



THE GREEN ARCHIVE

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CO-DEPENDENCY

THE UNTOUCHED
AMAZON RAINFOREST

THE DEEP OCEAN MISSION

REINTRODUCING CHEETAHS IN INDIA

FERAL DOGS
CONFLICT
IN CONSERVATION

Think coral!

THE GREEN ARCHIVE

*Feral dogs and Wildlife
conflicts* Page 4

The Deep Ocean Mission Page 5

*Reintroducing cheetahs in
India* Page 8

THE UNTOUCHED AMAZON RAINFOREST WAS ACTUALLY SHAPED BY HUMANS!

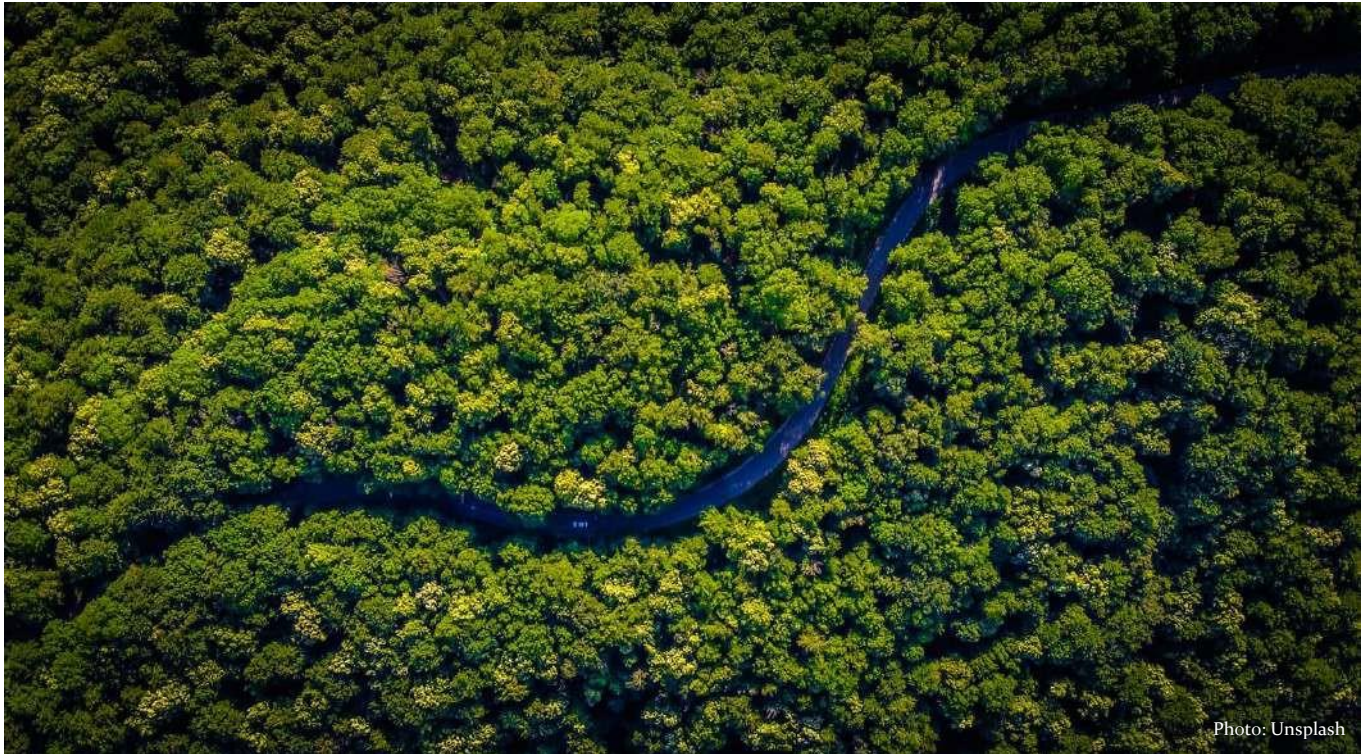


Photo: Unsplash

Jahanvi Raj

B.Sc. Agriculture I Year

More than millennia, local individuals assumed a solid part in trim the nature of this huge wild. The Amazon rainforest shows up wild and immaculate by mankind, however individuals have been forming its biodiversity for centuries.

