

Pathways to Green India

Volume III

Ways to Protect Our Species



EARTH DAY NETWORK

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EARTH DAY NETWORK

November 2019

Dear Reader,

Growing out of the first Earth Day (22 April, 1970), Earth Day Network today engages with around 75,000 partners in more than 190 countries to broaden, diversify and mobilise the environmental movement. Over one billion people take part in Earth Day activities each year, making it the largest civic observance in the world.

In keeping with our conviction that Earth's future relies on implementing sustainable practices, Earth Day Network, India, has put together this eBook, which showcases varied strategies adopted in the country to #ProtectOurSpecies, a campaign we have launched.

Read about the tremendous work being done to stop our planet reaching what is predicted to be the Sixth Extinction. Will humans be the catalyst for this one?

We hope you enjoy reading the case studies that expound some of the work done in India to save species. In a majority of the accounts, it is people, or people-focused approaches, that have brought about positive results. All the case studies are replicable. To help you connect for additional information on the strategies adopted, we have provided the contact details of the relevant person at the end of each chapter.

Earth Day Network is very grateful to all those who sent in material for the eBook, to our India team, which worked tirelessly to put together this volume and to Wysiwyg Communications for the design.

Regards,

Denis Hayes
Chairperson

Kathleen Rogers
President

Karuna A Singh
Country Director, India

INTRODUCTION

India is home to over 91,000 species of animals and 45,000 species of plants that flourish in the country's mountains, forests, seas, rivers, other waterbodies and deserts. According to the International Union for Conservation of Nature (IUCN) around 8% of all recorded plant and animal species live in India.

Indians have traditionally lived in close harmony with the natural world. Respect for nature is a part of the Indian psyche. Indian mythology and ancient texts showcase a major role for plants and animals. The legend of Hanuman, the monkey god who transported an entire mountain as the life-saving sanjeevani plant grew on it, is well-known. The wonderful Panchatantra is a collection of animal fables that most children grow up hearing. Ayurveda, the ancient art of herbal medicine is today recognised as a science in India. The daily worship of the tulsi (holy basil) plant takes pride of place in millions of courtyards—our ancestors knew about its antifungal and antibacterial properties much before the scientific world discovered them. Herbs such as haldi (turmeric), which has for ages been a ubiquitous ingredient in Indian cuisine, is today acknowledged as a great antiseptic.

Over the years, however, urbanisation and development have brought about a disbalance in the harmonious coexistence of humans with nature. This has taken a toll on the thousands of species of flora and fauna that once flourished. There is a threat to their existence and urgent steps are needed to provide them protection. Primates, birds, mammals, reptiles, amphibians, fish, spiders, coral, trees and plants make up close to 1,000 species from India that are placed on the IUCN's Red List. Many of these are endemic to the country and, if not protected, will vanish forever from the face of earth.

In support of Earth Day Network's 2019 global campaign #ProtectOurSpecies, the India team is working to widen and deepen awareness about the need to protect our natural heritage. Some of the exemplary work done by individuals and organisations is showcased in this volume of our Pathways to Green India series. Read about the people's approach to save the elusive hangul of Kashmir of which just 200 are left in the world; the beautiful coral reefs of the Andaman Islands that are being saved from dying; the efforts to clean rivers so that the Gangetic River Dolphin can continue to live in them; the mango variety that was given up for dead but the King lives on; saving bats—creatures unfairly considered from the dark side; the fishing cat which is not as guilty as accused of diminishing fish catches; how herbal medicine is now brought into easy reach; sacred groves that remain untouched; nature's pest controller—the pangolin; efforts to bring the twittering house sparrows back to urban spaces and finding homes for hornbills to nest in; forgotten rice species now back on our plates; Kids for Tigers, dancing frogs, the almost-forgotten Kamdhenu, gossamer-winged odonates, art to help conserve elephants... and so much more!

Should you know of other such efforts, do share those with us at:

earthdaynetworkindia@gmail.com

A Housing Crisis





A Housing Crisis

India is home to nine species of hornbills. To quote the Nature Conservation Foundation, ‘Hornbills naturally occur in low densities and are slow breeders. They are also monogamous birds with a long breeding season that involves intensive parental care. These birds nest in large softwood trees with existing cavities. During the breeding season, hornbill pairs find a suitable cavity. The female then seals herself inside the cavity with droppings and mud and lays her eggs, leaving only a slit for the male to bring back food for the family. Their biology thus makes them extremely vulnerable to hunting and habitat loss, which result in loss of breeding individuals from the population and loss of nesting sites respectively.’

Hornbills live symbiotically with trees. They eat the fruit from the trees, excrete the seeds and thus help afforest the area. The trees return this kindness by providing nesting spaces for the hornbills who build their

homes in the holes of softwood trees. New trees won’t do as these rarely have holes.

Several hornbill species are found around the Pakke Tiger Reserve in Arunachal Pradesh. Earlier, the birds were hunted by the local Nyishi tribesmen who used the hornbills’ beaks to adorn their traditional headdresses. Today, the birds are relatively safe from this human activity as the locals now use fibreglass beaks instead. However, a new crisis looms. A housing one. At the start of the breeding season, hornbill parents go house hunting. Perhaps there is a safe haven they can find in the nook of an old tree or prepared for them to occupy, pecked out by a woodpecker or a myna. Unfortunately, the trees in which to build their nests have become few and far between owing to the human activity of tree logging.

Anxious parents are seen flying from tree to tree in search of a possible home. Once found, there is no time for dilly dallying. If they are not quick enough to occupy it, the much-in-demand space is soon gone. Worse still, they might have to fight to retain what was found.

The lucky female enters her new home and then shuts the door, leaving just a narrow slit through which the male can adoringly gaze at her and the chicks when they hatch. The gap also serves as the service window for the male to push in nutrition for his family—fruit, reptiles and even small mammals. The young chicks and their mother live off home delivery for a couple of months before the chicks are ready to take flight.

Aparajita Datta was sad to see the hornbills face this space crunch. Borrowing an idea from Pilai Poonswad in Thailand, her colleagues at the Nature Conservation Foundation and she created a Hornbill Nest

Adoption Programme (HNAP). This was in partnership with the Ghora-Aabhe Society (GAS), an association of village elders (ghora means village and aabhe means father in the Nyishi language), and the State Forest Department. GAS itself was formed years earlier when heads of several villages neighbouring the Pakke Tiger Reserve pledged to work closely with the local forest department to protect and defend the forests of Pakke from deforestation and hunting, amongst other things. This was a major breakthrough as Pakke is a haven for hornbills with four of the nine species found here—the Great Hornbill, the Wreathed Hornbill, the Oriental Pied Hornbill and the Rufous-necked Hornbill.

HNAP was founded in 2011. Its first act was to take the help of the tribesmen to conserve the trees in the forest. Toward this, the communities ruled to prohibit cutting down of nesting trees. The fine for felling them was set as high as ₹1,50,000.

To keep an eye on their wards, the Nyishi guardians trek through harsh terrain, even when the monsoon turns forest paths into sliding chutes. In the first year, nine nests were found and protected; an honorarium of ₹1,000 a month was given. The next year, the programme paid each nest guardian a salary of ₹3,000 per month for eight months, from January to August, the breeding season. Even though they weren't paid for the remaining four months, the guardians continued to protect the nesting trees. Since then, many have come forward to be a part of HNAP. In 2019, the remuneration has gone up to ₹8,400 per month.

Since it began, the programme has helped more than 100 chicks fledge. To keep the interest in protecting the hornbill alive, the Pakke Paga Festival (paga is the Nyishi word for Great Hornbill) now runs in full swing. This unique event is centred around wildlife and celebrates

the role of the local Nyishi community in conservation efforts around the Pakke Tiger Reserve. The first edition of the festival was held in Seijosa in January 2015. In 2018, the Chief Minister declared it a State Festival of Arunachal Pradesh.

