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A LEOPARD COUNT WITH A MISSING BENCHMARK NUMBER

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

“India’s leopard population increases by 60% in 4 years” [since 2014] is what most newspapers highlighted when a first-of-its-kind report on leopard numbers in the country was released recently. Unlike the fanfare and debates that would have rolled out with tiger numbers, there was hardly any discourse about this species. Like always, the leopard loses out to its larger cousin. However, to get a population estimate of an elusive carnivore at the geographical scale of 21 States in India is tricky and requires colossal effort. On this front, the entire research team has to be congratulated for completing this massive task.

Most times, the goal of species conservation is to protect and increase the population of the species of interest. In this direction, scientific monitoring of their current numbers, and an increase or a decrease in numbers over the years will determine whether the conservation efforts undertaken to preserve the species are bearing fruit. To achieve this, a solid, authentic benchmark is very essential and critical.

Also read | [Have to ensure animals live in safe habitats: Modi on rise in leopard population](#)

Though the report, [Status of leopards in India, 2018](#), distinctly mentions that the figure is the ‘minimum number’, the way it was launched has depicted that the country has 12,852 leopards. If we go by these figures, I feel this is an underestimate by at least 40%. In my opinion, India may have over 20,000 leopards.

This study focused mostly on forested habitats where tigers are found, as it was a by-product of the all-India tiger estimate. Hence other leopard habitats such as rocky outcrops, smaller dry forests, higher elevation habitats in the Himalayas, agricultural landscapes (coffee, tea, arecanut, sugarcane plantations) where leopards are known to be found in good numbers were not a part of this exercise. Similarly, much of Northeast India was excluded from the study. Hence the area studied by itself does not represent a true pan-India leopard population. Though a very coarse scale map is made available in the report, it clearly depicts that vast stretches of leopard habitats have been excluded from the study. I think this is a key factor that has kept India’s leopard numbers lower than the true picture.

It requires enormous resources and time to carry out a study on the scale of a large nation such as ours. If this study had included leopard population estimates from other research organisations (for the same study period and which had used camera trapping as a methodology) from the areas that were not covered (by this study), it could have added significant information and leopard numbers to the current estimate of 12,852.

Also read | [650 leopards in Kerala’s tiger reserves](#)

My work on leopards is focused on my home State of Karnataka. Hence I will use this as an example to draw parallels on the all-India leopard numbers. Our camera trapping exercise in the BRT-MM Hills-Cauvery-Bannerghatta protected areas revealed a leopard population of 267 individuals. This protected area complex, of an area of 2,825 square kilometres, possibly represents less than 6% of leopard habitat in Karnataka. This landscape also has two competing large predators — the tiger and the dhole — who keep leopard numbers under check. Even in small, natural habitats such as the Devarayanadurga Reserved Forests and its adjoining areas,

our studies showed a population of 15 leopards in a small area of 70 square kilometres. Small rocky outcrops such as Devarayanadurga can potentially have high leopard numbers. Hence it is critical that such habitats are included when the population figure for an entire nation is projected.

Also read | [Karnataka second in country in leopard numbers](#)

The claim that “leopard numbers increased by 60%” also needs to be closely looked into.

In 2014, the study estimated a minimum leopard population of 7,910 individuals from 18 different Indian States covering a study area of 92,164 square kilometres. In 2018, the study was expanded to 21 States with a study area of 121,337 square kilometres, which shows a spatial increase in the size of the study area by 25%. Even the number of camera trap locations has increased by nearly threefold (9,735 to 26,838 camera trapping locations).

Also read | [Leopard habitats and wild prey base outside protected areas eroding: Study](#)

So, comparing results from 2014 with 2018, and hailing it as a 60% increase is quite misleading. It simply means that we covered more area and put in more camera traps to count leopards, which resulted in higher leopard numbers. It is like carrying out human population estimates in 18 States, and the next year we conduct a similar exercise but in 21 States. Obviously, the count will result in a higher number of people, but to claim that population figures have increased would be fallacious.

Overall, we need a benchmark number against which we can evaluate the trend in leopard numbers and threats to this carnivore. In general, habitat loss due to mining and quarrying, poaching for body parts, mortality due to vehicular collisions, retaliatory killing due to human-leopard conflict and accidental deaths due to snares set for catching wild prey all seem to be impacting the conservation of this rosette-patterned cat. If we can assess leopard numbers in a few selected sites and monitor the area occupied by them over large swathes, it will perhaps give us a better overview of leopard conservation efforts.

Sanjay Gubbi works on leopard ecology and conservation in Karnataka and is the author of the book, 'Second Nature: Saving Tiger Landscapes in the Twenty First Century'. The views expressed are personal

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ASIAN WATERBIRD CENSUS COMMENCES IN A.P.

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

Bird count:The census will cover at least two dozens sites, including Coringa Wildlife Sanctuary.
file photo

The two-day Asian Waterbird Census-2020 commenced in Andhra Pradesh on Tuesday under the aegis of experts from the Bombay Natural History Society (BNHS), covering at least two dozen sites, including Coringa Wildlife Sanctuary, Kolleru Lake and Krishna Sanctuary.

BNHS Assistant Director P. Sathiyaselvam, S. Siva Kumar and BNHS Andhra Pradesh coordinator K. Mrutyunjaya Rao trained amateur birdwatchers on Tuesday on technical aspects of the bird census and challenges, enabling them to conduct the task on their own.

Avian diversity

Dr. Sathiyaselvam, who had previously explored the avian diversity in the Godavari estuary, has presented a demonstration on the 90 species of birds sighted in the Godavari estuary and finalised 12 sites being covered in the census.

“There is a need of more birdwatchers in the State, as their critical inputs on the wetlands and waterbirds will help design the conservation plans of the respective sites in future,” said Dr. Sathiyaselvam.

On the endangered Indian Skimmer, Dr. Sathiyaselvam admitted that more study was still required to establish that the species breeds on the Kakinada coast, which supports a great number of Indian Skimmer.

In Godavari estuary, the Kumbabhisekham mudflat, the wetland opposite the Coromandel industrial area and other Important Bird Areas (IBAs) are being covered.

The birdwatchers from Visakhapatnam, Rajamahendravaram and Kakinada have been roped into the census in the Godavari estuary.

In Kolleru Lake and Krishna sanctuaries, the forest department employees are conducting the census. In-Charge Ranger (Wildlife-Kakinada) Sunil Kumar was present.

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SAVING POWER, GOING GREEN WITH FILAMENT-FREE KERALA

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

Chief Minister Pinarayi Vijayan on Thursday inaugurated the Filament-free Kerala project that seeks to replace ordinary filament bulbs at homes with the more energy-efficient LED bulbs.

The Kerala State Electricity Board (KSEB), which is implementing the project in collaboration with the Energy Management Centre (EMC), Kerala, hopes to save 100 to 150 MW power annually through the project.

3-year guarantee

Consumers are supplied LED bulbs that cost Rs. 100 at Rs. 65 apiece with a three-year guarantee. The price of the bulb can be paid at once or in instalments along with the electricity bill.

For participating in the project, a consumer has to register on the KSEB web portal. So far, 17 lakh applicants have registered. The initial phase will require one crore LED bulbs. Consumers who have not registered will have an opportunity to do so.

The Chief Minister urged the public to make the best use of the project, calling it an eco-friendly initiative. The KSEB will hand over the filament bulbs collected from consumers to the Clean Kerala Company for disposal.

Nilaavu project

The Nilaavu project seeks to transform all street lamps into LEDs. Of the 16 lakh street lamps, 5.5 lakh have undergone the conversion. The remaining 10.5 lakh will be converted soon, with the first phase consisting of two lakh lamps, the Chief Minister said.

The State government has succeeded in ushering in progress in the generation, transmission, and distribution of electricity in the past four-and-a-half years, he added.

Electricity Minister M.M. Mani, Minister for Local Self Government A.C. Moideen, KSEB chairman N.S. Pillai, and senior KSEB officials were present.

Precious commodity

KSEB hopes to save 100 to 150 MW power annually

Consumers are supplied LED bulbs that cost Rs. 100 at Rs. 65 apiece

They have to register on KSEB web portal

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U.P. YOUTH BEAT GANGETIC DOLPHIN TO DEATH

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

In the FIR lodged at the Nawabganj police station against unknown persons, it was mentioned that a post-mortem on the dolphin was conducted. Killing the Gangetic River Dolphin is a punishable offence under Section 9/51 of the Wildlife Protection Act, 1972, the FIR said. The motive behind the crime is not yet known.

On January 2, IFS officer Ramesh Pandey shared photo of the incident and tweeted: "In an unfortunate incident a Gangetic Dolphin got killed by locals in Pratapgarh district of UP. Locals thought the species a 'Fish' which may be dangerous for their lives. Wildlife awareness is much needed for conservation."

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NGT TO EVALUATE SAND-MINING SCENARIO

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

The National Green Tribunal (NGT) has decided to appoint an eight-member committee to check whether riverbed sand-mining in Kerala is being done in compliance with the sand-mining policy of the Union government and various environmental laws. The Southern Bench of the tribunal recommended the formation of the committee after taking suo motu notice of media reports quoting a study that recommended that nearly 30.3 lakh cubic metres out of the 81.45 lakh cubic metres accumulated sand in the Bharathapuzha river can be mined.

The Bench comprising Justice K. Ramakrishnan and expert member Saibal Dasgupta said that the court lacked clarity on the procedure adopted by the District Collectors while granting permission for mining the excess sand. It is also not known as to whether the district survey reports are prepared in a scientific manner as per the guidelines, it said.

The expert committee to be led by a senior officer of the Ministry of Environment, Forests and Climate Change has been entrusted with the task of finding out whether any monitoring is done to ascertain the quantity of sand to be mined, besides seeing whether the departments concerned have approved the mining plan. The committee is also directed to provide a status report on sand mining in riverbeds passing through the forests and eco-sensitive zones.

It will probe whether permission is being granted in those buffer areas. The committee is also permitted to co-opt the District Collectors whenever inspection is carried out as part of the field study to find out whether they are following a uniform method as per rules. The committee has to submit its report before the tribunal by March 16.

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THE HINDU EXPLAINS

Relevant for: Environment | Topic: Disaster and disaster management

The story so far: [Avian influenza](#), popularly known as [bird flu, has been reported](#) from Kerala, Rajasthan, Madhya Pradesh, Himachal Pradesh, Haryana, Gujarat and Uttar Pradesh in recent weeks. During the first week of January, reports of unusual deaths of a large number of birds, including wild ones, started coming in from many States, indicating that the virus is being actively transmitted among various bird groups. The two virus types identified so far in the outbreaks — [H5N1](#) and [H5N8](#) — come under the category of [Highly Pathogenic Avian Influenza](#) (HPAI), which is of major concern to those keeping birds, because it leads to disease and death of fowl and causes economic havoc. H5N1 is a known threat to humans as well. The spread of the disease in a variety of birds in several geographical regions, and the seasonal movement of migratory birds, have prompted the Centre to issue an alert to States to adhere to the National Action Plan for Prevention, Control and Containment of Avian Influenza 2021. Internationally, the [World Animal Health Information System](#) in December 2020 identified outbreaks of HPAI in Taiwan, Iran, Israel, Japan, South Korea and Vietnam, a dozen European Union countries, Ukraine, Russia and the U.K., leading to a loss of over 4.8 million birds by the end of December 2020.

Avian Influenza (AI) is a highly contagious viral disease, affecting a variety of birds, including those connected with human consumption — chickens, ducks, turkeys, quails — as well as pet birds and wild birds. The World Organization for Animal Health, which collaborates with the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), says HPAI virus strains H5N1, H5N2, H5N8, H7N8 have been identified in outbreaks, indicating active circulation. Infection histories point to H5N1 and H7N9 viruses posing a threat to human health as well.

Editorial | [Flu in full flight: On the avian flu outbreak](#)

The FAO says wild birds act as a natural reservoir of AI viruses. Their migratory movement could bring these pathogens to poultry, waterfowl and other domestic birds through contact. HPAI produces severe clinical signs of disease in birds, causing a high degree of mortality and economic loss. The response to an outbreak is a containment strategy, which is primarily centred around removing the diseased birds through culling. Such mass destruction causes a severe impact on farmers.