The manner in which some portray it, you'd think the Amazon was a knot of wilds, essentially immaculate by human hand. "The First Eden, a perfect regular realm," is the means by which Stanwyn Shetler, a Smithsonian botanist, portrayed this locale of the world in a 1991

book denoting the 500th commemoration of Christopher Columbus' journey to the New World. "The local individuals were straightforward in the scene, living as regular components of the ecosphere. Their reality ... was a universe of scarcely discernible human aggravation."

However, was it truly??! Researchers in the past 25 years have shown that this legendary picture of immaculate nature is only that—a fantasy. Like people all over the place, Native Americans molded their surroundings to suit them, through consuming, pruning, plowing and different practices. Furthermore, the Amazon is the

same: Look nearer, and you can see the profound impressions that people have made on the world's biggest tropical rainforest, researchers revealed this is Science Journal.

Regardless of its immensity the Amazon extends multiple million square miles, and has an expected 390 billion trees—this rainforest is not really the wild, relentless power of nature that the Romantics thought about, says José Iriarte, an excavator at the University of Exeter.

Truth be told, people have possessed the Amazon for around 13,000 years, and have been training plants for something like 8,000 years.

(Contd. on Page 3).

EDITOR'S DESK



The pandemic phase has passed significantly with time, and the year 2022 brings us immense joy and opportunities flowing our way. As the college reopened in the month of March, we experienced the much anticipated event post pandemic, The World Forest Day on the 5th of March.

The Department of Agriculture and Forestry in our college, left no stone unturned to impress us with their appreciable talents and feats in the event. Many brought to light the importance of agroforestry and

sustainability, while the others shared their thoughts on conservation, and the pivotal role of forests in all our lives. A few students had fabulous innovations that truly stirred the audience to think out of the box. After all, thinking out of the box might also mean to never be in a box in the first place. Broadening our horizons to think one of a kind and produce results in a class of its own, is all young minds have to offer to the world. It starts with kindling the curiosities and fuelling the desire to work things out. This edition of

our official newsletter is all about the spirit of conservation and the various environmental debasement faced in the world we live in.

The students of Doon Business School come up with multiple issues covering the destruction of our deep blue oceans, the verdant forests and the protection of the untamed beasts to make us well aware of the earth hitting the skids. After all, awareness is ultimately the spark to awakening.