Veena Rai

Programme Coordinator, Eastern Himalaya

Nature Conservation Foundation

1311, Amritha, 12th Main

Vijayanagar, 1st Stage, Mysuru 570017

Karnataka

veenarai@ncf-india.org

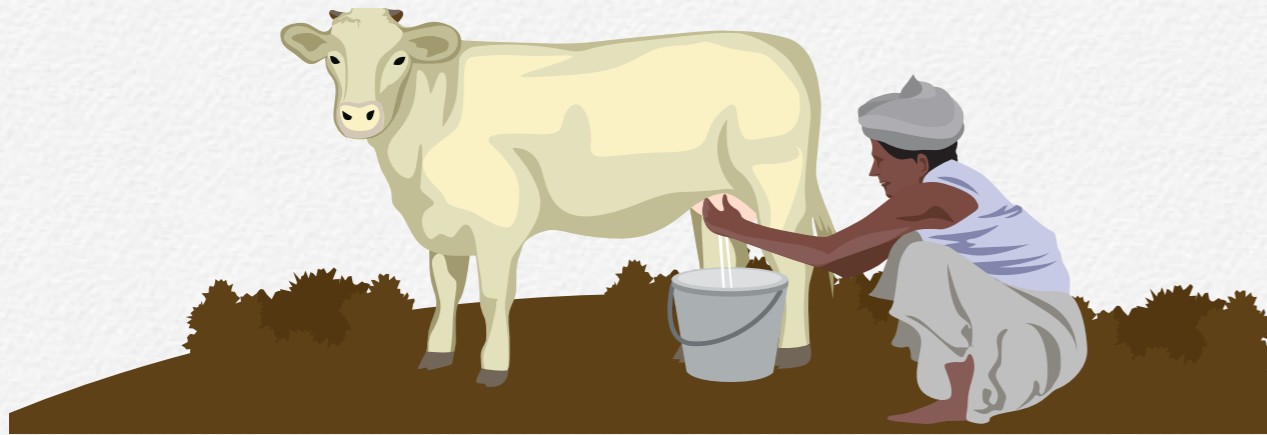
+91 8212515601

<http://ncf-india.org/>



A Modern-Day Kamdhenu





A Modern-Day Kamdhenu

India has the largest cattle population in the world. The Vechur (*Bos indicus*) is one of the indigenous cattle breeds of Kerala. It is named after the village of Vechoor in Vaikom Taluk, Kottayam district of the state.

The Vechur is the smallest cattle breed in the world according to the Guinness Book of World Records. Its average length is 124 cm and height 90 cm. This species is a modern-day Kamdhenu (the divine cow that gives so much). It is valued for the larger amount of milk it produces against fodder ratio as compared to other small local breeds.

The capacity to digest coarse fodder and the high tolerance to a hot, humid climate are the specialties of this breed. Look at the many other good qualities this cow has. It has higher resistance to foot and mouth disease, compared to the cross-bred species coexisting in the same locality. The medicinal properties of the Vechur cow's milk have been documented by Ayurveda and recent scientific studies have substantiated this. Folklore relates how the fame of the Vechur went far and wide and resulted in many ailing royals sending out their men

to Vechoor to bring back this priceless animal so that they could drink its milk and get well again. The protein component of the Vechur cow's milk has an antimicrobial property. As per recent findings, the antibacterial property of the lactoferrin protein present in the Vechur cow milk is more than that of the antibiotic ampicillin. The presence of A2 beta-lactalbumin in the milk and higher arginine content are much valued. The smaller fat globules of the milk make digestion easier. Vechur ghee (clarified butter) is famous for its medicinal values.

At one time, the tiny gentle cows were so greatly valued that well-wishers presented these as wedding gifts. Till the 1960s the Vechur continued to be the popular choice of cattle in Kerala. However, it became rarer over time, as native cattle continued to be crossbred with exotic varieties. It reached a critical stage in 2000 when the Vechur was listed on the Food and Agricultural Organisation of United Nation's World Watch List of Domestic Animal Diversity in its Critical-Maintained Breeds List. The signs pointed to imminent extinction as breeds are included in the list when the number of breeding females and males fall to very low levels.

Fortunately, the Vechur cows were saved from disappearing from the face of Earth by the remarkable efforts of Dr Sosamma Iype, Professor of Animal Breeding and Genetics. Along with a team of her students, she started a conservation unit in 1989 and then set up a Conservation Trust in 1999 to continue this work with the participation of farmers.

Dr Iype says, 'Our veterinary friends working in the field helped us make the initial contact with people owning these cows. The team of students also fanned out and kept a lookout and brought back information on any additional Vechur cows they heard about. Some were hidden away

in homes or placed in the sanctuary of temples. The locals were persuaded to hand over their cows for scientific breeding to increase the dwindled numbers. As they revered this species, they were happy to cooperate. The incentive promised was the assurance of receiving Vechur calves.'

And so with eight cows a conservation unit was started in the Kerala Agricultural University. Gradually more and more animals were added, taking the numbers to 40 in the first year alone.

The Vechur Conservation Trust has taken charge of the mission to save the Vechur.

According to a recent estimate there are now about 4,000–5,000 Vechur cows. This shows that a joint effort by varied stakeholders—the general public, scientists, government officials, cattle owners—is the mantra for conservation programmes to be successful and sustainable.

Sosamma Iype

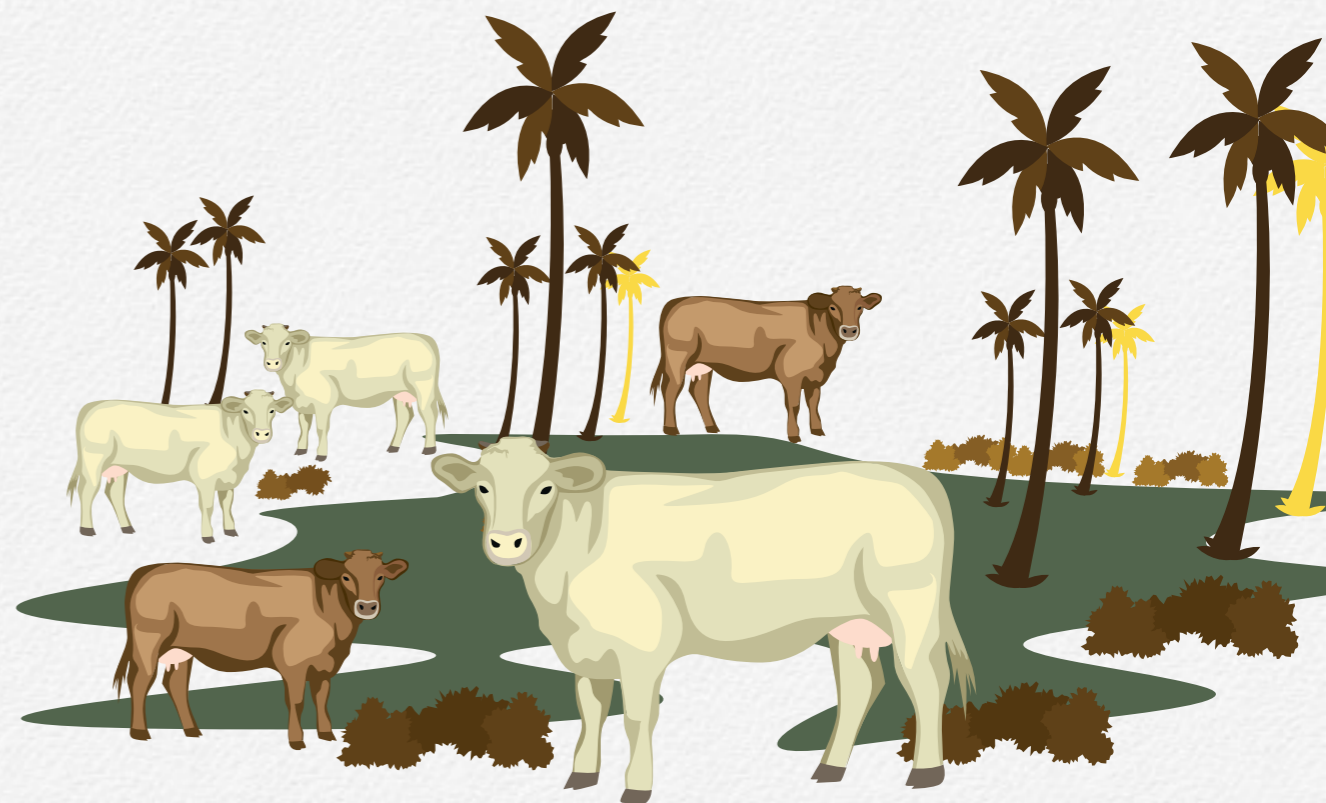
Director of Research

Vechur Conservation Trust
A-37, Street 2, Indira Nagar
Mannuthy PO
Thrissur 680651
Kerala

sosammaiype@gmail.com; sosammaiype@hotmail.com

+91 4872370689; +91 9447991580

<http://vechur.org/>



A People's Approach





A People's Approach

The Kashmiri Red Stag (*Cervus hanglu hanglu*) or hangul in common parlance is a rare species. Once widely found in the mountains of Kashmir and in parts of Himachal Pradesh's Chamba district, it is now restricted to areas in Kashmir. From a population of 5,000 in the early 1900s, hangul numbers today stand at around 200. It is alarming to think that future generations may never get a glimpse of this majestic deer with its 11 to 16-point antlers!