In the latest viral spread, in just one instance, Kerala has already identified over 69,000 birds, mostly ducks, stricken with H5N8, to be culled at four infection sites in the Kuttanad area of Alappuzha.

India's poultry sector, according to the Ministry of Agriculture and Farmers Welfare, is worth 80,000 crore, of which the organised sector represents 80%, and the rest is distributed among unorganised sectors, including backyard poultry-keeping which is crucial for income and nutritional security.

Also read | [Centre's Wildlife Division issues guidelines to States on containing avian flu](#)

Exports, mainly focused on West Asia, neighbouring countries and East Asia, were valued at 532 crore in 2017, with an emphasis on processed products such as egg powder, yolk powder, pharma ingredients, and chicken products. Avian flu is seen as a threat to the further growth of the sector as a whole.

By the government's estimates, there are 30 million farmers who keep backyard birds, while small and medium farmers who contribute to aggregators are crucial players in the larger ecosystem. India has a base of over 729 million poultry birds, of which 30% are layers and 40% are broilers, according to the National Action Plan for Egg and Poultry 2022. This large base shows that a serious outbreak of HPAI, as was witnessed during 2005-06 in some States, can be catastrophic. During that year, official data put the number of culled birds at over one million.

In later years, bird flu surfaced in several States, such as Manipur, Assam, West Bengal, Tripura, Bihar, and Kerala, leading to destruction of millions of birds.

Also read | [Bird flu — The Bar Headed Goose and its strong link with Pong Dam Lake in Himachal](#)

Where culling of birds is undertaken to combat bird flu, the National Action Plan prescribes compensation to be given to farmers at fixed rates. This, once again, underscores the value of prevention to protect captive birds.

The WHO, in its literature on avian influenza, states that humans can be infected with virus subtypes H5N1, H7N9 and H9N2. In a recent instance of human infection, a one-year-old was confirmed to have H5N1 in Lao PDR, thought to have been acquired from backyard birds kept by the family. Infection in other birds in the region was also confirmed. On the H5N1 virus, the WHO says, "Human cases of H5N1 avian influenza occur occasionally, but it is difficult to transmit the infection from person to person. When people do become infected, the mortality rate is about 60%."

The global health body records that since 2003, there have been 862 laboratory-confirmed cases of human infection with H5N1, and 455 deaths have been reported from 17 countries.

Also read | [Duck farmers in Kerala in deep trouble due to bird flu outbreak, seek govt. help](#)

On the H5N8 strain, the consensus is that human infection cannot be ruled out, although the likelihood is low. However, H5N6 infection, of a related clade (a descendant type) has occurred among humans, the WHO says. One case of the H9N2 strain, in a three-year old girl, was reported last October from Guangdong, China. It was mildly symptomatic and was detected during routine surveillance for Influenza-like illness.

All viruses in poultry have a public health dimension because they cause severe disease in humans and ["have the potential to mutate to increase transmissibility among humans"](#), the WHO adds. This calls for pandemic preparedness. Human-to-human transmission is believed to have taken place in some instances as a result of close or prolonged contact, but "there has been no sustained human-to-human transmission identified".

It is impossible to eradicate influenza viruses because they persist in a vast reservoir of aquatic birds. The answer to why there are periodic outbreaks that spread to domestic environments may lie in local bird-keeping conditions. After the unprecedented outbreak in 2006 in Asia, when as many as 258 cases of bird flu in humans had been reported till November 13 of that year, experts who met at an international conference in New Delhi under the aegis of WHO felt that continuous growth in poultry farming under poor sanitary conditions was sustaining the virus, with multiple susceptible species living in the same area. This underscores the importance of prevention and surveillance.

The Delhi Declaration passed at the summit resolved on a common framework for countries to build local strategies, but it did not lay emphasis on preserving the natural environment, which is

key to helping wild birds move safely in an unspoilt habitat and stop transmission of viruses to domestic fowl, which threatens humans with infections and a potential pandemic due to mutating viruses.

Governments lay down biosecurity measures to keep domestic birds safe from transmission by wild or migratory birds and prevent local spread. The protocol involves active surveillance of bird areas to identify emerging outbreaks. On the other hand, it is wrong and counterproductive, the FAO cautions, to attempt elimination of wild birds near human settlements through hunting, poisoning, and habitat destruction. Such activity disperses wild birds, and the viruses, to new areas. Moreover, hunting of wild birds and the absence of biosecurity measures bring the viruses directly to domestic fowl.

In the wake of an outbreak in 2020, the U.K. issued advice making it legally necessary for bird-keepers in that country to house them in such a manner that they do not come into contact with wild birds. The measures, which have general relevance to farmers everywhere, include housing or netting all captive birds, cleansing and disinfecting clothing, footwear and vehicles, reduction of people's movement in the farm bird areas to reduce contamination, eliminating or reducing contact between captive and wild birds, particularly through feed and water storage, and cleansing and disinfecting production areas. The U.K. uses a checklist approach to help farmers with best practices.

In India, the Central government requires veterinary staff to conduct inspections periodically under the [Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009](#), to catch any signs of disease among birds and other animals early. However, aquatic wild birds are often found in close proximity to domestic ones in many locations in India, near lakes, dams and reservoirs, making it difficult to achieve segregation. The waterways of Kerala are a good example of this phenomenon.

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Injectable vaccines have been designed to prevent symptomatic COVID-19 'disease', not the initial viral infection, says the Public Health Foundation of India (PHFI) president

Most Shigella illnesses in healthy individuals are mild and symptoms subside in a few days

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THE CURIOUS CASE OF THE GLOWING BEACHES

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

PANJIM : Just over a month ago, in remarkable unison, several separate communities arrayed on India's coastline alongside the [Arabian Sea](#) reported the presence of sparkling waves—the technical term is bioluminescent—which looked like they were embedded with blue-green glitter, and they kept rolling up to the shore one after another every night. Sizable crowds assembled to admire this “magical effect” at Juhu Beach in Mumbai, Udupi and Mangalore in Karnataka, as well as the Kochi waterfront in Kerala.

In my home state of Goa, the shimmering tides surfaced on the north and south beach belts, as well as the Mandovi and Zuari river estuaries. But no one cheered, because they came accompanied by dense swarms of [jellyfish](#), including species that are known to be toxic. Over just two days in late-November, 90 tourists were stung badly enough to require treatment, after which the panicked authorities stopped releasing data.

Before and after this cryptic natural event, as clearly visible from where I live near Miramar beach in the pocket-sized capital city of Panjim, thousands of these gelatinous creatures continue to wash up every day, with innumerable others bobbing just offshore.

The two phenomena—sea glitter and jellyfish, beauty and danger—are inextricably interlinked. Together, they represent yet another pressing warning about the ill-health of our oceans, which is profoundly connected to broader planetary trends associated with [climate change](#).

At the base of the problem is a drastic dwindling in oxygen levels in the Arabian Sea—a phenomenon known as hypoxia. This is caused by a variety of triggers that are just beginning to be understood by scientists, but sewage run-off from megacities and a drastic reduction in freshwater flows due to the loss of Himalayan snow cover are early suspects. The collapse in oxygen, however, allows malodorous, bioluminescent “sea sparkle” *Noctiluca scintillans* to flourish, which in turn leads to an explosion in the population of predatory jellyfish and salps (another gelatinous creature), eventually resulting in a disruption of the ocean's intricate food chain.

We have been seeing warning signs for years, but what is now playing out along the Konkan and Malabar coasts indicates that a perfect storm of devastating climate change-induced fallouts is already at India's doorstep.

“I wish I could sound optimistic, but I think the Arabian Sea ecosystem is past its tipping point,” said Joaquim Goes of Columbia University's Lamont-Doherty Earth Observatory.

Early last year, in May, he joined nine co-authors in publishing an important study in the *Nature Scientific Reports* journal entitled *Ecosystem state change in the Arabian Sea fuelled by the recent loss of snow over the Himalayan-Tibetan Plateau region*. It highlighted “exceptional changes” which “represent a significant and growing threat for regional fisheries and the welfare of coastal populations”.

Even as recently as the middle of 2020, the emphasis had still not been on India, but remained focused on the opposite shores of the Arabian Sea—on countries like Oman where desalination plants, refineries and other industrial complexes have become choked by jellyfish.

Even more dramatic are the effects in Yemen and Somalia, where there are strong suggestions

that the Noctiluca blooms and their strangling of fish supplies have greatly exacerbated food and economic insecurity, thus triggering the ongoing social destabilization, militarism and piracy that roils that region.

Alarm bells

When their research was published, Goes presciently alerted that “exactly the same changes that we report along the coasts of Oman and Yemen are happening on a smaller scale not too far from our (Indian) shores.” He had pointed out that Noctiluca was clearly present near Ratnagiri and Vengurla in Maharashtra, and warned unequivocally that “our planet’s alarm bells are ringing. There are very serious implications for India. All the hard-won economic gains of the past two decades could be wiped out now, just as the pandemic has done for the US.”

Fast forward just six months later, and now Goes is much more worried. He says the situation has become significantly worse. When I emailed him to tell him what has been happening on Miramar beach, he responded that it looked like an end game, which has “the propensity of short-circuiting the entire food chain, because, when Noctiluca abounds, the apex predators are not fish, but swarms of jellyfish and salps. The environmental and socio-economic costs can be huge as these swarms can clog the intake systems of all kinds of industrial plants, and also inflict huge economic losses on tourism and fisheries.”

Goes pointed to the newly published findings in Reviews and syntheses: Present, past, and future of the oxygen minimum zone in the northern Indian Ocean, which was published recently in Biogeosciences by Tim Rixen of the Leibniz Centre for Tropical Marine Research in Germany, and several co-authors.

Collaborators from nine different international institutions (which include the Physical Research Laboratory in Ahmedabad) discovered there are worrisome and seemingly self-perpetuating signs of “functional anoxia” (which means the lasting lack of sufficient oxygen to maintain normal ocean biodiversity) in the Arabian Sea. They reported widespread conditions in which Noctiluca flourishes, but almost nothing else can survive.

I immediately wrote to Rixen to ask for some perspective about what is happening in the ocean waters of India’s Arabian Sea coastline, and he responded, “I am not surprised but worried, because it indicates a regime shift caused by the expansion of the oxygen minimum zone [or OMZ, where oxygen saturation in the sea water is at its inhospitable lowest]. I could imagine that this will affect fisheries, as well as the role of the marine biosphere as an essential store of carbon dioxide.”

Rixen elaborated, “functional anoxia means that anoxic microbial processes start to dominate the ecosystem, even though trace amounts of oxygen are still present. This occurs naturally in mangrove soils and marine sediments, but only rarely in the ocean. At such low oxygen concentrations, the productivity of marine systems could fall and the formation of greenhouse gases could rise.”

Put more simply, these inhospitably low concentrations of oxygen are markedly below the percentages needed for most organisms to survive. This means India’s western coast is on the verge of mass mortality events, in which most fish—including the varieties that humans rely on for nutrition—will die en masse.

The causes

How did we get to this desperate state of affairs that imperils the lives and livelihoods of millions

of Indians as well as all the other communities that live near the Arabian Sea? One big reason is sewage: thousands of megalitres (the metric equivalent of a million litres) of untreated waste are released every day from megacities like Karachi and Mumbai, as well as every other coastal community in this part of the world.

Even in tiny Goa, as far back as 2011, the National Institute of Oceanography (NIO) had already cautioned that all coastal waters and rivers are so thoroughly contaminated with E-coli (faecal) bacteria that they're actually unsafe for swimming.

Another significant factor is the inexorable grinding logic of climate change. In their Nature Communications paper, Goes and Gomes et al wrote: "The recent trend of global warming has exerted a disproportionately strong influence on the Eurasian land surface, causing a steady decline in snow cover extent over the Himalayan-Tibetan Plateau region. This loss of snow is undermining winter convective mixing (which aids marine biodiversity, in turn supporting humans who rely on fisheries)."