Aadhya Chekoti
Editor

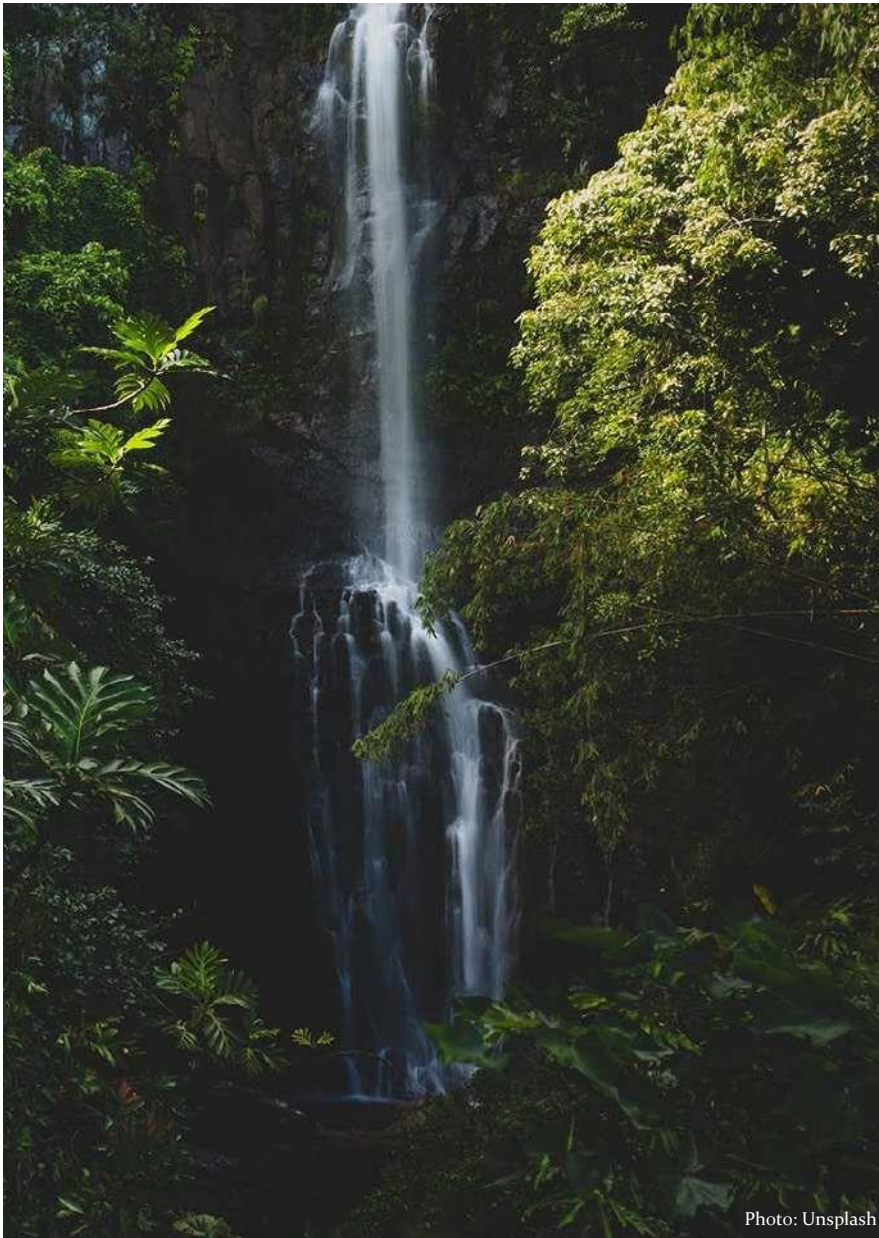


Photo: Unsplash

(Contd. from Page 1)

Late archeological investigations, particularly over the most recent twenty years show that native populaces in the past were more various, more complicated and greaterly affected the biggest and most biodiverse tropical woods on the planet [than already thought], Iriarte says

Biologist Hans ter Steege and partners were taking stock of the immense variety of the Amazon's trees. The group tested 1,170 dispersed plots a long way from current human occupants to

distinguish in excess of 16,000 distinct species among those 390 billion individual plants. Then, at that point, they saw something odd: Despite that wide variety, over portion of the absolute trees were comprised of a little more than 1% (227) of the species.

Around 20 of these "hyperdominant" plants were trained species, for example, the Brazil nut, the Amazon tree grape and the frozen yogurt bean tree.

That was multiple times the sum analysts expected assuming possibility were the main component. "The speculation came up that maybe

individuals could have tamed these species a ton [...] which would have helped their overflow in the Amazon," says ter Steege says, who is the lead creator of the new review.

To test this theory, ter Steege collaborated with archeologists to look all the more carefully at the quantity of tamed species in closeness to where there was proof of pre-Columbian people group. "Without a doubt, the distance to these archeological destinations significantly affects the overflow and extravagance of trained species in the Amazon," ter Steege says, noticing that he and his group had the option to plot a diminishing in the quantity of tamed species as the separation from archeological locales expanded.

The scientists likewise observed that a considerable lot of these tamed species were distinguished a long way from the areas where they initially emerged, prompting hypothesis that people shipped them to develop somewhere else. Cocoa, utilized by a few local people groups for refreshments and in strict services, was first trained in the northwestern area of the Amazon, where scientists today have distinguished a bigger hereditary variety reflecting additional time laid out there. Yet, today the species is most pervasive in the southern region of the rainforest.

Iriarte, who was not associated with this examination, says ter Steege's review is the biggest and most far reaching investigation of human effect on Amazon vegetation at any point done. He adds that the consideration of paleologist and soil researchers helped the concentrate massively, adding ability in demonstrating connections and examining whether an animal types would probably fill normally in the dirt of a specific region.

The review may likewise have invigorating ramifications past the biological beginnings of this area. Later on, Iriarte trusts this exploration could be figured out to assist archeologists with finding antiquated Amazonian settlements and pinpoint ancient rarities. By searching for districts that have surprisingly high convergences of tamed plant species, he says, specialists could more readily limit their focal point while looking for ancient rarities in the thick Amazon

"Maybe [...] the very biodiversity we need to protect isn't simply because of millennia of regular advancement yet additionally the consequence of the human impression on them,"

Iriarte says. "The more we learn, the more the proof highlight the last option."