In 2016, IUCN classified the hangul as a 'Critically Endangered' species. Conservationists opine that it is disappearing rapidly due to a number of reasons. These include poaching as well as shrinking and fragmented habitats as more and more virgin territory is inhabited by humans. The fear of its extinction is compounded by projections that a quarter of their population is likely lost every generation (14 years).

The NGO Wildlife Conservation Fund (WCF) is working to save the hangul. Led by their founder and mentor Nadeem Qadri, the group adopts a people-centric, multi-pronged approach in its mission to save this pride of Kashmir.

WCF's first task was to map hangul areas. Their habitat is the high mountain regions of the Himalayas. In winter, the herd moves south to the Dachigam National Park. This is an oasis located on the periphery of a densely inhabited city, Srinagar. When the weather changes, the hangul makes its way back to the higher altitudes.

Villages have sprung up at many points along the traditional transit corridors of the hangul. In addition, migratory communities such as the Gujjars and Bakarwals set up their temporary camps here. WCF members realised that in order to ensure the success of their campaign, it was necessary to have the goodwill of the locals. Thus, quality time was invested in holding discussions with various stakeholders. Hours spent patiently listening to locals' problems while sipping steaming hot Kawah Chai, often under the shade of a Chinar tree, not only helped build strong ties with the communities, but also led to opportunities to explain why the hangul was so very precious.

WCF focused on mobilising youth. 'Save the Hangul' Eco Clubs were established in schools around hangul areas. Innovative presentations, illustrated lectures, games and exposure visits to catch a glimpse of the elusive hangul, inspired students to pledge to save these beautiful creatures. They took their newly acquired knowledge a step further and disseminated it to those even beyond the confines of their schools. Local leaders were another important group. 'Move livestock away from where the hanguls graze, nurture trees whose leaves are

a favourite food for the hangul, be vigilant and report any signs of poaching,' was some of the advice shared with chieftains and the village heads.

The Wildlife and Forest Department officials, responsible for ensuring safe transit passages and undisturbed habitats for the hanguls, are another key group with which the NGO interacts. WCF petitioned the Department to increase the area reserved in Dachigam for the hanguls and to provide alternative land away from Dachigam for people to collect guchhi (wild mushrooms) that grow there. As the season to harvest the guchhi coincides with that of hangul fawning, hordes of enthusiastic gatherers of this Kashmiri delicacy descend upon Dachigam. This disturbs the shy hanguls and affects their fawning as they are very sensitive to movement. Even a step a few yards away will shy it away from mating. Officials from the police force as well as a multitude of other departments such as fisheries, tourism, road building etc were also sensitised to the important role they could play to save the hangul.

In most cases, win-win solutions were found. For example, single-use plastics are banned in and around wildlife areas in Jammu and Kashmir. To make the shift to biodegradable materials, affordable alternatives were offered. Migrants approached to translocate to areas away from hangul habitats were assured that the new lands were equally cultivable with enough pastures for grazing their flocks, had orchards and were within walking distance to villages so that they could get their daily needs.

Today, the 'Save the Hangul' initiative goes beyond the immediate hangul areas. In cities, many campaigns such as 'Run for Hangul' are organised to inspire children in urban areas to support the

conservation efforts. WCF members found it was critical to help policymakers (many of whom live far from hangul territories) understand the need to implement eco-friendly policies aimed at protecting this endangered species.

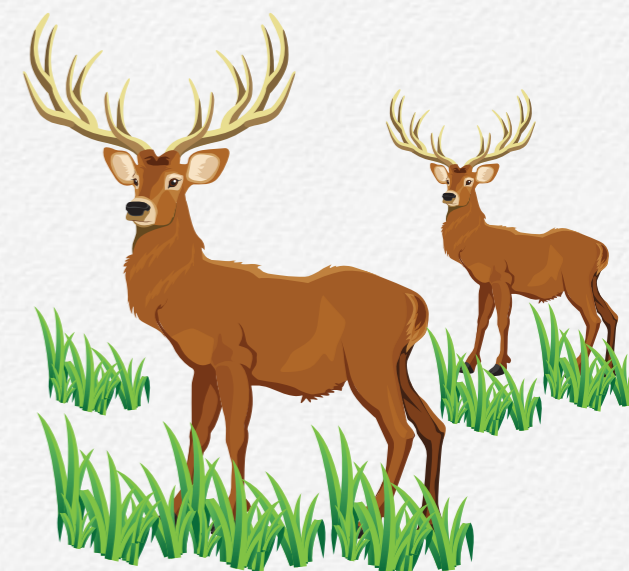
And so it was that a campaign with the people, and by the people, but for the hangul saw success. The census of March 2019 recorded 220 hanguls. The majestic deer are now sighted in areas they had previously abandoned such as those adjacent to the Conservation Reserves of Khrew and Khanmoh.

'We cannot be complacent,' Nadeem says. 'Much more is needed before we can breathe a sigh of relief, knowing that the hangul will safely remain in our midst. Efforts will continue till the hangul is taken off the 'Endangered Species' list,' he says.

Nadeem Qadri

Executive Director

Wildlife Conservation Fund
Gulshan-i-Jeelani, Namlabal
Pampore, Pulwama
Srinagar 192121
Jammu and Kashmir
qadrinadeem13@gmail.com;
wcf.ybjk@gmail.com
+91 9906780356
<https://wcf.org.in/>



Angels in Disguise





Angels in Disguise

Renowned writer Ruskin Bond has written a poem on one of the most neglected and misunderstood species on the planet—the bat! He writes, ‘Most bats fly high/ Swooping only/ To take some insect on the wing; But there’s a bat I know/ Who flies so low/ He skims the floor; He does not enter at the window/ But flies in at the door’.

We quote this simple verse because it is rare to find a writer willing to pen something for a species often despised and mistakenly considered a harbinger of bad luck with the result that in literature and cinema, the nocturnal creature is usually depicted as a vampire or creature of evil.

Much of this acrimony can be attributed to the bat’s clumsy appearance and uncanny habits. But these flying mammals are very useful and really quite fascinating, playing important roles in the ecosystem as pollinators, seed dispensers and pest controllers. Have you heard the term

chiropterophily? It means pollination by bats. There are many plants that depend solely on bats to pollinate their flowers or spread their seeds. You may be surprised to learn that dates, vanilla, bananas, guavas and chocolates (amongst others) are all products of bat-adapted plants.

Bats are broadly classified into two groups. Microbats form 70% and megabats largely make up the remainder. Megabats are usually large and live primarily in tropical regions. They are generally frugivorous and act as seed dispersers in a forest ecosystem, thus enabling the vital act of regeneration. They carry inside them seeds of the fruit consumed. These are often excreted far away from the original tree where they get mixed with the natural fertiliser of bat droppings, resulting in quicker germination. Similarly, nectar-feeding bats act as pollinators for large flowers that are not visited by insects. The bats’ well-developed noses help them. The microbats (insectivorous bats) are smaller with tiny eyes and large ears. They are excellent as pest controllers, feeding on three times their body weight of insects each night. What an excellent way to keep bugs away from crops!

Founded in 2014, the Bat Conservation India Trust (BCIT) is the brainchild of wildlife photographers, Rajesh Puttaswamaiah and Chaitra Ramaiah. Driven by a mission to conserve the natural habitats of the various bat species across India, as well as to bring bats into the narrative of mainstream conservation, BCIT produces documentaries to educate people on the importance of these small flying mammals. They also encourage budding naturalists, biologists and photographers to study bats as there is presently a dearth of data available on them.

