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THE PROBLEM OF AGEING DAMS

Relevant for: Environment | Topic: Disaster and disaster management

Dams and reservoirs are believed to secure our water needs for the future. However, data and studies show that they can threaten our water security. Here is how.

It is not a secret anymore that India's dams are now ageing and concomitantly, reservoir water is being replaced by soil, technically known as silt or sediment.

Also read | [Ageing dams in India, U.S., other nations pose growing threat: UN report](#)

India is ranked third in the world in terms of building large dams. Of the over 5,200 large dams built so far, about 1,100 large dams have already reached 50 years of age and some are older than 120 years. The number of such dams will increase to 4,400 by 2050. This means that 80% of the nation's large dams face the prospect of becoming obsolete as they will be 50 years to over 150 years old.

The situation with hundreds of thousands of medium and minor dams is even more precarious as their shelf life is even lower than that of large dams. Krishna Raja Sagar dam was built in 1931 and is now 90 years old. Similarly, Mettur dam was constructed in 1934 and is now 87 years old. Both these reservoirs are located in the water-scarce Cauvery river basin.

As dams age, soil replaces the water in the reservoirs. Therefore, the storage capacity cannot be claimed to be the same as it was in the 1900s and 1950s.

Also read | [293 big dams in country over 100-years old, Minister tells Lok Sabha](#)

To make matters worse, studies show that the design of many of our reservoirs is flawed. In a paper, [Supply-side Hydrology: Last gasp](#), published in 2003 in *Economic & Political Weekly*, Rohan D'Souza writes that the observed siltation rate in India's iconic Bhakra dam is 139.86% higher than originally assumed. At this rate, he wrote, "the Bhakra dam is now expected to function for merely 47 years, virtually halved from the original estimate of 88 years". Similarly, the actual siltation rate observed for the Hirakud, Maithan and Ghod dams are way higher at 141.67%, 808.64% and 426.59%, respectively. Studies in later years showed similar findings.

Almost every scholarly study on reservoir sedimentation shows that Indian reservoirs are designed with a poor understanding of sedimentation science. The designs underestimate the rate of siltation and overestimate live storage capacity created.

Therefore, the storage space in Indian reservoirs is receding at a rate faster than anticipated. Reservoirs are poised to become extinct in less than a few decades with untold consequences already under way.

Comment | [Raising Sardar Sarovar dam to its full height — Nothing learnt from history](#)

When soil replaces the water in reservoirs, supply gets choked. The cropped area begins receiving less and less water as time progresses. The net sown water area either shrinks in size or depends on rains or groundwater, which is over-exploited. Crop yield gets affected severely and disrupts the farmer's income. In fact, the farmer's income may get reduced as water is one of the crucial factors for crop yield along with credit, crop insurance and investment. It is important to note that no plan on climate change adaptation will succeed with sediment-packed

dams.

The flawed siltation rates demonstrated by a number of scholarly studies reinforce the argument that the designed flood cushion within several reservoirs across many river basins may have already depleted substantially due to which floods have become more frequent downstream of dams. The flooding of Bharuch in 2020, Kerala in 2018 and Chennai in 2015 are a few examples attributed to downstream releases from reservoirs. The nation will eventually be unable to find sufficient water in the 21st century to feed the rising population by 2050, grow abundant crops, create sustainable cities, or ensure growth. Therefore, it is imperative for all stakeholders to come together to address this situation urgently.

J. Harsha is Director, Central Water Commission, Government of India. Views are personal and not that of the Central Water Commission

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BUDGET 2021: GOVT PROPOSES VOLUNTARY VEHICLE SCRAPPAGE POLICY

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

New Delhi: Finance minister Nirmala Sitharaman on Monday, while presenting the [Union Budget](#) for FY22, announced the much-awaited voluntary vehicle scrappage policy to phase out unfit, pollution-causing vehicles.

Announcement

The policy will help reduce vehicular pollution and cut oil import bill. Vehicles will undergo fitness test in automated centres. Age of the vehicles will be 15 years in case of commercial vehicles and 20 years in case of personal vehicles. The ministry of road transport and highways will announce the finer details of the policy.

Also Read | [How India can fight vaccine hesitancy](#)

Implication

The policy, when implemented, is expected to increase production and capacity utilization of vehicles. It is seen as an attempt by the government to boost automobile demand, which has been hit by weak consumer sentiment amid a slowdown in the broader economy. Last week, transport minister Nitin Gadkari had approved the policy of deregistration and scrapping of vehicles owned by government departments and public sector entities. Such vehicles will have to be more than 15 years old. The policy will come into effect from 1 April, 2022.

Context

The voluntary vehicle scrappage policy has been under consideration for close to five years. It was stuck at various levels owing to concerns of revenue loss of the government. According to government data, commercial vehicles, which constitute about 5% of the total vehicle fleet contribute about 65-70% of total vehicular pollution. The older fleet, typically manufactured before 2000, constitutes less than 1% of the total fleet but contributes around 15% to total vehicular pollution. These older vehicles pollute 10-25 times more than modern vehicles.

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JAL JEEVAN MISSION TO HELP REVIVE URBAN WATERBODIES

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

The urban water supply mission announced in the Budget on Monday will include rejuvenation of waterbodies and 20% of supply from reused water, the Housing and Urban Affairs Ministry said on Tuesday.

In a statement, the Ministry said there was an estimated gap of 2.68 crore urban household tap connections that the Jal Jeevan Mission (Urban) (JJMU) would seek to bridge in all 4,378 statutory towns. The Mission would also aim to bridge the gap of 2.64 crore sewer connections in the 500 cities under the existing Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

The mission would include rejuvenation of water bodies to boost the sustainable freshwater supply and creation of green spaces.

“JJM(U) will promote circular economy of water through development of city water balance plan for each city focusing on recycle/reuse of treated sewage, rejuvenation of water bodies and water conservation,” it said.

The Ministry said 20% of the water demand would be met with reused water. The total expenditure on the mission would be Rs. 2.87 lakh crore over five years.

The Ministry said the MetroNeo and MetroLite technologies, which are cheaper than conventional Metros, mentioned in the Budget were already being considered.

“Some of the Tier-2 cities like Gorakhpur, Allahabad, Jammu, Srinagar, Rajkot, Baroda, Dehradun, Coimbatore, Bhiwadi-Daruhera etc. are making proposals under MetroLite/MetroNeo and Nashik has already sent a proposal for MetroNeo, which is under consideration,” the statement said.

Apart from the Budget announcements, the Ministry said there had been an increase in the funds to urban local bodies as per the 15th Finance Commission’s report. There had been a 78% increase, from Rs. 87,143 crore in the 14th Finance Commission period to Rs. 1,55,628 crore in the 15th Finance Commission’s period.

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ON WORLD WETLANDS DAY INDIA GETS ITS FIRST CENTRE FOR WETLAND CONSERVATION AND MANAGEMENT.

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

On the occasion of the World Wetland Day and as a part of its commitment towards conservation, restoration and management of India's wetlands, the Minister of State for Environment, Forest and Climate Change, Sh. Babul Supriyo today announced the establishment of a Centre for Wetland Conservation and Management (CWCM), as a part of the National Centre for Sustainable Coastal Management (NCSCM), Chennai, an institution under the Ministry. The event was attended virtually by NCSCM, State Wetland Authorities and the knowledge partners of the Wetland Division.

Speaking at the launch the Minister of State for Environment highlighted the importance of wetlands in providing various ecosystem services. "The dedicated Centre which is launched today would address specific research needs and knowledge gaps and will aid in the application of integrated approaches for conservation, management and wise use of the wetlands." said Shri Supriyo.

India has nearly 4.6% of its land as wetlands, covering an area of 15.26 million hectares and has 42 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 1.08 million hectares. The year 2021 also commemorates the 50th anniversary of the signing of the Ramsar Convention on Wetlands on 2 February 1971 in Ramsar, Iran, celebrated annually as World Wetlands Day.

The Centre will help in building partnership and networks with relevant national and international agencies. WCM would serve as a knowledge hub and enable exchange between State/ UT Wetland Authorities, wetland users, managers, researchers, policy-makers and practitioners. The Centre would also assist the national and State/ UT Governments in the design and implementation of policy and regulatory frameworks, management planning, monitoring and targeted research for its conservation.

The Minister also released publications relating to Faunal Diversity of all the Ramsar sites in the country and a brochure on Designation of Ramsar sites.

[Faunal Diversity in Ramsar Wetlands of India](#)

GK

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TOWARDS SUSTAINABLE GROWTH

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

The [COVID-19 pandemic](#) has taught us many lessons. It made us realise that we are a part of nature and emphasised the urgent need to protect the ecological functions of the biosphere we live in. It has unequivocally highlighted how vital the health of the planet is for our individual and collective well-being as well as the growth of our economies.

The pandemic has resulted in huge economic losses. Globally, the GDP is expected to contract 2.4% to 8% in 2020. The World Economic Forum (WEF) estimates that the global cost of dealing with the pandemic could be from \$8.1 trillion to \$15.8 trillion. Preventing such pandemics will cost only a fraction of this amount, estimated at \$22.2 billion to \$30.7 billion a year, and this is without factoring in the human suffering.

We have to recognise that there would not be an economy without the natural environment. Global studies documenting human ecological footprint, the decline in wildlife populations, and the conversion rates of natural ecosystems for other uses, place India among countries experiencing the highest rates of negative change. This increases our vulnerability towards catastrophes, including pandemics. Additionally, there is a strong correlation between human density, richness of biodiversity, and the emergence of zoonotic pathogens of wild origin, which renders India particularly vulnerable. With high human densities — among the highest diversity of mammals in the world — and a saturated interface between humans and wildlife, India is considered to be among the hotspots for zoonotic emerging and re-emerging infectious diseases.

The [WEF's Global Risks report for 2021](#) states that environmental risks continue to threaten the global economy. The top five risks are extreme weather, climate action failure, human environmental damage, infectious diseases and biodiversity loss. In terms of impact, infectious diseases top the list, followed by climate action failure. The top two risk response blind spots are climate action failure and biodiversity loss.

Our models of development and our notions about them have to change. Destruction of environment should no longer be justified in the name of development. Like all pandemics, COVID-19's emergence has been entirely driven by unchecked activities in the name of development. Rampant destruction of natural habitats, especially due to mining and infrastructure development, continued expansion and intensification of agriculture and animal husbandry as well as unrestrained consumption have disrupted nature, increased contact between wildlife, livestock, pathogens and people, setting the stage for the pandemic to take hold of our lives. Pandemic risk can be significantly lowered by reducing human activities that drive the loss of biodiversity as it will help prevent the spillover of new diseases.

A study by Swiss Re Institute published in 2020 introduces a new [biodiversity and ecosystem services index](#). It found that globally, 20% of countries, including India, have fragile ecosystems. It also states that 55% of the global GDP depends on high-functioning biodiversity and ecosystem services.

It is evident that policymakers should factor biodiversity and ecosystems into their economic decision-making. This will accelerate the transition from a fossil fuel-based economy to sustainable, equitable, inclusive and just development models. [The Economics of Biodiversity: The Dasgupta Review](#), commissioned by HM Treasury and released on February 2, 2021, highlights the grave risks faced by the world because of the failure of economics to take into

account the rapid degradation of nature. The review stresses the need to find new measures for growth and development to avoid a catastrophic breakdown. The world's governments need to come up with a form of national accounting that is different from the GDP model, and the new system has to account for the depletion of nature and natural resources.

The evidence is overwhelming. All budgets need to reduce investments, including subsidies, in activities that will further degrade our natural habitats. By orders of magnitude, we should enhance investment in research in sustainability science.

Editorial | [Circle of life: on economic growth factoring ecosystem](#)

A [National Mission on Biodiversity and Human Well-Being](#) has been approved by the Prime Minister's Science Technology and Innovation Advisory Council. The overarching objectives are to restore and enhance biodiversity, strengthen its sustainable use, generate thousands of green jobs and encourage the Indian public to appreciate the natural and associated cultural treasures that we have collectively inherited. This initiative has the potential to enable India to play a global leadership role in linking conservation with tangible human well-being outcomes.

Ravi Chellam is CEO, Metastring Foundation and is associated with Biodiversity Collaborative, Bengaluru

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A WORLDWIDE CAMPAIGN BY THE FISHING CAT CONSERVATION ALLIANCE TO PROTECT THE FELINE

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

In search of home Habitat loss and conflict with humans are some of the reasons behind the dwindling numbers of fishing cats; Murthy Kantimahanti at an awareness camp.

The highly elusive fishing cat, a lesser-known feline species, is facing several threats due to its depleting habitat. Listed as 'vulnerable' on International Union for Conservation of Nature's Red List, the species has a high probability of becoming endangered unless circumstances threatening its survival and reproduction improve.

Fishing cats have a patchy distribution along the Eastern Ghats. They abound in estuarine floodplains, tidal mangrove forests and also inland freshwater habitats. Apart from Sundarbans in West Bengal and Bangladesh, fishing cats inhabit the Chilika lagoon and surrounding wetlands in Odisha, Coringa and Krishna mangroves in Andhra Pradesh.

"Our team also reported the presence of the species for the first time in a completely inland freshwater riverine habitat in Srikakulam a couple of years ago. The conservation threats to fishing cats in the Eastern Ghats are mainly habitat loss [wetland degradation and conversion for aquaculture and other commercial projects], sand mining along river banks, agricultural intensification resulting in loss of riverine buffer and conflict with humans in certain areas resulting in targeted hunting and retaliatory killings," says Murthy Kantimahanti, a part of Fishing Cat Conservation Alliance and founder of Eastern Ghats Wildlife Society, India.

The Fishing Cat Conservation Alliance is a team of conservationists, researchers and enthusiasts across the world working to achieve a single dream — a world with functioning floodplains and coastal ecosystems that ensure survival of the fishing cat and all species with which it shares a home. With its regional group of conservationists and researchers, it has initiated an understanding of the bio-geographical distribution of the fishing cat in the unprotected and human-dominated landscapes of the northeastern Ghats of Andhra Pradesh. The project will use techniques like ecological niche modelling, camera trapping, signs and tracks survey, interviews with locals and documentation of historical records.

Major shifts in land use management like agricultural intensification in prime fishing cat habitats and wetland degradation are the main factors that can influence the population distribution of these cats in the Eastern Ghats. "We know nothing about their population dynamics, and very little about their ecology and habits in the wild. Therefore, it's very difficult to say the impact without such data. Although fishing cats are predominantly associated with wetlands, these highly elusive cats are adaptable to live even in human dominated landscapes and relatively drier habitats," Murthy adds.

Another major component is promoting awareness among people living near fishing cat habitats. "This is to engage them in conservation efforts by capacity-building measures not only to monitor its population but also to document any threats to their survival in unprotected/unclassified forest areas. The goal is to ensure healthy populations of fishing cats living in close harmony with humans in these areas," says Murthy.

