutlery orders for people who ordered meals using phones that cost more than \$1,151 increased by 22.2% as a result of green nudges, which was 3.92% more than for those who ordered using phones that cost \$273 or less (both as of January 2020).

People who ordered more expensive meals (based on pre-order expenditure) also responded more to green nudges on the Alibaba app.

Subsample analysis based on consumer characteristics. | Photo Credit: Reducing single-use cutlery with green nudges: Evidence from China's food-delivery industry, by Guojon He, et al.

Green nudges also increased the share of no-cutlery orders for individuals who had placed similar orders previously by 24%. This was 4-5% higher than for those who had never placed a no-cutlery order before, but the study said it is possible that this difference stems from environmental consciousness that individuals might have already that.

Over 18 months in Shanghai, eight months in Beijing, and one month in Tianjin, the number of SUCs reduced by more than 225.33 million sets. Although the weights and compositions of SUCs vary, the researchers estimated that this reduction may have prevented the generation of 4,506.52 metric tonnes of waste and saved 56,333 trees.

If all green points rewarded through the green nudges were used to plant trees, 112,665 additional trees could have been planted by Alibaba.

According to the study paper, China is the world's largest producer and consumer of SUCs. If Alibaba had introduced the green nudges to the entire country instead of just in three cities, more than 8.7 billion sets of SUC could have been saved every year in China, in accordance with the 2020 data. Additionally, total SUC consumption could have dropped by 21.75 billion sets if all food-delivery services in China adopted green nudges. This would be equivalent to

eliminating 3.26 million metric tonnes of plastic waste.

Zomato, an online food delivery platform in India that occupies over 50% of market share in the space, also has similar nudges on its app. While the company says that the option to skip cutlery was always available on its platform, it changed the default selection to “no-cutlery” in August 2021.

“Zomato’s no-cutlery initiative was designed to reduce not just plastic but overall material waste. Our data suggests that three out of every five orders choose to opt out of receiving cutlery, which has resulted in an estimated 1,000 metric tonne reduction in cutlery waste till now,” Zomato’s Chief Sustainability Officer Anjali Ravi Kumar told *The Hindu*.

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# ECO-RESTORATION PROJECT COVERS ANAMUDI SHOLA NATIONAL PARK AREA IN MUNNAR WITH NATURAL GRASSLANDS

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

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September 17, 2023 07:19 pm | Updated September 18, 2023 01:02 am IST - IDUKKI

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A view of the natural grassland at Pazhathottam in Anamudi Shola National Park in Idukki | Photo Credit: JOMON PAMPAVALLEY

From a stark burnt-out land, the Pazhathottam area in Anamudi Shola National Park, near Munnar, in Idukki has transformed into a green heaven teeming with life, thanks to an initiative by the Forest department.

The area stands as an example of how an eco-restoration project could help grow natural grasslands and ensure proper food for wild animals.

Munnar Wildlife Division converted a park filled with exotic species of trees into 50 hectares of forest land. The project was implemented through the United Nations Development Programme (UNDP). It was started in 2019 and completed in 2022.

“As part of the project, exotic species were cleared from the forest land, and natural grass was planted. Within months, the area was converted into a natural grassland. After changing the area to a natural grassland, the area once again saw the presence of Bison and other wild animals. Now, Nigiri Pipit and such birds are regular visitors in the area, and often, wild elephants arrive here. After the restoration, natural streams in the area were also revived. It also ensures water security in the summer season in the Chilantiyar area that is downstream the Pazhathottam region,” Munnar Wildlife Warden S.V. Vinod said.

“The eco-restoration project is being implemented with the participation of local residents. The department has formed an eco-development committee (EDC) named ‘Haritha Vasantham’ for the project. It is for the first time in the State that an EDC has been formed for an eco-restoration project,” said Mr Vinod.

The Forest department has also started a nature-friendly eco-tourism project in Pazhathottam. “Four families can stay inside the grassland. In addition, the tourists will get a chance to trek through the natural grasslands. The income thus generated will be used for paying the wages of EDC members,” said Mr Vinod.

“Even now, over 350 hectares of land inside the area is filled with exotic wattle trees. The Forest department is eyeing participation from corporate companies through their Corporate Social Responsibility (CSR) funds to change the entire area into a grassland. The move will ensure proper food for wild animals and prevent human-elephant conflict,” said Mr Vinod.

The move was also throwing up solutions for the water crisis in the area, Sherin Rajan, a forest protection watcher attached to the Pazhathottam area, said. “In the initial stage of the project, we had to collect water from another area. But after changing the hill into grasslands, old streams stand rejuvenated and water availability has been secured even during the summer season,” said Mr Rajan.

However, the task of the EDC is to preserve the area as a grassland. “Saplings of wattle and other exotic species still come up in the grassland. We remove it on time and ensure its management as a natural grassland,” Mahadevan, a member of the Haritha Vasantham EDC, said.

Vinod Kumar, another EDC member and native of Pazhathottam, said that the project was providing them with job security and proper income.

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# CHEETAH PROJECT ON RIGHT PATH TO BECOMING SUCCESSFUL: GOVERNMENT REPORT

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

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September 17, 2023 08:25 pm | Updated September 18, 2023 12:50 am IST - New Delhi

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A government report, released on the completion of one year of cheetah reintroduction programme, highlighted that the initial progress has largely followed a favourable trajectory well within the envisioned limitations. File | Photo Credit: ANI

Four of the six criteria established for assessing the short-term success of India's cheetah reintroduction programme have already been met, a government report said on Sunday.

Released upon the completion of one year of the programme, the report highlighted that the initial progress has largely followed a favourable trajectory well within the envisioned limitations.

The project is on the right path to becoming a successful large carnivore conservation translocation and population establishment endeavour, it stated.

"It cannot be overemphasised that the challenges are formidable. However, with concerted efforts by officials and managers from India, Namibia, and South Africa, along with the support from the highest offices in all three countries, the project is on its assured path to recovery," the report read.

The Cheetah Action Plan, published last year, lists six short-term success criteria, including 50% survival of the introduced cheetahs for the first year, establishment of home ranges in Kuno National Park, successful cheetah reproduction in the wild, survival of wild-born cheetah cubs past one year, successful F1 generation breeding, and cheetah-based revenues contributing to community livelihoods. F1 stands for the first generation of offspring.

The report noted that the project has achieved four of these criteria – 50% survival of the introduced cheetahs, establishment of home ranges, birth of cubs in Kuno National Park, and direct revenue contributions to local communities through the engagement of cheetah trackers and indirect appreciation of land value in surrounding areas.

India's ambitious initiative to reintroduce cheetahs after their extinction in the country marked its first anniversary on Sunday.

The project began on September 17 last year when Prime Minister Narendra Modi released a group of cheetahs from Namibia into an enclosure at Madhya Pradesh's Kuno National Park.



Conservationists and experts worldwide have closely monitored the project since its inception.

Twenty cheetahs were imported from Namibia and South Africa to Kuno in two batches – one in September last year and the second in February.

Since March, six of these adult cheetahs have died due to various reasons. In May, three of the four cubs born to a female Namibian cheetah succumbed to extreme heat. The remaining cub is being raised under human care for future wilding.

The report said that all cheetah individuals released in the wild "fared well and showed no aberrations in their natural behaviour".

A few mortalities of cheetah occurred from bacterial infection, maggots, renal failure, injuries and heat, it said.

The report noted that no unnatural deaths took place in free-ranging conditions despite some cheetahs traversing long distances in human-dominated areas. Such post-release mortalities are common in a project of this magnitude in Africa, it said.

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# CATS ARE KILLING INDIA'S BIRDS. ARE WE PAYING ATTENTION?

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

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September 18, 2023 10:30 am | Updated 12:05 pm IST - Bengaluru

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A cat on the prowl in Dehradun. | Photo Credit: Samyamee S. and Lakshay Tyagi

On the basis of 30 million observations by more than 30,000 birdwatchers, the [‘State of Indian Birds 2023’ exercise](#) recently concluded that birds in India are faring poorly. Among many factors, the report acknowledged a silent bird-killer lurking in India’s urban areas: cats.

Cats may seem to pale in the shadow of the threats posed by forest degradation, industrialisation, and climate change, but conservationists know better. In the U.S. alone, free-ranging domestic cats have been estimated to kill billions of birds every year.

[One study](#) found that cats may be the “single greatest source of anthropogenic mortality” for birds and mammals in the U.S. Worldwide, free-ranging domestic cats have [caused or contributed](#) to dozens of extinctions of bird species recorded in the IUCN Red List.

Disturbed by the lack of India-specific data on the issue, ecologist Monica Kaushik has been studying the hunting habits of free-ranging domestic cats on urban birds in Dehradun, a city that has 590 of the 1,359 species of birds recorded in the country. She found in a survey that pet cats hunted birds the most, followed by reptiles, insects, rodents, and amphibians.

While free-ranging dogs also harm wildlife, Dr. Kaushik said cats have retained the instinct to hunt through many years of domestication, even if they don’t need the skill anymore. Cats also can do something dogs can’t: “They can climb, so they can reach habitats such as the nests of canopy-dwellers.”

Cat saliva is also [more likely](#) to contain bacteria (*Pasteurella multocida*) that are lethal to birds. So if the direct impact of an attack doesn’t kill them, the bacteria will. Former urban wildlife rescuer Abhisheka Krishnagopal suspected that this could be why most cat-attacked birds reported to her didn’t survive the trip to a treatment centre.

Cats also maintain a ‘landscape of fear’. “This means that when cats are known to be in a particular area, the bird would avoid foraging or nesting there,” Dr. Kaushik explained. “They end up investing time and energy to be extra vigilant and to find alternative areas. This affects them individually and on a population level.”

Domestic cats (*Felis catus*) weren't always this widespread. [Palaeogenetic studies](#) have found that wildcats (*Felis sylvestris*) were probably first domesticated in West Asia some 10,000 years ago. They spread via sailing ships much later. Today, they are one of the [world's 100 worst](#) invasive alien species.

The proper way to deal with the cat problem has spiralled into a vicious debate in the west. Animal welfare groups usually advocate the 'trap-neuter-return' (TNR) policy, whereby stray cats or dogs are trapped, sterilised, and returned in the hope that this will reduce their populations. This is considered a humane approach because it could improve the quality of a cat's life as well.

The trouble is that cats are not easy to trap. And unless most of them are sterilised at once, the population will not decrease in a sustained way. This is why TNR programmes around the world have had limited success. "Neutering is definitely needed, but this alone doesn't help," Ms. Krishnagopal said, "because free-ranging cats hunt every day, and birds take several weeks to raise a family, so it really takes a toll."

Former director of the Smithsonian Migratory Bird Centre, Peter Marra, has critiqued policies such as TNR as being "dictated by animal welfare issues rather than ecological impacts". [His study](#), published in *Nature Communications* in 2013, provided an exhaustive quantitative estimate of mortality due to cats in the U.S. He said that only a "concerted, nationwide effort to rid the landscape of cats" can help. This could include euthanasia.