These twin processes—urban run-off into the Arabian Sea, and climate disruption due to global warming—have been at work for many years, but no one expected how quickly they could wind up wrecking the ecological balance.

After all, the first sizable presence of Noctiluca in the Arabian Sea was found as recently as 2000 by the NIO scientist Prabhu Matondkar (he has since retired), who says he was initially rather taken aback to find "massive green tides in the open ocean". It took another full decade of research for Matondkar to arrive at the realization. "This new bloom had come to stay."

But now, Matondkar, who lives in Goa and continues to pay close attention to the ocean, is quite alarmed. He told me what has happened on our shores in recent weeks is "beyond expectation". "Noctiluca means the end of the food chain as we know it. It poses major challenges to us, and our world, in the coming decades," he said.

"We have to study and understand the ecology of this organism fully, or we will not be able to manipulate the situation back in favour of the natural flora of our marine ecosystem. If that does not happen, there is going to be disaster for our environment, and the resources we need to survive," Matondkar added.

Future uncertain

In Understanding the dietary relationship between extensive Noctiluca bloom outbreaks and Jellyfish swarms along the eastern Arabian Sea, another new paper published in August in the Indian Journal Of Geo Marine Sciences, L. C. Thomas, S.B. Nandan and K.B. Padmakumar of the Cochin University of Science and Technology explained in detail what is now occurring on a giant scale along the entire western coastline.

Describing how closely Noctiluca and jellyfish overlap, thus driving concomitant increases in each other's population, they write "the increasing jellyfish population feeds on mesozooplankton and provides favourable conditions for *N. scintillans* to [flourish] by feeding on diatoms with less competition. With the plentiful availability of *N. scintillans* cells, these jellyfishes utilize them as a food source [which in turn leads] to jellyfish swarming." All this is the definition of "a disrupted food chain characterizing an unsustainable and less diverse ecosystem."

When I wrote to ask whether he was surprised about just how bad the situation had become in the marine environment off the western coastline, Padmakumar gave me a measured response, saying "We can't say that it is permanently being compromised. Of course, there are many

disruptive changes occurring in the Arabian sea ecosystem like habitat destruction, debris accumulation, microplastic pollution increase, and an increase in harmful algal blooms. However, there is some kind of resilience undertaken by these ecosystems that try to recoup toward a healthy state. This continuously happens but the limit of this resilience is questionable."

An identically hedged but distinctly ominous position was also taken by Rixen when I asked whether what we are seeing now marks a point of no return for the health of the Arabian Sea.

He cautioned, "One has to look at causes. Solving the problem of eutrophication (the term refers to accumulation of sediments, minerals and nutrients) and pollution is largely related to socio-economic issues, while global warming impacts will most likely be irreversible on interannual to decadal time scales, even if the Paris agreement (to reduce greenhouse gas emissions) will be implemented. This is largely caused by the slow response of the ocean to changes of the atmospheric temperature. Whether regime shifts will be reversible, I do not know."

For his part, Goes is clear that we are in a dire situation. He says we that have no choice but to act collectively and immediately to "limit our carbon footprint, and look to sustainable energy alternatives—such as solar and wind—to power our homes".

"We have to reduce our dependence on fossil fuels, especially coal, by incentivizing industries and homes to switch to renewable sources. This drastic loss of snow, if it continues, will permanently disrupt the monsoon rainfall cycle which drives our agricultural sector, and we are already seeing early signs of erratic and sometimes extreme rainfall patterns," he added.

Goes' prognosis is a grim one: it is clear our fisheries are now gravely threatened by the disruption of the marine environment. India's food security is at stake.

Vivek Menezes is a Goa-based writer and photographer

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NO NEED TO SHUT POULTRY MARKETS, SAYS GOVT.

Relevant for: Environment | Topic: Disaster and disaster management

The Centre on Monday asked State governments not to shut down poultry markets or restrict sale of eggs or broiler chicken meat in the wake of the avian influenza outbreak that has affected 10 States. There is no need to panic as there have never been any cases of bird flu being transmitted to humans in India, and there is no danger of such transmission if the meat is properly cooked, Animal Husbandry Minister Giriraj Singh told mediapersons.

The World Health Organization has said the virus will be destroyed if poultry products are cooked at 70 degrees Celsius or above.

Asserting that unfounded rumours about the safety of poultry products could have a devastating impact on the industry, and hurt thousands of small farmers, Mr. Singh appealed to States not to take drastic action without scientific evidence.

The Minister specifically appealed to the Delhi government to reconsider its decision to shut Ghazipur mandi, Asia's largest wholesale market for chicken, and said he had written to Chief Minister Arvind Kejriwal on the issue. There is also no evidence that restricting inter and intra-State movement of poultry products is necessary, he added. So far, five States, including Delhi, have issued such restrictive orders. Since January 3, when the current avian flu outbreak began, ex-farm gate prices of broiler chicken have fallen from a national average of Rs. 85-90 per kg to Rs. 55 per kg, according to Gulrez Alam, a director of the Indian Broiler Group. Sales have dropped 50%, he added.

Mr. Singh noted that maize, which was selling at Rs. 1,800/quintal has now dropped to Rs. 1,100/quintal. Maize is used as feedstock for the poultry industry. In March, the sector already took a major hit from false rumours that COVID-19 could be spread by meat consumption, added the Minister.

On Monday, Delhi, Maharashtra and Uttarakhand joined the list of affected States, taking the total number to 10. Mr. Singh emphasised that positive samples have been officially confirmed in commercial poultry only in Kerala and Maharashtra, while the other States have only reported confirmed cases among migratory birds, wild fowl and crows. In Delhi, he said the closure of several parks where migratory birds had been found dead was a necessary move, although there was no need to close poultry markets.

In his meeting with Chief Ministers, Prime Minister Narendra Modi also encouraged unaffected States to keep a constant vigil.

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NCAVES INDIA FORUM 2021

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

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HOT AGAIN: 2020 SETS YET ANOTHER GLOBAL TEMPERATURE RECORD

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

A man cools off with a bottle of ice water on his head in Death Valley National Park, California. | Photo Credit: [AP](#)

Earth's rising fever hit or neared record hot temperature levels in 2020, global weather groups reported January 14.

While NASA and a couple of other measurement groups said 2020 passed or essentially tied 2016 as the hottest year on record, more agencies, including the National Oceanic Atmospheric Administration, said last year came in a close second or third.

The differences in rankings mostly turned on how scientists accounted for data gaps in the Arctic, which is warming faster than the rest of the globe.

"It's like the film 'Groundhog Day.' Another year, same story — record global warmth," said Pennsylvania State University climate scientist Michael Mann, who wasn't part of the measurement teams.

"As we continue to generate carbon pollution, we expect the planet to warm up. And that's precisely what we're seeing." Scientists said all you had to do was look outside: "We saw the heat waves. We saw the fires. We saw the (melting) Arctic," said NASA top climate scientist Gavin Schmidt.

"We're expecting it to get hotter and that's exactly what happened." NOAA said 2020 averaged 58.77 degrees [14.88 degrees Celsius], a few hundredths of a degree behind 2016. NASA saw 2020 as warmer than 2016 but so close they are essentially tied.

The European Copernicus group also called it an essential tie for hottest year, with 2016 warmer by an insignificant fraction.

Japan's weather agency put 2020 as warmer than 2016, but a separate calculation by Japanese scientists put 2020 as a close third behind 2016 and 2019.

The World Meteorological Organization, the British weather agency and Berkeley Earth's monitoring team had 2016 ahead.

First or second rankings really don't matter, "but the key thing to take away is that the long-term trends in temperature are very very clearly up and up and up," said Mr. Schmidt, who heads NASA's Goddard Institute for Space Studies that tracks temperatures.

"We're in a position where we're pushing the climate system out of the bounds that it's been in for tens of thousands of years, if not millions of years." All the monitoring agencies agree the six warmest years on record have been the six years since 2015.

The 10 warmest have all occurred since 2005, and scientists say that warming's driven by the burning of coal, oil and natural gas.

Temperatures the last six or seven years “really hint at an acceleration in the rise of global temperatures,” said Russ Vose, analysis branch chief at NOAA's National Centers for Environmental Information.

While temperature increases have clearly accelerated since the 1980s, it's too early to discern a second and more recent acceleration, Mr. Schmidt said.

Last year's exceptional heat “is yet another stark reminder of the relentless pace of climate change, which is destroying lives and livelihoods across our planet,” United Nations Secretary-General António Guterres said in a statement.

“Making peace with nature is the defining task of the 21st century.” The United States, which had its fifth warmest year, smashed the record for the number of weather disasters that cost at least \$1 billion with 22 of them in 2020, including hurricanes, wildfires, tornadoes and a Midwest derecho.

The old record of 16 was set in 2011 and 2017. This was the sixth consecutive year with 10 or more billion-dollar climate disasters, with figures adjusted for inflation.

Earth has now warmed 1.2 degrees Celsius (2.2 degrees Fahrenheit) since pre-industrial times and is adding another 0.2 degrees Celsius (0.36 Fahrenheit) a decade.

That means the planet is nearing an international warming threshold set in Paris in 2015, Mr. Vose and Mr. Schmidt said.

Nations of the world set a goal of preventing at least 2 degrees Celsius (3.6 degrees Fahrenheit) of warming, with a tougher secondary goal of limiting warming to 1.5 degrees (2.7 degrees Fahrenheit).

“We cannot avoid 1.5 C above pre-industrial now — it is just too late to turn things around,” University of Oklahoma meteorology professor Jason Furtado, who wasn't on any of the measurement teams, said in an email.

“I also fear that the 2 C threshold is slipping away from us too unless changes become much more immediate in the US and other nations.” Earth has warmed 1.6 degrees (0.9 degrees Celsius) since 1942, when President-elect Joe Biden was born, and 1.2 degrees (0.6 degrees Celsius) since 1994, when pop star Justin Bieber was born, according to NOAA data.

The main reason the agencies have varying numbers is because there are relatively few temperature gauges in the Arctic.

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Suresh Nambath

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70 naturalists and 43 Forest Department staff were involved in the year-long survey

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INDIA METEOROLOGICAL DEPARTMENT (IMD) CELEBRATES ITS 146TH FOUNDATION DAY

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

India Meteorological Department (IMD) today celebrated its 146th Foundation Day. IMD is one of the oldest, scientific service organizations in the country, in existence well before Independence. Union Minister of Science & Technology, Earth Sciences and Health & Family Welfare, Dr. Harsh Vardhan; Secretary, MoES, Dr. M. Rajeevan; Director General, IMD, Dr. Mrutyunjay Mohapatra; Joint Secretary, MoES, Dr. Vipin Chandra; Shri Anand Sharma, Head / Sc-G, Chairman, Organising Committee and several officials of MoES and IMD were present on the occasion while Chief Minister Government of Uttarakhand, Shri Trivendra Singh Rawat; Chief Minister Government of Himachal Pradesh, Shri Jai Ram Thakur and former DGs of IMD joined through virtual platform.



On the occasion, Dr. Harsh Vardhan inaugurated **Doppler Weather Radars at Mukteshwar, Uttarakhand and Kufri, Himachal Pradesh; Multi-Mission Meteorological Data Receiving and Processing System in IMD in collaboration with ISRO (MMDRPS)** and released **Report on Cyclone disturbances during 2020; Hindi Patrika – ‘Mausam Manjusha’**; Official e-launched **“Online Web Portal of IMD Journal MAUSAM”** in collaboration with CSIR-NISCAIR (<http://mausamjournal.imd.gov.in/index.php/MAUSAM/about/submissions>); and released a special issue of **Mausam on Tropical Cyclone**.