The Alliance will kick-start a worldwide month-long campaign in February to raise awareness and garner support across the globe. The Association of Zoos and Aquariums (a non-profit

dedicated to the advancement of zoos and aquariums in the areas of conservation, education, science, and recreation) and Fishing Cat Species Survival Plan in conjunction with the Fishing Cat Conservation Alliance will be sharing their expertise via cartoons, videos and other material.

In doing so, the Fishing Cat Conservation Alliance hopes to inspire in both children and adults the necessity to act on behalf of such an incredible small wild cat, to join hands as a passionate community of fishing cat enthusiasts, and to in turn protect wetland ecosystems and all species they support.

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UNION MINISTERS JOINTLY LAUNCH UNIFIED PORTAL OF GOBARDHAN TO PROMOTE GOBARDHAN SCHEME AND TRACK REAL TIME PROGRESS

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

Union Minister, Agriculture and Farmers Welfare and Rural Development, Shri Narendra Singh Tomar; Union Minister of Petroleum, Natural Gas and Steel, Shri Dharmendra Pradhan; Union Minister of Fisheries, Animal Husbandry and Dairying, Shri Giriraj Singh; Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat and Union Minister of State, Jal Shakti, Shri Rattan Lal Kataria today jointly launched the Unified Portal of Gobardhan here today. Secretary, Ministry of Jal Shakti; Secretary, Department of Animal Husbandry and Dairying and other senior officials also attended the launch event.



The key stakeholders under Unified Approach namely, Ministry of New and Renewable Energy (MNRE), Ministry of Petroleum and Natural Gas (MoPNG), Department of Animal Husbandry and Dairying, Department of Agriculture, Cooperation and Farmers Welfare, Department of Agricultural Research and Education (DARE), and Department of Rural Development are having various Biogas programmes/policies/schemes like New National Biogas and Manure Management Programme (NNBOMP) of MNRE, Biofuel Policy & Sustainable Alternative towards Affordable Transportation (SATAT) of MoPNG, and Cooperative schemes through the National Dairy Development Board (NDDB) of Animal Husbandry Department and various other similar schemes. Under the new unified approach, all these programmes/schemes will be coordinated by the Department of Drinking Water and Sanitation under the Swachh Bharat Mission – Gramin (SBMG).



In his inaugural address, Union Minister, Shri Gajendra Singh Shekhawat, said that SBMG transformed itself into a Jan Andolan for sanitation under the guidance and leadership of Prime Minister, Shri Narendra Modi and achieved Open Defecation Free (ODF) rural India milestone in mission mode. Taking forward the extraordinary success, Phase 2 of the SBM (G) has been launched early last year, which focuses on ODF sustainability and Solid and Liquid Waste Management (SLWM) aiming at comprehensive cleanliness in villages or ODF Plus status. He added that for achieving ODF Plus goal, Gobardhan scheme was launched in early 2018 to manage the prevailing issues of bio-waste in villages including cattle waste and converting them into biogas and organic manure to improve the lives of villagers by providing economic and resource benefits to farmers and households. He hailed the new Unified Approach strategy and said that Unified Gobardhan portal will ensure close coordination with stakeholder Departments/Ministries for smooth implementation of Biogas schemes/initiatives and its real time tracking.



Union Minister of Fisheries, Animal Husbandry and Dairying, Shri Giriraj Singhin his address highlighted the importance of 'Waste to Wealth' aspect of Gobardhan. He remarked that rural India generates enormous quantities of bio-waste which can be efficiently utilized and lead to better environment and public health. This can be done through proper schemes and initiatives related to bio-waste processing especially cattle dung into Biogas & organic manure leading to generation of opportunities for employment and household savings. He mentioned the successful model of Cooperative schemes through the National Dairy Development Board (NDDDB) undertaken by his Department wherein Gaushalas & milk cooperatives are being linked to large community-based biogas units.



Union Minister of Petroleum, Natural Gas and Steel, Shri Dharmendra Pradhan in his address outlined the broader objectives and goals of Bio-Gas schemes undertaken by his ministry. He highlighted the successful model of SATAT which aims at setting up of Compressed Bio-Gas (CBG) production plants and ensuring market linkage for use of biofuel in automotive fuels. He mentioned that the pilot projects are being set up across the country and it will further increase economic benefits for farmers and overall cleanliness in rural areas.



Addressing the gathering, Union Minister, Agriculture and Farmers Welfare and Rural Development, Shri Narendra Singh Tomar expressed confidence that the launch of unified portal of Gobardhan will further strengthen the rural economy through a convergent approach for various Biogas projects/models and initiatives. The ODF Plus goal outlined in the Phase 2 of SBMG will depend on the performance of Gobardhan scheme to a great extent as it will not only effectively address the solid waste management challenge but will increase livelihood opportunities, and household earnings in rural areas.



Shri Pankaj Kumar, Secretary, Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti complimented the efforts of all key stakeholders Departments/Ministries, central and state teams as part of the Unified Approach of Gobardhan expressing hope for timely achievements of targets and better coordination for the common goal of Clean and Healthy village. He also listed the important benefits, objectives and guiding principles of Gobardhan scheme.

The link for the Unified portal is <http://sbm.gov.in/gbdw20>

BY/AS

Union Minister, Agriculture and Farmers Welfare and Rural Development, Shri Narendra Singh Tomar; Union Minister of Petroleum, Natural Gas and Steel, Shri Dharmendra Pradhan; Union Minister of Fisheries, Animal Husbandry and Dairying, Shri Giriraj Singh; Union Minister for Jal Shakti, Shri Gajendra Singh Shekhawat and Union Minister of State, Jal Shakti, Shri Rattan Lal Kataria today jointly launched the Unified Portal of Gobardhan here today. Secretary, Ministry of Jal Shakti; Secretary, Department of Animal Husbandry and Dairying and other senior officials also attended the launch event.



The key stakeholders under Unified Approach namely, Ministry of New and Renewable Energy (MNRE), Ministry of Petroleum and Natural Gas (MoPNG), Department of Animal Husbandry and Dairying, Department of Agriculture, Cooperation and Farmers Welfare, Department of Agricultural Research and Education (DARE), and Department of Rural Development are having various Biogas programmes/policies/schemes like New National Biogas and Manure Management Programme (NNBOMP) of MNRE, Biofuel Policy & Sustainable Alternative towards Affordable Transportation (SATAT) of MoPNG, and Cooperative schemes through the National Dairy Development Board (NDDB) of Animal Husbandry Department and various other similar schemes. Under the new unified approach, all these programmes/schemes will be coordinated by the Department of Drinking Water and Sanitation under the Swachh Bharat Mission – Grameen (SBMG).



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NITI AAYOG SEEKS TO TRACK IMPACT OF GREEN VERDICTS

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

Projects to be analysed include the construction of an airport in Mopa, Goa; cessation of iron ore mining in Goa, and the shutting down of the Sterlite copper plant in Thoothukudi, Tamil Nadu.

The others are decisions by the NGT involving sand mining, and construction activities in the National Capital Region.

“These have been some of the most significant cases in the recent past that have caused substantial damage to the economy,” the brief notes. The study is to be undertaken by the Jaipur-headquartered CUTS (Consumer Unity and Trust Society) Centre for Competition, Investment and Economic Regulation, that also has an international presence.

“The judiciary needs to take into account environment, equity and economic considerations while deciding cases, and needs to institutionalise a mechanism for it,” the brief notes.

“The absence of ex-ante (before an event) analysis of the economic costs associated with a decision is further exacerbated when judicial activism by courts and tribunals is also in play.”

Vikrant Tongad, Uttar Pradesh-based environmentalist and founder, Social Action for Forest and Environment (SAFE) was among those whom CUTS reached out to, as an expert, because of his involvement in campaigns against sandmining operations. He told *The Hindu* that he found the study “surprising” in its intent. “Does the government now want to train judges not to give such judgements? Is the government forgetting that due to their negligence, courts have been forced to give strict orders. Will the NITI Aayog also study how much damage will be done if the courts do not give such orders,” he asked.

Vice-Chairman of NITI Aayog Rajiv Kumar said the study was a purely economic exercise.

“The intent of this study is to analyse the cost and benefit of certain judicial decisions. It doesn't question judicial intervention. I was, for example, happy to see how Supreme Court's intervention led to the adoption of CNG (compressed natural gas, in transport vehicles in Delhi) and the economic benefits from it.”

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WATER SCARCITY LIKELY IN THE HIMALAYAN CATCHMENT IF WARMING CONTINUES

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

Role of melt: The glacier-melt increases about 15% to 70% in a warmer environment with its present volume, but then decreases when glacier volumes shrink. | Photo Credit: [Yumi mini](#)

The coldly white snowpacks and glaciers of the Himalayas that make for a picturesque panorama are also important sources of water for about a billion people who live in the basins of the Indus, Ganges and Brahmaputra rivers. But with rising global temperatures, these snowpacks and glaciers, which are highly sensitive, are affected.

This, in turn, affects the Himalayan hydrology. India, Nepal, Pakistan and China hugely depend on these Himalayan rivers for their daily needs and energy production.

A new paper published last month studied how these Himalayan rivers are affected by the different components – rainfall-runoff, snow-melt and glacier-melt – and notes that if drier and warmer scenarios continue in the near future (2031–2050), we are more likely to face water stress in these catchment areas. They also note that if there is increased rainfall, this could lead to a water surplus situation.

The team studied five basins in the central Himalaya – Sutlej, Thulo Bheri, Kali Gandaki, Dudh Kosi and Arun. They analysed the daily precipitation, maximum and minimum daily temperatures, wind speeds, land cover, elevation and soil properties. “We developed a new glacier melt model and integrated it to the currently used land surface model. The currently used land surface model – used even by the Ministry of Earth Sciences – does not take into account glacier melt. This could lead to serious errors in the study of north-Indian rivers. Our model helps make the current one complete and turns it into a more advanced and better one,” explains Subimal Ghosh, the corresponding author of the paper published in *Water Resources Research*. He is from the Department of Civil Engineering at the Indian Institute of Technology Bombay.

The results show that the glacier-melt increases about 15% to 70% in a warmer environment with its present volume, but then decreases to 3%–38% substantially when the glacier volumes shrink. However, such a decrease can be compensated if there is increased rainfall and if a wetter scenario persists.

“Snowpacks and glaciers are two important water storage units in the Himalaya. Though snow is lower density and will melt easily in a warming climate, the reduced snowfall will in turn reduce the amount of snow-melt. Though glacier melt will increase initially, they will shrink in size quickly and the amount of glacier melt will also decline in the latter end of the century,” adds Vikram S. Chandel, first author of the paper. He is a research scholar of Interdisciplinary Program in Climate Studies, IIT Bombay. The future study will focus on understanding the predictability of the land-atmospheric processes.

The team notes that proper water-management and governance are urgently required. “Changing patterns of precipitation systems — Indian Summer Monsoon and Western Disturbances — are important for the future situation of water resources in Himalayan catchments,” adds the paper.

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EXPERTS POINT TO CLIMATE CHANGE IMPACT

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

A deluge that resulted from a glacial melt on Nanda Devi flooded the Rishiganga river in Uttarakhand and washed away at least two hydroelectric power projects — the 13.2 MW Rishiganga hydroelectric power project and the Tapovan project on the Dhauliganga river, a tributary of the Alakananda.

There were also concerns that the excess water would further travel downstream to the river Alaknanda and threaten villages as well as hydro projects on the river.

However the India Meteorological Department has said that no rains are forecast. Officials of the Central Water Commission meanwhile said the flooding from the glacial burst has been contained.

Environmental experts have attributed the Nanda Devi glacial melt to global warming. Glacier retreat and permafrost thaw are projected to decrease the stability of mountain slopes and increase the number and area of glacier lakes, according to the latest assessment reports of the UN Intergovernmental Panel on Climate Change.

There is also high confidence that the number and area of glacier lakes will continue to increase in most regions in the coming decades, and new lakes will develop closer to steep and potentially unstable mountain walls where lake outbursts can be more easily triggered.

Farooq Azam, Assistant Professor, Glaciology and Hydrology division, IIT Indore, said such a glacial burst was an “extremely rare event”. “Satellite and Google Earth images do not show a glacial lake near the region, but there’s a possibility that there may be a water pocket in the region. Water pockets are lakes inside the glaciers, which may have erupted leading to this event. We need further analysis, weather reports and data to confirm if this indeed was the case,” he said.

Climate change has driven erratic weather patterns like increased snowfall and rainfall, warmer winters has led to the melting of a lot of snow. The thermal profile of ice, say experts, was increasing. Earlier the temperature of ice ranged from -6 to -20 degree Celsius, it is now -2 making it more susceptible to melting.

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HOW GLACIERS CAN BURST AND SEND FLOODS DOWNSTREAM

Relevant for: Environment | Topic: Disaster and disaster management

The floods that slammed into two hydroelectric plants and damaged villages in northern India were set off by a break on a Himalayan glacier upstream. Here's a look at how glaciers and glacial lakes form and why they may sometimes break:

HOW GLACIERS AND GLACIAL LAKES FORM

Glaciers are found on every continent except Australia and some are hundreds of thousands of years old. A large cluster of glaciers are in the Himalayas, which are part of India's long northern border. Sunday's disaster occurred in the western part of the Himalayas.

Also Read | [Scarcity on high seas hurting India's exports](#)

Glaciers are made of layers of compressed snow that move or "flow" due to gravity and the softness of ice relative to rock. A glacier's "tongue" can extend hundreds of kilometers (miles) from its high-altitude origins, and the end, or "snout," can advance or retreat based on snow accumulating or melting.

"Ice may flow down mountain valleys, fan out across plains, or in some locations, spread out onto the sea," according to the National Snow and Ice Data Center.

Proglacial lakes, formed after glaciers retreat, are often bound by sediment and boulder formations. Additional water or pressure, or structural weakness, can cause both natural and manmade dams to burst, sending a mass of floodwater surging down the rivers and streams fed by the glacier.

WHY DID THIS GLACIER BURST?

It's not yet known what caused part of the Nanda Devi glacier to snap off Sunday morning, sending floodwater surging downstream toward power plants and villages in India's northern state of Uttarakhand.

Seismic activity and a buildup of water pressure can cause glaciers to burst, but one particular concern is climate change. High temperatures coupled with less snowfall can accelerate melting, which causes water to rise to potentially dangerous levels.

"Most mountain glaciers around the world were much larger in the past and have been melting and shrinking dramatically due to climate change and global warming," said Sarah Das, an associate scientist at Woods Hole Oceanographic Institute.

CAN SUCH DISASTERS BE PREDICTED?

Past deadly or highly destructive glacial floods have occurred in Peru and Nepal.

But the remote locations of glaciers and a lack of monitoring mean we don't have a clear understanding of how often they occur and if they are increasing, Das said.

“Given the overall pattern of warming, glacier retreat, and increase in infrastructure projects, though, it seems natural to hypothesize that these events will occur more frequently and will become overall more destructive if measures are not taken to mitigate these risks,” said Das.

A number of imminent potentially deadly glacier burst and flood situations have been identified worldwide, including in the Himalayas and South American Andes.

But while monitoring is possible, the remoteness of most glaciers presents challenges.