That this debate is yet to kick off in India is partly because there is nearly no data. With the State of Indian Birds 2023's unambiguous conclusion that India's bird diversity is in peril, ecologists like Dr. Kaushik have called for more attempts to quantify the risks posed by various threats, including cats. "We need studies from various habitats where we would expect high mortality because of free ranging cats," she said.

One source of data could be wildlife rehabilitation centres, per Ms. Krishnagopal. "We need more collaboration between researchers and animal rescuers," she said. "Ornithologists can approach rehab centres and encourage them to start collecting data on the number of cat-attacked birds they receive. They can publish this data together and *then* we can start creating awareness based on evidence."

Meanwhile, there are measures pet parents can adopt to reduce the damage their animals are wreaking. For one, they can restrict their cats' outdoor movements. Dr. Kaushik's survey found that cats whose owners play with them tend to hunt less, as do neutered cats. Studies have also found that cats with more protein in their food are less inclined to hunt. She also recommended "reflective collars or collars with bells" to alert birds that a cat is nearby.

Seema Mundoli, who teaches sustainability at Azim Premji University, Bengaluru, has been a foster parent to more than 40 cats. She contended that humans have a lot to gain by being empathetic towards stray cats, "because, what better way to connect with the natural world than through these species which are all around us?"

She admits cats are a threat to wildlife but doesn't think killing them is the answer. "Thankfully, we don't take all our decisions based purely on research and data, but also go with what we inherently feel is the right thing to do."

So what is the right thing to do? Ms. Mundoli suggested that "conservation and animal rights groups can come together, pull in resources, to find a solution. What both want at the end of the day are populations that are under control and healthy."

*Nandita Jayaraj is a Mangaluru-based science writer and co-author of Lab Hopping (2023).*

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# IN SAN FRANCISCO BAY, ECOLOGISTS WORK TO PROTECT SEVENGILL SHARKS

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

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September 17, 2023 01:42 pm | Updated 01:42 pm IST

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Researchers cast lines to catch broadnose sevengill sharks from their vessel in the San Francisco Bay, California, U.S., June 15, 2023. | Photo Credit: Reuters

Meghan Holst studies the broadnose sevengill shark, so she was naturally concerned when [record-setting rain](#) this year altered the shark's nursery grounds in San Francisco Bay.

But the species appears to have withstood the challenge, based on initial observations from a recent outing on the water by Holst, a 31-year-old doctoral student in conservation ecology at the University of California, Davis.

Next, perhaps, will come California Fish and Game Commission protections for the sharks in San Francisco Bay, which she considers a nursing and pupping ground for a species believed to be in decline. Research like hers can help support such a designation.

[Also Read | The secret lives of silky sharks: unveiling their whereabouts supports their protection](#)

San Francisco Bay is one of the world's only known year-round nurseries for the species, Holst said, making the habitat critical to monitor. The sevengill, known for its thick body, broad head and blunt snout, measures up to 10 feet (3 meters) long and eats various fish including other shark species and rays, dolphins, seals and other prey. As its name indicates, it has seven gills, while most shark species possess five.

Heavy rain and snow in California last winter replenished reservoirs after a severe drought, but the resulting freshwater runoff into the bay may have affected the ecosystem, including salinity levels.

"That's something I'm really interested in and looking at is where are they going when maybe the water is too fresh in San Francisco Bay for them and they might get pushed out," Holst said from aboard her research vessel in the bay. "So the fact that they're here today is awesome."

Holst and her crew count the shark's seven gills each time they catch a member of the species with rod and reel, using salmon as bait. The team collects all manner of data, taking blood and muscle biopsy samples, before releasing the sharks back into the bay. Many of these sharks

were juveniles, much smaller than the full-grown adults.

### [Also Read | In Visakhapatnam, efforts are on to save the endangered whale sharks](#)

Up early, they motor through tides on frequently foggy mornings, navigating secret fishing spots to drop anchor.

"This is the only population that we know of that is putting all of their pups in one location in this nursery ground. ... So if something happens to San Francisco Bay, then we might lose an entire cohort of these sevengill juveniles," Holst said.

The species also can be found elsewhere around the globe, including in waters off New Zealand, South Africa and Argentina. Population numbers have proved difficult to determine for scientists, though the International Union for Conservation of Nature describes the species as vulnerable and says the population trend is decreasing.

"Sharks are a really great sign for a healthy, sustainable ecosystem, and they are what keeps our ecosystem in check," Holst said.

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# WHAT IS DRIVING THE GLOBAL BIOFUELS ALLIANCE?

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

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September 17, 2023 04:25 am | Updated 04:25 am IST

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Prime Minister Narendra Modi launched the 'Global Biofuels Alliance' with United States President Joe Biden and Brazilian President Luiz Inacio Lula Da Silva in New Delhi on September 10, 2023. Photo: X/@WhiteHouse via ANI

**The story so far:** On September 10, on the sidelines of the annual G-20 summit in New Delhi, an India-led grouping came together to give impetus to the production and use of biofuels, an alternative to fossil fuels like petroleum and diesel. The grouping, called [the Global Biofuels Alliance \(GBA\)](#) would attempt to bring countries together to co-develop, accelerate technological advances in production processes, and advocate for the use of biofuels particularly in the transport sector. The three founding members, India, the U.S. and Brazil, were joined by Argentina, Canada, Italy and South Africa, who are also G-20 member countries.

The International Energy Agency (IEA) defines biofuels as "liquid fuels derived from biomass and used as an alternative to fossil fuel based liquid transportation fuels such as gasoline, diesel and aviation fuels."

Experts in the field make a distinction between biofuels and sustainable biofuels. The former is derived from crops grown specifically to produce biofuels such as sugarcane, corn, or soybean, and the latter is from agricultural waste, used cooking oil and processed animal residues like fats. The former is colloquially referred to as 1G ethanol, or first-generation biofuel, and the latter as 2G, that is second-generation. This distinction has now come into sharp focus as climate change accelerates, with fears of threat to food security and increased loss of forests and biodiversity due to greater land required for farming. [Estimates](#) suggest that well over half of all vegetated land is under cultivation today, and that agriculture is one of the world's largest carbon emitters. The GBA has emphasised that its focus would be to develop 2G ethanol.

With severe disruptions to global crude oil supplies following the Ukraine war, several countries have been scrambling to find alternatives to the import dependence on petrol and diesel. India, for instance, imports 87% of its crude oil, and it is the main reserve currency expenditure for the country. With [transport](#) accounting for about one-quarter of global carbon emissions, there have been renewed attempts to accelerate the decarbonising of this sector, with several countries announcing battery production and electric vehicle (EV) policies and legacy automakers entering the now thriving EV sector. But some modes of transport like aviation, shipping and long-haul trucking will find it harder to reduce carbon emissions than say, self-driven cars or motorbikes. It is here that some experts feel that 2G ethanol could be a valuable substitute.



Most biofuels today are blended with petrol or diesel at varying degrees. For instance, India blends about 10% of biofuels and has plans to double this in the coming years. While some experts feel that accelerating EV adoption and developing alternatives like green hydrogen must be the focus of the ongoing energy transition, others argue that 2G ethanol would soften the impending disruption. It would do so by allowing to reduce greenhouse gas (GHG) emissions even while stretching the life of internal combustion engines, giving time for automakers to develop robust alternatives, while increasing farmers' incomes and providing jobs.

The three founding members of the GBA produce 85% of global biofuels and consume about 81% of it. In line with the renewed push to enhance biofuel use and production, the U.S. announced its latest amended ["Renewable Fuel Standard"](#) to substantially increase the production of biofuels and substitute about 1,40,000 barrels per day of crude oil imports by 2025. Similarly, India had announced the setting up of 12 new refineries as early as 2018 with the aim to meet 20% ethanol blending by 2025. This becomes even more significant following India's announcement to become net zero (removing as much carbon from the atmosphere as human activity emits) by 2070. The [IEA predicts](#) that about two-thirds of the global biofuel demand will come from three emerging economies – India, Brazil and Indonesia, and that they have "ample domestic feedstocks, additional production capacity, relatively low production costs and a package of policies they can leverage to increase demand." However, it remains to be seen if this would indeed hasten decarbonising of the energy sector.

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# POLLEN IN PEE: FOSSILISED URINE FROM A SMALL AFRICAN MAMMAL HELPS US UNDERSTAND PAST ENVIRONMENTS

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

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September 19, 2023 06:22 pm | Updated 06:22 pm IST

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Pollen grains are incredibly durable because they are made of an organic substance (called sporopollenin) that is very resistant to decay. Pollen is released into the air, often in large quantities, and can settle on surfaces like lakes, and become preserved in sediment deposits over thousands, or even millions, of years. | Photo Credit: M. Karunakaran/The Hindu

If you are allergic to pollen, you are likely to curse the existence of these microscopic particles. You're not alone: [up to 30%](#) of the world's population suffers from hay fever, which is often driven by pollen allergies. Shifting global climates are likely to [push that figure even higher](#).

However, pollen represents one of the most powerful tools to uncover the nature of past environmental change.

I am the head of the [Palaeoecology Laboratory](#) at [Nelson Mandela University](#) in South Africa. My research focuses on unravelling the secrets of ancient environments and ecosystems by examining fossil pollen grains. These tiny time capsules hold a wealth of information about the earth's past. They help scientists to reconstruct ecosystems, track climate change and understand the evolution of plant life.

But it can be difficult to source pollen deposits in arid regions. That's because such deposits are often found in large lakes, which are in short supply in southern Africa. That's where an unlikely scientific ally enters the picture: the fossilised urine of a small mammal, the [rock hyrax](#) (South Africans call them "dassies").

[Also Read | Meet the scientists giving a surprising new purpose to pollen](#)

Pollen grains are incredibly durable because they are made of an organic substance (called sporopollenin) that is very resistant to decay. Pollen is released into the air, often in large quantities, and can settle on surfaces like lakes, and become preserved in sediment deposits over thousands, or even millions, of years.

In the lab, we examine the pollen found in these deposits using a microscope. By identifying the different types of pollen grains found within the different layers (representing different time

slices) we can reconstruct the area's vegetation history. Plants grow under specific climatic conditions: for instance, desert plants can grow under low rainfall conditions whereas forest plants need high amounts of rainfall. So we can make inferences about the climate at the time that the pollen was incorporated into the deposit.

As I've said, southern Africa's arid climates mean there are very few large lakes in the region. This makes it a challenge to source deposits that adequately preserve pollen within them over long periods of time. That's where [fossilised dassie urine](#) comes in.

### [Also Read | Moths are key to pollination in Himalayan ecosystem](#)

These sticky deposits called "middens" accumulate in rock crevices in mountainous areas over thousands to tens of thousands of years and contain beautifully preserved pollen grains. As they also contain various other types of evidence (such as geochemical data) and can be accurately dated, they represent the most valuable archive of past climate data in southern Africa. The oldest middens we've worked with date back 50,000 years.