Smithsonian archaeobotanist Dolores Piperno, notwithstanding, is more doubtful of the creators' decisions. Piperno, who was not associated with the review, takes note of that over five centuries occurred between the pre-Columbian period and this review. At the end of the day, a ton has likely impacted the Amazon from that point forward.

Piperno likewise alerts reaching direct inferences from the tree information. She focuses to the way that a few researchers once felt that the Mayan progress in Central America intensely

developed the breadnut tree in view of the bigger than-anticipated quantities of them regularly found around Mayan ruins. Notwithstanding, later examination found that breadnut tree seeds can really be spread broadly by bats, and that the trees might have begun developing around the remains to exploit the limestone they gave to the close by soil.

For future examination, Piperno desires to see more work done finding and investigating the remaining parts of plants from ancient times, like charcoal and mineralized phytoliths and charcoal. "These are the intermediaries that should be depended on," Piperno says.

FERAL DOGS AND WILDLIFE CONFLICTS



Photo: Unsplash

Rahul Tharun
B.Sc. Forestry II Year

It's almost impossible to be gloomy around a puppy or an affectionate dog. They're practically fluffy balls of dopamine-inducing cuteness. Other than serving emotional

support to humans and being one of the most favoured pets in the world, dogs are also useful in the army, the forensics field, in aiding handicapped people, and they're also used as house guards (for obvious reasons). Despite being such versatile

and resourceful animals, well above half of India's population of dogs are feral(stray) dogs. That's on the huge pet-breeding business mafia.

While that is an issue that needs to be addressed as well, this article shall wholly

focus only on an entirely different aspect of Man's Best Friend. India has about 6 crore floofs and of them, 3,50,00,000 are stray dogs. Most of them are simply dependent upon urban waste or kind humans for their survival, both of which are currently abundant resources for the *doggos* (considering their rocketing populations). The rest, which is an alarmingly large number, seem to have tapped into their ancient predatory instincts. Feral dogs that live in rural or protected forest areas have resorted to preying on wildlife.

Dogs are extremely agile and ferocious pack hunters. They are remarkable swimmers and that allows them to hunt down prey both in land and water. They prey upon and interact with several

vulnerable species, ranging from Olive Ridley Turtles to Himalayan Brown Bears with deer and antelopes filling the large gap in between.

This is a problem because: A. It drastically reduces the prey base for wild predators such as tigers and leopards; B. Poses a serious threat to conservation of endangered and vulnerable species population and C. Increases chances of wild canids (wolves, foxes and dholes) contracting infectious diseases such as the Canine Distemper Virus.

The Neanderthal who got a bit too friendly with a wolf surely did not see this coming 30,000 years ago. This is an unfair disruption of nature's intricate ecological balance. To solve this issue,

mass sheltering and euthanasia are labelled ethically and statistically wrong, looking at the birth rates of feral dogs. Animal birth control, re-sheltering and relocating of feral dogs away from land inhabited by wild animals are some solutions that will not stir a protest among the public and are currently being debated upon in the Supreme Court. Presently we are left with no efficient measure to tackle this increasingly severe threat to Indian wildlife.

This article was in no way intended to show dogs in a bad light. If it is any consolation to dog-people, cats are an equally intimidating threat to rural wildlife, especially birds.

DIVING IN WITH THE DEEP OCEAN MISSION



Photo: The Indian Express

Sonakshee Jha

B.Sc. Agriculture III Year

India has been aiming to explore the resources present deep inside the

oceans, for quite some time now. The multi-institutional mission named **The Deep Ocean Mission**, proposed and implemented by the Ministry of Earth Sciences was

launched recently, after being approved by the cabinet earlier in June 2021.

The mission is set to follow certain predefined objectives, which are:

- Firstly, the mission aims at development of equipment and machinery with proper sensors and technologies for carrying out mining effectively and manned submersibles capable of carrying at least three people up to the depth of 6,000 metres.