“There are many glaciers and glacial dammed lakes across the Himalayas, but most are unmonitored,” Das said. “Many of these lakes are upstream of steep river valleys and have the potential to cause extreme flooding when they break. Where these floods reach inhabited regions and sensitive infrastructure, things will be catastrophic.”

A 2010 information page published by the International Centre for Integrated Mountain Development called for more glacier monitoring in the Hindu Kush Himalayas to better understand “the real degree of glacial lake instability.”

The region where the glacial burst occurred is prone to landslide and flash flooding, and environmentalists have cautioned against building in the region.

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DAMS AND DAMAGES

Relevant for: Environment | Topic: Disaster and disaster management

Broken dam and rubble along the Dhauliganga river valley close to Tapovan, Uttarakhand on February 7, 2021. Photo: IAF

In 2018, while travelling through the villages near the India-China border in Niti Valley in Uttarakhand's Chamoli district, I stopped at Reni village, the birthplace of the iconic Chipko movement. The way to Reni was dotted with hydropower projects that were marred by controversy. The villagers complained about the rampant flouting of norms by the hydropower developers, which forced them to protest against such projects.

On February 7, two such hydropower projects located close to Reni suffered damages from flash floods that left [more than 30 dead and more than 175 people missing](#). The barrages of the 13.2 MW [Rishiganga hydropower project](#), which is located on the river Rishiganga, only a few metres from Reni, and NTPC's 520 MW Tapovan-Vishnugad hydropower project, on the River Dhauliganga, about 4 km from Reni, were completely damaged. It is important to note here though that dams are not victims of disasters; they, in fact, exacerbate disasters.

Also read | [Projects above an elevation of 2,200 metres recipe for disaster, say experts](#)

While the actual cause of the February 7 floods is under investigation, pegging it as a natural disaster may be incorrect. A [June 26, 2019 order of the Uttarakhand High Court](#) questioned the use of explosives on the Rishiganga site — that too for illegal mining in the name of dam construction. The use of explosives has repeatedly been questioned for dam construction, and the construction of other infrastructure projects, such as roads, in the fragile Himalayan State.

Other than this, deforestation takes place when dams are constructed. While compensatory afforestation is the norm, it is often flouted. The construction material that is supposed to be dumped on separate land is often dumped into the rivers. It would be naïve to assume that a disaster in Uttarakhand that involves dams was 'natural'.

The Chopra Committee report of 2014 brings more clarity on how dams exacerbate a disaster such as floods. The committee was formed in October 2013 after the Supreme Court ordered the Union Environment Ministry to constitute an expert body to assess whether dams exacerbated the 2013 floods in the State where over 4,000 people were killed, mainly in the Kedarnath Valley. The committee was headed by environmentalist Ravi Chopra and comprised 10 other members including geologists and biodiversity experts. Its report mentions how dams exacerbated the 2013 deluge, mainly as riverbeds were already raised from the disposed muck at the dam construction sites, and could not contain the sudden increased flow from floodwaters. The report presents evidence to prove that dams are not only damaged in floods, they also cause immense damage in downstream areas. This is because as floodwaters damage a barrage, they increase the destructive capacity of the water that flows downstream of the barrage. The Chopra Committee suggested that 23 of the 24 proposed dam projects it reviewed be cancelled for the potential damage they could do. However, even after all these years, the matter remains pending in the Supreme Court, and environmental norms for dam construction continue to be flouted in Uttarakhand.

Also read | [Uma Bharati recalls her warning on Uttarakhand hydel projects](#)

In an affidavit submitted on December 5, 2014 in the Supreme Court, the Union Ministry of

Environment, Forest and Climate Change acknowledged the adverse impact of dams in the 2013 floods, but to no effect.

To make matters worse, Himalayan glaciers are receding and disintegrating as a result of climate change, and the snow cover in the Himalayas is also thinning. Research also shows how an increased number and volume of glacial lakes should be expected as a direct impact of increased temperatures. For dams, this means rapid increase or decrease in the reservoir water level. It also means that the projections on the life of a dam reservoir may not stand due to erratic events, such as floods, that could rapidly fill a reservoir with muck and boulders brought along with the floods.

There is also the threat of earthquakes. In terms of earthquake risk, Uttarakhand lies in Seismic Zone-IV (severe intensity) and Seismic Zone-V (very severe intensity). Ignoring this, many dams have been constructed in zones that are under high risk of witnessing severe earthquakes.

Also read | [Experts point to climate change impact](#)

Irrespective of the evidence, the Uttarakhand government plans on continuing to build dams as a source of revenue. The State plans to construct up to 450 hydropower projects of 27,039 MW installed capacity. Clearly, the Uttarakhand government has chosen to ignore the disastrous impacts of rampant dam-building. It is clear that dams worsen disasters, and for this to be ignored by the State authorities is unfortunate.

Kavita Upadhyay is a journalist from Uttarakhand, who has extensively reported on the State's environmental disasters. She's a graduate in Water Science, Policy and Management from the University of Oxford

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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INDIA NEEDS TO SPEND \$1.4 TRILLION MORE ON CLEAN ENERGY SHIFT

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

India will need to spend an additional \$1.4 trillion to adopt clean energy technologies and be on a sustainable trajectory over the next 20 years, the International Energy Agency said in a report titled 'India Energy Outlook 2021' on Tuesday

India will need to spend an additional \$1.4 trillion to adopt clean energy technologies and be on a sustainable trajectory over the next 20 years, the International Energy Agency said in a report titled 'India Energy Outlook 2021' on Tuesday.

The investment is around 70% higher than that envisaged under the country's current policy, but would bring huge benefits including savings of the same magnitude on its oil import bill, the report said.

India is set to experience the largest increase in energy demand of any country worldwide over the next 20 years as its economy continues to develop. Growth, industrialization and an expanding urban population will drive its energy use higher, raising the question of how best to meet that demand without exacerbating issues like costly energy imports, air pollution and greenhouse gas emissions, according to the report.

The country would need widespread electrification of processes, greater material and energy efficiency, the use of technologies like carbon capture, and a switch to progressively lower-carbon fuels. These transformations – on a scale no country has achieved in history – would require huge advances in innovation, strong partnerships and vast amounts of capital.

"All roads to successful global clean energy transitions go via India," IEA Executive Director Fatih Birol said in the report. "The stakes could not be higher, for India and for the world."

India's combined import bill for fossil fuels is projected to triple over the next two decades, with oil the largest component. Domestic production of oil and gas continues to fall behind consumption and net dependence on imported oil will rise to above 90% by 2040 from 75% today, the report said.

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PM INAUGURATES WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2021

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

Prime Minister Shri Narendra Modi today inaugurated World Sustainable Development Summit 2021 via video conferencing. The theme of the Summit is 'Redefining our common future: Safe and secure environment for all'.

Addressing the event, the Prime Minister congratulated to TERI for sustaining this momentum and said that Global platforms like this are important for our present and future. He said that two things will define how the progress journey of humanity will unfold in the times to come. First is the health of our people. Second is the health of our planet, both are inter-linked.

He said that we have gathered here to talk about the health of the planet. The scale of the challenge we face is widely known. But, conventional approaches cannot solve the problems we face. The need of the hour is to think out of the box invest in our youngsters and work towards sustainable development.

The Prime Minister emphasized on climate justice for fighting against climate change. Climate justice is inspired by a vision of trusteeship- where growth comes with greater compassion to the poorest. Climate justice also means giving the developing countries enough space to grow. When each and every one of us understands our individual and/ collective duties, climate justice will be achieved.

He said that India's intent is supported by concrete action. Powered by spirited public efforts, we are on track to exceed our commitments and targets from Paris. We are committed to reduce emissions intensity of GDP by 33 to 35 percent from 2005 levels. He also shared that India is making steady progress on its commitment to Land Degradation Neutrality. Renewable energy is also picking speed in India. We are well on track to setting up four fifty giga watts of Renewable Energy generating capacity by Twenty Thirty.

The Prime Minister said that sustainable development is incomplete without equitable access. In this direction too, India has made good progress. In march 2019, India achieved nearly hundred percent electrification. This was done through sustainable technologies and innovative models. He highlighted that through the Ujala program, three sixty seven million LED bulbs became a part of people's lives. This reduced over thirty eight million tonnes carbon dioxide per year. The Jal Jeevan Mission has connected over thirty four million house-holds with tap connections in just about 18 months. Through the PM Ujjwala Yojna more than 80 million house-holds below poverty line have access to clean cooking fuel. We are working to increase the share of natural gas in India's energy basket from 6 percent to 15 percent, he added.

The Prime Minister pointed out that often discussions on sustainability become too focused on green energy but green energy is only the means. The destination we seek is a greener planet. Our culture's deep respect for forests and green cover is translating into out-standing results. He also said that our mission to achieve sustainable development also includes special attention towards animal protection. He shared that in the last five to seven years, the population of lions, tigers, leopards and Gangetic river dolphin has gone up.

The Prime Minister drew attention of the participants on two aspects: Togetherness and Innovation. He said that sustainable development will only be achieved by collective efforts.

When every individual thinks of national good, When every nation thinks of global good, That is when sustainable development will become a reality. India has made an effort in this direction through the International Solar Alliance. He urged all participants to keep our minds and nations open to best practices from all over the world.

Regarding innovation, he said that there are many start-ups working on renewable energy, environment friendly technology and more. As policy makers, we should support as many of these efforts. The energy of our youth will certainly lead to outstanding results.

The Prime Minister specifically mentioned about disaster management capabilities. He said that this requires focus on human resource development and technology. As part of the Coalition for Disaster Resilient Infrastructure, we are working in this direction. He assured that India is ready to do whatever possible to further sustainable development. Our human centric approach could be a force multiplier for global good.

H.E. Dr Mohamed Irfaan Ali, President of the Cooperative Republic of Guyana; Hon. James Marape, Prime Minister of Papua New Guinea; Mr Mohamed Nasheed, Speaker of the People's Majlis, Republic of Maldives; Ms Amina J Mohammed, Deputy Secretary-General, United Nations, and Shri Prakash Javadekar, Union Minister of Environment, Forest, and Climate Change were also present on the occasion.

DS /AKJ

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CLEAN-UP BEGINS ON KERALA BEACH

Relevant for: Environment | Topic: Disaster and disaster management

Joint effort: Workers removing contaminated beach sand in Thiruvananthapuram on Thursday. Special Arrangement

The Industries Department on Thursday constituted a three-member committee to investigate the leak of furnace oil from pipeline of the Travancore Titanium Products Ltd (TTP) here into the coast.

It has asked the panel to submit its report within 10 days.

The panel comprises A.P.M. Mohammed Haneesh, Principal Secretary, Industries Department; M. Mohammed Ali, managing director, Malabar Cements; and S. Chandrabose, managing director, Kerala Minerals and Metals Ltd. (KMML).

Industries Minister E.P. Jayarajan said the leak, which had triggered concerns about environmental damage, warranted a comprehensive probe.

The panel will also submit a set of recommendations for preventing the recurrence of such mishaps.

Protests by residents

Roughly 5,000 litres of furnace oil leaked into the sea following a pipeline rupture on Wednesday morning. The incident had sparked vehement protests by the local people who accused the TTP of negligence.

Over Wednesday and Thursday, the TTP removed approximately 15,000 kg of beach sand from a four-km stretch suspected to have been contaminated by the spillage. The sand is being stored on TTP premises for the time being as directed by the Kerala State Pollution Control Board. The cleaning would continue on Friday, TTP officials said.

Following pressure from local residents, the authorities also initiated steps to close the discharge point of the drain leading from the TTP campus into the seashore.

Damage assessment

The Pollution Control Board will carry out a detailed assessment of the damage caused by the oil leak. The board is also examining whether an assessment of the impact on the livelihood of fisherfolk can be incorporated into the exercise.

Following the leak, the PCB had issued detailed instructions regarding the remedial measures and directed the TTP management not to restart operations without its permission.

The Coast Guard is continuing to monitor the situation to ascertain whether the oil had spread into the deep sea.

A Coast Guard vessel stationed in the area reported that no spillage has been detected far from the shore so far.

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THE AGONISING COST OF HAM-HANDED DEVELOPMENT

Relevant for: Environment | Topic: Disaster and disaster management

Following [flash floods at Chamoli in Uttarakhand](#), defence personnel are looking for missing persons in a mélange of rock, mud, water, and debris, airlifting rations to inaccessible villages, and repairing bridges and telecommunication networks. Social scientists are assessing the disaster's impact on the region's economy. Scientists and policy makers are debating whether climate change or unchecked development in an ecologically fragile region was primarily responsible for the disaster and the death toll. News reports of ancient temples having been swept away in the Alakananda's raging waters are bringing back traumatic memories of the Kedarnath floods in 2013. All these developments show the profound significance attached to this region and they prompt a historian to ask two fundamental and interrelated questions: How did the Uttarakhand Himalayas emerge as a *deva bhumi* and how did it develop into a focus of Hindu pilgrimage?

A study of the archaeological record and inscriptional evidence suggests that many and varied agents and processes played important roles in gradually transforming this borderland into a sacred landscape. Artefacts found in the Himalayan foothills that are datable to the period extending from 300 BCE and 600 CE include an Ashokan rock edict, brick altars for conducting *ashvamedha yagnas*, coin hoards, and sculptures.

Scientist warns of water build-up near Uttarakhand disaster zone

The forms of these artefacts and their find-spots indicate deepening contact between communities living in the Gangetic plains and in the foothills. These very developments fostered the growth of Haridwar and Kalsi as cosmopolitan towns and as "gateways" into the Himalayas. Initially, mendicants in search of retreats, merchants eager to enlarge trading networks, adventurous princes in their quest to establish principalities, and artisans in search of employment passed through these gateway towns. Eventually, in the seventh century, a regional tradition of stone temple architecture commenced in the Uttarakhand Himalayas. The earliest shrines in this tradition were built at Palethi and Lakhamandal, just upstream from Haridwar and Kalsi, by visiting sovereigns.

However, these two sites with royal patronage never became major *tirthas*. Instead, Jageshwar, situated well east of Lakhamandal and Palethi attained this stature. Between the seventh and tenth centuries, builders at Jageshwar modified local geography and ecology to encourage comparisons between it and celebrated locales such as Kashi and Devadarunavana, Shiva's legendary deodar forest. Eventually, Jageshwar came to have 150 stone temples. These early developments at Jageshwar are relatable to the sway of the Pashupatas and other Shaiva ascetics and not to the rise of local dynasties. In fact, the influence of these ascetic groups in this period distinguishes Uttarakhand from adjoining kingdoms where aristocratic lineages were the primary power brokers.

In time, the development of a distinctive architectural tradition, increases in the priestly population, greater availability of skilled craftsmen, and the emergence of small principalities, helped further alter the status of this borderland and perceptions of it. By the twelfth century, architects, master-masons, and sculptors from lands as far away as Gujarat travelled to Uttarakhand to build temples in elaborate typologies associated with their homelands. And by the thirteenth century, larger entourages of ascetics, and occasionally rulers from distant lands

began undertaking pilgrimages to established and emerging *tirthas* in this mountainous region. Their journeys and activities ultimately paved the way for the Char Dham Yatra.