The research my lab conducts, focusing on harnessing the power of the humble pollen grain and utilising unique archives such as hyrax middens, is strongly multidisciplinary. It draws together elements from botany, geography, geology, climatology and archaeology.

We are currently generating fossil pollen records from several sites within the Cape Fold Belt mountains of South Africa. For example, we have a midden sequence that covers the last 6,000 years from the Baviaanskloof in the Eastern Cape province. The fossil pollen from this sequence shows that there was a dramatic shift in vegetation about 3,300 years ago, driven by a large fire event and increased temperatures. We're hoping to publish this research soon.

### [Also Read | A skin patch to treat peanut allergies? Study in toddlers shows promise](#)

This information provides baselines of variability in natural systems and can help inform current conservation efforts within the Baviaanskloof, which is a biodiversity hotspot.

[Another project](#) that we are involved in is centred on the archaeological excavation within South Africa's southern Cape region at a site called Boomplaas Cave. By using the fossil pollen within hyrax middens found within the vicinity of Boomplaas Cave, we hope to provide the environmental context to the archaeological record which can help to decipher how early humans responded to climate change.

We are not only working within the realm of the past: as pollen is one of the main sources of allergies it is important to monitor the types and amounts of pollen currently present in the air we breathe. My lab is part of the [South African Pollen Monitoring network](#) and we generate pollen data for the city of Gqeberha in the Eastern Cape province.

This initiative focuses on analysing pollen captured in the air across several different parts of South Africa and ensuring that this information is publicly available. This project is particularly important as, [due to climate change](#), pollen seasons are lengthening and [allergenic pollen is increasing](#).

[Lynne Quick](#), Senior Research Fellow, [Nelson Mandela University](#)

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# KEEP CALM: THE HINDU EDITORIAL ON SOLAR RADIATION MANAGEMENT

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

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September 21, 2023 12:10 am | Updated 12:32 am IST

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India [had its rain-wise driest August in a century](#) this year. While scientists are yet to link this anomaly with the chaotic effects of climate change, it underscores the constant threat of disrupted weather, the resulting consequences for the economy, and the importance of climate mitigation. One of the more desperate, and dangerous, ideas to have emerged from this impetus is solar radiation management (SRM): to block some of the incoming solar radiation to cool the earth's surface. SRM's dangers emerge from the fact that it interferes with natural mechanisms with unavoidable planet-wide effects. For example, if an SRM experiment by one country leads to more rain over the Horn of Africa than expected, it could trigger a locust swarm that eventually destroys crops in Pakistan and India. There is currently no mechanism that holds a geoengineering government accountable to consequences beyond its borders nor through which affected countries can appeal for restitution. There has also been little research on understanding how the world's myriad weather systems affect each other and their relative sensitivities to interventions such as SRM.

This is why the report of the Climate Overshoot Commission, released last week, calls for more research to close crucial scientific and governance gaps before any deliberations on the implementation of SRM-like technologies. The commission was constituted by geoengineering researchers to assess ways to accelerate emission cuts. But while the report is careful to acknowledge that the scientific community does not understand SRM enough to attempt a deployment, even in experimental fashion, it also argues for retaining SRM in the mix of potential climate mitigation solutions. This is buttressed by appeals to lack of time as the earth's surface is poised to warm past the 1.5°C threshold enshrined in the Paris Agreement in the next decade. This is a precarious suggestion because even less controversial, but nonetheless problematic, mitigation technologies such as carbon capture take resources, focus, and political will away from the most effective strategy — cutting emissions — and increase emissions limits. SRM will only amplify this dilution. The commission also errs by claiming to act for the interests of developing countries at a time when corporate and political actors have hijacked their 'room to develop' to pursue economic growth at the expense of climate justice. The enormity of climate change requires quick and decisive action, but when better solutions have not been implemented as well as they can be, and while there is still time to do so, it is disingenuous to contend that more high-risk solutions should remain on the table.

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# CHINA, U.S. AND INDIA ABSENT AT U.N.'S CLIMATE AMBITION SUMMIT

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

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September 21, 2023 06:57 pm | Updated September 22, 2023 01:04 am IST - NEW DELHI:

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Delegates attend the U.N. Climate Ambition Summit on the sidelines of the 78th United Nations General Assembly at UN headquarters in New York City on September 20, 2023. | Photo Credit: AFP

The Climate Ambition Summit (CAS) in New York, as part of the United Nations General Assembly, that concluded on September 21, was marked by the absence of major economies whose actions significantly influence the future of global emissions.

China, United States and India — who collectively account for about 42% of global greenhouse gas emissions and are the top three emitters in that order — were all absent from the CAS that was designed, according to the U.N., to “showcase leaders who are “movers and doers”... and have credible actions, policies and plans to keep the 1.5°C degree goal of the Paris Agreement alive and deliver climate justice to those on the front lines of the climate crisis.”

In the run-up to the summit, about 100 heads of State had written in response to a call from Secretary-General Antonio Guterres to ramp up action to address the climate crisis. However, only representatives from 34 states and 7 institutions were given the floor on the day of the summit. India's neighbours Sri Lanka, Nepal and Pakistan were among the listed speakers and emerging economies such as South Africa and Brazil were also on the list. The European Union, Germany, France and Canada were also on the podium.

The criteria for countries to be considered for a speaking slot at the summit were: that they would be expected to present updated pre-2030 Nationally Determined Contributions (as agreed in Glasgow); updated net-zero targets; energy transition plans with commitments to no new coal, oil and gas; fossil fuel phase-out plans; more ambitious renewable energy targets; Green Climate Fund pledges; and economy-wide plans on adaptation and resilience. All the “main emitters” and notably all G-20 governments would be asked to commit to presenting, by 2025, more ambitious economy-wide Nationally Determined Contributions featuring absolute emissions cuts and covering all gases.

“The Climate Ambition Summit this year set a high bar for participation...The Secretary-General's Climate Action Team engaged governments, as well as businesses and local authorities with transition plans to reach net zero in line with the UN-backed credibility standard and accountability of net zero pledges,” Stéphane Dujarric, spokesperson for the UN Secretary



General, told *The Hindu* in an email. He didn't clarify if India had put in a request, or even participated, in the summit. An official in the Ministry of Environment, Forests and Climate Change also declined *The Hindu's* request for information.

India last updated its climate pledges in 2022 of reducing emissions intensity — or the volume of emissions per unit of gross domestic product (GDP) — by 45% from 2005 levels by 2030, a 10% increase from what it agreed to in 2015. The government committed to meet 50% of its electric power needs from renewable, non-fossil fuel energy sources — up from 40% committed at the Paris agreement. It assured to create an additional carbon sink of 2.5 to 3bn tonnes of CO<sub>2</sub>-equivalent [GtCO<sub>2</sub>e] through additional forest and tree cover by 2030. In 2021, Prime Minister Narendra Modi committed to India achieving net zero by 2070. The scientific assessment is that India's commitment, alongside similar commitment by G-20 economies are insufficient to keep temperatures from keeping below 2C by the end of the century. However, India's low per capita emissions and contribution to the carbon already in the atmosphere has led other analysts to suggest that India has committed to "more than its fair share" to keeping to the Paris-agreed limits.

"Our focus here is on climate solutions — and our task is urgent. Humanity has opened the gates to hell," Mr. Guterres said in his address, "Climate action is dwarfed by the scale of the challenge. If nothing changes we are heading towards a 2.8 degree temperature rise — towards a dangerous and unstable world."

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# BIG BUTTERFLY MONTH

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September 22, 2023 09:21 pm | Updated September 23, 2023 02:59 am IST

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A tailed jay butterfly spotted in the Biodiversity garden at K.J Somaiyya College of Science and Commerce, Vidyavihar, Mumbai on September 9, 2023. | Photo Credit: Sruthi Darbhamulla

A rainy September morning, an eclectic group of nature experts and amateurs is gathered about a bush in Sipna jungle near Panshet, around 25 kilometres away from the city of Pune.

"This is a great find!" Rajat Joshi, the Pune district coordinator for Big Butterfly Month announces. We all peer obligingly. It is a pupa of a butterfly belonging to the Pansy family; perhaps the Lemon Pansy we saw fluttering around a while ago.

A pupa belonging to the Pansy family on a plant in Sipna, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

For this group, that is indeed a good find. In September, butterfly and moth (together the order Lepidoptera) enthusiasts have an even more crystallised reason to pursue their passion for their pet creatures— it is Big Butterfly Month across India. It's a citizen science, conservation and outreach effort centred on butterflies and to some extent their less popular cousins, the moths.

Shantanu Dey, founder-convenor of Big Butterfly Month and avid butterfly expert based in Mumbai, says the main purpose of this month is to bring awareness to the broader challenges in conservation.

"There are two parts to it," he says. The first part is the science— the attempt to increase citizen counts of butterflies— lots of data handling, data collecting, and recording of species.

A plain tiger butterfly nectaring on a garden lantana plant, Sipna, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

Citizens are encouraged to maintain regular timed counts in a set area, making detailed notes and repeating the exercise on a fortnightly basis. Some of this data will find its way online through citizen observation portals like iNaturalist, Indian Biodiversity Portal and Butterflies of India. During Big Butterfly Month, there is an observable uptick in such logs.

The second aspect of Big Butterfly Month is outreach activities, aimed at increasing general awareness of the winged critters— perhaps being able to identify a few species and how not to

harm them. The idea, according to Mr. Dey, is that people “get interested in butterflies in general and in the ecosystem in its totality.”

A common crow butterfly settles on a flower in Maharashtra Nature Park, Mumbai on September 10, 2023. | Photo Credit: Sruthi Darbhamulla

This year, 22 States are involved in Big Butterfly Month; an attempt has been made to cover all districts in the nation, including far-flung areas like Ladakh and the Andamans. The event has also crept over the border into Pakistan— Pakistan Butterfly Society held an inaugural Butterfly Walk of Pakistan at Maple School and College in Saidu Shareef, Swat, as part of a regional initiative titled the Big Butterfly Month- Indian Subcontinent 2023.

As Mr. Dey says, “for experts there are other avenues; for everyone else, there is Big Butterfly Month.”

**Also read: [First-ever butterfly survey in Mudumalai Tiger Reserve records 175 species](#)**

During the Sipna walk, there is already deep enthusiasm to locate species, extending from creatures that look like bright splotches of colour to those that seek to escape attention by mimicking dead leaves. At one point, the group is divided between seeing a hyperactive Skipper fluttering through snakeweed plants or a Common Evening Brown, a crumpled leaf lookalike that likes the ground beneath the shade. Both are brown, and both are beautiful to this group.

A common Pierrot butterfly alights on a plant at Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

The group is also enthused alike by caterpillars munching away at leaves- a Plain Tiger caterpillar on a garden lantana plant, a Red Pierrot caterpillar inside a *Rui (Calotropis gigantea)* leaf, and a Tailed Jay caterpillar barely distinguishable from his green leafy background.

A group of butterfly enthusiasts examines a plain tiger caterpillar and moth caterpillar on plants at Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

Moth caterpillars too are spotted, and noted; a particularly intense level of enthusiasm is bestowed to female butterflies hovering around plants searching for a place to lay eggs— some of them tiny white dots that would otherwise escape scrutiny.