Conveying his greetings to all the officers and staff of IMD & the Ministry of Earth Sciences and entire meteorological community, Dr. Harsh Vardhan said, “IMD has been playing a significant role in protecting lives and livelihoods from the adverse effects of extreme weather events since its establishment in 1875”. He highlighted that forecasting monsoons, that are lifeline to our food security, has resulted in not only in improvement of economy but also reducing the loss of lives due to monsoonal floods and droughts. “IMD has been continuously redefining its focus for accurate Prediction of Monsoon and cyclones as our GDP is mainly based on agriculture. It has succeeded in minimizing loss of lives from various extreme events like cyclone, heavy rain, thunderstorm, heat wave and cold wave etc. in the recent years with its precise forecasting and timely warnings”, he added.

The Minister pointed out, “Recently in last monsoon season, IMD introduced Flash flood Guidance for all 30,000 watersheds of the country every 6 hours. Flash flood Guidance is also provided to Nepal, Bhutan, Bangladesh, Sri Lanka every 6 hours”. He recalled having inaugurated the Urban flood warning system for Mumbai also in July 2020 which has helped in better management of heavy rainfall events and floods over Mumbai, and added that similar system has also been implemented in Chennai and being extended to Kolkata and Delhi in coming years.

Dr. Harsh Vardhan said, “India Meteorological Department is modernizing its observational network in the Central and Western Himalayas by installation of state of art Doppler Weather Radars in a phased manner, at different locations”. “This radar will be providing severe weather information to the weather forecasters thus improving the service being provided by the Department catering to the welfare and safety of the public in the states of Uttarakhand and Himachal Pradesh. It will also provide valuable support to the disaster managers and to the pilgrims undertaking the pilgrimage to Kailash Manasarovar and Char Dham yatra”, he highlighted.

The Minister elaborated that the output by Multi-Mission Meteorological Data Receiving and Processing System that has been established in IMD in collaboration with ISRO, will be utilized for monitoring and forecasting of severe weather events and many sectoral applications Defence services, Disaster Management, Power Sector, Aviation, Railway, Tourism & Agro-meteorological advisory services etc by generating specific satellite-based products imageries. He also applauded that India is 4th in its computing power after UK, USA and Japan and pointed out, “I am told that we are the only country to have two ensemble models with the resolution of 12 km each which were helping to provide the probabilistic forecast and warning for severe weather”.

Chief Minister of Uttarakhand, Shri Trivendra Singh Rawat and Chief Minister of Himachal Pradesh, Shri Jai Ram Thakur applauded the IMD for its great services in meteorological forecasting that helps the two hilly states in saving lives and property. Both of them highlighted the importance of accurate and advance weather information for their states as they are largely dependent on agriculture and tourism.

Director General, IMD, Dr Mrutyunjay Mohapatra in his welcome address highlighted that there has been significant improvement in forecast accuracy of various severe weather events including tropical cyclones, heavy rainfall, fog, heat wave, cold wave, thunderstorm etc. “The accuracy has increased by about 15-40% for different severe weather events forecast during last five years. The thunderstorm warning is being provided for all districts and 894 cities and towns”, he said.

On the occasion, Secretary, MoES, Dr. M. Rajeevan gave a broad outline of important developments being planned for IMD in near future. He informed that under Agro-Meteorological Services, it is targeted to establish 660 DAMUs by 2025 and increase from 2,300 blocks in 2020 to 7,000 blocks in 2025. The advisories will cover 70 million Farmers by 2022 and 100 million by 2025. More than 43 million farmers have subscribed for the information through mobile for planning their agricultural activities. He said that the warning and advisory services are helping farmers and fishermen to improve their economy as found from a latest survey by National Centre for Applied Economic Research.

WMO has recognized IMD for various activities like continuous observations for more than 100 years. About 12 observatories in the country have been recognized so far as centennial stations. IMD earned appreciations from United Nations and the President of India, Govt. of West Bengal and Odisha for accurate prediction of cyclone Amphan, from Govt of Maharashtra for accurate

prediction of cyclone Nisarga and establishment of Mumbai Flood Warning System.

Awards and Appreciation certificate to officials, scientists, and IMD institutions in various states were also announced on the occasion.

NB/KGS/(IMD inputs)

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NGT DIRECTS GOVERNMENT TO FINALISE EPR REGIME WITHIN 3 MONTHS, SAYS PLASTIC WASTE SERIOUS HAZARD

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

National Green Tribunal. File

The National Green Tribunal has directed the Ministry of Environment and Forests to finalise the “Extended Producer Responsibility” (EPR) regime for plastic waste within three months saying that steps taken by it were “too slow”.

A bench headed by NGT Chairperson Justice Adarsh Kumar Goel said unscientific management of plastic waste is a serious hazard for the environment and public health.

EPR (Under Plastic Waste Management Rules 2016) puts the onus on the manufacturers for the treatment, recycling, reuse or disposal of products after a consumer has used and disposed them.

“Regretfully, steps taken by the MoEF for finalising EPR regime are too slow. We note that the PWM Rules were framed in the year 2016 in place of 2011 Rules. There is no justification for long delay in finalisation of EPR models even after more than four years of the publication of the Rules. The same may now be finalised at the earliest, preferably within three months,” the bench said.

The NGT said that state level authorities also need to take necessary effective steps for enforcement, including coercive measures.

Environmental compensation and penal action regime proposed by the Central Pollution Control Board (CPCB) may be duly implemented by state PCBs, State Level Monitoring Committees and all other concerned authorities, the tribunal said.

“CPCB may continue to coordinate with the State Level Monitoring Committees, the State PCBs/PCCs or any other authorities with reference to the steps taken by the State Level Monitoring Committees in coordinating with the concerned Local Bodies, Gram Panchayats, Waste Generators, Producers, Importers, Brand Owners, Recyclers, Manufactures, Retailers and Street Vendors in accordance with the rules.

“Whenever, necessary CPCB may issue further directions from time to time in the light of experiences gained considering different suggestions and viewpoints, including the suggestions of the Oversight Committee for State of UP,” the bench said.

The tribunal was hearing a plea filed by CPCB alleging that states were not paying heed to the seriousness and ill effects caused by plastic.

Referring to its 2013-14 annual report, the CPCB had said there were a total of 689 unregistered plastic manufacturing units running in the various states and UTs including Andhra Pradesh, Jharkhand, Karnataka, Manipur, Puducherry, Punjab and Telangana.

As per 2014-15 there were 217 such units in Andhra Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Punjab, Uttar Pradesh and Telangana, it had said.

The CPCB had said it had issued directions under the Environment (Protection) Act, 1986 on June 30, 2016 to various municipal bodies but they paid no heed till date.

The apex pollution monitoring body has sought directions to states and UTs to prepare a plan of action for implementation of Plastic Waste Management Rules 2016 and its effective execution of such plan of action within the stipulated time frame as envisaged in the law.

It has sought imposition of penalty on the respondents as per "Polluter Pays Principle" for their non-cooperation and inaction which has resulted in huge loss of "health, soil, animal, crops and groundwater etc apart from exemplary damages."

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70 naturalists and 43 Forest Department staff were involved in the year-long survey

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INDIA HOME TO BOTH SPECIES OF RED PANDA, SAYS ZSI STUDY

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

Himalayan Red Panda (*Ailurus fulgens*) | Photo Credit: [DST INSPIRE Red Panda Project](#)

A couple of recent scientific publications by the Zoological Survey of India (ZSI) have resolved the mystery on the demography and speciation in red panda (*Ailurus fulgens*), one of the most iconic species in terms of its importance relating to global conservation.

Scientists from the ZSI have concluded that India is home to both the (sub) species — Himalayan red panda (*Ailurus fulgens*) and the Chinese red panda (*Ailurus styani*) and the Siang river in Arunachal Pradesh splits the red panda into these two phylogenetic species.

The red panda was considered a monotypic species till 2020 until the scientists studied its genetic make-up with respect to the geographical distribution and described the occurrence of the two species.

“This study provides pragmatic genetic evidence and demonstrates the Siang river as a potential boundary of species divergence in red panda by contributing samples from Indian Himalayan Region,” Mukesh Thakur, scientist from the ZSI said. Dr. Thakur is also the author of the paper “Siang River in Arunachal Pradesh splits red panda into these two phylogenetic species” published last week in the *German Society of Mammalian Biology*.

For this study, scientists of the ZSI intensively carried out field sampling in eastern Himalayas for three years and collected over 250 faecal samples of the red panda. Dr. Thakur said the analysis carried out from such samples collected from West Bengal, Sikkim and Arunachal Pradesh revealed the clustering of all the samples in two major group.

The clade 1 represented the Himalayan red panda which was formed by the samples originated from the north West Bengal, Sikkim and central and western Arunachal Pradesh and South Tibet, located in the west of the Siang river. Clade 2 represented the Chinese red panda with samples originated from the Dibang valley of eastern Arunachal Pradesh, India and southwest China, in the east of the Siang.

Dr. Thakur, who is a DNA expert and also the principal investigator of the INSPIRE Faculty project on red panda funded by the Department of Science and Technology, and another scientist Lalit Sharma, head of the wildlife section of the ZSI, are also trying to map the potential corridor supporting the movement of the red panda across the eastern Himalayas.

Another publication titled “Geological and Pleistocene glaciations” explains the demography and disjunct distribution of the red panda (*A fulgens*) in the eastern Himalayas which reveals the demographic history of the red panda in the entire eastern Himalayan region. According to Dr. Thakur, the species divergence time is about 0.30 million years ago (CI 0.23–0.39 MYA) corresponding to the middle-late Pleistocene transition.

“The Himalayan red panda was relatively affected more during the Pleistocene glaciation and experienced a severe reduction in the population size when compared to the Chinese red panda,” he said. He said the reason for the reduction in the population size of the Himalayan red panda is due to the geological and climatic oscillations as the landscape was exposed to heavier

topographic and geological changes through repeated cycles of the wet and dry periods during the last glacial maxima and Pleistocene Era.

Though it is considered an indicator species for ecological change, the red panda is shy, solitary and arboreal animal. It primarily feeds on bamboo and avoids human presence. Highlighting the significance of these publications, Kailash Chandra, Director of the ZSI, said the overall conservation of this ecologically sensitive species required an effort from both the national and international stakeholders and adequate awareness among the local communities.

“The scientists of the ZSI are trying to extend the scope of the research and replicate studies in collaboration of other range countries like Bhutan, Nepal and China. The results will help in proposing long term monitoring and conservation,” Dr. Chandra said.

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GUJARAT RIVERS REMAIN HIGHLY POLLUTED

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

Death of a river: Untreated effluents being released into the Sabarmati. File photo

The unchecked flow of untreated industrial effluent into rivers in Gujarat has led to increasing pollution in the Sabarmati, Mahisagar, Narmada, Vishwamitri and Bhadar. According to data from the Ministry of Environment and Forest (MoEF), the Sabarmati is among the most polluted rivers in the country.

Gujarat ranks fourth among the top five States with highly polluted rivers, with as many as 20 rivers in the critically polluted category. Recently, a thick froth on the Mahisagar, along a stretch of several kilometres, raised serious concern, prompting the Gujarat Pollution Control Board (GPCB) to constitute a high-level committee to study the rising level of pollution in the river.

“Pollution in rivers has emerged as a major threat in the last few years because the lackadaisical approach of the authorities has emboldened the industries to discharge untreated effluents into flowing rivers,” said Vadodara-based environmental activist Rohit Prajapati.

He said that both treated and untreated effluent is released into the estuary of the Mahisagar and Gulf of Cambay, flouting the guidelines of the Central Pollution Control Board (CPCB).

As per the official parameters, if the chemical oxygen demand (COD), which indicates organic pollutant load, is higher than 250 mg per litre, then it should not be released into the rivers.

“Most of the Gujarat rivers where the effluents are dumped into, the COD level is in the range of 700 to 1000 mg per litre. While Dissolved Oxygen (DO) level [indicating the health of a river] in perennial rivers like Mahisagar should be in the range of 6 to 8 mg per litre, it is actually below 2.9 mg per litre,” he added.

In December 2020, Mr. Prajapati and a few others wrote a letter to the State authorities providing evidence, including videos and photographs, of how toxic effluents were being dumped into the Mahisagar and other rivers by industries.