- The mission also aims at developing ways for exploration of the undiscovered flora and fauna of the deep-sea ecosystem and judicial utilization of the bio resources present there.

- Based on various studies and observations, the plan also includes development of models to illustrate expected climate changes in the deep-sea ecosystem on various time scales including annual, seasonal and decadal.

- Models illustrating the possible climatic changes expected to take place in the deep-sea ecosystem resulting from mining activities are also said to be developed under this mission. The model will provide data on various time scales including annual, seasonal and decadal.

- The mission also comprises surveys to explore and identify the hotspots of mineral and ores deposits.

- Finally, the mission also seeks to engineer and develop hydrothermal and desalination plants to extract fresh water and generate power from the ocean water.

A threat to marine biodiversity?

The mission is expected to bring about the blue revolution in the country and boost up its economy significantly but environmentalists have been



Photo: Indian Mining Intel

expressing concerns regarding the damage this can cause to the marine ecosystem, few of which are listed below;

- Most of the species found at seabed are indigenous making it possible for the entire species to be wiped out in mere one single intervention.

- Mining will cause noise and sound pollution in the quietest of the places disturbing the organisms naturally accustomed to dark and quiet habitat.

- The working of the machinery is expected to stir up the sediments of the sea bed, causing pollution which may alter organism's eating habits or may even end up choking and killing them.

- According to the International Union for Conservation of Nature, the oscillations and vibrations produced by the equipment involved in the process may even pose threat to the larger species like tuna, sharks and whales.

Though the plan has been envisioned to be executed in the least damaging way, causing minimum possible harm to the marine ecosystem, but no matter how cautiously and sustainably it is carried

out it's still concerning to disturb the ecosystem of the most tranquil place of the planet, which has till now been safe from human intervention, while around 96 percent of the ocean still remains completely unexplored it may end up modifying the habitats or may even completely tear down the population of the organisms which we might have not even discovered yet.

Progress made so far:

Indian Space Research Organisation developed the design of a manned submersible capsule capable of travelling 6,000 m deep for the mission. The development was announced on the sidelines of the silver jubilee celebrations of the National Institute of Ocean Technology. A deep-submergence vehicle named Matsya 6000 is under development. First unmanned trail of the vehicle was conducted on 27 October 2021 where the 'personnel sphere' was lowered upto a depth of 600 m, off the coast of Chennai. The trial was successful and received the certification for further development. Following the success of the trial, the "Samudrayaan" program was formally launched on 29 October 2021.

CO-DEPENDENCY OF FORESTS AND AGRICULTURE IN TODAY'S WORLD

Ashwin J Anil

B.Sc. Agriculture IV Year

W Forest and Agriculture ecosystem are two important aspects of human sustainability in terms of food, shelter, livelihood, medicines, etc. According to the latest SOFO report forest helps or supports sustainable agriculture in terms of balancing climate and soil, regulating flow of water, by providing shade and shelter and habitat for pollinator and natural predators of the agricultural pest. Both play an important role in economic status of country. Agriculture, Forestry and fishing provide about 21.82% share in Indian revenue.

Agriculture plays an important role in well being of human life as well as in economy. Because agriculture does not only provide raw materials for production of food products and others items, it also provides a good

amount of employment opportunity across the country. Agriculture provide about 60% of job opportunity and contribute 17% of India's GDP.

Forest or forest attributes either directly or indirectly are part of our day to day life, like the bed in which we woke up to the tires of our car we take to work. Forest provide woods, shelter, livelihood for human above all it helps to prevent oil erosion, watershed protection and so on. Forest is a home to about 80% of the terrestrial biodiversity of the world.

Both agriculture and forest helps each other in many ways along maintaining a balance in the ecosystem. According to the latest report of 'State of the World's Forest' (SOFO) forest play a role in support of sustainable agriculture by maintaining soils and climate, regulate flow of water, provide

shelter and shade and provide a habitat for pollinators and natural predators of agriculture pests.

Balance between these two ecosystems will be maintained unless one or other starts dominating other use to the influence of external agents such as human interaction. People started to clear forest for land in order to establish an agriculture land (for increase the cropping area) or other beneficial structures (house, buildings, roads, etc) which leads to deforestation. According to Jonah Busch, a senior research fellow at the US-based non-profit Center for Global Development - if increase in crop productivity and direct forest protection are paired together then it will lead to increase in both crop production and forest cover. But without direct protection of forest but increasing the crop productivity can risk the forest.