A plain tiger caterpillar (on stalk) and butterfly (on flower) is spotted in Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

The Sipna jungle is a unique place, a manmade forest with a mix of exotic and native plants. Started by Pramod Nargolkar in 1989, it is now run by his wife Nayana Nargolkar. The forest was soon a large 22-acre venture, named Sipna for a river in Melghat Tiger Reserve— a favorite of its founder. In 2004, following the devastating Indian Ocean tsunami, Mr. Nargolkar, then visiting the Andamans, was reported missing, along with several others from Pune. But from 2005, the project soldiered on, under the careful tending of Mrs. Nargolkar, and 10 to 12 acres now remain.

Grass yellow butterflies flutter around a patch of flowers in Sipna, Maharashtra on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

A trio of grass yellows engage in mud puddling in Sipna, Maharashtra on September 17, 2023. |

Photo Credit: Sruthi Darbhamulla

A butterfly garden is a recent addition to the mix, created last year to provide a different attraction for students and children. Mrs. Nargolkar and Mr. Joshi came in contact a few months ago, and around 30 to 40 plants were added to the garden. These include butterfly host plants like milkweed, snakeweed, periwinkle, garden lantana and Bryophyllum plants.

Prey-predator: A signature spider has built its home in the grass, a menacing presence for grass yellow butterflies, at Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

This marks the first time a Big Butterfly Month event is taking place here.

If Sipna marks a private endeavour to conserve plants and encourage biodiversity, the Maharashtra Nature Park (MNP) represents a government initiative in the same vein— in a different city. A park created by plantation on what was originally a dumping ground/landfill, MNP borders the Dharavi area in Mumbai— known more in popular culture for less-than-genteel dwellings than for natural beauty.

A common leopard (orange, right) and a red Pierrot butterfly (white, blurred, left) is seen at Maharashtra Nature Park in Mumbai on September 10, 2023. | Photo Credit: Sruthi Darbhamulla

It was here that, on September 10, another BBM event was held by a local NGO called Naturalist— albeit of a slightly different shade. This one was about creating butterfly gardens, with details about host plants for larvae and nectaring plants for adult butterflies —and how to potentially build one in your own home. The NGO, in collaboration with the Mumbai Metropolitan Region Development Authority (MMRDA), held a lecture followed by a trail to identify both butterflies and the plants that beguile them.

A Danaid eggfly seeks nectar in Maharashtra Nature Park, Mumbai, on September 10, 2023. | Photo Credit: Sruthi Darbhamulla

Sachin Rane, Naturalist co-founder and leader of the day's event, says the park is Asia's first project of this nature—37 acres of manmade forest on an erstwhile dumping ground.

The future sustainability of landfill -turned- ecozone MNP is something experts will perhaps deliberate over with mixed opinions. But the place sees a score of butterflies — ranging from ubiquitous grass yellows to common leopards, Danaid eggflies, white orange tips, and red Pierrots. More than 85 butterfly species can be found in this park, according to Mr. Rane. The greater Mumbai region, he says, hosts 165 species, if you include Panvel and Navi Mumbai.

A group looks on as Sachine Rane, of the NGO Naturalist, examines a palm tree for caterpillars and pupae, at the Maharashtra Nature Park, Mumbai, on September 10, 2023 | Photo Credit: Sruthi Darbhamulla

During the event, Mr. Rane notes the most important requirements for a butterfly garden— sunlight for several hours a day, plants which are hosts for specific butterfly species (for example, the tamarind is a host plant for the Black Rajah and Bryophyllum plants is a host for red Pierrot caterpillars). These host plants should also be within a 50 metre-radius from a flowering plant.

There is a hands-on activity as well— everyone gets to plant a tree in MNP; each tree is the host plant for a particular butterfly species. And at the end of the event, each participant receives

Jamaican Blue Spike plants (also called blue snakeweed or vervain) — a species mentioned by Indian Biodiversity Portal as attracting butterflies to its flowers and being a host plant for Death's Head Hawkmoth caterpillars.

Participants in a Big Butterfly Month event at Maharashtra Nature Park plant butterfly-host trees under the guidance of the park gardeners, in Mumbai on September 10, 2023. | Photo Credit: Sruthi Darbhamulla

The NGO has more events in the works— it plans to host a butterfly trail at the Conservation Education Center on September 23, while a Butterfly Race is being planned for September 24, where participants will be tasked with photographing as many species as possible from the morning till sunset, in locations across Mumbai and its suburbs, including Navi Mumbai and Panvel.

This month has seen variety in programming— if there are introductory sessions for amateurs and data collection walks for the slightly more knowledgeable, there are fun activities for students and children—like a butterfly painting competition on the K.J Somaiya campus in Mumbai's Vidyavihar area.

A board announces Big Butterfly Month events at K.J Somaiya College of Science and Commerce in Mumbai on September 9, 2023. | Photo Credit: Sruthi Darbhamulla

On September 9, under the aegis of Big Butterfly month, Club Zoology of the Zoology department of K.J. Somaiya College of Science and Commerce also organised a macro photography workshop, in collaboration with Photowalks Mumbai and photo equipment company Godox. Even at 8 in the morning, the hall is filled with bright faces. The subject— macro photography — is of keen interest to anyone trying to document creatures that range from the length of a fingernail to as big as a man's face.

The speaker is noted wildlife photographer Yuvraj Gurjar, who has held exhibitions and won international awards for his work centred around many species— spiders, orchids, mushrooms, beetles, and of course, butterflies. Back in their day, when they were “wandering in forests in the 80s, a camera was like a Cinderella,” Mr Gurjar said, highlighting further that even regular cameras may not suffice for the purpose. As he says, a birding lens cannot shoot butterflies, which can range from the large Atlas moth, measuring 10-12 inches, to the tiny Grass Jewel, a mere 14 millimetres.

**Also read:** [Spot a Blue Pansy butterfly on a periwinkle flower](#)

As he talks the crowd through how to select a background to make the subject pop, and how to light up a subject, Mr. Gurjar scrolls through his own work, not just of butterflies — of a scorpion with its babies on its back, snake cannibalism and a mosquito oozing a drop of extra blood, which won a national award.

Wildlife photographer Yuvraj Gurjar holds a talk during Big Butterfly Month at K.J Somaiya College of Science and Commerce in Mumbai on September 9, 2023. | Photo Credit: Sruthi Darbhamulla

One thing he makes clear— as nature lovers, wildlife photographers are not to cause harm to the subject. “Leave it as it is,” he says. When asked about whether flashes may harm butterflies, Mr. Gurjar is less severe. Insects have compound eyes, he points out; they are startled but not harmed by photography.



The crowd tests its newly acquired knowledge in the field. The college has a biodiversity garden, created in 2019 under the guidance of the iNaturewatch founder Dr V. Shubhalaxmi, funded by the US Consulate under a mentorship programme for youth leaders in environment conservation. Now, the little patch hosts many butterfly species—tailed jays, blue tigers, glassy blues, common Mormons, and crimson roses.

A moth caterpillar is spotted in the Biodiversity Park at K.J Somaiya College of Science and Commerce in Mumbai on September 9, 2023. | Photo Credit: Sruthi Darbhamulla

At every event, participants milled around capturing shots of little creatures. If generating interest was the aim of Big Butterfly Month, it was clear that it had been piqued, in three groups of around 20 people, at various locations across Maharashtra.

But I wondered about the other aspect—conservation. Were we, as amateur enthusiasts, adding to our environment or taking away, I wondered morosely, as I saw the leaves flattened by our footsteps in Sipna. “There is a lot of regrowth here,” Mr. Joshi reassures me — if I come back a month later, all of this will be renewed.

Rajat Joshi, Pune District Coordinator for Big Butterfly Month, shows participants a leaf hosting a red Pierrot caterpillar, which is eating it from the inside, at Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

And citizen scientists are hard at work, holding timed counts on butterfly walks— in Bangalore, Mysore, Dehradun, Pune, Jammu & Kashmir. The Indian Butterfly Monitoring Scheme (IBMS) was launched in 2021, after a few local monitoring efforts proved fruitful, chiefly in Bengaluru. Earlier this month, IBMS was also launched in Mysore, by Dr. Krushnamegh Kunte, Associate Professor at the National Centre for Biological Sciences (NCBS), Bengaluru.

Citizen counts online rise during this September. Mr. Joshi told local media that last year, nearly 1,336 observations were registered by 55 enthusiasts in Pune during the month of September— with around 130 butterfly species documented. This is an uptick from 2019— when Big Butterfly Month was first launched at a national scale— with around 200 observations.

According to data from the [Big Butterfly Month website](#), this year’s tally stands at 10,894 observations from 608 users, from 205 districts. Last year saw 14, 497 from 867 users. Maharashtra leads the table in number of observations and users— like last year.

Mrunal, a participant in a Big Butterfly Month walk, attempts to photograph a tailed jay caterpillar on a plant in Sipna, Maharashtra, on September 17, 2023. | Photo Credit: Sruthi Darbhamulla

That there is enthusiastic participation from this region is no surprise. After all, a local Big Butterfly Month was launched in Mumbai 7 years ago— by Sohail Madan and Shantanu Dey with the aid of the Bombay Natural History Society (BNHS). It then went national in 2019. Pune Butterfly Club was in fact launched due to Big Butterfly Month, says Mr. Dey. Further, the Western Ghats, a biodiversity hotspot, have a sizeable number of species— a report cites 337 species sighted in the area.

They are of course no match for the Northeastern region, which hosts an astounding number of lepidopteran species— [one paper](#) places it at a mind-boggling 3600. But the prevalent ethnic strife in Manipur and its fallout across the region have tamped down outreach efforts in the region— although Mr. Dey informs me that counts are still going on.

The eventual aim is to harness civilian interest to track populations of butterflies nationwide, a

data-gathering exercise that will bear fruit not in days and months, but years. Keeping track of butterfly populations in various parts of the country is expected to shed light on the health of local ecosystems; butterflies are regarded as a keystone species and are crucial pollinators for several flowering plants.

A plain tiger butterfly hovers near a Rui (Giant Caliotrope) plant, potentially scouting for a location to lay its eggs, at Sipna, Maharashtra on September 17, 2023 | Photo Credit: Sruthi Darbhamulla

After a morning of rain, a consistent sun only emerges as our walk through Sipna winds down. We have spotted 27 species— a good find for a rainy day.

As we all leave the forest, the little path is filled with light, and more butterflies, now undisturbed by human presence, slowly emerge. As the grass yellows flutter around calmly, in leisurely fashion, I find myself hoping that Big Butterfly Month succeeds in its mission.

***On September 23 and 24, Naturalist Foundation will hold a trail and a Butterfly Race in Mumbai. [Learn more here.](#) Find other Big Butterfly Month events near you [here](#) and [here](#).***

See [data from Big Butterfly Month here](#).