“The Vadodara Enviro Channel Ltd, which runs a 55-km-long pipeline to discharge treated effluents into the deep sea, releases the effluents into the river. The effluents are not getting discharged into the deep sea as required,” a former official of the Gujarat Pollution Control Board told *The Hindu*.

Now, the State government has proposed a Rs. 2,300 crore project for a deep sea effluent disposal pipeline to cater to nearly 4,500 industrial units. The project will serve four highly industrialised districts (Ahmedabad, Vadodara, Kheda and Rajkot), which are the main sources of pollution.

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414 INDIAN STAR TORTOISES SEIZED

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

The tortoises seized in a raid in East Godavari district.

Forest Department personnel on Monday seized as many as 414 live endangered Indian star tortoises from a gang which was smuggling them from Samalkot area in East Godavari district to Malkangiri district in Odisha by a van.

The Gokavaram Forest Range staff, led by Forest Ranger V. Durga Kumar Babu, nabbed the gang members during a raid near the Burugupudi forest check-post in East Godavari district in the early hours of Monday.

According to Mr. Durga Kumar Babu, the arrested were identified as S. Sali and Viswajeet Mandal of Odisha. The tortoises will be released into the river Godavari.

“Cases under the Wildlife (Protection) Act, 1972, were registered against the gang members. They were produced before a local court and investigation is on,” said Mr. Durga Kumar Babu.

In a similar incident in the end of 2020, Gokavaram forest range officials busted a gang that was smuggling 437 Indian star tortoises in the district.

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CHENNAI BIRDERS GO ON A GUIDED WALK AROUND PALLIKARANAI MARSHLAND

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

Birdwatchers at Margazhi Bird Utsav 2021 | Photo Credit: [Special arrangement](#)

Margazhi concerts might have taken the virtual route in 2021, but there is still one *utsav* that saw in-person participation — the Margazhi Bird Utsav.

The event coincides with the bird migratory calendar in Chennai's wetlands. Pallikarnai marsh has an enviable heterogeneous hydrology and ecology, making it one of the most diverse natural habitats in the country. The biological diversity boasts 349 species of flora and fauna including 133 species of birds. The marsh supports over 40,000 birds at a time during the migratory season and over 5,000 birds during the non-migratory season. Come winter, the wetlands transform into a bird-watcher's paradise as over 15,000 birds make special appearances.

The Tamil Nadu Forest Department and the Conservation Authority of Pallikaranai Marshland in association with Care Earth Trust (CET), organised the second edition of an immersive bird watching experience from January 10 to 14. Participants were taken around the Pallikaranai marsh and the Perumbakkam wetland adjacent to it, in small groups, with walks guided by Vinoth Balasubramanian, wildlife biologist at CET, and project associate, CET, J Subramanean.

"We had a good mix of both amateur and seasoned bird watchers aged from four to 65 years. They were treated to a beautiful collage of birds that migrated from Siberia and Europe as well as resident great egrets, spot-billed pelicans, purple and grey herons and black-winged stilts. In all, we recorded 54 species, which is an improvement on the count in 2020, though there were fewer birds overall, compared to last season. This was probably because of the longer spells of rain we had in late 2020," explains Vinoth, who said the lower footfall this year was compensated by the enthusiastic birdwatchers.

Migratory birds spotted over the week included the garganey, northern pintail, northern shoveler, blue-tailed bee-eater, western marsh harrier, grey-headed lapwing, yellow wagtail and fulvous whistling duck.

The watershed-landscape that cradles the marsh is a confluence of freshwater, brackish water, and estuarine conditions. Over the last few decades, there has been a steady increase in the diversity of birds that flock to Pallikaranai, especially an abundance of fish-eating birds, which points to resilient underwater biodiversity as well.

Nirupama Viswanath, a city-based freelance illustrator and architect, was smitten with the avian diversity on display. "I am not an avid birder, but I love learning new things about animals and birds. As we made our way from the ELCOT Toll towards Medavakkam, it was amazing to see grey pelicans, cormorants, and ducks that came all the way from northern Europe and large painted storks that flew gracefully across the sky."

Residential buildings adjacent to the marsh offer unique vantage points and students brought binoculars, as they perched themselves on terraces and balconies to get a bird's eye view of the wetland.

The Margazhi Bird Utsav 2021 coincides with the Pongal and Bihu Bird Count as well, wherein birders are encouraged to spend 15 minutes identifying avian species, recording them on ebird.org.

The Asian Waterbird Census (AWC) runs concurrently through the end of February. The citizen-science event is part of the global International Waterbird Census (IWC) that supports the conservation and management of wetlands and waterbirds worldwide. By using eBird, and filling an additional site form, birders can participate in a multi-country effort to document the state of wetlands and waterbirds.

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A video on the world's declining insect population

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GREENHOUSE GAS EMISSIONS HAVE REGIONAL IMPACTS ON WILDFIRE OUTBREAKS: STUDY

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

This photo provided by CAL FIRE San Diego shows a wildfire in northern San Diego County early Thursday, Dec. 24, 2020. | Photo Credit: [AP](#)

In a first-of-its-kind study, scientists have assessed the influence of human activities on extreme fire weather risk, and found that greenhouse gas emissions and air pollution have distinct regional impacts on wildfire outbreaks.

[The research](#), published in the journal *Nature Communications*, analysed the climate under various combinations of human influences since 1920, isolating individual effects and their impacts on extreme fire weather risk.

While previous studies found that human activities and their products like greenhouse gas emissions, and air pollution raise the risk of extreme fire weather, the scientists, including those from the University of California (UC) Santa Barbara in the U.S., said the specific influence of these factors has been unclear.

"To get a wildfire to ignite and spread, you need suitable weather conditions — you need warm, dry and windy conditions," explained Danielle Touma, a co-author of the study from UC Santa Barbara. "And when these conditions are at their most extreme, they can cause really large, severe fires."

According to the researchers, heat-trapping greenhouse gas emissions are the dominant contributors to temperature increases around the globe.

By 2005, they said emissions raised the risk of extreme fire weather by 20% from preindustrial levels in western and eastern North America, the Mediterranean, Southeast Asia, and the Amazon.

The study predicted that by 2080, greenhouse gas emissions are expected to raise the risk of extreme wildfire by at least 50% in western North America, equatorial Africa, Southeast Asia and Australia, while doubling it in the Mediterranean, southern Africa, eastern North America and the Amazon.

According to the scientists, biomass burning and land-use changes have more regional impacts that amplify greenhouse gas-driven warming.

The study noted a 30% increase of extreme fire weather risk over the Amazon and western North America during the 20th century caused by biomass burning. Land use changes, according to the research, also amplified the risk of extreme fire weather in western Australia and the Amazon.

The scientists said industrial aerosols block some of the solar radiation from reaching the ground and tend to have a cooling effect on the climate.

"We knew something had been compensating in a sense for greenhouse gas warming, but not the details of how that compensation might continue in the future," said Samantha Stevenson, a

co-author of the study from UC Santa Barbara.

However, in Southeast Asia, "where aerosols emissions are expected to continue," the study said there may be a weakening of the annual monsoon, drier conditions and an increase in extreme fire weather risk.

"Southeast Asia relies on the monsoon, but aerosols cause so much cooling on land that it actually can suppress a monsoon," Touma said. "It's not just whether you have aerosols or not, it's the way the regional climate interacts with aerosols."

The scientists hope that the current understanding of fire risk at a regional scale helps in mitigation and planning purposes.

"In the broader scope of things, it's important for climate policy, like if we want to know how global actions will affect the climate," Touma said. "And it's also important for understanding the potential impacts to people, such as with urban planning and fire management."

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Males modulate their reproductive investment based on perceived competition

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FOLLOW THE HOWL

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

The Golden Jackal photographed at Ponnani beach in 2015 | Photo Credit: [Dhruvaraj S](#)

The jackal does not exactly have a glorious track record. Even in fables, it is the wily trickster. For villagers and those living in semi-rural areas, it is often the culprit who steals their bounty. So, it is safe to say the jackal has never been portrayed as a shining example of virtuousness.

“But when was the last time you heard their howls?” a group of wildlife researchers in Kochi, wonders. Their non-governmental organisation, Aranyakam Nature Foundation, has initiated an online survey to collect information about the creature’s distribution. The common jackal, known as the golden jackal, is believed to have dwindled in number.

“Though stories about the animal are rife in folklore and popular culture, and it was commonly seen in villages and rural areas, there is uncertainty about it now,” says wildlife expert and chairman of Aranyakam Nature Foundation, P S Easa. “We want to understand the animal better and its distribution patterns in Kerala,” he adds.

The survey, which encourages people from all over Kerala to participate, contains basic questions about the jackal, such as when the last time the respondent saw a jackal or heard its howl was, the region where he or she spotted it, their number and such.

A community-driven survey will yield better results as it would be practically impossible to visit places across the State, Easa says. In Malayalam, the survey can be accessed on Aranyakam’s website and was announced through print and visual media and shared as Whatsapp messages.

Though the jackal falls under the ‘least concern’ category in the IUCN Red List (International Union for Conservation of Nature), it is no longer a ubiquitous presence in the countryside.

Since there have not been many in-depth studies about the animal, Aranyakam decided to launch the survey, hoping the responses would throw some light on issues such as the animal’s habitat and people’s attitude towards it.

Launched in the first week of January, the survey will be open till February 15. “We have already received 1,800 responses from across Kerala,” Easa says. The team is looking at gaps, especially places such as Alappuzha, Neriya Mangalam and Idukki, as not many sightings have been reported from these areas. “The larger aim involves setting up a conservation plan,” Easa says.

The numbers of the animal will serve as a biodiversity indicator, says Dhruvaraj S, managing trustee of Aranyakam. The survey will also reveal information on the vegetation, elevation and population density of the regions covered.

The Indian golden jackal (*Canis aureus indicus*) is a sub-species of the golden jackal (*Canis aureus*), and is known by many names in Kerala, some of the popular ones being *kurukkan*, *kurunari*, and *oolan*. A shy and elusive nocturnal animal, the jackal is highly adaptable in nature. Its proximity to human habitations ensures a steady supply of food — it eats anything from fruits to insects, birds and smaller animals such as wild hogs.

Considered a wild animal as per the Schedule III of the Wildlife Protection Act of India, 1972, the jackal, however, is seen mainly in the undergrowth and bushes of the semi-urban and rural landscape. "Urbanisation that leads to the clearing of undergrowth could have led to the loss of their habitat which resulted in a reduction in their numbers," says Dhruvaraj.

The findings of the survey will be published on Aranyakam's website, publications and scientific journals. Aranyakam, based in Kochi, works towards the conservation of flora and fauna in the non-protected areas.

If you hear a jackal or better still, see one before February 15, log on to aranyakam.org/kurukkan/. Past sightings can also be entered.

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CENTRE TARGETS DELHI GOVT. OVER YAMUNA POLLUTION

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

The Centre has accused Delhi of being a “habitual offender” in polluting the waters of the Yamuna. File photo

The Centre on Tuesday accused Delhi of being a “habitual offender” in polluting the waters of the Yamuna.

The State of Haryana, on the other hand, objected to Delhi’s accusations about it releasing untreated effluents into the river due to faulty treatment plants, saying the “problem is not with Haryana, but within Delhi”.

A three-judge Bench led by Chief Justice Sharad A. Bobde gave Haryana a week’s time to file its affidavit. The Centre has also been asked to place on record its views.

The Bench was hearing an urgent petition filed by the Delhi Jal Board (DJB), represented by advocate Shadan Farasat, to “immediately stop” Haryana from discharging pollutants into the Yamuna, which is causing an alarming increase in ammonia levels in the water. The Board said the increased ammonia level has impaired its water treatment plants and a drinking water and health crises loom large in Delhi.

The DJB said the national capital’s woes were made worse with Haryana not releasing the full quantity of water entitled to Delhi at Wazirabad. Instead of releasing at least 450 cusecs downstream from Wazirabad, only 330 cusecs have been released.

“Due to lesser water being released, the concentration of ammonia in the water reaching Delhi has increased,” the DJB said.