Photo: ICAR

REINTRODUCING CHEETAHS IN INDIA



Photo: Time Magazine

Divya Tomar

B.Sc. Forestry I Year

India once again is going to be home to the world's fastest land mammal – the cheetah which has been extinct in India for as long as 30 years. So, finally, the Indian government has decided to reintroduce cheetah in India, under the “Action plan for the introduction of a cheetah”, which were expected to be reintroduced in November 2021 in Madhya Pradesh but the plan went limbo due to COVID-19.

“In the next five years, 50 cheetahs will be reintroduced in India”, Mr. Bhupender Yadav an Indian politician who serves as the Union Cabinet Minister of Labour and Employment, Environment, Forest, and Climate Change in the Government of India, said in the statement issued. The 300 – page action plan said “The animals’ lineage and condition shall be checked in the host

country to ensure that they are not from an excessively inbred stock and are in the ideal age group, to conform to the needs of a founding population”. Initially, around 3 to 4 male cheetahs aged about 4 to 5 years will be imported as they would be dominant and will look to hold for their territory. Also, 6 females will be a part of this group who should be around the age of 2.5 years.

From South Africa to India, they will be transported by air and after that, they will be brought to Kuno National Park (KNP) by truck. The Kuno Palpur National Park in Madhya Pradesh was roled the highest among the 10 surveyed sites because of its suitable habitat and adequate prey base.

It is 748 square kilometers in area, devoid of any human settlement and forms part of the shop-Shivpuri deciduous open forest landscape, and is estimated to have a capacity to sustain 21

cheetahs.

Cheetah became extinct now we are making plans to reintroduce them but the main question here is how did they even become extinct?

According to a different account, cheetahs were found in the entire country except for the high mountains, west and the north-east region but the large scale captures for coursing, bounty, spot hunting, and extensive habitat conservation along with the increasing decline in prey base lead to decrease in their population.

During the rule of Akbar, there were as many as 10,000 cheetahs out of which 1000 were in his court only. Between 1799 and 1960, at least 230 cheetahs in the wild were recorded. And the last 3 of them were shot dead in the sal forest of Kariya district (present-day Chattisgarh) by Maharaja Ramanuj Pratap Singh Deo in 1947.

THINK CORAL!