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# SIGNS OF LIFE? WHY ASTRONOMERS ARE EXCITED ABOUT CARBON DIOXIDE AND METHANE IN THE ATMOSPHERE OF AN ALIEN WORLD

Relevant for: Others | Topic: Miscellaneous Science Related Topics

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September 22, 2023 06:14 pm | Updated 06:14 pm IST

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This artist's rendering provided by University College London Centre for Space Exochemistry Data researchers shows Exoplanet K2-18b, foreground, its host star and an accompanying planet in this system. On Wednesday, the scientists announced they discovered water on the planet outside our solar system that has temperatures suitable for life. | Photo Credit: AP

Are we alone? This question is nearly as old as humanity itself. Today, this question in astronomy focuses on [finding life](#) beyond our planet. Are we, as a species, and as a planet, alone? Or is there life somewhere else?

Usually the question inspires visions of weird, green versions of humans. However, life is more than just us: animals, fish, plants and even bacteria are all the kinds of things we seek signs of in space.

One thing about life on Earth is that it leaves traces in the chemical makeup of the atmosphere. So traces like that, which are visible from a long way away, are something we look for when we're hunting aliens.

Scientists in the United Kingdom and the United States [have just reported](#) some very interesting chemical traces in the atmosphere of a planet called K2-18b, which is about 124 light-years from Earth. In particular, they may have detected a substance which on Earth is only produced by living things.

[Also Read | ISRO hoping to wake up Chandrayaan-3's Vikram and Pragyan on September 22](#)

K2-18b is an interesting exoplanet – a planet that orbits another star. Discovered in 2015 by the Kepler Space Telescope's K2 mission, it is a type of planet called a sub-Neptune. As you probably guessed, these are smaller than Neptune in our own Solar System.

The planet is about eight and a half times heavier than Earth, and orbits a type of star called a red dwarf, which is much cooler than our Sun. However, K2-18b orbits much closer to its star than Neptune does – in what we call the habitable zone. This is the area that is not too hot and

not too cold, where liquid water can exist (instead of freezing to ice or boiling into steam).

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Earth is what is called a rocky planet (for obvious reasons), but sub-Neptunes are gas planets, with much larger atmospheres containing lots of hydrogen and helium. Their atmosphere can also contain other elements.

Which brings us to the excitement around K2-18b.

The planet was first discovered by the Kepler Space Telescope, which was monitoring distant stars and hoping for planets to pass in front of them. When a planet does pass between us and a star, the star becomes momentarily dimmer – which is what tells us a planet is there.

By measuring how big the dip in brightness is, how long it takes for the planet to pass in front of the star, and how often it happens, we can work out the size and orbit of the planet. This technique is great at finding planets, but it doesn't tell us about their atmospheres – which is a key piece of information to understand if they hold life or are habitable.

NASA's James Webb Space Telescope – the big space telescope launched at the end of 2021 – has now observed and measured the atmosphere of this exoplanet.

### [Also Read | Our galaxy's black hole not as sleepy as thought: astronomers](#)

The telescope did this by measuring the colour of light so finely, it can detect traces of specific atoms and molecules. This process, called spectroscopy, is like measuring the fingerprint of elements.

Each element and molecule has its own colour signature. If you can look at the colour signature, you can do a bit of detective work, and work out what elements or compounds are in the planet.

While the planet does not have its own light, astronomers waited for when K2-18b passed in front of its star, and measured the starlight as it went through the planet's atmosphere, allowing the team to detect fingerprints of substances in the atmosphere.

The new study found a lot of carbon dioxide and methane. This is interesting as this is like what is found on Earth, Mars, and Venus in our Solar System – rather than Neptune.

However, it also found a small amount of dimethyl sulfide. Dimethyl sulfide is an interesting molecule, made up of carbon, hydrogen, and sulfur.

### [Also Read | Closest known black hole to Earth spotted by astronomers](#)

On Earth, it's generally a bit smelly. But it's also closely linked to life.

The only process we know that creates dimethyl sulfide on our planet is life. In particular, marine life and plankton emit it in the form of flatulence.

So yes, scientists are excited by the potential idea of alien marine farts. If it is real. And linked to life.

While on Earth, dimethyl sulfide is linked to life, on other planets it may somehow be related to geological or chemical processes.

After all, K2-18b is something like Neptune – a planet we do not really know a lot about. Just last month, researchers discovered that [clouds on Neptune are strongly linked](#) to the Sun's 11-year cycle of activity. We have a lot to learn about planets and their atmospheres.

### [Also Read | Indian Astronomical Observatory: Where the stars must not twinkle](#)

Also, the measurement of dimethyl sulfide is very subtle – not nearly as strong as the carbon dioxide and methane. This means more detailed measurements, to improve the strength of the signal, are required.

Other telescopes may need to join the effort. Instruments on the Very Large Telescope in Chile are able to measure the atmospheres of planets around other stars – as is a new instrument called Veloce on the Anglo Australian Telescope at Siding Spring Observatory in Australia.

And new space telescopes, like Europe's PLATO which is under construction, will also help us get a better look at alien atmospheres.

So while the signs of dimethyl sulfide on K2-18b may not be linked to life, they are still an exciting prospect. There is plenty more to explore.

[Brad E Tucker](#), Astrophysicist/Cosmologist, [Australian National University](#)

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# DOZENS OF NATIONS TO SIGN U.N. OCEAN TREATY BUT IMPLEMENTATION STILL AWAITS

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

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September 22, 2023 01:38 pm | Updated 04:30 pm IST

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The global pact to conserve biodiversity on the high seas is seen as a crucial tool to meet a target agreed last year to protect 30% of the earth's land and sea by 2030. | Photo Credit: AP

A new [U.N. treaty](#) to protect the world's oceans was signed by 67 countries on Wednesday, another step in efforts to reverse the damage done to fragile marine environments by overfishing and other human activities.

The global pact to conserve biodiversity on the high seas was finally agreed in March and formally adopted by the United Nations in June. It is seen as a crucial tool to meet a target agreed last year to protect 30% of the earth's land and sea by 2030, known as "30 by 30."

Despite the nearly 70 signatures at the United Nations General Assembly on Wednesday, the treaty needs to be ratified on a national level before it goes into effect.

## [Explained | What the new High Seas Treaty means for India, and the world](#)

"With the signature of the High Seas Treaty, we can safeguard the ocean from human pressures, and get closer to our objective of protecting at least 30% of the planet by 2030," said European Environment Commissioner Virginijus Sinkevicius, calling the treaty "our constitution for the ocean."

Mads Christensen, interim executive director of Greenpeace International, described the signings as a "powerful signal" which should help maintain momentum to meet the "30 by 30" target.

"But this signing is a purely symbolic moment," he said. "Now politicians must bring the treaty home and ensure it is ratified in record time."

The agreement will create ocean sanctuaries where fishing will be prohibited, and also ensure human activity on the high seas is subject to environmental impact assessments.

## [Also Read | Nations reach accord to protect marine life on high seas](#)

The International Union for the Conservation of Nature estimates that \$500 million in funding will

be required to kickstart the treaty, and a special implementation and capacity-building fund could require another \$100 million per year.

Threats to the ocean environment have been mounting in recent years as a result of overfishing as well as rising temperatures, and new threats could also emerge from ocean-bed mining and the use of geoengineering technologies to boost the ocean's capacity to absorb carbon dioxide.

Environmental groups say the treaty must be brought fully into effect by 2025 at the latest to ensure the "30-by-30" protection target is reached.

"The ocean can't wait, and with the treaty being in the making for the better part of the past 20 years, there is absolutely no time to waste," said Jessica Battle, an ocean expert with the Worldwide Fund for Nature.

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# MAHARASHTRA'S EPHEMERALS: PLANTS THAT WAIT FOR MONSOON TO BLOOM

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

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September 24, 2023 07:36 am | Updated 07:36 am IST

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*Corynandra elegans* species is seen in the Konkan region of Maharashtra. This monsoon flora was clicked near Rajapur. | Photo Credit: Special Arrangement

Blooming is often associated with the spring season. Yet, only a few know that in parts of Maharashtra, certain plant species wait throughout the year to bloom only during the monsoon because they love rain.

Such plants are termed ephemerals. They are of two types — annual and perennial, explain researchers from the International Union for Conservation of Nature - Species Survival Commission (IUCN SSC). Aditya Gadkari, member and researcher at IUCN SSC, Western Ghats Plant Specialist Group (WGPSG), says, “Annual ephemerals form new individuals every year and are seen for a very short period. They form seeds at the end of their life cycle, remaining dormant till the next year. Perennials have a source like a tuber or a bulb in the soil, so it is the same individual, but the other parts (stem, flowers) are newly formed.”

*Curcuma karnatakensis*, clicked near Yellapur, is found in the forest regions of West Ghats. The word *ensis* suggests belonging to Karnataka. | Photo Credit: Special Arrangement

The IUCN SSC WGPSG does not work only on monsoon flora; its primary work involves making threat assessments of all species distributed in the Western Ghats.

Monsoon ephemerals bloom towards the end of May and throughout June, July, August, and September. “Some other monsoon ephemerals will just form leaves and little branch structures after a few showers. These leaves stay for a month or more and then flowering starts, which goes on till July and August. The leaves stay till the end of monsoon and then disappear. In some plants, like *Nervilia* and wild yam, flowers appear first and then the leaves,” says Mr. Gadkari.

*Ceropegia sahyadrica* var. *karulensis*, clicked in Gaganbawda. This monsoon flora is found in the Karul Ghats of Maharashtra. The name *karulensis* means belonging to Karul, a village after which the Ghat is named. | Photo Credit: Special Arrangement

The onset of monsoon brings flowers such as ground orchids (*Nervilia* and *Eulophia*), lilies (crinum lily, pancratium lily, grass lily, star lily), wild yam (suran), and Indian squill. The late

monsoon brings flowers such as ground orchids (*Habenaria* and *Peristylus*), several types of balsams, hill meadow rue, *Dipcadi* species, spider-flowers (*Corynandra*), pond-weeds (*Aponogeton*), lantern flowers (*Ceropegia*), bladderworts (*Utricularia*), pipeworts (*Eriocaulon*), and species of grasses.

*Ceropegia mohanramii* is found on a single low elevation coastal plateau near Malvan, Maharashtra. | Photo Credit: Special Arrangement

The primary job of these flowers is to act as an important source of nectar and pollen for native pollinators. Their presence in all micro habitats on a plateau ensures the appropriate presence of soil and, most importantly, water. Quite a few of them are threatened due to land use change, and expansion of roadways and infrastructure.

Environmental and educational organisations have been carrying out flora walks over the last few years. Anurag Karekar, project director of Naturalist Foundation and founder of Naturalist Explorers, says walks are organised to see the mass flowering of the crinum lily on the hilly slopes and plateaus of Bhatpada hills in Virar, upper Kanheri, and Gaimukh treks of the Sanjay Gandhi National Park. Trekkers also spot unique flowers like kali musli and squill in the Yeoor Hills of Thane.