Sparring neighbours

Senior advocate Shyam Divan, for Haryana, said the DJB petition was not “maintainable at all”. “We are supplying from our share of water far more than what is required. What DJB is saying is completely incorrect. I need a week’s time to put in a response,” he submitted.

The DJB petition had said the “actions/inactions constitute a violation of the principle of cooperative federalism. It amounts to an upper riparian State taking undue advantage of a shared river for irrigation and industrial purposes while effectively not allowing a lower riparian State to access water for drinking”.

Additional Solicitor General Aishwarya Bhati, for the Centre, said Delhi was a “habitual offender”.

Senior advocate and amicus curiae Meenakshi Arora intervened to say that the case should focus on “what States are doing as regards the pollution of water” rather than restrict itself to the quantum of water shared between Haryana and Delhi.

Ms. Arora said the amount of ammonia in the Yamuna has considerably lowered to .3 ppm as of January 18. The tolerable level is .9 ppm.

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MIT DEVELOPS CONCEPT FOR AIRPLANES TO COMBAT AIR POLLUTION

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

MIT develops concept for airplanes to combat air pollution. | Picture by special arrangement.

(Subscribe to our Today's Cache newsletter for a quick snapshot of top 5 tech stories. Click [here](#) to subscribe for free.)

Asthma, respiratory diseases, and cardiovascular disorders have a common enemy –nitrogen oxides or NOx. The chemical, emitted by aeroplanes and motor vehicles, pollutes the air.

Motor vehicles have an emission control system that washes out exhaust gas, limiting NOx in vehicular emission. This process could not be replicated in airplanes as the emission control system would interfere with the thrust required to lift off the aircraft.

Also Read | [Greenhouse gas emissions have regional impacts on wildfire outbreaks: study](#)

The noxious chemical waste from airplanes' exhaust kills 16,000 people every year globally, according to a Massachusetts Institute of Technology (MIT) research note.

To combat the rising threat, a team of researchers at MIT have developed a concept hybrid-electric aeroplane propulsion system.

The team published the details of the design, including analyses of its potential fuel cost and health impacts in *Energy and Environmental Science* journal. Their proposed concept changes the way an aeroplane's propellers are powered.

In the hybrid electric system, the gas turbine drives a generator, producing electricity to power aircraft's wing-mounted, electrically-driven propellers.

Also Read | [BMW's electric wingsuit can fly at speeds of 300 kmph](#)

To make this happen, they moved the power-generating gas turbine from the wings and integrated it with the plane's cargo hold – where the generator is located.

This design, the team claims, will clean the exhaust before releasing harmful chemical into the atmosphere as it ensures post-combustion emissions pass through the control system.

"This would still be a tremendous engineering challenge, but there aren't fundamental physics limitations," Steven Barrett, Professor of aeronautics and astronautics at MIT, said. "If you want to get to a net-zero aviation sector, this is a potential way of solving the air pollution part of it, which is significant, and in a way, that's technologically quite viable."

Also Read | [Rolls-Royce tests technology to make world's fastest electric plane](#)

The team estimates that the concept would eliminate 95% of aviation's NOx emissions, and thereby reducing premature deaths by 92%.

They also calculated that if such a hybrid electric system were to be implemented in a Boeing

737 or Airbus A320 aircraft, the extra weight would require about 0.6% more fuel to fly the plane.

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WhatsApp is facing criticism for the recent update in its privacy policy. This has led to a surge in Telegram users. But how different is Telegram from WhatsApp?

Facebook bought the platform in 2014, and gradually changed the way it accessed user data from WhatsApp. The social networking company is now showing WhatsApp users a 'take it or leave it' attitude with the latest policy update.

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THE HINDU EXPLAINS

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

U.S. President Joe Biden signs a series of orders at the Oval Office of the White House in Washington D.C. on January 20, 2021. | Photo Credit: [AFP](#)

The story so far: Joe Biden [assumed office as President of the United States](#) on January 20, 2021, and [among the first orders he signed](#) was one to restore America's participation in the [United Nations Paris Agreement on climate change](#). His decision on America's return will take effect on February 19, which would be 107 days after its [withdrawal under the Donald Trump administration](#) became formal on November 4, 2020. Under President Barack Obama, the U.S. played an active role in climate negotiations, although the Copenhagen UN Framework Convention on Climate Change (UNFCCC) conference in 2009 [failed to produce a consensus](#), and member-countries only acknowledged the science, without committing themselves to greenhouse gas (GHG) emissions-reduction targets. By 2015, the negotiations progressed with the Obama administration engaging in diplomacy, resulting in the [Paris Agreement](#) premised on voluntary targets for national emissions cuts. On the long road to Paris, the U.S., [under George W. Bush, had pulled out](#) of the previous pact, [the Kyoto Protocol](#), in 2001.

The withdrawal from the Paris Agreement meant that the U.S. was no longer bound by its national pledge made under the pact: to achieve an economy-wide reduction of its GHG emissions by 26%-28% below the 2005 level in 2025 and to make best efforts to reduce emissions. America also stopped its contribution to the UN's Green Climate Fund, to which it had pledged \$3 billion, after transferring an estimated \$1 billion.

Also read | [Committed to working closely with Joe Biden administration to overcome climate emergency: U.N. chief](#)

On the contrary, the Trump regime focused on, among other things, relaxing controls on emissions from fossil fuel-based industries, diluting standards on air quality and vehicular emissions, hydrofluorocarbon leaking and venting from air-conditioning systems, loosening the way the government calculated the social cost of carbon, restraining individual States such as California from setting higher standards, revoking protection for natural habitats, including the Arctic sought by the oil and gas industry, and for individual wildlife species. In all, more than 100 environmental rules were tinkered with by the administration, with some rule reversals remaining in process when the presidential election took place, and others taken to court. The ability of the Environmental Protection Agency (EPA) to enforce the law was weakened, and the scientist leading the production of the National Climate Assessment, Michael Kuperberg, was replaced just after it became clear that Mr. Trump was losing the election.

The Clean Power Plan, a major provision from the Obama-era to cut power sector emissions by 32% over 2005 levels by 2030, was initially replaced with the Affordable Clean Energy (ACE) rule, with a reduction effect of only 0.7%, according to an estimate by Harvard Law School. In the final days of the Trump presidency, however, the ACE rule was struck down by a court, giving Mr. Biden the freedom to reformulate a strong rule.

Also read | [Beijing welcomes U.S. rejoining WHO, Paris Accord](#)

The U.S. accounts for 15% of global GHG emissions, but it is the biggest legacy contributor of atmosphere-warming gases. Transport (28%) and power (27%) are the two biggest national sectors contributing to GHG emissions, followed by industry (22%) and agriculture (10%),

according to data published by the EPA in 2020. Commercial and residential emissions together make up only 13%. Significantly, 10% of U.S. emissions are methane, which has a greater warming effect than CO₂, and 81% is carbon dioxide. The rest is made up of nitrous oxide and fluorinated gases.

Mr. Biden, who has formed a high-powered team including special presidential envoy for climate, John Kerry, to lead clean development, has placed climate change front and centre among his priorities. He has promised an “enforcement mechanism to achieve net-zero emissions no later than 2050”, including a target no later than the end of his term in 2025, aided by a planned federal investment that will total \$1.7 trillion over ten years, besides private investments.

Comment | [The Paris Agreement is no panacea](#)

The plan revolves around 10 million well-paying clean energy jobs with a focus on solar and wind power, close linkages between university research and the private sector modelled on the post-World War II economy, active support for carbon capture, utilisation and storage, and a renaissance in green transport that includes the “second great railroad revolution” in a country that starved the railways to promote cars and road freight.

In his Plan for Climate Change and Environmental Justice released before the election, Mr. Biden says America will strongly support multilateralism again, but also call for accountability from other countries, including the top emitter, China, on GHG emissions. Nations that default could face carbon adjustment fees or quotas. This year’s UN climate conference in Glasgow will see the new administration engaging UNFCCC member-nations to raise global ambition.

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MORE FLASH DROUGHTS IN INDIA BY END OF CENTURY

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

Impact: Frequent flash droughts can have deleterious effects on crop production in India. |

Photo Credit: [Getty Images](#)

In 1979, India faced a severe flash drought, affecting about 40% of the country and taking a toll on agriculture. An article published that year in the journal *India International Centre Quarterly* noted that the big granaries of Uttar Pradesh and Andhra were affected, and the country suffered a loss of about 5,000 crores. A new study has now pointed out that India could experience more such flash droughts by the end of this century.

Flash droughts are those that occur very quickly, with soil moisture depleting rapidly. Normally, developing drought conditions take months, but these happen within a week or in two weeks' time. Several factors including atmospheric anomalies, anthropogenic greenhouse gas emissions play an important role.

"The ongoing climate change has caused a significant increase in global temperature and this can lead to more and more flash droughts in the coming years. If we can meet the 'Paris Agreement' goals and limit global warming to well below 2 degrees C, the numbers and frequency of the projected flash droughts may go down," says Vimal Mishra from the Civil Engineering and Earth Sciences at IIT Gandhinagar. He is the corresponding author of the paper published in *npj Climate and Atmospheric Science*. The team analysed the major flash droughts that occurred from 1951 to 2016 in India. They simulated the soil moisture using the meteorological data obtained from the India meteorological department. Duration, intensity, and area of the flash droughts were studied and an overall severity score was given. The top five flash droughts based on the overall severity score occurred in 1979 followed by 2009, 1951, 1986 and 2005.

To predict the future flash droughts the team used a Community Earth System Model which simulates the summer monsoon precipitation, sea surface temperature, role of El Nino Southern Oscillation, and air temperature over India. The analysis showed a considerable rise in the frequency of extremely dry and hot years in the coming three decades. They also examined the role of greenhouse gas emissions, industrial aerosols, and land-use/land-cover change. "The frequency of concurrent hot and dry extremes is projected to rise by about five-fold, causing an approximately seven-fold increase in flash droughts like 1979 by the end of the 21st century," adds the paper.

They conclude that this increased frequency of flash droughts can have deleterious implications for crop production, irrigation demands and groundwater abstraction in India.

The team has planned future studies that will consider the flash-drought prediction ahead of time using operational meteorological forecasts from India Meteorological Department. They explain that this will help manage irrigation water demands and avoid considerable losses in agriculture.

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TWO NEW SPECIES OF ANTS DISCOVERED FROM KERALA AND TAMIL NADU

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

Ooceraea decamera (top) and *Ooceraea joshii*. Credit: Zookeys [Bharti H. et al. 2021]

Two new species of a rare ant genus have been discovered in Kerala and Tamil Nadu by a team of scientists, the Department of Science and Technology said on Saturday.

One of the two species found in the Periyar Tiger Reserve of Kerala has been named *Ooceraea Joshii* in honour of professor Amitabh Joshi — a distinguished evolutionary biologist from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR). The other named *Ooceraea decamera* (*decamera* refers to the ten-segmented antennal count) was discovered from Alagarkoil in Madurai.

"The species of the ant genus *Ooceraea* found in Kerala and Tamil Nadu add to the diversity of this rare genus. They differ from others of the same genus on the basis of the number of antennal segments," the DST said. [The discovery has been published](#) in the journal *ZooKeys*.

The genus is currently represented by 14 species of which eight possess nine-segmented antennae, while five possess 11-segmented antennae and one species has recently been reported with eight-segmented antennae.

In India, the genus was so far represented by two species with nine and 11-segmented antennae respectively. "The newly discovered ant species with 10-segmented antennae discovered, establish an old world lineage that contains a species emerging as the only model organism among the ant subfamily," the statement added.

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CSIR-CMERI UNVEILS 'AQUA REJUVENATION PLANT' WHICH FACILITATES AN ORGANIC FARMING MODEL THROUGH TREATED WASTE WATER

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

CSIR-Central Mechanical Engineering Research Institute, Durgapur unveiled the first-ever WasteWater Treatment Technology Model which purifies Waste Water for Irrigation/Farming purposes. Prof. (Dr.) Harish Hirani, Director, CSIR-CMERI inaugurated the 'Aqua Rejuv' along with Shri Subhendu Basu, Additional District Magistrate (Zila Parishad), Paschim Bardhaman and Additional Executive Officer, Paschim Bardhaman Zila Parishad today at CSIR-CMERI colony in Durgapur (West Bengal).