Data | Over 50,000 hectares of forest land in Uttarakhand diverted for various projects in last 30 years

The Char Dham Yatra today consists of a pilgrimage to Badrinath, Kedarnath, Gangotri, and Yamunotri. Like many other *tirthas* in Uttarakhand, Badrinath and Kedarnath have long been associated with gods and sages. For instance, in the *Mahabharata*, Badrinath is described as the site of Narayana's discourse to Nara. Kedarnath is mentioned in the *Skanda Purana*, in medieval lists of *jyotirlingas*, and in the names of temples built as far away as Karnataka.

Additionally, both Badrinath and Kedarnath are associated with Adi Shankara who is said to have visited them in the eighth century. Possibly his followers played a role in constructing temples at Pandukeshwar where medieval edifices built in the Dravida and Nagara modes stand side-by-side. The oldest historical evidence of the establishment of a sacred centre at Badrinath comes from a charter dating to the ninth century preserved at Pandukeshwar.

Issued by a hill ruler, the charter instructs priests living at nearby villages of Joshimath and Pandukeshwar to help *brahmacharis* upstream at Badrinath. Centuries later, in 1808, when a motley troupe of Englishmen reached the Badrinath temple in disguise, they reported it as welcoming 45,000-50,000 pilgrims annually. Given its location in an avalanche-prone valley above the tree line, it is likely that the Badrinath temple has been built and rebuilt several times in its history. Like the present Badrinath temple, the temple standing at Kedarnath today, dates to the early modern period.

A resilient future for Uttarakhand

As sites located close to the glacial sources of the Ganga and the Yamuna, Gangotri and Yamunotri have also been given sacred associations. Historically sought out by fearless sadhus, in the more recent past they have been visited by intrepid Englishmen eager to participate in ongoing efforts to map India. In the early 20th century, the Jaipur royal family supported the construction of a temple at Gangotri. The shrines at Yamunotri today are ever newer.

Demographic, political, social and economic shifts that have occurred in the past six decades have led to an increase in the number of pilgrims visiting sacred centres in Uttarakhand. After 1962, the Indian government recognised that the world's highest and loftiest mountain range no longer served as an insurmountable wall. To safeguard against future incursions, a massive development programme along the country's mountainous northern border was launched. Agencies such as the Border Roads Organisation, the Indo Tibetan Border Police, and the THDC India Limited (formerly Tehri Hydro Development Corporation Limited) were established. They were granted sizeable budgets, and charged with the construction of roads, tunnels, bridges, cantonments, hospitals, dams, and telecommunication pylons.

Over time, these efforts stimulated the region's economy, nurtured new settlements, and introduced infrastructure that facilitated pilgrimage to select sacred centres. The foundations laid by the agencies intensified after 2000 when owing to regional demands for greater political autonomy, Uttarakhand was carved out of sprawling Uttar Pradesh. Recognising religious tourism as an important source of income for a landlocked State mostly covered by snowcapped peaks and dense forests, a succession of governments have created further amenities for pilgrims, widely publicised initiatives, and embarked on the construction of new dams, multi-lane highways, and railroads. As a result of these efforts, many more individuals now undertake sacred journeys, which until 60 years ago were made by only the bravest, fittest, and most

determined pilgrims.

Until about 10 years ago, I believed that it was possible to have hydropower projects in Uttarakhand: PSI Director

The [2013 Kedarnath floods](#) and the flash floods that have swept through the Alakananda Valley earlier this week suggest that ham-handed development in the name of god, or otherwise, can come at an agonising cost. Now is the time for our leaders to recommit themselves to the ideas and activism of Chandi Prasad Bhatt, Gaura Devi, Guru das Agrawal, Ravi Chopra, Sunderlal Bahuguna, Vandana Shiva, and other Gandhian environmentalists and social workers. Over the past few decades, they have mobilised local communities to protect Uttarakhand's forests, created local employment, and questioned the wisdom of constructing large hydroelectric projects in a seismically sensitive sacred landscape. They have also reminded us that unless we change our course of action, another Himalayan miscalculation is imminent.

Nachiket Chanchani is an associate professor at the University of Michigan, Ann Arbor, U.S. and the author of Mountain Temples and Temple Mountains: Architecture, Religion, and Nature in the Central Himalayas

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A RESILIENT FUTURE FOR UTTARAKHAND

Relevant for: Environment | Topic: Disaster and disaster management

A vehicle stuck in the swamp at the site of the Tapovan hydel project as rescue work is under way. | Photo Credit: [PTI](#)

Days after a [glacier burst in the Chamoli district of Uttarakhand](#) caused flash floods, the scientific community is still struggling to understand what triggered the disaster. At the time of writing this article, the death toll was 34 with more than 170 people missing. The floods have also caused heavy damage to public and private infrastructure, including the NTPC's Tapovan-Vishnugad hydropower project and the Rishiganga mini hydro project. The incident was reminiscent of the 2013 disaster in Uttarakhand which killed thousands.

Uttarakhand is located in the midst of young and unstable mountains, and is subject to intense rainfall. But these natural characteristics can't be solely responsible for devastations the State has witnessed in the past decade. For years geologists, glaciologists and climate experts have voiced their fears about an impending disaster due to climate change, rapid and indiscriminate construction activities, and the subsequent ecological destruction in the region.

The agonising cost of ham-handed development

The occurrence of the current glacier burst was loosely attributed to erosion, a build-up of water pressure, an avalanche of snow or rocks, landslides or an earthquake under the ice. According to the Wadia Institute of Himalayan Geology, a rock mass, weakened from years of freezing and thawing of snow, may have led to the creation of a weak zone and fractures leading to a collapse that resulted in flash floods. What has intrigued experts and the local community is that this avalanche occurred unexpectedly, out of the regular flood season.

Experts also identified large-scale human settlements and expansion of agricultural activities leading to massive deforestation, as a possible trigger. Studies have shown that widespread settlements, farming, cattle grazing and other anthropogenic activities could destroy the natural barriers that control avalanches and floods, thereby enhancing the possibilities of a glacial lake outburst flood. The Hindu Kush Himalaya Assessment Report (2019) had pointed out that one-third of the Hindu Kush Himalaya's glaciers would melt by 2100 and potentially destabilise the river regime in Asia, even if all the countries in the region fulfilled their commitments under the Paris Agreement. It also warned that any ecologically destructive activities would lead to more intensified disasters like landslides.

Experts and activists have incessantly asked for scrutiny into the construction of hydroelectric power projects in Uttarakhand. There have also been allegations about the use of explosives in the construction of dams and other infrastructure. In 2014, an expert committee led by Dr Ravi Chopra, instituted to assess the role of dams in exacerbating floods, provided hard evidence on how haphazard construction of dams was causing irreversible damage to the region.

Scientist warns of water build-up near Uttarakhand disaster zone

The need of the hour is to invest in long-term crisis response mechanisms and resilience solutions. A few immediate steps include: (i) investing in resilience planning, especially in flood prevention and rapid response; (ii) climate proofing the infrastructure such as by applying road stabilisation technologies for fragile road networks and strengthening existing structures like bridges, culverts and tunnels; (iii) strengthening embankments with adequate scientific know-

how; (iv) reassessing development of hydropower and other public infrastructure; (v) investing in a robust monitoring and early warning system; (vi) establishing implementable policies and regulatory guidelines to restrict detrimental human activities, including responsible eco- and religious tourism policies; and (vii) investing in training and capacity building to educate and empower local communities to prevent and manage risks effectively.

Data | Over 50,000 hectares of forest land in Uttarakhand diverted for various projects in last 30 years

The time for wake-up calls is long behind us. India needs to urgently rise up to the challenge by applying innovative and inclusive solutions that support nature and marginalised communities, to restore and rebuild a resilient future for Uttarakhand.

A. Nambi Appadurai is Director, Climate Resilience Program, World Resources Institute, India. Views are personal

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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ON THE GROUND WITH CHENNAI'S OLIVE RIDLEY TURTLE TROOPS

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

There is something about the pull of the homeland that can make any story a universal one.

Turtles, for instance, don't understand political, linguistic or other human boundaries, yet the story of how an Olive Ridley turtle gives birth is something Chennai division's Forest Department officials know verbatim. For, a turtle may travel all over the world through the years, but when "that time" comes, it will return to the exact spot where it was born. In January 2021, about a decade after they grew, the Olive Ridelies born along Chennai's coastline came back to their "*thai mann*" (mother-soil or motherland), to dig nests in the sand and lay eggs.

So when the first of these buried nests in Besant Nagar was discovered around January 10, patrollers on the beach cared enough to handle it gently. On the same day, the eggs were collected and safely transported to a locked, walled hatchery, safe from predators. They were then buried back just as deep as they were found, as deep as their mother had kept them.

This process will be repeated with every fresh nest found throughout the season; each new rehabilitated nest will be marked with a broad stick, on which details like the discovery date, depth, and the number of eggs will be specified. Why? Because threats to these eggs are many — stray dogs, crows and even poachers have contributed to reduced populations of this species, categorised as vulnerable across the globe by the International Union for Conservation of Nature (IUCN).

If all goes well, the first of this year's hatchlings should be crawling back to sea sometime towards the end of this month, hope the Forest Department employees manning the protected hatchery on Besant Nagar beach.

The nesting season has been a busy one since January this year, and is likely to go on till April. The month of February, however, is considered the peak of the season, and with over 100 Olive Ridley nests having been found already, all four hatcheries along this stretch of the coast are hoping to soon fill up with eggs — cool, cosy, and ready to hatch.

According to the office of Forest Range Officer, Clement Edison, "Last year, we had completed 300 nests and 32,000 eggs. Hopefully, this year, we are expecting the numbers to be more, by around 20%." It is a reasonable hope, considering that over 100 nests have been discovered and rehabilitated already: 50 nests with 5,745 eggs in Besant Nagar, 19 nests with 2,041 eggs in Neelankarai and 33 nests with 3,599 eggs in Pulicat. And the season is just getting started. "We have a total of four hatcheries, including one in Kovalam," says the officer, "There have been no nests in Kovalam yet, but we are hopeful."

How these nests are discovered is an interesting story, one that is retold and demonstrated time and again this time of year. The first sign is a mother turtle's track in the sand — criss-cross tracks caused by the shifting of the sand by its forelimbs. The width of the tracks is an indication of the size of the paddle-like forelimbs, and thus of the turtle itself.

But it is not often that this track can be followed to a mother in the very act of nesting; the mother turtle is usually done with her task within 20 minutes, and the tracks are not spotted till much later. Patrolling teams have a lot of ground to cover — especially this year, when public

volunteers could not be allowed due to COVID-19 safety measures. The patrolling has been done mainly by the Forest Department, with select, seasoned volunteers from the city's Students Sea Turtle Conservation Network (SSTCN) joining in only since the past four days, for a three-hour daily shift.

The patrollers, in teams of three, hope to spot the turtle tracks, and then circle the whole area around the tracks to search... they search not for the creature or its eggs, but for unusually soft and loose sand. The sand in usual spots, where there is no egg, will be tight and packed — hard enough for adults to walk or children to frolic on. The area with eggs underneath will be soft, because the sand would have been dug and repacked. These areas, if poked lightly with a stick, act almost as miniature sink-holes.

The eggs hatch within 44 to 46 days of getting laid, depending on humidity, temperature and other factors. It could also depend on the depth at which the eggs are laid. Nearer to the surface is warmer, so it will hatch faster. If it is deeper, it may not hatch for another day.

Most of the hatchlings in Chennai division turn out to be female, almost 97% to 99%. According to Edison's office, it is only at far higher temperature conditions that males can be born.

Generally, hatching and the release of hatchlings into the sea only happens in the evening, after sunset, when the temperature is more suitable for the newborns. And that is a sight to behold... scores of little creatures smaller than a fist, bursting with urgency, making their steady, frantic way to the cool ocean under the calm Chennai moon, as their human caretakers cheer them on.

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CLIMATE CHANGE RESILIENCE ACTIONS, IN STEP WITH INDIA

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

Last year tested the strength of our communities and the resilience of our countries. It was a year dominated by the [COVID-19 pandemic](#). And yet, for Australians, it also started with the most devastating bushfires in our history.

For all its challenges, 2020 demonstrated the importance of innovation, resources and leadership to protect and support our communities and countries.

Climate change is an increasingly pressing global issue, which will require our collective will to ensure a sustainable future for our countries and for the world. By working together, we can reduce emissions — which will remain critical to ensuring global average temperatures stay well below 2° Centigrade — and adapt and build resilience to the climate change already occurring.

The virtual [Climate Adaptation Summit](#) hosted by the Netherlands on January 25-26 provided a valuable opportunity to the international community for collective action to realise a more climate-resilient future. At the summit, Australia reaffirmed our commitment to ambitious and practical action to combat the impacts of climate change at home, in our region, and around the world.

Australia is one of the driest inhabited continents in the world. We also have the oldest living cultures and some of the richest biodiversity in the world. We are fortunate to be able to learn from the continuing connection of the First Australians, our Aboriginal and Torres Strait Islander Peoples, to their country. For over 65,000 years their traditional knowledge and practices have preserved and protected Australia's natural environment.

Data | [What made the Australian bushfires so severe in January 2020?](#)

The recent [bushfires](#) demonstrated the importance of bringing together traditional Indigenous knowledge about the land with modern science. Indigenous Rangers are on the frontline of this work, preserving and protecting Australia's natural and cultural heritage. For example, using traditional fire management practices, through cool and controlled burns.

Australia has committed over 1,500 crore to making our natural resources, environment and water infrastructure more resilient to drought and climate disasters. We are spending more than 200 crore on bushfire recovery efforts, supporting local communities to design their own economic, social and environmental recovery. This includes the important job of regenerating habitats, helping native animals recover and building knowledge for better land management. By July 2021, Australia will establish a new National Resilience, Relief and Recovery Agency to drive the reduction of natural disaster risk, enhance natural disaster resilience and ensure effective relief and recovery to all hazards. While our adaptation and resilience work starts at home, Australia is also committed to supporting neighbouring and global communities tackle climate change.

Australia has pledged at least 150 crore over the period 2020 to 2025 for global climate finance; 50 crore of this funding will directly help our Pacific neighbours deploy renewable energy, and improve their climate change and disaster resilience.

We are sharing our climate adaptation expertise, experiences and skills with the world through our development programme and the Australian Infrastructure Financing Facility for the Pacific.

Australia's strong support for the Coalition for Disaster Resilient Infrastructure, spearheaded by India's Prime Minister Narendra Modi, is another example of how we are working together with partners — such as India — to help ensure our infrastructure is resilient and adapts to the effects of a changing climate.

As is our ongoing engagement with the International Solar Alliance — a global initiative designed to harness solar power to provide for the energy needs of members of the alliance.

Our work with India on Water Resources Management is another important initiative initiated by India and designed to further enhance each country's water management capabilities and share expertise and best practice.