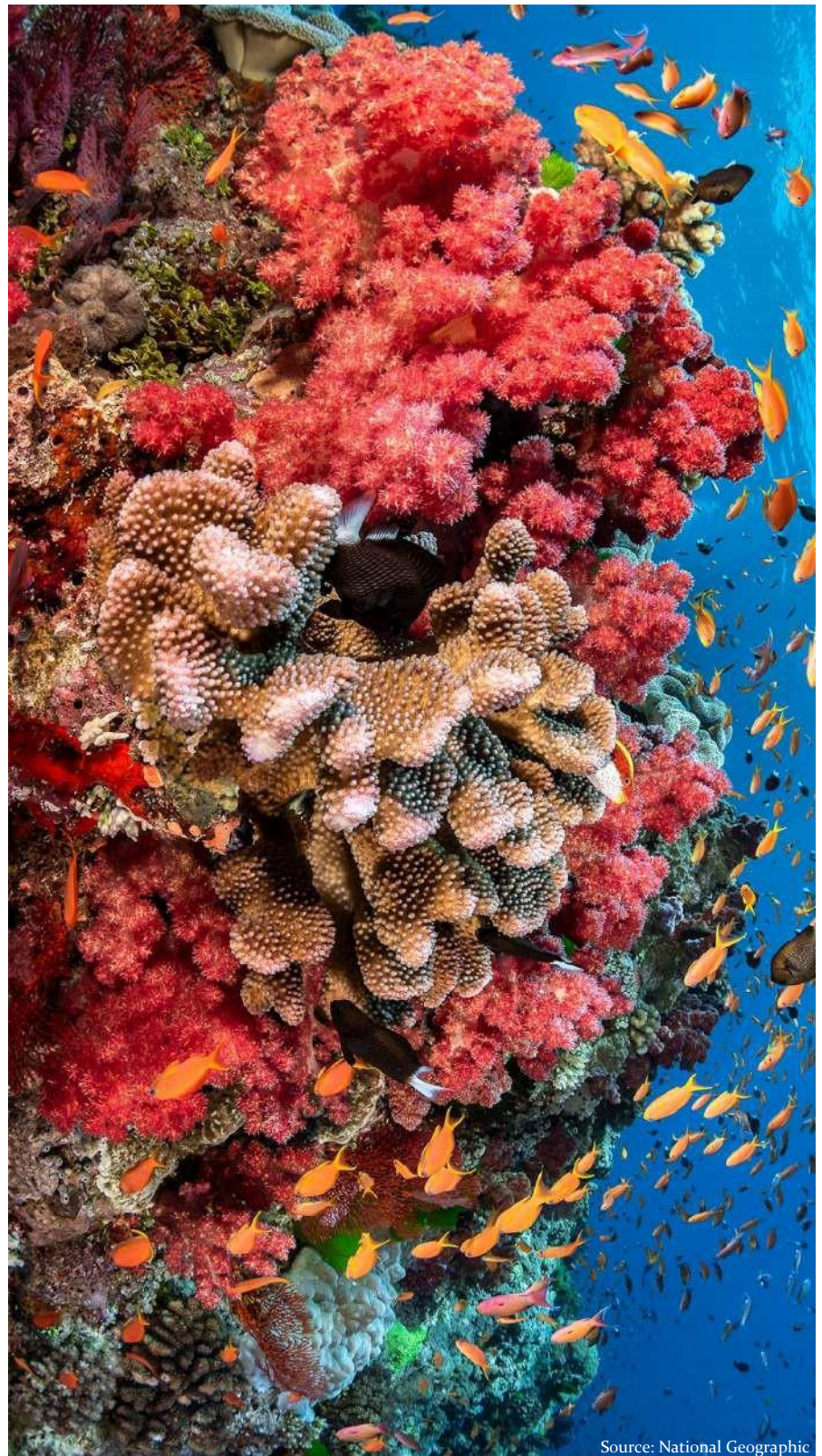
Dhruvataa Chatterjee
B.Sc. Forestry I Year

Since past years corals have been suffering, dying. It is highly possible that the next generation or generations to come may never see these creations except in documentaries or movies. It's time to THINK CORAL!

Most of us still believe that these corals or coral reefs are maybe some underwater plant species or some sort of rock. But that's not true. We are not much aware that most of the oxygen in the atmosphere comes from the activities of photosynthetic organisms in the ocean. The ocean provides water, oxygen, nutrients and moderates the climate on earth, and corals are among the major beings that help maintain good health of the vast oceans and seas. But what are coral reefs?

Corals are invertebrate animals belonging to a group of beautiful, colourful and fascinating phylum of animals called Cnidaria. They exhibit a wide variety of colours, shapes and sizes. They all share the same distinguishing characteristics, a simple stomach with a single mouth opening surrounded by stinging tentacles. Each individual coral animal is called a polyp. They live in groups of hundreds to thousands of identical polyps that form a 'colony'. Some other animals of this group include jellyfish and sea anemones.

Corals are classified as soft corals and hard corals.



Source: National Geographic

Soft corals include sea fans, sea feathers, and sea whips and they often resemble brightly coloured plants or trees. They have tentacles, a distinctive feathery appearance and they capture food floating in the

currents. Hard corals which are also known as "reef building" corals. Millions of tiny polyps extract abundant calcium carbonate from the surrounding sea water and use this to create a hardened

structure for protection and growth which then results in forming large carbonate structures, which we call coral reefs.

These coral reefs are home to hundreds of thousands, if not, millions of other species of fishes, invertebrates, plants, sea turtles, and marine mammals and support diversity of life. About 25% of fish depend on healthy coral reefs. Because of the diversity of life found in the habitat created by coral reefs they are often called the "rainforest of the sea". Unique feature of corals is the highly evolved form of symbiosis. Inside the tissue of coral polyp live this microscopic single-celled photosynthetic algae called zooxanthellae. The coral provides a protected environment and compounds zooxanthellae need for photosynthesis. In return the algae provide coral with carbohydrates for food as well as oxygen and help coral remove waste. These magnificent creatures not only maintain the diversity and good health of the ocean but also protect the coastline from storms and erosions.