During his inaugural speech Prof. Hirani said that he wanted the solution for the society from Carbon Dioxide, frequent chockage of the drainage system and the discharge of sewage water through application of basic sciences. He also referred to different studies where it has been outlined that the COVID virus have the potential to survive up to 34 days in the sewage water. Keeping in mind these societal aspects, he envisioned this technology following the norms of the National Green Tribunal which is the statutory body for handling the expeditious disposal of the cases pertaining to environmental issues in our country.



Aqua Rejuvenation Plant (ARP) is an Integrated Waste Water Rejuvenation Model which has Six-Stage purification profile for comprehensive treatment of Waste Water, based upon diverse purification parameters. The approx. 24,000 litres of Water that can be rejuvenated using ARP will be sufficient for almost 4 acres of Agricultural Land (barring seasonal variations in water requirements). The used filtration media have been specially developed to handle Indian Sewage Water Parameters and based upon Geographical Variations they may be modified. The filter media is also locally source-able, so as to ensure that there would not be any stress in the Supply Chain for scaled-up Manufacturing of ARP. The treated water which is now being used for irrigation can be used even for drinking purpose also when little more time is given for settling. The system has dual benefit as while the treated water is being used for irrigation purpose, the filtered sludge generated is also utilized as manure / fertilizer. The bio char prepared from dry leaves falling in autumn season is also used for mixing in soil as it reduces the water requirement for irrigation thus saving precious water. The Institute was earlier also

using alternate technologies like sprinkle system and others for reduced water requirement for such purpose. Prof. Hirani urged the different stake holders of the Society, Civic bodies, Governmental authorities, NGOs to come forward and work with the scientific community.

Shri Subhendu Basu appreciated the scientific efforts of the Institute and stated that this technology is a much needed one in the present environment. He said that shortly the Municipal Corporation, Irrigation Department and the District Administration would arrange a seminar with CSIR-CMERI to discuss the issue for its proper implementation at the required places. Shri Basu expressed confidence that CSIR-CMERI has the potential and R&D solutions to the Industrial pollution related issues including waste water management.



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SATELLITE IMAGES TO AID ELEPHANT CONSERVATION FROM SPACE

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

In this file photo taken on September 28, 2019 an elephant sits in water in the Okavango Delta near the Njaraga village in the outskirts of Maun. | Photo Credit: [AFP](#)

Conservationists have started using satellite imagery to count elephants from space, a technique that British experts hope will help protect threatened populations in Africa.

Researchers at the University of Oxford and the University of Bath said the use of algorithms, machine learning and satellite technology could replace current techniques used to count elephants — a critical aspect of conservation.

"The population of African elephants has plummeted over the last century due to poaching, retaliatory killing from crop raiding and habitat fragmentation," Oxford said in a statement. "To conserve them requires knowledge of where they are, and how many there are: accurate monitoring is vital."

Currently, the most common technique for surveying elephant populations in savannah environments is aerial counts from manned aircraft.

The academics said aerial surveyors can get exhausted, and are sometimes hindered by poor visibility.

"Satellite monitoring is an unobtrusive technique requiring no ground presence, thus eliminating the risk of disturbing species, or of concern for human safety during data collection," they added. "A process that would formerly have taken months can be completed in a matter of hours."

The scientists first developed the techniques at South Africa's Addo Elephant National Park.

The images, from a satellite orbiting 600 kilometres above the Earth, could survey upward of 5,000 square kilometres of land in one pass, captured in a matter of minutes.

The scientists trained the algorithm to recognise only adults among a dataset of 1,000 elephants in the park and then found it was also able to identify calves.

They hope such conservation technologies will be embraced as a matter of urgency to protect the world's biodiversity.

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Sexual cannibalism — when the female of a species consumes the male during or after mating — is also known among spiders and scorpions

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AN 'OCEAN FUND' AIMS TO SCALE UP CIRCULAR ECONOMY

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

From discarded debit cards to packaging material, [plastic waste](#) is choking up our streets and oceans. Covid-19 and lockdowns made it worse as throwaways increased while collections got disrupted.

India generates around 10 million tonnes of plastic waste a year, 40% of which is not even collected, let alone being recycled. This is not just a massive problem but also an opportunity to create value from waste, with tech innovations.

The scale of this prompted Singapore-based Circulate Capital to dedicate half of its \$106 million "ocean fund" to India. The fund aims to reduce plastic waste going into the ocean in South and Southeast Asia. The investment firm has committed \$39 million to six Indian companies so far.

"Our strategy to prevent leakage of plastics into the ocean is to invest in a circular economy. We looked at over 350 companies in the region over the last couple of years, and many of them are in India," says Rob Kaplan, founder and CEO of Circulate Capital, who was a director of sustainability at Walmart in the US before becoming an impact investor.

A circular economy has multiple facets, from collection to recycling, manufacturing and finding buyers for products from waste. So, Circulate Capital has been investing in solutions across this spectrum.

Expansion mode

In November, it invested in Nepra, which has been working with waste pickers and other collectors of dry waste in Ahmedabad, Pune and Indore. "The plan is to help them expand to 25 cities over the next five years," says Kaplan. "Our investments are targeting interventions that we feel need to be scaled in order to transform waste and recycling across India."

Once the plastic waste is collected and sorted, it has to be recycled. Here, the big opportunity is in recycling the PET (polyethylene terephthalate) plastic used for soft drink and water bottles. "Right now in India, all of the recycled bottle-grade PET plastic for use in bottling is imported. None of the domestic supply is used; instead, it's downcycled, mostly into textiles and apparel," points out Kaplan.

So, in December, Circulate Capital invested in Hyderabad-based Srichakra Polyplast and Mumbai-based Dalmia Polypro which are developing bottle-to-bottle recycling facilities for food-grade applications. "We're helping them bring in new technology to be able to do that," he says.

While bottles are made of rigid plastic, the collection and recycling challenge is even greater with flexible plastics used in packaging like sachets and wrappers. Unlike the demand for recycled PET bottles, the market for products from flexible plastic waste is yet to develop. Here, two solutions are Lucro and Ricron, which are creating products ranging from shopping bags to sheets used as building material.

And finally, for all such interventions to work more efficiently, there's a need for digitalization. That's where Hyderabad-based Recykal comes in with an online marketplace connecting waste

generators and collectors with recyclers. This creates more options to sell or buy waste. For example, an NGO collecting waste in Bengaluru that was relying on local recyclers can now look at potential buyers nationwide. And, like an e-commerce firm, Recykal also provides the logistics support to fulfil these transactions.

"The biggest problem recyclers face is consistent material supply. The second challenge is the quality. Now, because of our marketplace, they have visibility throughout the country. They can see the ratings of sellers, check how much material is available, compare prices and optimize production," says Abhishek Deshpande, co-founder of Recykal.

Another area where Recykal comes into play is in extended producer responsibility (EPR). World over, manufacturers are increasingly being held to account for managing the waste their products generate after consumers have used them. India also proposes to enforce EPR rules.

Here, the Recykal platform connects brands with various service providers on the ground who can help them fulfil their EPR obligations. "We're working with 75 brands already," says Deshpande.

Fixing responsibility

At the same time, India has been dragging its feet on holding brands responsible for the plastic waste they produce. Critics have questioned new EPR draft rules that give companies the option to pay money into a central kitty in compensation, which will ostensibly be used to manage plastic waste. This falls short of putting the recycling onus on brands.

So, despite the Swachh Bharat Mission initiated in 2014 to improve solid waste management, among other things, that's not reflected in effective regulatory action on the ground. It's the familiar story of lots of promises, talk and framing of regulatory schemes, without enough follow-through.

Municipalities can also do a lot more. "Cities need to take more responsibility and introduce degrees of formalization instead of leaving waste collection and management mostly to the informal sector," says Kaplan. "There's just not enough waste being collected."

What's needed at a fundamental level is a change in mindset, says Kaplan. "Instead of just thinking about it as a problem we want to go away—just like trash that we want to throw away—we can look at it as an opportunity, as this waste is a resource that can be deployed into economic development, job creation and tax revenue."

Nevertheless, despite the slow-moving wheels of governance and regulation, the idea of creating value from waste has caught the interest of entrepreneurs and impact investors. Bengaluru-based Social Alpha, for one, is an incubator for startups making a social and environmental impact. Among those it has backed is Hasiru Dala Innovations, which provides waste management services to apartment complexes, corporations and brands, while generating demand from recyclers. Social Alpha founder Manoj Kumar also believes that a shift in thinking is the way forward. "This whole activity around waste management was seen as a public service and not as a business. What we are now seeing with the likes of Hasiru Dala and Nepra is a focus on building businesses around it," he says.

For Kaplan, the key to making a difference lies in scaling up such solutions. "In India, you've got a kind of fragmentation, with small, medium-sized players. We're at a stage now where we can start to say, how do you roll this up into a national strategy and footprint."

US-based Rubicon, for example, provides waste recycling solutions for businesses and governments worldwide, with a marketplace model not unlike that of Recykal. But while the Indian startup has seed funding of \$2 million, the American company is a unicorn with nearly \$300 million in funding.

Kaplan hopes that the first few startups that Circulate Capital has backed will instigate more and larger investments, because the untapped opportunity is massive.

Malavika Velayanikal is a Consulting Editor with Mint. She tweets @vmalu

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LISTEN TO THE STRANGE CALL OF A POSSIBLE NEW MAMMAL SPECIES FROM AFRICA

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

The tree hyrax song may continue for more than twelve minutes, and it consists of different syllables that are combined and repeated in various ways. Credit: Hanna Rosti.

When Hanna Rosti, a researcher from the University of Helsinki, set out to Taita Hills in Kenya, her main aim was to look for and study dwarf galagos, which are small nocturnal primates endemic to Africa. She recorded their calls and played them to Emeritus professor Simon Bearder from Oxford Brookes University, who told her that it was the call of tree hyraxes and probably a new species. [The findings were published](#) last month in the journal *Diversity*.

Click to listen to [the 'strangled thwack' scream](#) and the [song of the tree hyrax](#).

Tree hyraxes are small nocturnal mammals that feed on leaves and fruits and are native to Africa. "Their ecological niche is the same as sloths in South America and koalas in Australia. Interestingly, tree hyraxes are relatives of elephants and even have little tusk-like teeth. Another peculiar thing about this animal is that they can climb almost 50-metre tall trees with three sausage-like toes. They can call very loudly, and have a very large repertoire of different calls," writes Rosti in an email to *The Hindu* from the Taita forests. She is now studying tree hyrax behaviour, population size, diet, acoustic communication with thermal imaging cameras.

When asked how we can confirm if the call was from a new species, Rosti explains: "Confirming the species status requires a dead animal...if and when we find animals that have died of natural causes or by roadkill, then the description of the new species would be possible. We are now continuing our research based on behavioural and acoustical studies."

She adds that in Taita Hills tree hyraxes have only three-square kilometres of indigenous forest left and the small size of the habitat may lead to inbreeding or loss of the whole population due to diseases. Conservation of these forests and reforestation is very important to prevent the extinction of the species.

"Indigenous and ancient (about 30 billion-year-old) forests of Taita Hills have been cleared almost completely and replaced by small scale farming and tree plantations. We are hoping that as this tree hyrax species is recognised, it will lead to significant conservation measures in the area. Conservation of this and all other species is only possible if local people will benefit from it economically. This may happen through sustainable ecotourism or/and compensations paid for the reforestation," she adds.