To support our resilience and adaptation efforts, Australia is also investing in and developing the green technologies of tomorrow. Indeed, Australia is aiming to leverage 7,000 crore of new investment in low emissions technologies by 2030.

To get there, we recently released our Technology Investment Roadmap — a comprehensive plan to invest in the technologies we need to bring emissions down, here and around the world.

We are focussed on accelerating technologies like hydrogen, carbon capture use and storage, soil carbon, energy storage to backup renewables and decarbonise transport, and low or zero emissions steel and aluminium. Dr. Alan Finkel, Australia's Special Adviser for Low-Emissions Technologies, spoke at the World Economic Forum in Davos in January on the enormous potential of these technologies to support the global transition to net zero emissions.

Widespread global deployment of those technologies will reduce emissions or eliminate them in sectors responsible for 90% of the world's emissions — 4,500 crore tonnes. Our goal is to get the cost of deploying these new technologies to parity with existing, higher-emitting alternatives. This is a practical pathway to achieve net zero emissions that also presents economic opportunity.

But of course, we cannot do it alone, which is why we are working with the major economies in the region — such as India — to transfer technologies which will support lower global emissions.

The Australia-India Joint Energy Dialogue will strengthen cooperation between our two countries in pumped hydro storage, cost-effective battery technologies, hydrogen and coal gasification, adoption of clean energy technology, fly ash management technologies, and solar forecasting and scheduling. And there are many more opportunities for Australia and India on low-emissions technology which we will continue to explore together as partners.

Whether in responding to the COVID-19 pandemic, or tackling the ongoing challenge posed by climate change, we need to embrace innovation and strengthen global partnerships. We need to consider those most in need, engage all stakeholders equally and respect indigenous culture and knowledge in taking climate action.

Our scientists tell us that, even with the most ambitious global emissions reductions, we will still need to adapt to changes in our climate over the coming decades. Practical actions that help us adapt to those changes and strengthen the resilience of our local environments are critical.

Together with India, we can make a difference.

Barry O'Farrell is the Australian High Commissioner to India

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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THE HINDU EXPLAINS

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

The story so far: A snow [avalanche triggered possibly by a landslide](#) caused a flash flood in the Rishi Ganga river, a tributary of the Alaknanda in Chamoli district of Uttarakhand, on a sunny morning on February 7, [washing away a functional small hydroelectric project](#) and destroying the under-construction 520 MW Tapovan Vishnugad project of the NTPC on the Dhauliganga river. The [death toll from the disaster was 38](#) as of Friday. Rescue teams were straining to locate scores of people who remained missing. These were mostly workers in the two power projects, besides some local residents.

Union Home Minister Amit Shah told Parliament that satellite imagery from Planet Labs indicated that the landslide-avalanche event at an altitude of 5,600 metres occurred in a glacier in the Rishi Ganga catchment, and covered an area of 14 sq. km, causing the flood. In the initial rescue, 12 people trapped in a tunnel in the NTPC project and 15 from the Rishi Ganga project were saved. While a fuller picture of the loss of life and destruction will emerge only after rescue operation and inquiry is complete, the disaster that struck Chamoli has turned the spotlight on several ongoing dam-based hydroelectric projects, rampant road building, tree felling for projects, and also construction practices in the State.

Comment | [Dams and damages](#)

Uttarakhand, which gained a distinct identity in the year 2000 as a separate State carved out from Uttar Pradesh, is geologically unique. As a part of the lesser Himalaya, in the populated terrane — a region bounded by earth faults — it remains active in terms of deep movement of rock assemblages. In an article in *Current Science* in 2014, geologist K.S. Valdiya pointed to the fragility of the entire landscape from a geological point of view: “As the northward moving peninsular India presses on, the lesser Himalaya rock assemblages are compressed and are pushed under the huge pile of the Great Himalayan rocks, the latter riding southwards onto and over the lesser Himalaya. The movement has been going on since the MCT [the Main Central Thrust] was formed 20-22 million years ago.” The MCT, running east-west along the Himalaya, is where the Indian and Eurasian plates connect. The result of these geological stresses, scientists say, is weakening of rocks, making the development of large dam projects in the region unwise.

There are several researchers who refer to other characteristics that call into question the wisdom of committing vast resources to large dam-building in Uttarakhand. A key concern is the active nature of rock fractures, known as faults, which respond to earthquakes, creating enormous instability, especially along slopes. In an assessment of the proposed 315-metre-high India-Nepal Pancheshwar dam project across the Kali river in the Kumaon region, with a drainage area of 12,000 sq. km, Shubhra Sharma and colleagues wrote in *Current Science* in 2019 that the chosen site could witness a strong earthquake in the Nepal area from the Rangunkhola Fault, perhaps of a magnitude of 7.4, with a potentially serious fallout.

Prof. Valdiya, who advocated small low-impact dams of less than 5 megawatts as an alternative, pointed out that investigations done along rivers Kali, Darma, Gori, Western Dhauliganga, Alaknanda, Mandakini and Bhagirathi, which offer the bounty of hydropower, have been found to be tectonically active in recent times across the area of the MCT. In fact, many locations in a 50-km area within the MCT zone have witnessed several earthquakes of varying intensity, including those with magnitudes of over 5. Although dam builders assert that their structures can withstand even high-intensity earthquakes, researchers say lessons from large structures, such

as the Tehri dam, should also be studied, since there are concerns about induced seismic effects caused by the repeated filling and emptying of the reservoir, which may be deforming the area around the young dam.

Also read | [Until about 10 years ago, I believed that it was possible to have hydropower projects in Uttarakhand: People's Science Institute Director](#)

Moreover, the geology of mountains in many parts of Uttarakhand is such that the threat of landslides is high. Rocks here have been weakened by natural processes across time and are vulnerable to intense rainfall as well as human interference, in the form of house-building and road construction. The careless disposal of enormous debris from mining and construction projects has added to the problem, blocking flow paths and providing additional debris. In fact, researchers from IIT Roorkee writing in the Indian Geotechnical Journal (2018) estimate that various tourist locations such as Gopeshwar, Joshimath, and Badrinath fall within high-hazard and very high-hazard zones for landslides, as does Chamoli town, calling for preventive and protective measures.

The IPCC (Intergovernmental Panel on Climate Change) Special Report on the Ocean and Cryosphere in a Changing Climate found that in the Himalayan ranges, there could be variations in overall water availability, but floods, avalanches and landslides were all forecast to increase. Changes in monsoonal precipitation could also bring more frequent disasters.

In 2013, catastrophic loss of lives was seen in the floods that swept Kedarnath. They were triggered by heavy rainfall over a short period in June, first destroying a river training wall, and then triggering a landslide that led to the breaching of the Chorabari moraine-dammed lake, devastating Kedarnath town.

Also read | [Scientist warns of water build-up near Uttarakhand disaster zone](#)

What this means is that aberrations in the Indian summer monsoon caused by changes to long-term climate could produce even greater damage, by bringing debris and silt down the river courses, destroying physical structures, reducing dam life, and causing enormous losses. These problems are also aggravated by the erosion of mountain slopes and the instability of glacial lakes in upper elevations. On the other hand, as the IPCC Special Report points out, the retreat of glaciers in the high mountains has produced a different kind of loss — of aesthetic and cultural values, declines in tourism and local agriculture.

In reply to a question in the Lok Sabha in September 2020, the Power Ministry stated that in the 25 MW-plus category, there are projects with a combined capacity of 12,973.50 MW under installation. Of this, eight projects totalling 2,490 MW are in Uttarakhand, most of them by the Central government. The Ministry describes this source of power as “highly capital-intensive” but without recurring cost, renewable and cheaper compared to coal and gas plants. But a response it gave earlier this month in the Lok Sabha indicates that it has been offering incentives since March 2019 to make hydropower attractive. These include classification of large hydropower projects as Renewable Energy sources, creating a separate category for hydropower within Non-Solar Renewable Purchase Obligation, tariff rationalisation to bring down tariff, and budgetary support for putting up enabling infrastructure such as roads and bridges.

Also read | [Uma Bharati recalls her warning on Uttarakhand hydel projects](#)

The International Renewable Energy Agency estimated that in 2019, the average levelised cost of electricity in India was \$0.060 per kilowatt-hour (kWh) for small hydropower projects added over the last decade. In comparison, the global cost for solar power was \$0.068 per kWh in 2019

for utility-scale projects. Though hydropower has been reliable where suitable dam capacity exists, in places such as Uttarakhand, the net benefit of big dams is controversial because of the collateral and unquantified damage in terms of loss of lives, livelihoods and destruction of ecology. Chipko movement activist Sunderlal Bahuguna argued that large dams with an expected life of about 100 years, that involve deforestation and destruction, massively and permanently alter the character and health of the hills.

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LEATHERBACK NESTING SITES COULD BE OVERRUN BY ANDAMANS DEVELOPMENT PROJECT

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

Gentle giant: A Leatherback nesting at West Bay, Little Andaman. Adhith Swaminathan

Proposals for tourism and port development in the Andaman and Nicobar (A&N) Islands have conservationists worried over the fate of some of the most important nesting populations of the Giant Leatherback turtle in this part of the Indian Ocean.

The largest of the seven species of sea turtles on the planet and also the most long-ranging, Leatherbacks are found in all oceans except the Arctic and the Antarctic. Within the Indian Ocean, they nest only in Indonesia, Sri Lanka and the Andaman and Nicobar Islands and are also listed in Schedule I of India's Wildlife Protection Act, 1972, according to the highest legal protection.

Surveys conducted in the A&N Islands over the past three decades have shown that the populations here could be among the most important colonies of the Leatherback globally. There is concern now, however, that at least three key nesting beaches — two on Little Andaman Island and one on Great Nicobar Island — are under threat due to mega "development" plans announced in recent months. These include NITI Aayog's ambitious tourism vision for Little Andaman and the proposal for a mega-shipment port at Galathea Bay on Great Nicobar Island.

Little Andaman in focus

The Little Andaman plan, which proposes phased growth of tourism on this virtually untouched island, has sought the de-reservation of over 200 sq km of pristine rainforest and also of about 140 sq km of the Onge Tribal Reserve. Two sites where key components of the tourism plan are to be implemented are both Leatherback nesting sites — South Bay along the southern coast of the island and West Bay along its western coast. South Bay is proposed to be part of the "Leisure Zone" where a film city, a residential district and a tourism special economic zone are to come up. West Bay is to be part of West Bay Nature Retreat with theme resorts, underwater resorts, beach hotels and high-end residential villas.

The roughly 7-km-long beach at West Bay has been the site of ongoing marine turtle research projects. Set up post-2004 by the Andaman and Nicobar Environment Team (ANET), Dakshin Foundation, the Indian Institute of Science and the A&N Forest Department to monitor how turtle populations have responded after the devastating earthquake and tsunami, it has thrown up new information on turtles and their behaviour. Not only are the numbers of females nesting here significant, satellite telemetry has revealed hitherto unknown migration patterns. Satellite-tagged female turtles have been tracked swimming up to 13,000 km after nesting on West Bay, towards the western coast of Australia and southwest towards the eastern coast of Africa. One of the tagged turtles travelled to Madagascar, covering 12,328 km in 395 days while another travelled 13,237 km in 266 days to the Mozambique coast.

Waning protection

For the Leatherback, perhaps even more important is Great Nicobar Island, the southernmost of the A&N group. Large numbers have been recorded nesting here — mainly on the long and wide beaches at the mouth of the Dagmar and Alexandira rivers on the west coast and at the

mouth of the Galathea river along its south eastern coast. Galathea Bay was, in fact, proposed as a wildlife sanctuary in 1997 for the protection of turtles and was also the site of a long-term monitoring programme. The monitoring was stopped after the tsunami devastation of 2004, but it provided the first systematic evidence of numbers and importance of these beaches.

The A&N Islands are prominent in the National Marine Turtle Action Plan released on February 1, 2021, by the Ministry of Environment, Forest and Climate Change. The plan notes that “India has identified all its important sea turtle nesting habitats as ‘Important Coastal and Marine Biodiversity Areas’ and included them in the Coastal Regulation Zone (CRZ) - 1”. South Bay and West Bay on Little Andaman and Galathea on Great Nicobar, along with other nesting beaches in the islands, find a specific mention here as “Important Marine Turtle Habitats in India” and the largest Leatherback nesting grounds in India.

The plan identifies coastal development, including construction of ports, jetties, resorts and industries, as major threats to turtle populations. It also asks for assessments of the environmental impact of marine and coastal development that may affect marine turtle populations and their habitats.

Developments in the A&N Islands indicate, however, that even as the action plan was being finalised, decisions were being made in violation of its basic concerns and premises. Not only has the mega-tourism plan in Little Andaman been pushed in spite of serious objections by the A&N Forest Department, a major decision was also made recently on the Galathea Bay Wildlife Sanctuary. The Standing Committee of the National Board for Wildlife, at its 60th meeting on January 5 under the chairmanship of the Environment Minister, agreed to its denotification for the “construction as well as operational phases of the International Shipment Project”.

The A&N Port Management Board had in 2019 floated an expression of interest for the container transshipment terminal here, along with that for a free trade warehousing zone, and the Prime Minister announced in August 2020 that a transshipment project would come up here on an investment of Rs. 10,000 crore.

The scale of the project and the investment proposed indicate it could signal the end of a crucial Giant Leatherback nesting site.

(Pankaj Sekhsaria has been researching issues of the A&N Islands for more than two decades and has authored ve books on the islands.)

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ELECTRIC VEHICLES USAGE SHOULD BE MADE MANDATORY FOR ALL GOVT OFFICIALS: NITIN GADKARI

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

Transport Minister Nitin Gadkari also suggested that the government should give subsidy to buy electric cooking appliances instead of giving support for buying cooking gas to households

NEW DELHI : Transport Minister [Nitin Gadkari](#) on Friday made a case for making it mandatory to use electric vehicles for all officials in government ministries and department.

He also suggested that the government should give subsidy to buy electric cooking appliances instead of giving support for buying cooking gas to households.

Addressing at the launch Go Electric campaign, Gadkari said, "Why don't we provide subsidy on electric cooking appliances. We already provide subsidy on cooking gas. "

He was of the view that electricity cooking is clean and will also reduce import dependence for gas.

Gadkari suggested that use of electric vehicles should be made mandatory for all government officials.

He, further, urged Power Minister R.K. Singh to make is mandatory to use electric vehicles for officials in his department saying he will do so for his departments.

He said that use of 10,000 electric vehicles in Delhi can alone save 30 crore per month.

On this occasion, Singh also announced that a fuel cell bus service will be launched from Delhi to Agra and Delhi to Jaipur soon.

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TEETH FROM SIBERIAN MAMMOTHS YIELD OLDEST DNA EVER RECOVERED

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

Ancient DNA retrieved from different mammoth species is illuminating a complex evolutionary picture. Credit: Beth Zaiken/Centre for Palaeogenetics

Scientists have recovered the oldest DNA on record, extracting it from the molars of mammoths that roamed northeastern Siberia up to 1.2 million years ago in research that broadens the horizons for understanding extinct species.