*Dipcadi concanense* is found only on the plateaus of Konkan region. It was clicked near Ratnagiri. | Photo Credit: Special Arrangement

Two years ago, Priyal Soni saw Instagram posts on monsoon flora and since then has been part of such trails. “When I learnt that the Naturalist Foundation was taking people to see the crinum lily in the dense forest of Bombay Natural History Society’s Conservation Education Centre, I joined it. We were amazed to see the trumpet-shaped petals shimmering with raindrops. It felt like learning about a beautiful secret of the forest.”

Prathamesh Desai has been observing birds for 13 years. Though flowers have sparked his interest, he found the technicality of flora overwhelming. “One of my flora enthusiast friends ignited my interest in the world of flowers. I am now interested in the habitat and niche preferences of particular species. Finding a particular species is like a treasure hunt, which I find exciting,” he says.

*Eulophia spectabilis* is seen in India, South East Asia and even Australia. This bloom was clicked in Lonavala. | Photo Credit: Special Arrangement

*Impatiens dalzellii* is the only yellow coloured Balsam in Western Ghats, otherwise yellow Balsams in India are found in Himalayas. This monsoon bloom was clicked at Mahabaleshwar. | Photo Credit: Special Arrangement

Photographed near Ratnagiri, *Utricularias* are seen on both low and high elevation plateaus of Western Ghats all the way from Maharashtra to Kerala. | Photo Credit: Special Arrangement

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# TAMIL NADU, KERALA MAY JOIN HANDS TO COUNT ENDANGERED NILGIRI TAHR

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

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September 24, 2023 05:02 am | Updated 05:02 am IST

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For the first time, drones may be incorporated in the census, as the Nilgiri tahr prefers montane grasslands, with steep and rocky terrains at an altitude between 300 and 2,600 metres above sea level. File | Photo Credit: M. Sathyamoorthy

After launching Project Nilgiri Tahr last year for the conservation of the State animal, Tamil Nadu is now working on a standardised protocol to count the endangered population of southern India's only mountain ungulate. The Tamil Nadu Forest Department will also propose to its Kerala counterpart to conduct a synchronised census, as the animal is only found in select habitats in the two States.

For the first time, drones may be incorporated in the census, as the Nilgiri tahr prefers montane grasslands, with steep and rocky terrains at an altitude between 300 and 2,600 metres above sea level. There are believed to be a little over 3,100 of the animals living in highly fragmented habitats in the Western Ghats in Tamil Nadu and Kerala, ranging between the Nilgiris in the north and the Kanniyakumari hills in the south, according to a 2015 study by WWF-India.

The Tamil Nadu Forest Department is proposing two censuses: one in November, after the southwest monsoon, and the other in March or April, after the calving season. If Kerala agrees to the proposal, the second census is likely to be a synchronised count, while the post-monsoon monsoon exercise in November will be carried out in tahr habitats in Tamil Nadu alone.

Supriya Sahu, Additional Chief Secretary of the State's Environment, Climate Change and Forest Department, said that this would be the first comprehensive, exclusive census for the State animal. Modern technologies will be adopted to carry out the exercise in difficult terrain, and the Department will seek technical support from institutions such as the Wildlife Institute of India (WII).

"Experts, with whom the Department had a consultation, have opined a synchronised survey is the need of the hour," said Ms. Sahu, who took the lead in launching Project Nilgiri Tahr.

Senior forest officials and biologists from the two States, and the research team from Project Nilgiri Tahr recently held discussions with experts from WWF-India, the Nature Conservation Foundation, and the WII to formulate a scientific and accurate technique of population enumeration. Experts felt that bounded count and double-observer survey methods could be

priority models. Camera traps could also be used in difficult terrains.

“The focus was to adopt a refined model from different methods that provide high accuracy and less variability in results,” said M.A. Predit, coordinator for WWF-India’s Nilgiri tahr conservation programme.

This November, Tamil Nadu is hoping to count the tahrs living in various habitats, including the Nilgiris hills; Siruvani hills; Anamalais, high ranges and Palani hills; Srivillipudur, Theni and Tirunelveli hills; and the Kalakad Mundanthurai Tiger Reserve and Ashambu hills. Among these, the Anamalai hills and the Nilgiris, mainly the Mukurthi National Park, are home to the highest number of the animals.

The experts felt that Tamil Nadu can conduct an annual census each November, as well as an additional biennial synchronised census with Kerala, after the calving season.

“The Project Nilgiri Tahr team, during field visits, experimented with drones to observe tahr groups. Contrary to our perception, they were not disturbed by the drone flown around 100 metres above them,” said S. Ramasubramanian, Conservator of Forests and Field Director of the Anamalai Tiger Reserve, which is the second biggest habitat of the animal after the Eravikulam National Park in Kerala.

Officials hope that the exercise will help the Project Nilgiri Tahr team to understand the dynamics of population density of the ungulate spread across the different landscapes, and its range of habitats.

Besides anthropogenic pressures, Nilgiri tahr habitats face threats in the form of the spread of invasive plants such as wattles, pines, and eucalyptus in the grasslands. A component of the Project Nilgiri Tahrs aims to study the possible causes of the lumpy skin disease that has been observed in the animal, and suggest a remedy for it.

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# THE PHILIPPINES WEIGHS LEGAL OPTIONS AGAINST CHINA OVER CORAL REEF 'DESTRUCTION'

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September 23, 2023 04:12 pm | Updated 04:12 pm IST

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The Philippines is exploring legal options against China accusing it of destruction of coral reefs within its exclusive economic zone (EEZ) in the South China Sea. | Photo Credit: AP

The Philippines is exploring legal options against China accusing it of destruction of [coral reefs](#) within its exclusive economic zone (EEZ) in the South China Sea, an allegation rejected by Beijing as an attempt to "create political drama".

The Philippines foreign ministry late on Thursday said it was awaiting assessments from various agencies of the extent of environmental damage in Iroquois Reef in the Spratly islands and would be guided by Solicitor General Menardo Guevarra.

The Philippines is studying the possibility of filing a second legal case before the Permanent Court of Arbitration (PCA) in the Hague, Guevarra said on Friday. It won its first case, filed in 2013, contesting China's claims to the area.

The study "was prompted not only by the alleged destruction of reefs but also by other incidents and the overall situation in the West Philippine Sea," Guevarra told Reuters, adding that a report and recommendation would be sent to President Ferdinand Marcos Jr and the foreign ministry. Manila refers to the part of the South China Sea that it claims as the West Philippine Sea.

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"The DFA stands ready to contribute to this effort," the Department of Foreign Affairs said in a statement.

"States entering the Philippines' EEZ and maritime zones therefore are likewise obliged to protect and preserve our marine environment," it said.

Any move to pursue arbitration would be highly controversial after the Philippines' landmark [2016 victory](#) in a case against China that concluded Beijing's claim to sovereignty over most of the South China Sea had no basis under international law.

Iroquois Reef is close to the Reed Bank, where the Philippines hopes to one day access gas

reserves, a plan complicated by China's claim to the area.

China, which has refused to recognise the 2016 ruling and has chafed at repeated mention of the case by Western powers, denied the latest claims of destruction of coral reefs.

[Also Read | AI to protect coral reefs, marine life, \\$9.6 bn worth tourism, 1 billion livelihoods](#)

"We urge the relevant party of the Philippines to stop creating a political drama from fiction," its embassy in Manila said late on Thursday, quoting Chinese foreign ministry spokesperson Mao Ning.

The Philippines' coast guard and armed forces earlier this week reported "severe damage inflicted upon the marine environment and coral" at the Iroquois Reef, where it said 33 Chinese vessels had been moored in August and September.

They described the vessels, which are typically fishing trawlers, as "maritime militia" and said they were harvesting the coral. Coral in the South China Sea has been used for limestone and construction materials, traditional medicines and even souvenirs and jewellery.

China has asserted its claims of sovereignty over the Spratly area with a series of manmade islands built upon submerged reefs, some equipped with runways, hangers, radar and missile systems. Vietnam, Malaysia and the Philippines also occupy islands in the archipelago, where several countries' EEZs overlap.

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## EXPLAINED

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

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September 24, 2023 10:05 pm | Updated 10:10 pm IST

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Thousands of South Korean protesters demand a stop to Japan's release of treated radioactive water into the sea from the damaged Fukushima nuclear power plant, in Seoul, South Korea on August 26. | Photo Credit: AP

**The story so far:** Last month, amid strong backlash from the public and neighbouring countries, Japan began the release of contaminated water from the Fukushima nuclear plant into the sea.

On April 13, 2021, Japan's government announced plans to release over one million tonnes of contaminated water from the Fukushima nuclear plant into the sea over the next 30 years. The wastewater is a byproduct of the catastrophic 2011 earthquake and tsunami, which disabled the Fukushima Daiichi nuclear power plant, leading to the release of radioactive materials. After more than a decade of storing this wastewater, Japan says they are running out of storage space, and allege that the, now treated water is safe for release.

However, since the announcement in 2021, a sizeable fraction of the public, both domestic and foreign, have been speaking out against this decision, claiming that mixing radioactive materials in the sea poses major health risks, especially since these countries rely heavily on seafood.

The water is being treated by the Tokyo Electric Power Company (TEPCO), Japan's largest electric utility firm. Since 2011, TEPCO has been in charge of decommissioning the Fukushima Daiichi power plant, and managing the waste. The water has been treated with multiple techniques, notably the Advanced Liquid Processing System (ALPS), which removes 62 types of radioactive materials.

However, it doesn't remove tritium. TEPCO and the Japanese government argue that the concentration of tritium does not exceed international standards, in particular, those of the International Atomic Energy Agency (IAEA), the United Nations' nuclear watchdog. According to TEPCO's website, the radiation emitted by tritium is "extremely weak, and can be blocked with a single sheet of paper." The concentration is also six times less than the limit for tritium in drinking water, set by the World Health Organization.

"You can't remove tritium because it is identical to hydrogen. So removing it, chemically extracting it from wastewater becomes quite impossible," explains Dr. Arun Vishwanathan, Associate Professor at the School of National Security Studies at Central University of Gujarat, Gandhinagar. "What they [have done], and what other nuclear plants ... also do is mix it with water so that the tritium quantity reduces further, before it is actually released into the sea."

Fears persist within the majority. A poll conducted by Japan's Jiji Press in September shows that 16.3% of respondents are opposed to the discharge of the treated water, and 30.8% were neither opposed nor in favour. Several protests have been held in Seoul against the release, and many hoarded seafood ahead of the discharge. Some surveys show that 80-85% of South Koreans oppose the water's release. The Chinese government, which has been against Japan's decision since the announcement was made, has already banned seafood from Japan.

"Countries have to balance what is the scientific truth, or what can be established, and the general perception of the public," says Mr. Vishwanathan, adding that these fears always come up after such large-scale disasters.

M. V. Ramana, Professor and Simons Chair in Disarmament, Global and Human Security School of Public Policy and Global Affairs at the University of British Columbia, says that, although, scientifically, the levels of radiation in the wastewater are not so high as to cause panic, there is evidence showing that exposure to radiation, even at low levels, can harm the health of humans and the environment.