To showcase bats in a favourable light, BCIT publishes a cartoon series illustrated by Rohan Chakravarty featuring Cheeku, a fruit bat and Meeku, an insect bat, as its protagonists. The series is translated into several languages so that children in multiple regions better understand these much-maligned creatures.

Talking about their agenda, Rajesh and Chaitra explain, 'With the frontier between humans and wildlife diminishing at an alarming rate, BCIT emphasises a comprehensive strategy that includes field conservation, supplemented by public awareness campaigns and citizen science programmes. Orthodoxy and misconceptions continue to outweigh the ecological importance of bats. Much more needs to be done to protect bats from becoming extinct. Their very useful role as a key species in the ecosystem must be brought to the fore. Fruit bats need to be removed from the vermin list of Schedule V of India's Wildlife Protection Act 1972 so that they are not hunted to extinction. We need to have more students take up research work on bats. Furthermore, we need collaborations with various universities and laboratories to document the migration of bats and decode their DNA. We need to map all the major roosts such as caves, ruins and temples and ensure the population is monitored for stability. It is also important to construct artificial caves in places where natural cave ecosystems are lost due to quarrying and to provide alternate roost sites for bats to thrive. It will be helpful to influence farmers to reduce their dependency on pesticides and let natural predators such as bats do their job,' they say.

One of the team's conservation projects relates to the harvesting of bats by the Bomrr community in the State of Nagaland. This is a very challenging task because Bomrrs believe their souls will find acceptance in the afterlife only if they consume bat meat in this one. Every year,

around October, members of the Bomrr clan celebrate an annual festival in Mimi village. Ascending a stiff climb, they reach caves where thousands of bats live. The tribesmen suffocate the bats by burning large piles of wood in the caves. The dead bats are then collected, turned into a curry and consumed with rice in a ceremonial feast. The clan members believe that by doing so their souls will face no hindrance in reaching their ancestors. With little funding, overcoming a cultural practice sanctified by tradition in a remote area of Nagaland is not easy. But the team plods on with the hope of a major mindset reversal led by the Bomrr community opinion leaders.

BCIT officials say bats continue to face a lack of popularity as a species. This is a great challenge. It is hoped that the extensive and attractive communication materials they produce will play a big role in making people better understand these much-maligned creatures. 'We must secure for them their just status of creatures important to ecological systems,' they say.

Rajesh Puttaswamaiah

Trustee

Bat Conservation India Trust
285, 10th Cross, Rashi Residency Layout
Kadabgere, Magadi Road
Bengaluru 562130
Karnataka

rajesh@bcit.org.in

+91 9448313180

<http://www.bcit.org.in>



Damsels and Dragons





Damsels and Dragons

Damselflies and dragonflies are beautiful works of nature. Their gossamer wings and sleek elegance are fascinating. These insects are categorised as Odonata—useful biocontrol agents that are predators in both larval and adult stages. For guess what is their favourite snack? Mosquitoes and mosquito larvae! If only there were more of them in dengue-infested areas, citizens might perhaps be less vulnerable to contracting the disease.

These insects, well represented in the history of human culture, have both aquatic and terrestrial modes of life. Not restricted to just one particular habitat, they happily exist in varied ones—static and fast flowing waterbodies, streams close to hills, forests and marshes. Because of their complex life cycle and a tendency to occupy varied habitat niches at different life stages, these are model organisms to study evolutionary processes such as prey-predator interactions.

Damselflies and dragonflies are even acknowledged as ecological indicators of riparian ecosystems.

Though taxonomy provides some information on them, it is only lately that in India dragonflies and damselflies have become favourites to study by naturalists. Neha Mujumdar, who is with the prestigious Bombay Natural History Society (BNHS), is one of them. She is working to do her bit to research and document the species for she notes that even the IUCN Red List of Threatened Species mentions these as data-deficient.

Her focus of study is the many stages in the reproductive behaviour of the damselflies and dragonflies, the microhabitat and waterbodies they choose to lay their eggs in, and other abiotic factors such as temperature levels that attract their presence. Speaking about her work, Neha says, 'The reproductive behaviour of damselflies and dragonflies is unique. The males conduct what is termed 'sperm guarding.' That is, they mark out and secure their territory against rival claimants and then guard the female till the egg-laying stage is over.' Over her years spent researching damselflies and dragonflies, she is happy to note that the tribe of odonate-lovers is growing in India—both of experts and even amateurs. With wider sharing of knowledge and experiences, interest and concern for odonates is taking a quantum leap forward. People find it fascinating to learn how diverse Odonata are and how varied their locations. 'I am happy to report', Neha says, 'That the common people are also brought into the fold and are encouraged to be Citizen Scientists.'

To keep this growing interest alive, experts (Neha included) seize all opportunities to conduct introductory workshops for large audiences. The growing interest in the taxa is evidenced by larger attendances

at events such as the annual Dragonfly South Asia Meet. They have been particularly successful in attracting young minds through presentations at Young Ecologists Talk and Interact (YETI 2018, Baroda) and with engagements at multiple Student Conferences on Conservation Science (SCCS 2018 and 2019 Bangalore). The Dragonfly Festival, hosted in Delhi by the World Wide Fund for Nature—India and BNHS's Conservation Education Centre, Delhi team led by Mr Sohail Madan, has several innovative strategies to draw in students. Held during the monsoon, when the creepy crawlies are more likely to come out, the month-long exercise has a series of youth-centric events that include conservation photography and drawing competitions; campus censuses for the youth to discover Odonata in their study spaces; and training sessions by The Indian Dragonfly Society experts to help youth be dragonfly educators.

However, Neha cautions that this is just a drop in the ocean. 'Much more scientific research is needed and also multiple innovative strategies adopted to widen public interest so that they take on the role of scientists,' she says. 'So far, major research is conducted mainly in protected areas. But what about the non-protected ones? For a clearer picture of the distribution of the known species, and to 'discover' so far undocumented damselflies and dragonflies, work on both is necessary. The data will help lay the foundation for the formulation of policies for Odonata conservation,' she says.

Neha Mujumdar

Scientist A, Conservation Department

Bombay Natural History Society
Hornbill House
Shaheed Bhagat Singh Road, Fort
Mumbai 400001
Maharashtra

n.mujumdar@bnhs.org

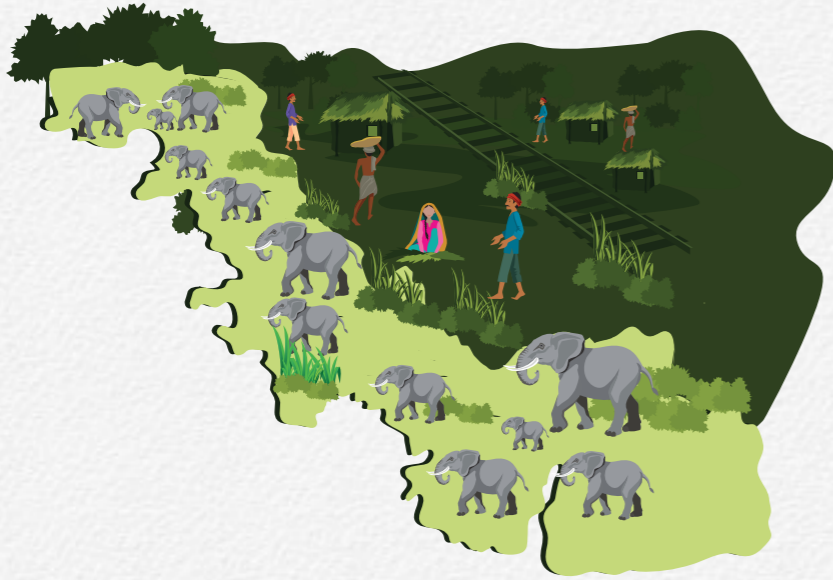
+91 9029044487

<https://www.bnhs.org/>



Gajah to the Prajah





Gajah to the Prajah

Elephants have roamed the Indian subcontinent for centuries. Over time, this majestic species established close ties with humans. They are mentioned in mythology, folklore, religion, history, warfare, culture, tradition, art and law. The Asian Elephant is India's National Heritage Animal. It is conferred the highest level of protection under Schedule I and Part I of the Indian Wildlife Protection Act (1972).