The researchers said on Wednesday they had recovered and sequenced DNA from the remains of three individual mammoths — elephant cousins that were among the large mammals that dominated Ice Age landscapes — entombed in permafrost conditions conducive to preservation of ancient genetic material.

While the remains were discovered starting in the 1970s, new scientific methods were needed to extract the DNA.

The oldest of the three, discovered near the Krestovka river, was approximately 1.2 million years old. Another, from near the Adycha river, was approximately 1 to 1.2 million years old. The third, from near the Chukochya river, was roughly 700,000 years old.

Why did woolly rhino, mammoth go extinct?

"This is by a wide margin the oldest DNA ever recovered," said evolutionary geneticist Love Dalén of the Centre for Palaeogenetics in Sweden, who led the [research published](#) in the journal *Nature*.

Until now, the oldest DNA came from a horse that lived in Canada's Yukon territory about 700,000 years ago. By way of comparison, our species, *Homo sapiens*, first appeared roughly 300,000 years ago.

DNA is the self-replicating material that carries genetic information in living organisms — sort of a blueprint of life. "This DNA was extremely degraded into very small pieces, and so we had to sequence many billions of ultra-short DNA sequences in order to puzzle these genomes together," Dalén said.

Most knowledge about prehistoric creatures comes from studying skeletal fossils, but there is a limit to what these can tell about an organism, particularly relating to genetic relationships and traits.

Ancient DNA can help fill in the blanks but is highly perishable. Sophisticated new research techniques are enabling scientists to recover ever-older DNA.

"It would be a wild guess, but a maximum of two to three million years should be doable," Dalén said.

That could shed light on some bygone species but would leave many others unattainable — including the dinosaurs, who went extinct 66 million years ago. "When we can get DNA on a

million-year time scale, we can study the process of speciation (formation of new species) in a much more detailed way. Morphological analyses on bones and teeth usually only allow researchers to study a handful of characteristics in the fossils, whereas with genomics we are analysing many tens of thousands of characteristics," Dalén said.

The researchers gained insights into mammoth evolution and migration by comparing the DNA to that of mammoths that lived more recently. The last mammoths disappeared roughly 4,000 years ago.

The oldest of the three specimens, the Krestovka mammoth, belonged to a previously unknown genetic lineage that more than 2 million years ago diverged from the lineage that led to the well-known woolly mammoth.

Geneticist Tom van der Valk of SciLife Lab in Sweden, the study's first author, said it appears that members of the Krestovka lineage were the first mammoths to migrate from Siberia into North America over a now-disappeared land bridge about 1.5 million years ago, with woolly mammoths later migrating about 400,000 to 500,000 years ago.

The Adycha mammoth's lineage apparently was ancestral to the woolly mammoth, they found, and the Chukochya individual is one of the oldest-known woolly mammoth specimens.

DNA analyses showed that genetic variants associated with enduring frigid climes such as hair growth, thermo regulation, fat deposits, cold tolerance and circadian rhythms were present long before the origin of the woolly mammoth.

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The picture "captured the largest volcano in the solar system, Olympus Mons, emerging into the early morning sunlight"

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REBELS WITH A GREEN CAUSE

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

When Extinction Rebellion set out to literally block the path of the fossil fuel-powered economy in the U.K., in the autumn of 2018, the core of its philosophy was that stopping public activity with even small actions would change politics. It would shock a status quoist, cynically manipulative system, and turn public attention to the world's biggest problems: climate change and biodiversity loss.

The vision of its small group of founders led by Roger Hallam, an organic farmer-turned-researcher of civil disobedience at King's College, London, and Gail Bradbrook, a molecular biology scholar from Yorkshire who had launched her activism in the Occupy movement after the 2008 financial crisis, draws heavily from the U.S. civil rights struggle and Gandhian civil disobedience. The two worked to create an environmental movement that would use disruptive, non-violent methods in the climate and biodiversity struggle. It immediately appeared to resonate with common citizens, hundreds of whom were ready to court arrest in street protests.

"We refuse to bequeath a dying planet to future generations by failing to act now. We act in peace, with ferocious love of these lands in our hearts. We act on behalf of life," says the Declaration of Rebellion document of the movement. When it formally made the declaration on October 31, 2018, XR, as it has come to be known, expected a couple of hundred people to gather at Westminster outside the British Parliament, but the event attracted a thousand. Since then, its logo of an hourglass within a circle has become familiar globally.

The high visibility protests carried out by XR groups — three major ones so far — often involve dramatic scenes staged by brightly costumed activists to drive home the message of climate ruin. The movement has three primary demands: all governments 'Tell the Truth' about the climate crisis and the mass extinction of species, commit themselves to act on net zero carbon emissions by 2025, and create citizens' assemblies that will advise them on a just transition. Yet, the group also does not look to the government to solve the world's problems. It favours people collectively creating the structures to challenge power, eliminating the bias of the voice of the rich and the powerful. Among the core concerns it pursues are "decent healthcare, education, social care and housing, clean energy production, and protections in law to prevent ecocide."

Open source model

Like any good open source project, the U.K. kernel produced by XR has been embraced by activists abroad, who get the freedom to build upon it. A strategy document released by XR last year titled "Power Together" says it is now present in 75 countries. Legal systems and political tolerance levels for protest differ around the world, inviting prosecutions and harsh crackdowns. Yet, XR has inspired groups of citizens, particularly the youth, and professionals in different fields to start local branches. The India website of XR lists 14 local groups, ranging from Bengaluru and Delhi to Rajasthan and Guwahati. The COVID-19 pandemic, however, hobbled the climate protests in many places around the world.

Initially seen as nothing more than an outcrop of the environmental fringe made up of small groups of straggler activists, XR moved to the mainstream as it linked up with activists such as Greta Thunberg and the Fridays for Future campaign she inspired and acquired a wider base of supporters connected with the arts, sciences, law, and finance.

Over the past two years, the movement has received support from many prominent people,

including the former Archbishop of Canterbury Rowan Williams, the former Chief Scientific Adviser to the British government, David King, public intellectuals like Noam Chomsky, actors, doctors, health workers, scientists and blue collar workers.

XR's most prominent rebellions have thus far been carried out in the U.K. against projects that are carbon intensive (such as the costly HS2 high speed railway line). Protests have also been held in other countries, including India.

XR launched its first major protest in April 2019, a two-week rolling wave of demonstrations, at which activists blocked important road intersections in London, one of them using a boat, hoisted themselves on to the roofs of city trains, chained themselves to fences, smashed windows at oil company Shell's headquarters, and staged mass "die-ins" in public to shock people into confronting climate change. Greta Thunberg told one group of demonstrators in London during the protest that they were showing the world the path they had chosen to take and were waiting for others to follow. There were over 3,000 arrests.

Yet, the path for XR itself has not been smooth, and the movement has been wracked by differences involving co-founder Roger Hallam. A major critique, to which the movement has responded, is on the role of minorities in protests and the impact that aggressive tactics have on them.

Just over a year after the mass protests in London, in July 2020, it acknowledged that its disruptive approach centred around privileged white people and put people of colour at risk vis-a-vis the police. Youth, who wanted a separate identity, formed their own sub-group, XR Youth.

Mass arrests

Mr. Hallam, now 55, looked at mass arrests — within the bounds of a democratic system that tolerates dissent — as a tactic that would overwhelm the government. "We recognise now that our tactic of arrest has made it easier for people of privilege to participate and that our behaviours and attitudes fed into the system of white supremacy. We're sorry this recognition comes so late," a statement said. More recent interpretations among XR activists view the climate change, COVID-19 and human rights crises (including rights of people of African origin) as the ramifications of an economic and financial system run wild.

Mr. Hallam was censured by the movement for making comments that described the Holocaust as "an almost normal event" in the long sweep of history. He apologised. Once a moving force at XR, he has taken part in protests against Heathrow airport expansion separately and describes himself also as a leader of another combative organisation, Burning Pink (BP), whose activists splash bright pink spray paint on property and court arrest in support of climate and equality objectives.

Gail Bradbrook, 49, is the prominent face of XR today. "I am involved in both BP campaigns and also doing mobilisation training and development work with XR groups around the world, as well as videos and interviews," Mr. Hallam said in an email to *The Hindu*. "Assuming COVID retreats, there will be a new impetus to mass civil disobedience given the situation is getting exponentially worse," he said.

Challenge policies

With every new crisis — wildfires, failed agriculture, drought, flood, heatwaves and coldwaves — governments and corporations are apprehensive that XR's idea of "collaborative rebellion" will challenge locked-in policies on fossil fuels. In the U.K., the movement is encouraging 'money

rebellion' by small businesses. Participants will fund green goals, and work to deny funds to non-compliant governments to stop funding of fossil fuels interests.

Disha Ravi, who organised Fridays for Future events in India, activists Nikita Jacob and Shantanu Muluk have provoked the government's ire. The implications of growing environmental and climate crises merging with other struggles, such as the farmers' agitation, add to the establishment's worries. XR is constantly tweaking its toolkit for non-violent direct action, attracting public attention and demanding responsible replies from governments.

In Focus

The vision of XR's founders draws heavily from the U.S. civil rights struggle and Gandhian civil disobedience

We act in peace, with ferocious love of these lands in our hearts. We act on behalf of life, reads its Declaration, released on October 31, 2018

XR has three key demands: Governments should 'tell the truth' about the climate crisis; commit themselves to act on net zero carbon emissions by 2025; and create citizens' assemblies that will advise them on a just transition

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pursues are 'decent healthcare, education, social care and housing, clean energy, and protections in law

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IN A FIRST, PREMIUM HYDROGEN FUEL BUS TO START IN DELHI-JAIPUR ROUTE

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

The service will be the first of its kind in India to be used for intercity commute. Previously, similar bus services were seen testing in metro cities like Mumbai

Giving a boost to green mobility, state-run [National Thermal Power Corporation Limited](#) is planning to start a premium hydrogen fuel bus service on Delhi to Jaipur route.

A feasibility study for the service is currently underway to test the viability of fuel cell buses for the intercity commute. The government has until now not provided any timeline for the bus to start plying the roads.

The service will be the first of its kind in India to be used for intercity commute. Previously, similar bus services were seen testing in metro cities like Mumbai.

"We are planning to start premium hydrogen fuel bus service from Delhi to Jaipur and gradually we will also try experimenting running electric bus on the same route," power minister RK Singh said on the launch of 'Go Electric' campaign on Friday.

At the same event, the announcement of an all-new electric tractor was made by Union Minister Nitin Gadkari. "I will be launching an electric tractor in the next 15 days," Gadkari said.

The government is also trying to procure 40,000 battery-powered buses in Maharashtra for an intracity commute.

The central government is trying to make a gradual shift towards alternative fuels in a bid to reduce its dependence on the import of crude oil as prices of petrol and diesel skyrocket in the country.

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ELIZABETH ANN, THE FIRST CLONED FERRET, SPURS HOPE FOR ENDANGERED U.S. SPECIES

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

In this photo provided by the U.S. Fish and Wildlife Service is Elizabeth Ann, the first cloned black-footed ferret and first-ever cloned U.S. endangered species, at 48-days old on Jan. 27, 2021. | Photo Credit: [AP](#)

U.S. scientists have successfully cloned an endangered black-footed ferret using frozen cells from an along-dead wild animal, the first time any native endangered species has been cloned in the United States.

Black-footed ferret recovery efforts aimed at increased genetic diversity and disease resistance took a bold step forward on December 10, with the birth of Elizabeth Ann, created from the cells of Willa, a black-footed ferret that lived more than 30 years ago, the U.S. Fish and Wildlife Service said.

"Although this research is preliminary, it is the first cloning of a native endangered species in North America, and it provides a promising tool for continued efforts to conserve the black-footed ferret," said Noreen Walsh, director of the Service's Mountain-Prairie Region.

The species, North America's only native ferret, were once thought to be extinct but were brought back from nearly vanishing forever after a Wyoming rancher discovered a small population on his land in 1981. They were captured to begin a captive breeding program to recover the species.

But only seven of the original wild animals bred, and all living ferrets today are closely related. That puts limitations on the species' genetic diversity, creating challenges for resilience to changing environments and emerging disease threats.

Elizabeth Ann is a genetic copy of Willa, a black-footed ferret captured among the last wild individuals, who died in the 1980s and has no living descendants, so is not one of the seven founders.

The Wyoming Game & Fish Department had the foresight to preserve her genes and sent tissue samples from Willa to San Diego Zoo Global's Frozen Zoo in 1988. Years later, that provided viable cell cultures for the project.

The team — which includes biotech conservation group Revive & Restore, private pet cloning company ViaGen Pets & Equine, San Diego Zoo Global and the Association of Zoos and Aquariums — is working to produce more black-footed ferret clones in the coming months as part of continuing research efforts.

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PLANET EARTH ITS QUIETEST IN DECADES AS LOCKDOWNS REDUCE SEISMIC NOISE

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

A researcher looks on a display showing a status overview of Swiss seismic stations at the Swiss Seismological Service at ETH Zurich in Switzerland January 14, 2021. | Photo Credit: [REUTERS](#)

Earth had its quietest period in decades during 2020 as the COVID-19 pandemic significantly reduced human activity and its impact on the planet's crust, according to scientists working on a global study.

An international group of seismologists from 33 countries measured a drop of up to 50% in so-called ambient noise generated by humans travelling and factories humming after lockdowns came into force around the world.

The team, which included experts from the Swiss Seismological Service at ETH Zurich, a university, measured lower noise levels at 185 of the 268 seismic stations analysed around the world.

Urban ambient noise fell by up to 50% at some measuring stations during the tightest lockdown weeks, as buses and train services were reduced, aircraft grounded and factories shuttered.

This made it much quieter than Christmas, traditionally the quietest time of the year.

"The weeks during lockdown were the quietest period we have on record," said seismologist John Clinton, referring to data archives covering the last 20 years. "With human noise always increasing, it is highly likely that it was the quietest period for a very long time."

The experts, led by Thomas Lecocq from the Royal Observatory of Belgium, were able to track the "wave of quiet" around the world as lockdown came first in China, then Italy, before spreading across the rest of the world.

Lower background noise during lockdowns also means small earthquakes that otherwise would not be observed have been detected in some places. Small tremors allow us to improve our understanding of the seismic hazard, said scientist Frederick Massin, and also help assess the probability of larger earthquakes in the future.

"This was an unprecedented opportunity. There's no way we would normally be able to do this kind of experiment," said Massin.

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Five WIHG researchers travel to disaster site and undertake aerial surveys

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RED-EARED TURTLE A THREAT TO WATERBODIES

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

Tiny terror:The red-eared slider turtle is a favourite among pet lovers because of its small size.Special arrangementSpecial arrangement

After the Pink Bloom, an alien flower that choked the Avala Pandi canal at Perambra, yet another invasive species is posing a threat to the biodiversity of waterbodies in the State. This time, it is a cute red-eared slider turtle, a huge hit with pet lovers.