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Suresh Nambath

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Abdul Latif, curator of the zoo, said the coronavirus pandemic had blocked recent efforts to bring in a male rhino from Africa

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TAXING CLUNKERS: THE HINDU EDITORIAL ON RAISING TAX ON OLDER VEHICLES

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

The Centre's proposed policy to [raise road tax on vehicles of a certain age](#) from April 1 next year has the potential to renew a big part of India's vehicular fleet, reducing air pollution, raising fuel efficiency, and improving safety standards. It has taken the government years to finalise a "tax on clunkers" proposal, under which commercial transport vehicles will have to pay 10%-25% extra on road tax after eight years when renewing the fitness certificate, and, similarly, personal vehicles after 15 years; public transport is given concessions, while hybrids, electrics and farm vehicles are exempt. A higher tax in the most polluted cities, and on diesel engines is also on the cards. States, which enforce motor vehicles law, now have to weigh in on the proposed changes. Unlike similar programmes, such as the post-2008 recession CARS rebate plan in the U.S., India's scheme relies on penal taxation to persuade owners to scrap their old vehicles, with no cash-for-trade-in arrangement. For this approach to work efficiently, the additional tax proposed should exceed the resale value of the polluting motor, making its disposal more attractive, with enough safeguards to ensure that it is indeed scrapped and recycled under a monitored system. Equity features can be built into the scheme, offering a discount to income-vetted marginal operators such as autorickshaw drivers, on the lines of the 2009 stimulus given under the JNNURM scheme for buses. This should ideally be part of a green post-pandemic recovery plan, with an emphasis on electric vehicles.

When the scrappage policy was on the drawing board last year, Road Transport Minister Nitin Gadkari envisioned a reduction in automobile prices of 20% to 30%, driven by recovery of scrap steel, aluminium and plastic, all of which would be recycled. Now that he has a better-scoped plan, the focus must be on building capacities in the organised sector to manage the task of efficient materials recovery. Provisions will have to be built in to see that the sudden demand stimulus available to the auto industry does not disadvantage consumers, particularly those selling junk vehicles. The vehicle registration database for all States also requires updating, to reflect true numbers of old vehicles on the road, eliminating those scrapped; a significant number, more than 15 years old, still run. Such data will help target scrappage policy benefits better. Moreover, many transport vehicles are operated by small entrepreneurs who lack the resources to transition to newer ones and need help as loans and grants. India's policy to eliminate polluting fuel guzzlers has had a long gestation, and States should see the value of operationalising it as planned. New vehicles and cleaner fuels should help clear the toxic air in cities and towns and make roads safer.

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CONSERVATIONIST JOINS PANEL ON ELEPHANT CORRIDOR CASE

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

Jumbo hub: One of the main elephant corridors in the Nilgiris at Masinagudi. M. Sathyamoorthy

The Supreme Court on Wednesday appointed conservationist Nandita Hazarika as Member of a Technical Committee constituted by it on October 14 last year to hear complaints by land owners against the action taken by the Nilgris Collector, which included sealing of their buildings and allegations about the “arbitrary variance in acreage of the elephant corridor.”

The order came after a Bench led by Chief Justice of India Sharad A. Bobde was informed of the death of one of the committee members, Ajay Desai, through an application filed by the Hospitality Association of Mudumalai.

On October 14, the top court upheld the Tamil Nadu government’s authority to notify an ‘elephant corridor’ and protect the migratory path of the animals through the Nilgiri biosphere reserve. The reserve is the largest protected forest area in India, spanning across Tamil Nadu, Karnataka and Kerala.

A three-judge Bench led by CJI Bobde had said it was the State’s duty to protect a “keystone species” such as elephants, immensely important to the environment.

The corridor is situated in the ecologically fragile Sigur plateau, which connects the Western and the Eastern Ghats and sustains elephant populations and their genetic diversity.

It has the Nilgiri Hills on its southwestern side and the Moyar River Valley on its north-eastern side. The elephants cross the plateau in search of food and water.

The Supreme Court judgment was based on 32 appeals filed by resorts/private land owners, including Bollywood actor Mithun Chakraborty, against a Madras High Court decision of July 2011.

The High Court had confirmed a State government order of August 2010, notifying the corridor.

The three-member Technical Committee of the National Elephant 2 Action Plan also includes former Madras High Court judge, Justice K. Venkatraman; and Praveen Bhargava, trustee of Wildlife First.

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NEW ZEALAND TOPS COVID-19 PERFORMANCE RANKING

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

New Zealand and Vietnam were ranked the best performing countries in their response to the pandemic, according to a COVID-19 “performance index” put together by the Lowy Institute, an Australian think tank, which sought to assess the impact of geography, political systems and economic development in assessing outcomes.

The index, which was based on six different indicators, including confirmed cases and deaths per million people and the scale of testing, sought “to gauge the relative performance of countries”, assessing 98 countries in the 36 weeks that followed their hundredth case.

“Fewer reported cases and deaths, both in aggregate and per capita terms, point towards a better response to the virus,” the Sydney-based think tank said. “More tests conducted on a per capita basis reveal a more accurate picture of the extent of the pandemic at the national level. Lower rates of positive tests, meanwhile, indicate greater degrees of control over the transmission of COVID-19.”

U.S., Brazil worst

India ranked 86 out of 98 countries, while the U.S. stood at 94 and Brazil at the bottom of the index. Taiwan, Thailand and Cyprus were in the top five. Sri Lanka was the best faring nation in South Asia, ranking 10, while the Maldives was at 25, Pakistan at 69, Nepal at 70, and Bangladesh at 84.

The think tank said China was not included “due to a lack of publicly available data on testing”.

Assessing regional responses, the institute found that although the outbreak began in China, the Asia-Pacific region fared the best, while Europe and the U.S. were initially overwhelmed. Europe, however, “registered the greatest improvement over time of any region” before succumbing to a second wave, which it attributed to more open borders.

Population size was one factor. Smaller countries with fewer than 10 million people “consistently outperformed their larger counterparts throughout 2020”.

The level of economic development and regime-type were less significant than expected, which it attributed to “the relatively ‘low-tech’ nature of the health measures used to mitigate the spread of the virus” which “may have created a more level playing field between developed and developing countries”. “In general, countries with smaller populations, cohesive societies, and capable institutions have a comparative advantage in dealing with a global crisis such as a pandemic,” the think tank concluded.

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NATIONAL MARINE TURTLE ACTION PLAN LAUNCHED.

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

Considering the need to have a conservation paradigm for marine mega fauna and marine turtles, the Ministry of Environment Forest and Climate Change (MoEF&CC) has released 'Marine Mega Fauna Stranding Guidelines' and 'National Marine Turtle Action Plan' in New Delhi today.

Speaking at the virtual launch event the Union Environment Minister said that both floral and faunal diversity including the marine biodiversity is the beauty of India and we need to conserve it with best possible action and interventions.



India has rich marine biodiversity along a vast coastline of over 7,500 km. From colorful fish, sharks, including Whale Sharks, turtles and big mammals like whales, dolphins and dugongs to bright corals, marine habitats not only harbor diverse species but also provide resources essential for human wellbeing.

Millions of people depend on these resources ranging from maritime trade and transport, food, mineral resources, cultural traditions, spiritual values and inspiration that draws tourists from around the world.

Despite the immense economic, ecological and cultural values of marine habitats in India, marine mega fauna species and marine turtles face a wide variety of challenges including

stranding and entanglement. Managing such challenging situations requires coordination, action and people's participation which would help in the long-term conservation of marine species and their habitats.

The documents launched today contains ways and means to not only promote inter-sectoral action for conservation but also guide improved coordination amongst the government, civil society and all relevant stakeholders on the response to cases of stranding, entanglement, injury or mortality of marine mammals and also conservation of marine turtles.

These two documents highlight actions to be taken for handling stranded animals on shore, stranded or entangled animals in the sea or on a boat, management actions for improved coordination, reducing threats to marine species and their habitats, rehabilitation of degraded habitats, enhancing people's participation, advance scientific research and exchange of information on marine mammals and marine turtles and their habitats.

GK

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THE HINDU EXPLAINS

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

The story so far: Union Transport Minister Nitin Gadkari has announced his Ministry's approval of a ['green tax' on vehicles of specified vintage](#), as a means of dissuading people from using polluting vehicles. Among the major features of the measure is a 10%-25% additional green tax on the road tax payable by commercial transport vehicles that are older than eight years at the time of fitness certification renewal, and for personal vehicles after 15 years. The policy provides exemptions for tractors, harvesters and tillers used in farms, hybrid, electric, ethanol, liquefied petroleum gas (LPG) and compressed natural gas (CNG)-powered vehicles, and a lower green tax for public transport vehicles such as buses; conversely, a higher additional 50% of road tax is proposed for vehicles in highly polluted cities, as well as differential tax based on fuel and vehicle type, such as diesel. Vehicles of government departments and public sector units that are older than 15 years are to be deregistered and scrapped. Green tax funds are to be kept in a separate account to help States measure pollution and tackle it. State governments must now comment on the proposal. The policy is [scheduled to come into force on April 1, 2022](#).

India has been working on a scrappage policy for years that could, on the one hand, give a boost to the automobile industry and related businesses by stimulating demand, and lead to recovery of steel, aluminium, plastic and so on for recycling, on the other. Newer vehicles conforming to stricter emissions and fuel efficiency standards are more environment-friendly, and have modern safety features. In 2016, India notified the Corporate Average Fuel Economy (CAFE) Standard for passenger vehicles to boost efficiency. Those with not more than nine seats and weighing less than 3,500 kg were covered from April 1, 2017. The average fuel consumption standard is given by the [Power Ministry's Bureau of Energy Efficiency \(BEE\)](#) as less than 5.49 litres per 100 km. A second round of tighter efficiency norms is scheduled for 2022. Separate standards for light, medium and heavy commercial vehicles exist. CAFE also regulates CO2 emissions, while other pollutants such as carbon monoxide, oxides of nitrogen and sulphur are covered by Bharat Stage fuel standards. The benefits from vehicle replacements can be gauged from Transport Ministry data: commercial vehicles making up 5% of the vehicle fleet but contribute an estimated 65-70% of total vehicular pollution.

Editorial | [Taxing clunkers: On raising tax on older vehicles](#)

The Centre provided funds under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) to State governments to augment bus fleets, and help the recession-hit bus industry in 2009. Globally, accelerated vehicle replacement schemes have been used in several countries. The most notable were those in Europe, besides the high-profile, \$3 billion "Cash for Clunkers" or CARS (or Car Allowance Rebate System) programme in the U.S. after the 2008 recession. The official evaluation of the U.S. scheme was that it led to an average mileage efficiency increase of 58%, and upgraded vehicles generally were high on environmental benefits such as lower air pollution. Some critics say the U.S. scheme was not carefully targeted to primarily help those who could not afford a replacement. The BEE estimates that higher efficiency norms could result in a fuel use reduction of 22.97 million tons by 2025 in India.

In 2015, as the Transport Ministry was drafting it, Mr. Gadkari said the idea was to give a certificate to owners selling off old vehicles of specified age, which [could be redeemed for a discount of 30,000](#) to 50,000 for new passenger vehicles. For a commercial vehicle, the benefits including taxes would be an estimated 1.5 lakh. This idea did not progress, however, and among those who expressed reservations on high costs was NITI Aayog. The Aayog was concerned that some sections may not be in a position to retire old vehicles because of the high capital

cost. The proposals in earlier drafts also envisaged tax discounts for those who exchanged old motors for new ones. The present initiative, however, has the limited objective of nudging the owners of older vehicles to sell them off rather than pay a green tax penalty. Without sufficient incentive or penalty, and careful targeting of vehicles with knowledge of their condition, a tax penalty could be less of a disincentive to commercial vehicle owners, since the tax would be far lower than its resale value and earnings potential; there would be no compulsion to retire it. Continued operation of the vehicles would defeat the clean air objective and bring no cheer to the automobile industry.

For a clean-up, commercial transport vehicles are of highest concern: on fuel efficiency, emissions and safety. The Centre could offer a green new deal with financial options such as loans and grants to smaller operators to scrap their junk vehicles, while escalating the green tax annually to achieve the nudge effect. A second stimulus to bus companies could help green the fleet and cut pollution.

Small operators such as autorickshaws could be offered low-interest loans, particularly to move to electric vehicles.

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