Elephants are nomadic animals that traverse long distances to support their sizeable diets. They are a keystone species and are essentially called the gardeners or architects of forests. 'Asia's largest land mammal' is hard to overlook, not just because of its size but also for the massive role it plays in maintaining ecosystems.

Despite all of the above—their splendid history of association with humans; their critical role in the ecosystem; and the legal status conferred to ensuring their protection—Asian Elephants are running out of space and time. In less than a century, there has been an estimated decline of 50% in their population in India.

India is home to around 27,312 elephants, which is around 60% of the world's Asian Elephant population. The country has 29 elephant reserves distributed across 10 elephant landscapes within 14 states. The landscape however is not contiguous and is interspersed with areas of human use and habitation. Moreover, 'elephant reserves' have not been granted any legal protection against further encroachment (except for the ones falling under the existing Protected Area (PA) network). Hence, the species is protected by law but their home-range isn't. This has resulted in massive habitat loss and fragmentation owing to pressure from fast-increasing human population, changing lifestyles and consequential agriculture and development activities. The ever-shrinking forests are bringing elephants into direct conflict with humans, more often than not leading to fatal results for both. Every year, in India, nearly 100 elephants get killed, 450 human lives are lost, a million hectares of agricultural land is destroyed (due to crop-raiding by elephants) and 5,00,000 families are affected.

Rising intolerance towards a species that has traditionally been revered in the country is a major cause of concern. It is important to curtail this change in perception.

To secure a future for elephants in India (and promote human-elephant co-existence), it is important to ensure their unhindered movement between key habitats. For uninterrupted access to larger areas, elephants are using narrow passages called 'elephant corridors' that are the only linkages connecting the once contiguous but now fragmented elephant habitats. The Wildlife Trust of India (WTI), through a project titled 'Right of Passage', has identified (and aims to protect) 101 such elephant corridors across 11 elephant range states in India in partnership with the Government of India's Project Elephant.

Further, to take Gajah (the elephant) to the Prajaha (the people), WTI initiated a nationwide campaign, Gaj Yatra, a journey celebrating elephants, in 2017. Launched in partnership with the Ministry of Environment Forest and Climate Change, United Nation Environment Programme and International Fund for Animal Welfare (IFAW), Gaj Yatra in the form of a roadshow, aims to influence public demand and policy change to ensure 'Right of Passage' for elephants.

The campaign will be taken to all corridor states to sensitise and involve the targeted stakeholders. Specialised workshops (with media, line agencies, tea estates etc), localised rallies, street plays, flash mobs, awareness talks, inter-school elephant-themed competitions, school wall painting and felicitation of local heroes are some of the activities conducted during the campaign. So far, the yatra (journey) has covered the states of Meghalaya and Tamil Nadu.

As a part of the campaign, WTI conducted the largest event around Asian Elephants in August 2018 titled Gaj Mahotsav. The event was organised in New Delhi for four days starting on 12 August, World Elephant Day.

It was a blend of eight carefully curated tracks: Gaja Shastra (policy and technical sessions); Gaja Sutra (media sessions); Gaja Dharma (elephants in religion); Bala Gaja (sessions with children); Airavata (elephants in literature, culture and heritage); Gaja Gamini (film screenings); Gajotsava (evening sessions and festivities); and Gaja Yatra (art for elephants). 101 life-sized elephant art pieces created by artists across India were put on display during the event, along with elephant-themed photography and painting exhibitions. The event witnessed participation from nearly 6,000 people, including policymakers, politicians, senior bureaucrats, elephant experts, leaders of industry, senior journalists, influencers from the world of entertainment, prominent filmmakers, religious leaders, artists, authors, publishers, children and the general public.

These concerted efforts towards Asian Elephant conservation have impacted several policy level interventions and favourable judgments by Supreme Court (SC) and National Green Tribunal (NGT). To mention a few: SC recommended sealing/demolition of 821 illegal constructions within the Nilgiris elephant corridor; NGT proposed declaration of all elephant corridors as eco-sensitive zones; Kerala Forest Department initiated construction of ramps across the steep ghat-road to ensure safe passage for elephants; the NGT directed the removal of electric fences and barbed wires installed by resorts around elephant corridors in Tamil Nadu and Karnataka; Odisha Government ordered power distribution companies to disconnect power supply in elephant corridors; NGT imposed a fine on National Highway Authority (NHAI) for delay in construction of an elephant underpass in Rajaji; Ministry of Road Transport and Highways directed National Highway and Infrastructure Development Corporation Ltd (NHIDCL), Border Road Organisation, NHAI and states to ensure proper 'animal passage plans' for road projects passing through wildlife habitats; Additional Chief Secretary, Assam proposed legal protection for corridors in Assam in a joint meeting with WTI; Karnataka Forest Department extended the Edayarahalli-Doddasampige corridor secured by WTI and IFAW in 2005 by 500 metres.

By bringing elephant conservation centre stage, WTI aims to secure a future for India's National Heritage Animal. There is still a long journey ahead that calls for persistence and optimism. With support from the relevant sectors 'Right of Passage' for Asian elephants in India can definitely be ensured.

Vivek Menon

Executive Director & CEO

Wildlife Trust of India

F-13, Sector 8

Noida 201301

Uttar Pradesh

vivek@wti.org.in

+91 120 4143900 (30 lines)

<https://www.wti.org.in/>



Kids for Tigers





Kids for Tigers

International Tiger Day 2019 brought great cheer. The Status of Tigers in India Report announced an increase in population. Conservationists were all smiles to hear that the tiger population now stands at 2,967 tigers in the wild—a 33% increase from 2014 and double the 2006 count.

While trained wildlife officials and scientists are justifiably pleased with the numbers, let us not forget the work done by organisations such as Sanctuary Nature Foundation, founded by wildlife icon Bittu Sahgal, which works tirelessly to help conserve tigers. Their Kids for Tigers programme is a prime example.

In 2000, Bittu, working with colleagues that included Dr Anish Andheria and Brother Noel de Sa, formalised outreach to kids with the launch of Kids for Tigers, an environmental education programme developed to create mass awareness amongst children about this majestic animal and the need to save it to secure even our own futures. Bittu firmly believes that the powerful voice of kids is devoid of materialistic gain and that they have the idealism and energy to take campaigns to fruition. His infectious enthusiasm and ready wit work magic in capturing young attention as he explains how the tiger is crucial to all species, playing as it does a pivotal role in the health and diversity of an ecosystem. ‘As a top predator at the apex of the food chain, it keeps the population of the wild in check to maintain the balance between prey herbivores and the vegetation upon which they feed. More tigers lead to greater regeneration of degraded forests and growth of catchment areas that in turn result in millions of gallons of pure water making its way into as many as 600 rivers,’ he explains.

The launch of the campaign in Mumbai with a Kids for Tigers mela (fête) saw an unprecedented turnout of 25,000 children and their families. The rallying cry raised there, ‘Tiger Bachao, Bharat Bachao!’ (Save the Tiger, Save India), today resonates across the length and breadth of the country. Since its inception, Kids for Tigers has reached over 1 million children in over 750 schools across some 30 cities. Through exciting workshops and nature walks, the programme has successfully sown the seeds of appreciation for wildlife amongst children and has empowered them as well as their teachers towards conservation and environmental action.

The annual Tiger Fests held in different cities celebrate all that is special about the tiger and its habitats and serve as a reminder of how closely our lives are connected to our wonderful National Animal. It is also a marvellous opportunity for children to showcase all they have learned about nature and the environment with a lot of fun, colour and creativity. They express their support for saving the tiger through activities such as poster making, fancy dress competitions, art installations, nature games and face painting.

Every year, Kids for Tigers chooses exceptional children from across the country to be their Tiger Ambassadors for that year. The selected Ambassadors camp in a tiger reserve to experience wild nature first hand and interact with experts in the field. They then carry the message of conservation wider, to friends and peers and others with whom they interact.

Keeping in mind the multiplier role teachers play, Teachers' Environmental Leadership Workshops are held every year at which renowned naturalists, NGOs and policymakers engage with the educators to widen their knowledge of environmental issues.