"[Tritium] is easily absorbed by the bodies of living creatures when it is in the form of tritiated water, and rapidly distributed throughout bodies via blood. Since tritiated water can pass through the placenta, it could lead to developmental effects in babies when ingested by pregnant women." Chemically, he said there is no difference between tritiated water and water with tritiate. He also pointed out that the IAEA's most important objective is to 'seek to accelerate and enlarge the contribution of atomic energy.' He said that "one should not be surprised that they underplay the risks involved".

"Japan is trying to use the IAEA decision as a tool to release the water," says Jagannath Panda, Head of the Stockholm Center for South Asian and Indo-Pacific Affairs (SCSA-IPA) and Editor of the Institute Security and Development Policy, which he says have somewhat brought public, political and social stakeholders to a consensus in Japan.

Mr. Vishwanathan further explains that there is no other option, besides releasing the water, partially because of space around the plant, but also because of potential leakages. "They don't want to take this all over the country and store this — it increases the cost and the risk [of leaks] exponentially." Besides, governments knew that the handling of this wastewater would have to be dealt with, since the earthquake hit.

Japanese Prime Minister Fumio Kishida and South Korean President Yoon Suk Yeol publicly ate seafood after the discharge began in order to strengthen public trust in the water treatment process. A key factor for Japan in maintaining relations with South Korea in particular, has been transparency over the treatment and release process. South Korea's government, following repeated consolation by the IAEA, has told people that the water and the seafood is safe. They have also assured the public that they will continuously monitor the seawater and seafood, and that the 2011 ban on seafood from the water near Fukushima, would remain intact.

For Mr. Kishida and Mr. Yoon, the water may pose more geopolitical problems than health issues. Japan colonised the Korean peninsula in the early 20th century, and the tensions of that time continue to strain relations even now. But both leaders have been working toward forming friendlier relations, especially given the potential threats that their more aggressive neighbours, China and North Korea, present. Mr. Panda said that, although the South Korean government had opposed the water's release, the IAEA's approval was able to provide adequate reassurance.

Maintaining transparency on the risks and the measures being taken has helped Japan's



domestic and geopolitical standing. Mr. Vishwanathan explained that since 2021, Japanese authorities have met with their regional counterparts, like South Korea and China, and even Russia, to discuss the treatment and release plan. Although China and Russia were not on board at the time of the release, he said most other countries were comforted by such transparent communication.

Mr. Vishwanathan said that China's response must be seen through a wider geopolitical lens. Japan-Sino relations have fluctuated repeatedly in the recent past, especially as China grows its military presence in the South China Sea. This has evoked more nationalist sentiments from both sides, making this wastewater issue notable, but not necessarily new.

China is also watching South Korea and Japan's strengthening relationship. "China, of course, is not comfortable about the growing bonhomie between South Korea and Japan. The Chinese government aims to make it an issue just to create further strategic fissures between South Korea and Japan," explains Mr. Panda. "Though it appears at present to be a big issue, I don't think that the Chinese government will succeed in politicising the issues to create a further divide between South Korea and Japan."

Japan will release the treated wastewater over the next 30 years, and will continue to monitor the seawater's radiation. The government is also setting aside 80 billion yen to compensate fishers who will lose business because of public fears. The government is looking to revive the country's nuclear power plant industry, with the hopes to stabilise the energy sector. Before the 2011 earthquake, 30% of Japan's electricity needs were met via nuclear reactors. In March, less than 10% of Japan's power came from these facilities. "It appears to want to create the impression that the Fukushima accident is long over, whereas the reality is that it will be decades and decades before... the radioactive materials [are] at least segregated," states Mr. Ramana.

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# ANTARCTIC WINTER SEA ICE HITS 'EXTREME' RECORD LOW

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

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September 26, 2023 09:06 am | Updated 09:06 am IST

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Small chunks of ice float on the water near Fournier Bay, Antarctica, February 3, 2020. | Photo Credit: Reuters

Sea ice that packs the ocean around Antarctica hit record low levels this winter, the U.S. National Snow and Ice Data Center (NSIDC) said on September 25, adding to scientists' fears that the impact of climate change at the southern pole is ramping up.

Researchers warn the shift can have dire consequences for animals like penguins who breed and rear their young on the sea ice, while also hastening global warming by reducing how much sunlight is reflected by white ice back into space.

Antarctic sea ice extent peaked this year on Sept. 10, when it covered 16.96 million square kilometers (6.55 million square miles), the lowest winter maximum since satellite records began in 1979, the NSIDC said. That's about 1 million square kilometers less ice than the previous winter record set in 1986.

"It's not just a record-breaking year, it's an extreme record-breaking year," said NSIDC senior scientist Walt Meier.

NSIDC in a statement said that the figures were preliminary with a full analysis to be released next month.

Seasons are reversed in the Southern hemisphere with sea ice generally peaking around September near the end of winter and later melting to its lowest point in February or March as summer draws to a close.

The summer Antarctic sea ice extent also hit a record low in February, breaking the previous mark set in 2022.

The Arctic has been hit hard by climate change over the last decade, with sea ice rapidly deteriorating as the northern region warms four times faster than the global average.

While climate change is contributing to melting glaciers in Antarctica, it has been less certain how warming temperatures are impacting sea ice near the southern pole. Sea ice extent there

grew between 2007 and 2016.

The shift in recent years toward record-low conditions has scientists concerned climate change may finally be presenting itself in Antarctic sea ice.

While Mr. Meier cautioned it is too soon to say, an academic article published earlier this month in the journal *Communications Earth and Environment* pointed to climate change as a potential factor.

The study found that warming ocean temperatures, driven mainly by human-caused greenhouse gas emissions, are contributing to the lower sea ice levels seen since 2016.

"The key message here is that to protect these frozen parts of the world that are really important for a whole number of reasons," said Ariaan Purich, a sea ice researcher at Australia's Monash University who co-authored the study, "we really need to reduce our greenhouse gas emissions."

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# CRITICAL FOR CITIES IN GLOBAL SOUTH TO LOCALISE CLIMATE AGENDA: HARDEEP PURI

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

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September 26, 2023 03:42 am | Updated 06:59 am IST - NEW DELHI

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Union Minister for Petroleum and Natural Gas, Housing and Urban Affairs Hardeep Singh Puri at the inaugural session of Urban Shift Asia Forum in New Delhi on Monday | Photo Credit: ANI

Union Housing and Urban Affairs Minister Hardeep Singh Puri on September 25 said that cities need to reduce dependence on central funds for their financial needs to address climate change.

He said that there was a need to complement traditional revenue streams with innovative instruments and more diverse access to finance for climate action at the urban level.

Addressing the first Urban Shift Forum (Asia) programme here, Mr. Puri observed that for cities in the Global South, it is critical to localise the climate agendas. "No discussion on urban planning can be removed from fiscal health. Cities depend heavily on central grants to meet basic financial needs. This needs to change," he said.

The Union Minister said that for India, the 'Panchamrit' Action Plan was the anchor for climate response with the thrust centred on rapidly urbanising cities. He pointed out that the results were already showing.

The Panchamrit Action Plan pledges to reach 500 gigawatts (GW) of non-fossil energy capacity by 2030, meet 50% of India's energy requirement from renewable energy (RE) sources by 2030, reduce the carbon intensity of the economy by 45% below 2005 levels by 2030, reduce total projected carbon emissions by one billion tonnes by 2030 and achieve the target of net zero emissions by 2070.

The Urban Shift Forum brings together diverse expertise, trainers and businesses to find holistic and hands-on solutions for tackling urban challenges.

The National Institute of Urban Affairs (NIUA), United Nations Environment Programme (UNEP), Asian Development Bank (ADB) and Global Environment Facility (GEF) were among the organisations and institutions that are participating. More than 150 representatives of national governments and cities in India, Indonesia, China, Vietnam, Malaysia, Nepal, Philippines, Jordan and Sri Lanka.

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# SCIENTISTS UNCOVER A SCALY SURPRISE WITH NEW PANGOLIN SPECIES

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

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September 27, 2023 03:21 am | Updated 03:21 am IST - Bangkok

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Even as the species was discovered, there are signs it may be disappearing, according to research published. Representational file image.

The small, scaly, and highly endangered pangolin has been keeping a secret: it comprises not eight species but nine, with a new one discovered through analysis of confiscated scales.

Scientists previously believed there were four Asian and four African varieties of the shy, nocturnal creature, which is often described as the world's most trafficked mammal.

However, even as the species was discovered, there are signs it may be disappearing, according to research published Tuesday in the journal Proceedings of the National Academy of Sciences.

Pangolin scales are coveted for use in traditional medicine, despite being made of keratin, just like fingernails, and the diminutive creature is also hunted for its meat.

More than a million are believed to have been poached from the wild in the decade to 2014, according to conservationists, and all international trade has been banned since 2016.

Despite its elusive nature, there have been suggestions before that the pangolin family might be bigger than believed.

Analysis of 27 scales confiscated in Hong Kong in 2012 and 2013 suggested a lineage unrelated to the eight known species.

But only limited gene fragments were available, and no definitive conclusion could be reached.

Picking up that trail, researchers analysed scales from two confiscations in China's Yunnan province in 2015 and 2019 and compared them against whole genome data from all previously known species.

They found a lineage "distinct from all eight currently known pangolin species", with signs it belonged to the Asian or "Manis" branch of the pangolin family.

They assigned the new species the tentative name “Manis mysteria” in a nod to its enigmatic nature and found it likely diverged from the Philippine and Malayan pangolin species about five million years ago.

The newly described animal’s existence only came to light through samples seized from traffickers, and the research suggests the new species is already under pressure.

Analysis “showed genomic signatures of a declining population, including the relatively low genetic diversity when compared to other pangolins... (and) high levels of inbreeding and genetic load”.

Just where Manis mysteria roams remains... something of a mystery.

Asian pangolins arriving in Hong Kong and Yunnan are believed to mostly originate in Southeast Asia.

But because the new species does not look very different from its Asian cousins, it may well have been overlooked in the wild.

It could also have escaped notice because it lives in an understudied region, or simply because pangolins tend to be hard to find.

Regardless, the findings suggest the “urgent need” for more research, as well as “effective strategies for this mysterious species”, the study said.

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# BOOST IN SOLAR ENERGY AND ELECTRIC VEHICLE SALES GIVES HOPE FOR CLIMATE GOALS, REPORT SAYS

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

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September 27, 2023 02:54 am | Updated 08:30 am IST

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The report found that solar power capacity increased nearly 50% in the last two years and electric car sales increased by 240%. Representational file image. | Photo Credit: AP

The window to limit human-caused warming to a globally agreed goal is narrowing but still open because of the huge growth of solar energy and electric vehicles sales worldwide, a report said on September 26.

For the last two years, the rate of the build-up of solar energy and electric vehicle sales were in line with achieving emissions reduction targets that will help cap warming to 1.5°C above pre-industrial levels, the Paris-based International Energy Agency said.