A few days ago, Adithyan D. Thambi, a Class 6 student of St. Vincent Pallotthi Central School, Kalathode, got a medium-sized turtle while he was fishing in a canal at Kalathode. He posted his catch on Facebook, which was noticed by Sandeep Das, a researcher at the Kerala Forest Research Institute (KFRI). Identifying the turtle, an exotic and major invasive species, he alerted the boy and cautioned him against releasing it back to the waterbody.

Scientifically called *Trachemys scripta elegans*, is a favourite of pet lovers because of its small size and colour, noted T.V. Sajeev, Senior Principal Scientist and Research Coordinator, KFRI.

“The turtle can even be kept in a matchbox. But it grows fast. Adult turtles require lots of aquatic plants. They are omnivores. Many find it difficult to keep them as they grow bigger, and release them into waterbodies. This turtle is considered one of the world’s worst invasive species,” noted Dr. Sajeev.

Illegal in many places

Originally from the area around the Mississippi river and the Gulf of Mexico, they live in still and warm waterbodies such as ponds, lakes, streams, and slow- running rivers. They pose a major threat to native turtle specials, as they grow large, produce more offspring, and are aggressive. They out-compete native turtles for food, nestling, and basking sites.

As they eat plants and animals, they can finish off a wide range of aquatic species, including fish and rare frogs. They can also transfer diseases and parasites to native reptiles. In Australia and the European Union, it is illegal to import and keep these turtles.

The turtle found in the Kalathode canal has been referred to the Nodal Centre for Biological Invasions (NCBI) at KFRI.

“The KFRI has been active in alien invasive species research for over a decade now. We had started with the case of the fast spread of an alien invasive climber, *Mikania micrantha* — the mile-a-minute weed. We attended to the case of the Giant African Snail outbreaks, which occurred in more than 200 locations in Kerala in the past five years.

Currently, the KFRI has the NCBI, which restores landscapes invaded by alien species and mounts early detection and rapid control of alien invasions,” said KFRI director Syam Viswanath.

Plea to public

The NCBI has started a massive survey and restoration efforts to remove the red-eared slider turtle from the wild. It is also working on discouraging pet shops from selling the species. People who spot the turtle can contact NCBI at 0487 2690222.

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CLEAN ENERGY POST COVID-19

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

A ventilator bed. File | Photo Credit: [The Hindu](#)

The year 2020 was one that only a few of us will forget. While the effects of the [COVID-19 pandemic](#) have played out unevenly across Asia and the Pacific, the region has been spared many of the worse effects seen in other parts of the world. The pandemic has reminded us that a reliable and uninterrupted energy supply is critical to manage this crisis.

Beyond ensuring that hospitals and healthcare facilities continue to function, energy supports the systems and coping mechanisms we rely on to work remotely, undertake distance learning and communicate essential health information. Importantly, energy will also support cold chain systems and logistics to ensure that billions of vaccine doses make their way to the people who need them the most.

Also read | [Power cuts leave Kashmir's COVID-19 patients gasping](#)

The good news is that our region's energy systems have continued to function throughout the pandemic. A new report, titled *Shaping a Sustainable Energy Future in Asia and the Pacific: A greener, more resilient and inclusive energy system*, released on Monday by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) shows that energy demand reductions have mainly impacted fossil fuels and depressed oil and gas prices. Renewable energy development in countries across the region, such as China and India, continued at a healthy pace throughout 2020.

As the Asia-Pacific region moves towards clean, efficient and low-carbon technologies, the emergence of the pandemic raises some fundamental questions. How can a transformed energy system help ensure our resilience to future crises such as COVID-19? Can we launch a 'green recovery' post COVID-19 that simultaneously rebuilds our economies and puts us on track to meet global climate and sustainability goals?

By emphasising the importance of Sustainable Development Goals (SDGs) as a guiding framework for recovering better together, we must focus on two critical aspects. First, by making meaningful progress on SDGs, we can address many of the systemic issues that made societies more vulnerable to COVID-19 in the first place — health, decent work, poverty and socioeconomic inequalities, to name a few.

Second, by directing stimulus funding to investments that support the achievement of SDGs, we can build back better. If countries focus their stimulus efforts on industries of the past, such as fossil fuels, we risk not creating the jobs we need, or deflecting from the right direction for achieving the global goals that are critical for future generations. The energy sector offers multiple opportunities to align stimuli with clean industries of the future.

Evidence shows that renewable energy and energy efficiency projects create more jobs for the same investment in fossil fuel projects. By increasing expenditure on clean cooking and electricity access, we can enhance economic activity in rural areas and support modern infrastructure that can make these communities more resilient and inclusive, particularly for the well-being of women and children.

Additionally, investing in low-carbon infrastructure and technologies can create a basis for the

ambitious climate pledges we need to fulfil to reach the Paris Agreement target of a 2-degree global warming limit. On this note, several countries have announced carbon neutrality. Phasing out the use of coal from power generation portfolios and substituting it with renewables, ending fossil fuel subsidies, and implementing carbon pricing are some steps we can take.

The COVID-19 crisis has forced us to change many aspects of our lives. It has shown that we are more adaptive and resilient than we may have believed. But we should not waste the opportunities this crisis presents. It should not deflect us from the urgent task of making modern energy available to all and decarbonising the region's energy system through a transition to sustainable energy. Instead, it should provide us with a renewed sense of urgency.

Armida Salsiah Alisjahbana is Under-Secretary-General of the United Nations and Executive Secretary of ESCAP

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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IN THE EASTERN GHATS, A SMALL MOVEMENT IS UNDERWAY TO PROTECT THE ENDANGERED PANGOLIN

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

Shy, solitary and nocturnal, the pangolin is believed to be the world's most trafficked animal. The toothless, sticky-tongued creature thrives on ants and termites, and lives in hollow trees and burrows throughout the Eastern Ghats ranges in Visakhapatnam, Vizianagaram and Srikakulam.

When threatened, the pangolin curls up into a tight ball, exposing its scales to prevent attack by predators. Unfortunately, this defense mechanism is the primary cause for its near-extinction, making it an easy prey for poachers.

The scared pangolin is simply lifted away by poachers, who then boil it to death and tear up the scales. These scales are used to make traditional medicines that are said to cure diseases. However, the medicinal value is not conclusively proven yet.

The World Pangolin Day is observed on the third Saturday of February each year (February 20) and serves as a reminder of the sad plight of these creatures and the urgent need to speed up conservation efforts to protect them.

The species is legally protected under Schedule I (on a par with the Bengal tiger) of the Indian Wildlife (Protection) Act, 1972 and is also categorised as 'endangered' by the International Union for Conservation of Nature (IUCN).

There are eight species of pangolins; among them the population of four Asian pangolin species, including Indian Pangolin (*Manis crassicaudata*) is reported to have declined significantly in many areas due to hunting and trade.

Little is known about the conservation status and activity pattern of the Indian pangolin throughout its range.

However, reports from local communities have revealed there has been a rise in poaching and illegal trade of pangolins since 2010 in the three districts of North Coastal Andhra Pradesh in South India, according to the Eastern Ghats Wildlife Society (EGWS).

In order to collate data on the status of pangolins in the North Coastal AP region, EGWS in collaboration with Save Pangolins and Pangolin Crisis Fund USA initiated an immediate conservation status survey to acquire vital data on the presence/absence of the species and specific human-induced threats. The project areas are mainly human-dominated landscapes and unprotected forest patches where Pangolins inhabit.

"We mainly use interview-based data, followed by any historical records or rescues in the region. Burrow counts and camera trapping will also be carried out in the future, once we have reliable information about their presence. In 2019 alone, our team rescued two pangolins from Madugula and Anakapalle regions where locals picked them up ignorantly and put them in confinement. We released the animals in the presence of the Andhra Pradesh Forest Department Officials deep in the reserve forest," says Murty Kantimahanti of EGWS.

The main goal of the project is to generate baseline data on the distribution of Indian pangolins

in Northern Andhra Pradesh.

“The objective is to assess the presence/absence of Indian pangolin in protected and unprotected human-dominated landscapes of the three coastal districts in north-eastern ghats of Andhra Pradesh; to understand local perceptions of rural communities living alongside the pangolin habitat; assess human-induced threats to the species and the habitat in the region; impart awareness about the threatened status and conservation significance of Indian pangolin among all major stakeholders,” Murty adds.

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BEING PETROLEUM-INDEPENDENT

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

An attendant at a fuel station fills fuel in a vehicle. File | Photo Credit: [PTI](#)

Speaking on the increase in petrol and diesel prices, Prime Minister Narendra Modi recently said the middle class would not have been burdened if the previous governments had focused on reducing India's energy import dependence. He also emphasised the need for clean sources of energy. Expanding and diversifying energy supply is good, but if India is to reduce its energy import dependence, it must look towards first managing the demand for petroleum products. It is worthwhile to reflect on measures taken by the previous governments as well as the government under Mr. Modi in this context.

The UPA-2 administration under Prime Minister Manmohan Singh formulated fuel efficiency standards for passenger vehicles that are now in effect. It also constituted the National Electric Mobility Mission Plan (NEMMP). While well-intended, both these actions fell short in terms of ambition. India's 2022 fuel efficiency standards for passenger cars are nearly 20% less stringent than the European Union's standards. The NEMMP primarily focused on hybrid electric vehicles, and most of the incentives under the NEMMP went towards subsidising mild hybrids instead of electric vehicles. No wonder global manufacturers are rushing to deploy electric passenger cars in Europe while largely ignoring the Indian market.

The government under Mr. Modi has undertaken several initiatives to increase energy security. Heavy-duty vehicles, which consume nearly 60% of the diesel used in the country, are now subject to fuel efficiency standards. The share of bioethanol in petrol has risen to nearly 8% by volume under the 2018 National Policy on Biofuels. The government has encouraged multiple fuel pathways in the transport sector including natural gas. Importantly, it has recognised the urgency for us to transition to electric vehicles. The Faster Adoption and Manufacturing of Electric Vehicles (FAME-II) scheme now focuses largely on electric vehicles. The government has also provided several additional fiscal and non-fiscal incentives to encourage a transition to electric vehicles.

While these are steps in the right direction, there are many things that the government can and should do to reduce dependence on petroleum. First, the government should formulate a zero-emissions vehicle (ZEV) programme that would require vehicle manufacturers to produce a certain number of electric vehicles. Such programmes are in effect in China, certain States in the U.S., British Columbia in Canada, and South Korea. At present, the electric mobility initiative in India is driven largely by new entrants in the two- and three-wheeler space. Market leaders have adopted a wait-and-watch attitude. A ZEV programme would require all manufacturers to start producing electric vehicles across all market segments.

The government should also strengthen fuel efficiency requirements for new passenger cars and commercial vehicles. Two-wheelers, which consume nearly two-third of the petrol used in India, are not subject to any fuel efficiency standards. A recent analysis by the International Council on Clean Transportation (ICCT) suggests that a standard requiring 50% reduction in fuel consumption by new two-wheelers by 2030 will not only lead to internal combustion engine (ICE) efficiency improvements, but also ensure that nearly 60% of all new two-wheelers sold in India are electric driven. Similar opportunities exist on the passenger vehicle and heavy-duty commercial vehicle fronts. Adopting stringent fuel efficiency standards and a ZEV programme by 2024 can result in India's petroleum demand peaking by 2030, in spite of tremendous projected growth in economic and vehicular activity. Consumers will save money at the pump due to more

fuel-efficient ICE vehicles. Those who switch to electric vehicles will save even more as these consume less energy and electricity is cheaper compared to petrol and diesel.

The FAME scheme focuses on two- and three-wheelers, taxis, and buses. It should be extended not only to all passenger cars and commercial vehicles but also to agricultural tractors. Extending fiscal incentives to all kinds of vehicles and stepping up investments in charging infrastructure are essential complementary policies. By next year, the GST rates for all passenger vehicles could be made proportional to their fuel efficiency level, instead of the present system that relies on vehicle length and engine size.

As the economy recovers from the pandemic, the demand for petroleum products will rise, as will prices. But the government can save money for the consumer while enhancing long-term energy security by wielding the regulatory tools at its disposal.

Anup Bandivadekar is the passenger vehicle programme director at ICCT

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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HYDROGEN USAGE CAN BE A GAME CHANGER FOR INDIA

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

India's National Hydrogen Energy Mission, which is in the works, may mandate fertilizer, steel and petrochemicals industries to shift to green hydrogen use. The proposal may be taken up by cabinet for approval soon. Mint explains the importance of hydrogen in India's energy mix.

India's [National Hydrogen Energy Mission](#), which is in the works, may mandate fertilizer, steel and petrochemicals industries to shift to green hydrogen use. The proposal may be taken up by cabinet for approval soon. Mint explains the importance of hydrogen in India's energy mix.

What are the different shades of hydrogen?

Green hydrogen gas is produced by splitting water into hydrogen and oxygen using an electrolyzer, that may be powered by electricity generated from [renewable energy sources](#) such as wind and solar, or 'green' hydrogen. While hydrogen produced from natural gas is referred to as 'grey' hydrogen, the emission-free fuel produced from coal or petroleum coke is 'brown' hydrogen. Hydrogen produced from carbon capture and storage is known as 'blue' hydrogen, while the one from biomass and plastics is known as 'white' hydrogen. The clean fuel can be a game changer for India, which imports 85% of its oil and 53% of gas demand.

Has green hydrogen gained traction here?

There is growing interest in the space, as India is running the largest renewable energy project, with record low solar and wind power tariffs. Apart from state-owned firms, such as NTPC Ltd and Indian Oil Corp. Ltd, private companies Greenko, Adani Group and Acme Solar Holdings Ltd have been tying up with technology providers too. The interest comes amid India's deteriorating air quality, with Solar Energy Corp. of India looking to invite bids to build green hydrogen plants. Given that hydrogen can be used for both fuel cell and internal combustion engines, it is also being leveraged for mobility applications.

How have other countries reacted to green hydrogen?

Experts say green hydrogen is at the same stage today as solar power a decade ago. In a post-covid world, it will form the thrust of a green recovery plan by Canada, China, Australia, Germany, Japan, South Korea, Spain and US. A case in point is France's €7-billion plan to promote hydrogen use. The fuel has gained acceptance with 17 nations announcing hydrogen pathways.

What about the super high production cost?

Apart from high capital cost for electrolyzer manufacturing, the availability of rare materials, besides water and land availability are also areas of concern. While electrolyzer prices are over \$800 per kilowatt, they are likely to fall below \$200 per kW. As per Reji Kumar Pillai, president, India Smart Grid Forum, some people are promising electrolyzer at \$550 per kW, which could bring down price of green hydrogen near \$2/kg from \$7-8/kg. A further drop may make green hydrogen competitive vis-à-vis fossil fuels by 2030.

Is hydrogen a strategic imperative for India?

Hydrogen finds special resonance in India, given the uncertainty in global energy markets. A case in point being the spike in [crude oil prices](#) impacting India, with fuel retailing at record highs. India spent \$101.4 billion on crude imports in FY20 and \$111.9 billion in FY19. Tata Motors, Kerala government, IOC and NTPC have plans for hydrogen fuel cell buses. The Railways plans to run a hydrogen-led suburban train too. With India's attempt to secure climate leadership, it can leverage its growing clean energy capacity for a green hydrogen push.