And thus awareness about the circle of life expands rapidly. Who could imagine that a seed sown by one man would have such wide-ranging benefits? But it has. Kids for Tigers take a bow. Your role is just as important in helping to save the tiger—no ordinary animal but one designated an indicative species as it denotes the health of an ecosystem and a keystone species as well for without it so many other species are likely to die out.

‘Our efforts to save the tiger cannot slack, no time for complacency,’ Bittu says. ‘While I am happy to note the increase in numbers, let us not forget that there are vast landscape tracts from which the National Animal has vanished. Can we bring it back to these habitats also?’ is his question.

Kids for Tigers goes beyond just tigers to other species as well. Designated vans traverse villages surrounding wildlife sanctuaries plagued by human-animal conflict. To name a few: Ramnagar, Dudhwa, Dachigam National Park and Ranthambore. The trained staff in the vans go from village to village educating the children and the villagers on the importance of conservation. Wildlife related films are screened, topical books lent, photo-exhibitions held, and famous conservationists and naturalists featured as speakers. This has translated into support and participation of local communities in conservation efforts. The people now don't kill wild animals that stray into their homes or fields but instead rescue and leave them back in the forest. Many of the kids have grown up to take charge as forest officials while others have become guides. Family members are persuaded by their children to turn away from poaching and instead become conservationists.

Amandeep Kaur Bamrah

National Coordinator, Kids For Tigers

Sanctuary Nature Foundation

Pragati Industrial Estate

NM Joshi Marg

Mumbai 400011

Maharashtra

Amandeep@sanctuaryasia.com

+91 9970699350

<https://www.sanctuaryasia.com/>



Living Reefs





Living Reefs

Coral reefs are like bustling underwater cities. The buildings here are made of calcium carbonate. They come in all kinds of shapes—boulder, branching, table-top—and are home to thousands of small fish and invertebrates that they attract from the vast sandy stretches of the sea floor. Over millions of years, coral reefs have become such hotbeds of life that more than a third of ocean life is found here, even though they cover less than 0.02% of sea surface.

The difference between the ruins of underwater cities and coral reefs is an amazing fact. These underground structures of calcium carbonate are themselves living, breathing, animals. Though they look like stones, each coral is made up of millions of little jellyfish like animals called polyps. These soft-bodied invertebrates have a symbiotic relationship with algae called zooxanthellae that live inside their tissues and photosynthesise to produce enough energy for the

polyps to replicate, make a calcium carbonate exoskeleton and grow. Over hundreds of thousands of years, layer-by-layer, polyp after polyp has laid down calcium carbonate to make the massive reefs that we see today.

Although the corals appear to have tough exteriors, in reality these organisms are extremely fragile. They thrive only in specific environmental parameters such as clear water, a seabed shallow enough for light to penetrate, warmth and low nutrient levels. And a delicate balance is essential. For example, while warmth is important, temperatures too high lead to a break down in the relationship between polyps and zooxanthellae. The polyp then expels its colour and energy-giving partner from its tissue. This leads to bleaching, weakening and also death.

Today, 75% of Earth's coral reefs are listed as threatened. Sadly, many have already reached the point of no return. With the rate at which our sea surface temperatures are rising, bleaching incidents have become almost common. The beautiful coral reefs in the Andaman Islands are no exception. The archipelago has faced multiple bleaching incidents in the last decade. Surveys, post the 2010 bleaching, brought up the dismal statistic of over 70% of the coral cover being adversely affected. The two subsequent events have affected even more areas.

The loss of coral reefs, even though they cover such a small percentage of the ocean relatively speaking, can have catastrophic effects on marine life, coastal communities and even global climate. With such a large percentage of the world's coral reefs in such a dangerous state at the

moment, the time for action is right now. What coral reefs eventually and undoubtedly need is for us to stop emitting carbon at the rate that we are, so that the oceans stop warming. The key in coral reef conservation in the long term is definitely for the world to come together to stop burning fossil fuels as much and for individuals to lead that change by making better, more sustainable choices.

However, while these large-scale solutions are being worked upon, there is a need to act on a local scale to help offset the loss. This involves setting up marine protected areas, where corals are left alone, undisturbed by localised anthropogenic pressures. ReefWatch Marine Conservation is one such organisation that does just that. It rehabilitates the reefs of the Andaman Islands by creating artificial structures for them to grow on and also further strengthening those structures by giving them a low voltage of electricity that's generated through floating solar panels. This electric current creates mineral accretion, which has been proven to help corals grow faster as well as be more resilient to periods of warm temperatures.

Nayantara Jain of ReefWatch Marine Conservation says, 'Our members rescue broken fragments of coral and rehabilitate these on artificial reefs. The artificial structures are built out of construction-grade iron rebars and sunk into the sand next to the existing reef in the water. Rubble found on the ocean floor is laid under these structures. This helps create some complexity in habitat, places for fish and invertebrates to take shelter, just as they would do on a natural reef. It also helps stabilise the structures in the sand so that they don't keel over when currents are strong. Once all is set with the structure, the team goes

out onto the reefs in search of coral fragments that have broken off from their colonies. These could have broken off due to wave action, fish bites, clumsy divers, anchor damage, fishing practices and more. Broken fragments stay alive for a few days, before getting smothered in the sand and dying. The job is to rescue them before that happens, not to break pieces off live and secure coral colonies. These fragments are then taken over to our artificial structures and tied on using cable ties, making sure that each fragment is securely attached to the structure with no wiggle room. We then monitor how each fragment takes to being transplanted, how well it survives and grows.'

The Re(ef)Build project works because of the ability of corals to asexually reproduce. 'However, corals also have the ability to sexually reproduce and as a tangent to our initial project we initiated Re(ef)Grow. Here we aim to study and understand the natural sexual reproduction of corals in the Andaman Islands. Corals reproduce through spawning and a large part of it occurs on one night in a mass spawning event, where the seed of future corals are spread. It happens at a different time of the year in each part of the world and its timing has never been scientifically recorded in the Andaman Islands. Knowing when this happens, where it happens, and identifying which are the seed areas, can greatly enhance the natural resilience of reefs in the region,' Nayantara explains.

As they move forward, their goals are to better understand these processes while simultaneously educating and raising awareness about coral reefs, their beauty, their fragility, and the importance of individual actions and choices in conserving these biodiversity hotspots.

Nayantara Jain

Executive Director

ReefWatch Marine Conservation

14C Bungalow, Boran Road

Bandra West, Mumbai 400050

Maharashtra

nayantara@reefwatchindia.org

+91 9531958375

www.reefwatchindia.org



Long Live the King!



Section 9



Long Live the King!

Ask anyone, ‘Which is the king of fruits’ and the answer is invariably, ‘The mango, of course.’ Mango trees belong to the flowering plant genus *Mangifera*. This National Fruit of India has thousands of varieties distinguished by size, flavour, colour and time of blossoming. Besides its exquisite taste, it is a rich source of Vitamins A, C and D.

Indians have enjoyed this delicious, juicy fruit from time immemorial. Famous poets such as Kalidas have sung its praises. Alexander the Great relished its taste, as did the Chinese traveller Hiuen Tsang. Mughal emperor Akbar had over 1,00,000 mango trees planted.

Unfortunately, over the years, some of the varieties have physically died out and are alive today only in the memories of older generations. ‘Remember that variety? Our house was always full when mangoes ripened. Relatives from far and wide came to visit and partake

of the delicious mango. But today, alas, it is no more!’ are snippets from conversations of those who remember the mangoes fondly.

Rajapalayam in the state of Tamil Nadu is an area rich with mango orchards of different varieties. KS Jegannatha Raja grew up there. He recalls spending many happy hours in the lush green orchards of the family holdings. He would eagerly wait for the koel (cuckoo) to sing its melodious song to announce that the mango trees were now in bloom, and that soon the orchards would be redolent with the King of Fruits. The heat of summer was forgotten as the fruit pervaded all of his senses. ‘The fragrance wafted in, the laden trees were a sight to behold, and as for sinking your teeth into it, that was pure bliss,’ he says.