Over half a billion people are dependent on reefs for food, income, and

protection. Reefs provide a variety of economic benefits, such as recreational activities, tourism, habitat for commercial fisheries and preservation of marine ecosystems. Yet few of us are aware that corals are dying off at alarming rates. Coral reef ecosystems are severely threatened. Due to the effect of global climate change, unsustainable fishing and land-based pollution, coral reefs are facing coral bleaching, a situation in which corals appear to turn white. This happens when coral polyps expel their symbiotic algae (zooxanthellae) as a result of some stress events. Stresses that may lead to bleaching include extreme temperatures, salinity, pollution and sedimentation. Warmer ocean water because of rising CO₂ levels becomes more acidic, which causes ocean acidification. This makes it more difficult for corals to form their hard exoskeleton, hence the reefs. These factors fluctuate any given day, but when the changes are severe or last long, bleaching occurs. The process has been taking place for some time, and without the algae present to provide coral with food they are beginning to

starve. If the stress events continue for too long, the corals will eventually die leaving the skeleton behind, the ocean unhealthy, without any home for the diversity of life.

Though the good news is that coral bleaching is not the death sentence. If the stress events are controlled in time, coral may take new algae and return to a healthy state. While we have already lost many of these corals, scientists are trying their best to help left and yet not affected corals to thrive and come back to life. Coral nurseries are being practiced, activists are opposing unsustainable fishing and actions are taken. There are several ways an individual can start helping corals and it begins simply with being aware and spreading awareness about corals. The continuous small actions can lead to big changes, such as less consumption of fish or seafood, preventing waste products, plastics, from going into oceans and controlling CO₂ emissions by daily little tasks.

We need corals, corals need us. It's time we protect the "rainforest of the sea". It's time to think about corals.

Abantika Das

B.Sc. Agriculture III Year

The Bunder diamond block in the Chhatarpur district of Madhya Pradesh has been in the news for quite some time now. But what we don't know is that the proposed diamond mining project goes back to the early 2000s.

In the year 2004 an Australian company named Rio Tinto discovered diamonds in the

DIAMONDS IN BUXWAHA: IS IT WORTH IT?

Buxwaha forests region of Chhatarpur and estimated that the block had millions of carats of rough diamonds. And in 2006, finally a contract was given to the company with a mining lease of over 954 ha. As per the contract, whatever revenue the company would generate, 10% will be given to

the state. But in 2016, the Australian company closed the project even after spending around 90 million dollars and left everything to the state government. They later revealed their reasons in a statement "...as part of its ongoing efforts to drive shareholder value by



Photo: Down to Earth

conserving cash and cutting costs further, it has decided not to proceed with the development of its Bunder project." But the real reasons were that the company had to face severe backlash and opposition from environmentalists, little help from the state government and of course many PILs.

But again in 2019, bidding for the same contract was restarted but this time for 382 ha out of which only 62 ha will be used for mining purpose and the remaining will be used to dump rocks, debris and soil wastes. This time the contract was given to Aditya Birla Group (Essel Mining & Industries Ltd.) for a time period of 50 years. Since diamond mining is a water

intensive procedure, the company stated that a dam will be constructed to meet the water requirements i.e., 5.9 million cubic meters a year. Locals fear that this will worsen the state of the already water scarce region and might end up using all of the groundwater and a dam will deteriorate the water supply in the nearby areas.

The proposed project will surely provide employment, generate state revenue and uptake diamonds hence, build our economy. But at the expense of lakhs of trees, rare species of animals, thousands of families and gallons of water. Destroying these, all because of diamonds which serves no purpose other than being a luxury item and

which can be manufactured in a lab also of the same purity. It is high time that we reconsider the idea of development which is not at the cost of destruction as the severe ecological impact that this project will cause cannot be compensated by afforestation. This pandemic is proof of how nature was healing itself and now if we start to interfere with it again, this will have some major consequences.

We have seen how the unavailability of oxygen shook the nation amid the pandemic and now we want to destroy a forest because of diamonds. Is this how we want to build our economy, at the expense of a precious forest and priceless water?

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