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IMPORTANT TO ENSURE THAT NO PARALLEL TRACKS FOR CLIMATE NEGOTIATIONS ARE CREATED BRUSHING ASIDE THE FUNDAMENTALLY AGREED PRINCIPLES: INDIA AT UNSC

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

Representing India at the United Nations Security Council Open Debate on "Addressing climate-related risks to international peace and security", Union Environment Minister, Shri Prakash Javadekar, stressed that the idea of climate action should not be to move the climate ambition goal post to 2050 and it is important for countries to fulfill their pre-2020 commitments.

Shri Javadekar said that the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement negotiated under the Framework are the central mechanisms for climate action in a nationally determined manner based on certain fundamental agreed principles, the foremost amongst which is "Common but Differentiated Responsibility and Respective Capabilities"

Citing the 2019 IPCC Special Report "Climate Change and Land" which says that extreme weather and climate or slow-onset events may lead to increased displacement, disrupted food chains, threatened livelihoods, and could contribute to exacerbated stresses for conflict, Shri Javadekar put forward the point that even the best science available claims that Climate Change only exacerbates conflict and is not a reason for conflict and does not threaten peace and security and therefore it is important, said the Minister, to ensure that no parallel tracks for climate negotiations are created brushing aside the fundamentally agreed principles.

"While climate change does not directly or inherently cause violent conflict, its interaction with other social, political and economic factors can, nonetheless, exacerbate drivers of conflict and fragility and have negative impacts on peace, stability and security; and therefore it is for precisely this reason that developing country's' Nationally Determined Contributions under the Paris Agreement included information on adaptation activities, and the need for finance, technology development and transfer, capacity building, and transparency.", said the Union Environment Minister.

Shri Javadekar again reiterated that the commitment by developed countries to jointly mobilize \$100 billion per year by 2020 in support of climate action in developing countries has not been realized and also stated that there is an urgent need to promote and support the meaningful participation of women and marginalized groups in national-level climate change policy and planning processes.

On India's Climate Actions Shri Javadekar stated that India is the only country on track among the G20 nations to meet its climate change mitigation commitments. We are not only meeting our Paris Agreement targets but will also exceed them. The Minister highlighted the International Solar Alliance (ISA) and the Coalition for Disaster Resilience Infrastructure (CDRI), the two initiatives by India that have been launched to addressing challenges of climate change and adaptation.

Commenting on post COVID-19 recovery, Shri Javadekar highlighted that India believes that there is a significant opportunity for countries to integrate low-carbon development in their COVID-19 rescue and recovery measures and long-term mitigation strategies that are

scheduled to be announced for the reconvened 26th session of the Conference of the Parties (COP 26) in 2021.

The United Kingdom is holding the Presidency of the UNSC for the month of February 2021 and one of their Presidency events is organizing the United Nations Security Council Open Debate on "Addressing climate-related risks to international peace and security".

[Text of India Statement](#)

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WINTER POLLUTION SHOWS RISE IN MOST INDIAN CITIES, SAYS CSE

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

Heavy smog and air pollution near Ambattur Industrial Estate in Chennai in Tamil Nadu. | Photo Credit: [Vedhan M](#)

The levels of PM 2.5, the most threatening of particulate matter, worsened in 43 out of 99 cities whose winter air in two years, 2020 and 2019, was compared by the Centre for Science and Environment (CSE). Only 19 registered “substantial improvement” — and one of these was Chennai. The rest of the cities did not experience significant change.

In the aftermath of the lockdown, several cities reported improved pollution levels but by winter, when lockdowns were significantly eased, pollution levels had clawed back to pre-COVID-19 levels, the CSE notes, underlining the significant contribution of local and regional factors to a city’s pollution levels.

The cities with the worst pollution spikes in 2020 over 2019 include Gurugram, Lucknow, Jaipur, Visakhapatnam, Agra, Navi Mumbai, and Jodhpur. Kolkata is the only mega city in this group.

In 37 cities that are otherwise showing stable or declining seasonal averages, their peak pollution levels have risen significantly during winter. These include Aurangabad, Indore, Nashik, Jabalpur, Rupnagar, Bhopal, Dewas, Kochi, and Kozhikode. On the other hand, in north India, other cities, including Delhi, have experienced the reverse, that is, an increase in the seasonal average but decline in the seasonal peak.

During winter, cool and calm weather traps and spikes daily pollution, particularly in north Indian cities located in the Indo Gangetic Plain. This year, the average level of PM2.5 during the summer and monsoon months was considerably lower than the previous year due to the summer lockdown. However, the winter PM2.5 concentration has risen compared to the 2019 winter in many cities across regions.

“This bouncing back of pollution post-lockdown unmask the high impacts of local and regional pollution. This demands quicker regional reforms to curb pollution from vehicles, industry, power plants and waste burning to curb the winter pollution and also sustain annual improvement at a regional scale with speed,” says Anumita Roychowdhury, CSE’s executive director in charge of research and advocacy, said in a statement.

The analysis is part of the air pollution tracker initiative of CSE. It’s based on publicly available granular real time data (15-minute averages) from the Central Pollution Control Board (CPCB). The data is captured from 248 official stations under the Continuous Ambient Air Quality Monitoring System (CAAQMS) spread across 115 cities in 22 States and Union Territories. The CSE analysts only considered cities that had readings for both years in at least 75% of the winter days (from October 1 to January 31).

When ranked from the most to the least polluted cities, 23 of the most polluted cities are from north India. While Mysuru is the least polluted, followed by Satna in Madhya Pradesh and Kochi in Kerala, Ghaziabad is the most polluted city in the northern belt. There are only four cities

(Satna, Mysuru, Vijayapura and Chikkamagaluru) that have met the national 24-hour standard (60 g/m³) during the winter season. Satna and Maihar in Madhya Pradesh, and Mysuru in Karnataka, are the cleanest cities in the country, according to the report.

The authors of the study also emphasise that rather than mega cities, it was the smaller and upcoming cities that were emerging as pollution hotspots. “ This report makes it amply clear that this winter pollution challenge is not limited to mega cities or one specific region; it is an omnipresent problem and requires urgent and deliberate action everywhere. This requires quicker reforms and action in key sectors of pollution — vehicles, industry, power plants and waste management to control winter pollution and bend the annual air pollution curve.”

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STUDY SUGGESTS HABITAT LOSS IS LEADING TO INBREEDING OF INDIAN TIGERS

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

A camera-trap image of a tiger in the Upper Nilgiris, Tamil Nadu. | Photo Credit: [Special Arrangement](#)

While Indian tigers have the highest genetic variation compared to other subspecies of the feline across the world, their populations continue to be fragmented by loss of habitat, leading to inbreeding and potential loss of this diversity, [says a new study](#).

"As human population started expanding, so also their signatures on the land. We know that some of these signatures would result in disrupting the ability of tigers to move," Uma Ramakrishnan, co-author of the research, published in the journal *Molecular Biology and Evolution*, told *PTI*.

According to Dr. Ramakrishnan, molecular ecologist and assistant professor at the National Centre for Biological Sciences, Bangalore, this habitat loss from human activities leads to tigers being "hemmed into their own protected area." "Now, they can only mate with the other tigers in their own population. Over time, this will result in inbreeding, they will end up mating with their relatives," she explained.

"Whether this inbreeding compromises their fitness, their ability to survive, we do not yet know," the molecular ecologist added.

While genetic diversity across a population improves their chances of survival in the future, the study said population fragmentation of tigers can decrease this variation, and endanger them further.

Although tigers have received significant conservation attention, the scientists said very little is known about their evolutionary history and genomic variation, especially for Indian tigers.

Human-tiger conflict in Kodagu: Should tigers be translocated?

With 70% of the world's tigers living in India, the researchers said understanding the genetic diversity of tigers in the country is critical to the feline's conservation worldwide.

The results of their three-year long study offer insights into genomic variation in tigers and the processes that have sculpted it.

Based on the results, the scientists believe there have been relatively recent divergences between subspecies, and intense population bottlenecks that may have contributed to inbred individuals.

According to the NCBS scientist, maintaining structural connectivity, enabling tigers to move between protected areas can help overcome these bottlenecks. "This would require the right types of habitat between protected areas, for example having densely populated human settlements would not work. Further, there also needs to be functional connectivity, that tigers do actually move," Dr. Ramakrishnan added.

In the study, the scientists sequenced whole genomes from 65 individual tigers from four subspecies of the feline, and conducted a variety of population genomic analyses that quantify genetic variability. They investigated the partitioning of genetic variation, possible impacts of inbreeding, and demographic history, and possible signatures of local adaptation.

While the total genomic variation in Indian tigers was higher than in other subspecies, the study found that several individual tigers in the country had low variation, suggesting possible inbreeding.

According to the research, tigers from northeast India were the most different from other populations in India "Given our results, it is important to understand why some Bengal tigers appear inbred and what the consequences of this are," said Anubhab Khan, co-first author of the research.

The study showed recent divergences between tiger subspecies, within the last 20,000 years, which the scientists believe is concordant with increasing human impacts across Asia and a transition from glacial to interglacial climate change in the continent.

However, the scientists believe this finding needs to be investigated further with expanded data and analyses of more tiger genomes.

"Most studies focusing on species of conservation concern use limited numbers of specimens to try to gain understanding into how genomic variation is partitioned," said Ellie Armstrong, co-first and co-corresponding author of the study from Stanford University in the U.S.

"It is clear from our work here, and a growing number of other studies, that it is crucial to increase our sampling efforts and use caution when interpreting results from limited sample sizes," Armstrong added.

According to Dr. Ramakrishnan, the genomic variation of Indian tigers continues to be shaped by the ongoing loss of connectivity. "Population management and conservation action must incorporate information on genetic variation. I hope doing so will help India maintain the gains in tiger conservation achieved so far," she added.

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RARELY SPOTTED MANDARIN DUCK AND BLACK-NECKED CRANE STOP BY IN ASSAM

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

Mandarin duck in Assam | Photo Credit: [Gunjan Gogoi](#)

“I couldn’t believe it,” says Madhab Gogoi excitedly over the phone from Assam, about his surprise date with the spectacular-looking bird in the early weeks of February. He was at Maguri-Motapung *beel* (wetland) in Tinsukia district, Assam, birdwatching in the wetlands when he noticed a colourful bird floating on the surface of the lake. Curious, he zoomed in with his binoculars and realised that it was the Mandarin duck, a rare bird that was last seen in Assam in the 1900s.

“It was a historic moment, as the bird has shown up after 120 years at the same location. It was last spotted at Dibru river in Tinsukia in 1902. The streak of colours on the plumage, especially the male during the breeding season is a mind-boggling mix of white, green, golden orange and blue. You can call it the ‘queen’ among water birds,” says Gogoi.

The eBird website, a platform that documents birds the world over, calls it a ‘small-exotic looking bird’ native to East Asia, and describes the male as ‘very ornate with big orangey ‘sail fins’ on the back, streaked orangey cheeks, and a small red bill with a whitish tip.’

According to birders like Jaydev Mandal, the duck “seems to have strayed from its regular migratory path”. He says over call from Assam, “They breed in Russia, Korea, Japan and the northeastern parts of China — as the name Mandarin also suggests. The species is also found in western Europe and the US. The bird rarely visits India as the wintering grounds of the birds are Mongolia and China.”

Jaydev spearheaded the second edition of Bihu Bird Count that covered 27 districts and recorded 400 species of birds. “ We can call it a vagrant that briefly stopped by at the same location where it was last seen in the 20th Century, making it a record sighting.”

“Maybe it’s a casual sighting” says Nilutpal Mahanta, a PhD scholar at Gauhati University and an avid birder. “If one studies the migratory pathways listed on ebird, we learn that this bird is not a winter visitor to India. The birds that flock wintering grounds in India take the Central Asian Flyway, and Mandarin ducks don’t take that route.

It could even be a species that escaped from an illegal wildlife trader. The ducks is often captured and traded because of its beauty. Illegal trading of exotic species is rampant along China, Bangladesh, and Myanmar border,” he adds.

Naturalists suspect that climate changes and habitat destruction have triggered a spate of rare sightings in Assam. A pair of black-necked cranes were also sighted in the countryside of the outskirts of the Panbari range of Manas National Park, a first-ever record in Assam.

Explains Nilutpal, “It is a medium-sized crane that breeds on the Tibetan Plateau and remote parts of India and Bhutan. They have been mostly recorded in high altitudes of Jimithang and Sangti valley in western parts of Arunachal Pradesh in India. Locals of Panbari have named bird *deu korchon* (Deu means related to God and mythology, and Korchon means crane) as it has mythological importance in Buddhist culture.”

Though the environment became stable in the last year with less pollution, habitat destruction is a cause of worry, says Nilutpal. “In January, we also spotted the rarely seen Indian golden oriole in Assam. Such rare sightings make us happy but also leave us confused,” he explains.

Gogoi is happy; the appearance of Mandarin duck has kick-started a discussion on conservation. “Of the 1,200 birds that can be seen in India, over 900 species are found in the Northeast part of India, including Assam and Mizoram. Birders throng to Assam to see resident beauties like grey peacock pheasant and white winged wood duck,” he says. Then adds, “But the beauty of Mandarin has left not just the naturalists, but also the general public speechless. It has inspired them to give a serious thought about conservation. It is heartening.”

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IT'S ALIVE! BLACK-BROWED BABBLER REDISCOVERED AFTER 170 YEARS

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

Black-browed Babbler. Credit: Muhammad Rizky Fauzan

A bird last seen more than 170 years ago in the rainforests of Borneo has been rediscovered, amazing conservationists who have long assumed it was extinct.

The Black-browed Babbler has only ever been documented once — when it was first described by scientists around 1848 — eluding all subsequent efforts to find it.

But late last year, two men in Indonesian Borneo saw a bird they didn't recognise and snapped photos of it before releasing the palm-sized creature back into the forest, according to Global Wildlife Conservation.

Ornithologists were astounded to find that the Black-browed Babbler was alive and well, despite not having been seen since before Charles Darwin published "On the Origin of Species".

"It was a bit like a 'Eureka!' moment," said Panji Gusti Akbar, lead author of [a paper on the discovery](#) published Thursday in the journal *BirdingASIA*.

"This bird is often called 'the biggest enigma in Indonesian ornithology.' It's mind-blowing to think that it's not extinct and it's still living in these lowland forests."

Little is known about the creature with brown and grey feathers, which has been "missing" longer than any other Asian bird, according to the paper.

Researchers hoped to go back to the area where it was recently spotted, but Covid-19 travel restrictions could slow the effort.

"There is now a critical window of opportunity for conservationists to secure these forests to protect the babbler and other species," said Ding Li Yong, a co-author on the paper and a Singapore-based conservationist with BirdLife International.

More than 150 species of birds around the world are considered "lost" with no confirmed sightings in the past decade, conservationists say.

"Discoveries like this are incredible and give us so much hope that it's possible to find other species that have been lost to science for decades or longer," said Barney Long, Global Wildlife Conservation's senior director of species conservation.

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