In the late 1990s, the Periyakulam Horticulture College, under the Tamil Nadu Agricultural University, Coimbatore, classified Puliadias, a native variety of mango, as endangered. Some apprehended that the variety was already lost to the world. Raja was heartbroken. He packed his bags and returned post-haste to his ancestral lands with a mission to try and resurrect this mango and any others on the brink of extinction.

Hours of conversations with elders gave him a flicker of hope. One of them recalled seeing a surviving Puliyadi mango tree in an orchard somewhere. But where exactly? Raja began an intensive search to locate the lone survivor. ‘Do you have a tree that looks like this?’ he asked villagers as he went from farm to farm showing them a photograph of it. The possibility of finding one appeared remote,

but Raja didn't give up. His joy knew no bounds when he found the treasured tree!

Raja now started his efforts to conserve it. Taking a branch from the tree that stood tall and majestic, he sought the help of an experienced farmhand and was successful in grafting this to create a mother plant. The graft took a couple of years to grow into a tree. Raja waited with bated breath for the Horticulture Institute to confirm that it was indeed a Puliyadi. There were whoops of delight all around when the Institute confirmed that indeed it was. The Puliyadi was back from the dead. And soon it was flourishing. People were stunned to know that the variety, that was given up for lost some decades ago, today has so many trees standing tall.

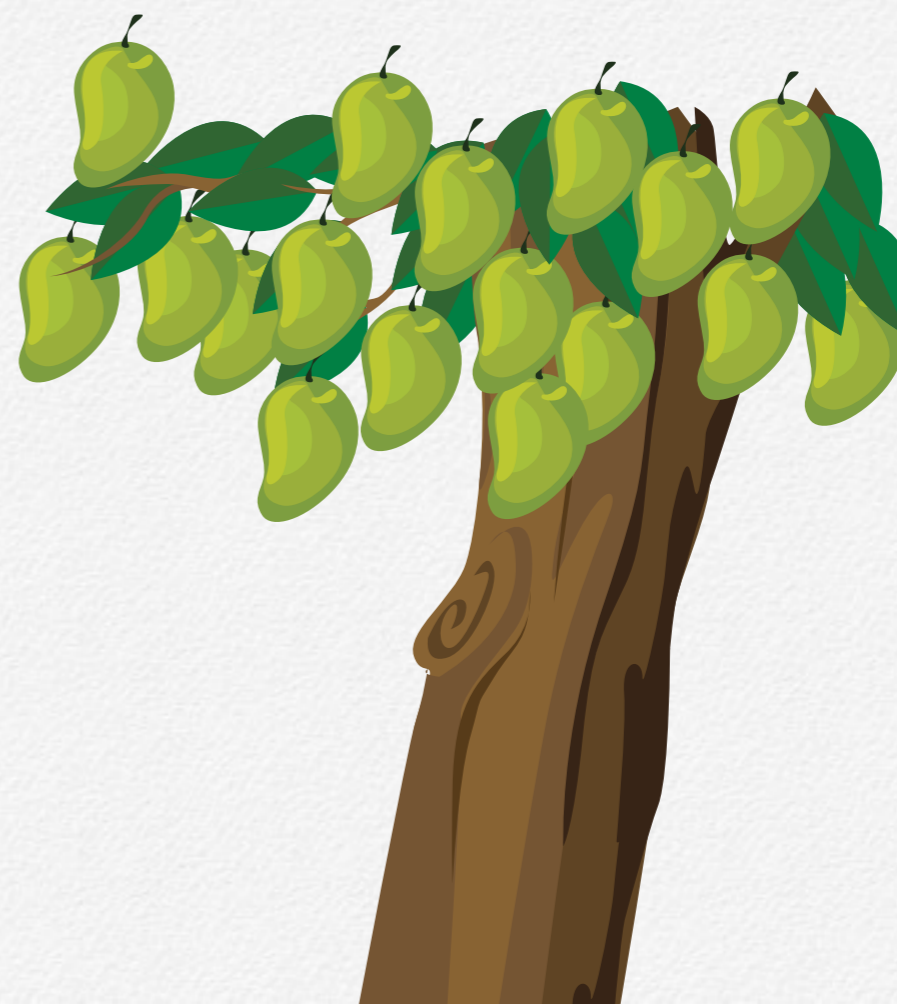
The success of bringing the Puliyadi back to the area has motivated Raja to work on saving other endangered mango varieties. His farm has large tracts of mango orchards where over 20 varieties grow. Each is unique in itself. For example, the Karuppatti kai (or jaggery fruit) is aptly named as it tastes like jaggery. The Panjavarnam variety is a speciality of Rajapalayam. Raja remembers how his mother would preserve the mangoes in jars of honey so that these could be enjoyed till the next harvest came.

To ensure that history is not repeated again, Raja distributed 5,000 saplings of rare mangoes to the local farmers entreating them to grow these so that a day doesn't come when they have to import for consumption mangoes that were once the speciality of the region.

And so, the King lives on and continues to provide so much joy, year after year!

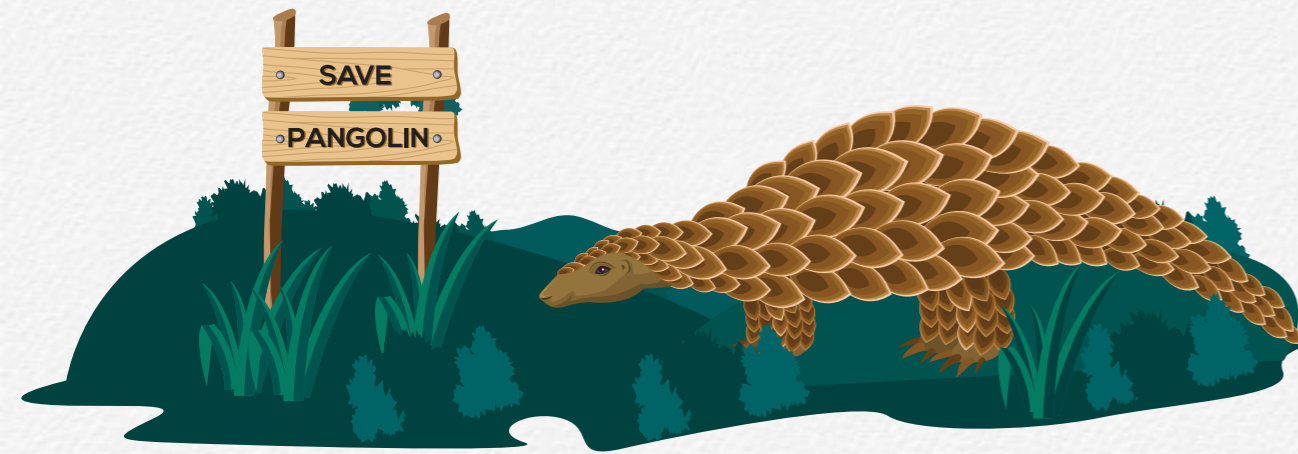
KS Jegannatha Raja

Rajapalayam 626117
Virudhunagar District
Tamil Nadu
rjpmnurserry@gmail.com
+91 9442057077



Nature's Pest Control Company





Nature's Pest Control Company

The pangolin, an insectivore, is aptly referred to as an anteater. This huge creature feeds on thousands of tiny insects—about 70 million per year. Its specially adapted long, sticky tongue helps it ferret out and lap up insects from deep crevices. To tear open anthills or termite mounds, the pangolin's powerful forelimbs are armed with three disproportionately long claws. A nocturnal creature, the anteater rests in burrows during the day and goes hunting once night descends.

The Indian pangolin (*Manis crassicaudata*) was once found in large numbers in the Konkan region of the Western Ghats. Today, it faces the threat of extinction due to an increase in illegal trafficking and trade. Pangolin meat and the rigid keratinised scales on its body are highly in demand in international markets, to the extent that the species has received the unfortunate label of 'most trafficked species

in the world'. As a result, the IUCN has placed it on its Red List of threatened species.

In 1992, a group of like-minded people formed Sahyadri Nisarga Mitra (SNM). The organisation's mandate is to work with communities to help conserve nature across the Konkan. The tremendous work they do with the Forest Department to save pangolins is especially noteworthy. Bhau Katdare, the founder of SNM says, 'Hunters and poachers enter the region in the guise of scrap merchants or daily labourers. Over time they build a rapport with the locals and gather information on where the pangolins can be located. It is difficult for forest or law enforcement officials to monitor such nefarious activities because of the diverse landscape of the region and due to the low levels of awareness within the community. All this helps the poachers.'