But renewable power needs to triple by 2030, the sale of EVs needs to rise much more sharply — 70% of all vehicle sales as opposed to the current 13% — and methane emissions from the energy sector needs to fall by 75% if global warming is to be curbed to the the Paris Agreement goal. Methane is a powerful greenhouse gas that is up to 80 times more potent than carbon dioxide in the short term.

**Also read | [Climate change 'dystopian future already here', says UN rights chief](#)**

Investments in climate action also need to rise, from \$1.8 trillion in 2023 to \$4.5 trillion annually by the early 2030s, the report said.

“Global climate continues to change at a frightening speed,” said Fatih Birol, executive director of the IEA at an online press event, but “there are legitimate reasons to be hopeful. The spectacular increase in clean energy is keeping the door still open.”

The report found that solar power capacity increased nearly 50% in the last two years and electric car sales increased by 240%.

But carbon dioxide emissions from the energy sector — which includes the production of coal, oil and gas — remain worryingly high, reaching a new record of 37 gigatons last year.

“Instead of starting to fall as envisaged in our 2021 report, demand for fossil fuel has increased,” the report said, pointing to Russia's invasion of Ukraine as well as lack of investments in supply chains for clean energy for the growth in dirty fuels.

Failure to increase ambition to slash emissions would create additional climate risks and make achieving the 1.5 degrees Celsius (2.7 degrees Fahrenheit) goal dependent on a massive deployment of carbon removal technologies which are expensive and currently unproven at scale.

Nearly five gigatons of carbon dioxide would have to be removed from the atmosphere every year during the second half of this century if countries don't drastically reduce emissions to recommended levels, the IEA said.

“The actions we need to take now are increasingly massive, and there is no slack left in the plan,” said Dave Jones, an energy analyst at London-based climate think tank Ember.

Tripling renewables by 2030 and making energy more efficient so it emits less CO2 are goals that the hosts of the next global climate summit in Dubai in late November and December this year have also laid out for the upcoming talks.

“It is now in the hands of governments to deliver,” Jones said.

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# CHEETAHS MAY BE FLOWN IN FROM NEW COUNTRIES

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

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September 26, 2023 10:56 pm | Updated 10:57 pm IST - NEW DELHI

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A cheetah after its release inside a special enclosure of the Kuno National Park in Madhya Pradesh on September 17, 2022. Photo: PMO via PTI

With [six adult cheetahs dying](#) within the first year of their relocation to India, wildlife experts associated with Project Cheetah are considering options of importing the next batch of big cats from countries other than South Africa and Namibia. A final decision is awaited.

Though it was expected that future batches of the animals would be brought from South Africa and Namibia — the result of extensive discussions with both countries and agreements at the highest diplomatic levels — experts privy to the goings-on in matters of Project Cheetah told *The Hindu* that the experience with the animals over the past year were prompting a rethink.

A major factor was some of the animals' vulnerability to infections from their biological proclivity to generate 'winter coats' during the summer and monsoon months in India.

A biological adaptation to winter, the covering in the wet and humid conditions of India proved to be detrimental as it facilitated fatal infections that may have killed at least two of the animals. With South Africa and Namibia being in the Southern Hemisphere, there are concerns that future batches of cheetahs from these countries could be similarly vulnerable.

"The development of a winter coat is a serious problem. In future, we will likely import animals that are less prone to developing them," said S.P. Yadav, Member Secretary of the National Tiger Conservation Authority (NTCA), who is closely involved with Project Cheetah.

"At present, we are looking at South Africa as even the President of South Africa has committed to providing the animals. We need 12 to 14 animals a year but if we need more, we can consider even animals outside these countries. Our agreement with all countries stand. Also, not all animals from South Africa and Namibia have a winter coat issue."

The location for the future batches of animals would be the Gandhi Sagar Park in Madhya Pradesh. All the cheetahs relocated to India from South Africa and Namibia so far have been put at the Kuno National Park in the same State.

Another official associated with a key committee linked to Project Cheetah said that a decision to

import South African cheetahs had not been “finalised” though the winter coat was a “prominent” factor before the steering committee tasked with charting the future of Project Cheetah.

“It will be many months before the next batch comes as Gandhi Sagar — though an excellent park with natural savannah grass — still needs quite a lot of preparation. We have to ensure that the next set of cheetahs that come in have access to adequate prey,” the official told *The Hindu*.

Another factor weighing on the experts is that despite a year in India, most of the animals continue to be in enclosures.

“We could also consider cheetahs from the Northern Hemisphere (Kenya, which partly lies in the Northern Hemisphere) that are free-ranging and more likely to adapt to Indian conditions,” the official said.

Several of the cheetahs currently at Kuno have been bred in captivity and reportedly have not fully adapted to the forests in India. Currently, all the cheetahs have been moved to large enclosures and are expected to be released into the wild with the onset of winter next month.

Another expert privy to the project said that other than the home country, factors such as logistics, age, and gender would be considered before a decision to finalise the next batch of cheetahs was taken in December or January.

“There is a suggestion to consider animals outside these two countries but the logistics are daunting and involves diplomatic and political factors. The winter coat issue has surprised everyone, including the African experts, and we would prefer animals resilient to this. However, we have time until December or January-next for considering the next batch and will weigh many factors,” the expert said.

A year after Prime Minister Narendra Modi released the first of eight African cheetahs, flown from Namibia into enclosures at the Kuno National Park, the plan was to have the animals — later joined by a cohort of 12 cheetahs from South Africa — range in the 748 square kilometres of the park. However a year down, six of the 20 animals have died and of the quartet of the first litter born to one of the animals, three succumbed to Kuno’s heat, with the surviving animal being hand-reared by the park officials.

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## EXPLAINED

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September 28, 2023 08:30 am | Updated 08:30 am IST

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A National Tiger Commission team investigate after 10 tigers including six tiger cubs died in the last 40 days, in Nilgiri. | Photo Credit: ANI

**The story so far:** A total of 10 tigers (six cubs and four adults) have died in the Nilgiris since the middle of August. The six tiger cubs died in two separate incidents, while the four adult tigers died in four separate events, with at least one suspected to have been poisoned. The inability of the state forest department to trace the whereabouts of the two mother tigresses has raised concerns among conservationists about the welfare of the animals.

The first reported tiger deaths occurred on August 16 in the buffer zone of the Mudumalai Tiger Reserve (MTR) in Siriyur. After conducting a postmortem on the remains, forest department officials said that they suspect that the cubs, believed to be only two weeks old, could have died due to starvation or umbilical infection. The second death was of an adult tigress in the Naduvattam Range in the Nilgiris forest division on August 17, with officials suspecting that the tigress died due to injuries after fighting with another animal. Another suspected incident of fighting is believed to have caused the death of the fourth tiger, the second adult, in the Kargudi forest range of MTR on August 31. On September 9, two more tigers were found dead in Udhagai South Range near Avalanche in the Nilgiris Forest Division. One of the tigers, a sub-adult, was found with injury marks, indicating that it too died due to a fight with another animal. However, the larger male, found dead nearby, had no apparent injuries. A search of the area led forest department staff to the carcass of a cow that had been preyed upon by the larger tiger. After an investigation, a man was arrested for poisoning the carcass of the cow in retaliation for the tiger hunting the animal. In a final incident, on September 17, four tiger cubs were found dead over the course of three days in Kadanad in the Nilgiris North Range.

In February this year, the forest department arrested four poachers from Rajasthan who had allegedly poached a tiger in the areas surrounding Emerald Dam near Avalanche, a few kilometres away from where the two tigers were found dead. In addition, the inability of the forest department to track down the two mothers of the six tiger cubs that died in Siriyur and Kadanad has raised concerns over their well-being. Camera traps and tiger trackers continue to look for the animals, but with little luck.

One of the theories put forward by senior forest department officials is that the high density of tigers in the Mudumalai-Bandipur-Nagarhole complex of the Nilgiri Biosphere Reserve is pushing populations into the surrounding habitats in the Mukurthi National Park, Nilgiris and Gudalur forest divisions. This leads to increased competition between animals and more

fighting, resulting in more deaths. According to Nilgiris Division's District Forest Officer, S. Gowtham, the division is now home to 54 tigers, a significant population. In fact, tigers have been frequently recorded in the outskirts of the Udhamandalam town multiple times over the last few years.

Conservationists worry that this increase in population could lead to more negative human-animal interactions in the near future. They emphasise the need to regenerate degraded habitats that can be re-colonised by the tigers' prey such as Sambar, spotted deer and the Indian gaur.

To allay fears that poachers could be targeting tigers, the forest department plans to set up anti-poaching camps in six forest ranges surrounding the Mukurthi National Park. There are also plans to begin annual monitoring of tiger populations in the Nilgiris Forest Division, with the population size, range of each individual animal and other parameters to be recorded for better management. They have also increased perambulation of areas surrounding key tiger habitats in Mukurthi and Mudumalai.

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# DRAWING THE LINE: ON INFORMATION AND RISKS UNDERLYING INFRASTRUCTURE DEVELOPMENT IN UTTARAKHAND

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The year began on a calamitous note with reports that the temple town of Joshimath in the Chamoli district of Uttarakhand was ‘sinking’ and that cracks had appeared on residential and commercial structures. This prompted a humanitarian crisis with people fleeing and taking refuge in tents and open spaces, fearing that their homes would crumble. A proximate reason for the acceleration in the fissures and cracks was attributed to tunnelling activities from the Tapovan Vishnugad power project being developed by the National Thermal Power Corporation. There were also concerns on whether groundwater depletion, or increased urbanisation that encouraged faulty construction, had reached a point from which disasters had become inevitable. To address all these, the Uttarakhand State Disaster Management Authority had commissioned eight reputed institutions to study the land-subsidence phenomenon from multiple angles. Surprisingly, it banned the public dissemination of information from scientists involved with the institutions on the grounds that satellite imagery pictures — from Indian and international sources — of the subsurface in Uttarakhand were aggravating “panic” and that information was to be shared only after it was “cleared” by the Centre. The net result of this is that despite reports of all institutions being available for months, it took a strong rebuke from the High Court of Uttarakhand last week for the State authorities to make this information public.

Though these reports are technical, they reiterate what has been known about the risks underlying infrastructure development in Uttarakhand. The Central Building Research Institute, Roorkee, for instance, pointed out that 99% of construction in the region did not comply with the mandatory building codes. The National Institute of Hydrology, Roorkee, in its report, said that the network of springs, drainage systems and areas of subsidence may influence land subsidence and there was a need to monitor them. Overall, the tenuous geology made city-like infrastructure projects risky and strict town-planning and construction measures were necessary to minimise the risk from accidents and a loss of lives. While there is a legitimate case for ensuring that citizens in the hill States are not denied basic amenities and the opportunities for material advancement, it is incumbent upon governments to take hard decisions that are sustainable as against those that are aimed to score in the next election. A necessary step is in ensuring that information on the risks is widely disseminated and communicated in a way that it becomes a part and parcel of public life. Independent scientific counsel must form the backbone of policymaking and clear lines must be drawn around the limits to development in the region.

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