To save the pangolin, SNM has developed a master plan that has proven successful over the years. SNM members first identify villages that are within or close to pangolin domains. They begin with small group meetings with the locals to establish direct communications with them. Once a strong bond is established, a random sample survey is conducted so that a baseline can be established. Questions such as 'Are you aware that there are laws for the protection of the pangolin?' are asked. This brings forth valuable information. Their experience is that the majority are unaware of such legislation and thus end up unknowingly getting involved in illegal trade. The questionnaire also helps identify forest dwellers and tribals from amongst the locals who have an inherent talent in tracking pangolin burrows. Their help is taken to narrow down

the pangolin's haunts. Camera traps are then deployed in these areas to verify the results of the survey.

The major trouble spots are shortlisted for immediate attention. SNM begins the exercise by organising specially designed training workshops for the village headmen who are then expected to take on the role of educators for the wider community. Following this, large gatherings with law enforcement and forest officials present to answer questions are held in the village. This helps build bonds of understanding between the local communities and officials. Eye-catching 'Save the Pangolin' messages are printed in the local language and widely distributed. Prominent educational institutes in the area are encouraged to hold lectures on the species, screen documentaries and conduct awareness building exercises through drawing and writing competitions. Pictorial storybooks on the pangolin are shared in Marathi, the local language.

To lure communities away from the poachers, SNM provides training and support that enables locals to take up alternate nature-based livelihoods such as apiculture of wild honeybees (now regularly undertaken in Panhali village) and eco-tourism (home stays and nature guides have begun in Choravane and Veer villages).

SNM is proud to note that in 2018–2019 a total of 12 pangolins were rescued by the community with the support of the Forest Department. These were then released into the wild. SNM was also successful in having 'A Night out with Baby Pangolin,' a short story written by Katdare, introduced as a part of the Maharashtra State Board's Class VII course syllabus.

Things have not always been easy. Winning the support of the local community is challenging. Many members find the urgent need to save pangolins difficult to understand. Furthermore, raids by security officials and seizures of pangolin parts have caused locals to become reluctant to share information. Continuous public relation exercises are needed to maintain healthy ties with the community, allay a fear of those in uniform and remind people how essential pangolins are to the ecological balance.

Over the next two years, SNM hopes to cover the entire Konkan region and thereafter begin work in other pangolin inhabited areas in India. Realising that studying the pangolin is not a favourite subject for researchers, SNM is doing its level best to encourage the scientific community to help them by providing reliable data.

Bhau Katdare

Member of IUCN SSC Pangolin Specialist Group

President

Sahyadri Nisarga Mitra

11 United Park, Markandi

Chiplun, Ratnagiri 415605

Maharashtra

bhaukatdare@gmail.com; sahyadricpn@gmail.com

+91 2355253030; +91 9373610817; +91 9423831700

<https://www.snmcpn.org/>



Sacred Forests





Sacred Forests

Perhaps you watched the film Avatar and wished, 'If only there was a place as magical on Earth.' Don't feel disappointed because the Sacred Forests of India can exchange your reel experience for a real one.

Sacred Forests or Sacred Groves are amongst the few least disturbed forested areas. These natural treasure houses of biodiversity teem with amazing plants, flowering trees, orchids, mushrooms, butterflies and more. Many of these are endangered and rare species. In these patches of tranquillity, time stops and life flourishes, undisturbed by human activity. The green expanses stand out today in a landscape that has become significantly browner as more and more land is appropriated for roads and other human needs.

But even today, you can walk into a Sacred Forest and be transported into another world. They are devoid of normal, everyday sounds. Instead, you will hear the wind as it rustles through the leaves, creating a symphony of its own; birds singing and insects chirping; and the crackling of the undergrowth, clearly audible in the stillness of the forest. Just listening to the sound of water flowing into the streams will refresh your spirit. The fragrance of the flora will engulf you. All around you, beautiful trees of a myriad colours, shapes and sizes surround you in a cocoon of meditative peace.

These virgin forests have a deep spiritual and cultural significance for the tribal communities that reside around them. They consider the forests hallowed ground, believing that the deity that protects them dwells therein. As a result, these spaces are protected by what is often termed 'shadow conservation'—conservation as a by-product of religious stewardship. It is forbidden to cut trees, pluck leaves, gather fruit or flowers, pick up twigs or disturb the natural growth of the forest in any way whatsoever. Woe betide anyone who angers the deity by disturbing the sanctity of the forest. 'Misfortune will surely befall them,' the tribals say.

Meghalaya has a number of Sacred Forests. Mawphlang, located 25 km from Shillong is one of the most frequently visited ones. The Secretary of the Mawphlang Sacred Grove, Tambor Lyngdoh, ensures that traditional rites, rituals, special days and festivals are observed. These remind the community of its duty to preserve the Sacred Grove. Lyngdoh involves younger generations in the ceremonies to prepare them to take up the responsibility to carry on the traditions.

The Sacred Grove is also a fantastic gene pool that helps enhance the community forest around it. Lyngdoh understands this and has worked to protect the 25,000 hectares under Umiam Mawphlang Sub-Watershed, that includes about 9,000 hectares of dense forest and 6,000 hectares of open forest. Ten indigenous governments (Himas) have jurisdiction over the area. After hours in conference with these Hima chieftains, he was able to persuade them to form the Ka Synjuk Ki Hima Arliang Wah Umiam-Mawphlang Welfare Society. This federation has adopted the Conservation of Forest Through Assisted Natural Regeneration method to rejuvenate the area. Although this is labour-intensive, there is adequate help from the entire community to make it productive. Only indigenous varieties are planted, seedlings for which are cultivated in a nursery. In addition to enhancing the green cover, the community helps its women earn by raising pigs, establishing poultry farms, producing handicrafts, forming eco-villages and managing eco-tourism. It also encourages the practice of herbal medicine by tribal healers. This has minimised the community's dependency on forest produce by about half and thus reduced the risk of people removing anything from the Sacred Forests.

The challenges faced by the area include the risk of forest fires during the dry season, the reduction in seeds for planting as rodents enjoy eating these and the practice of open grazing of animals that tend to destroy saplings. Limited funds are an additional issue.

As we all know, deforestation and forest degradation are the leading causes of global warming, responsible for as much as 15% of global greenhouse emissions. This makes the loss and depletion of forests a major contributor to climate change. Lyngdoh has a simple solution to reverse this. 'Just extend the concept of Sacred Groves to the entire state,' he recommends in presentations he makes in the country and abroad when speaking on the significance of the Sacred Forests of the state of Meghalaya before varied audiences as well as prominent leaders such as the Honourable Prime Minister of India, Narendra Modi.

Tambor Lyngdoh

Head and Secretary

Ka Synjuk Ki Hima Arliang Wah Umiam Mawphlang Welfare Society
Dongiewrim Mawphlang, PO Mawphlang
East Khasi Hills District
Meghalaya 793121

tamborlyngdoh70@gmail.com

+91 9863082456



The Gift of a Home





The Gift of a Home

The moment we hear the term ‘Endangered Species’, extinction of wild creatures comes to mind. But who could imagine that the once common house sparrow, a bird that lived in close proximity to humans (not in forests) till recently, is today endangered?

The house sparrow is a social species. It is found in groups of 8 to 10, chirping and chattering to communicate with each other. It is known to nest in buildings, finding crevices and holes in walls, or at best, using the birdhouses and nesting boxes put out by humans in their gardens. It feeds mostly on seeds but in the breeding season adults feed their young with insects.

The ubiquitous chirping of sparrows was the sound people woke up to in the mornings. No matter where humans lived, in a city or on a farm, the beautiful twitter of these birds was always around. Sparrows were spotted everywhere and their nests espied in nooks

and crannies, on the roofs of bus and railway stations and in cracks of walls. Today, over construction, felling of trees and an increasing human population, leave no space for small birds such as sparrows to roost, added to which are the hazardous emissions from mobile towers, air pollution and cables strung everywhere. All this has forced these birds to disappear from most urban spaces in India.

In 2002, the IUCN placed the house sparrow (*Passer domesticus*) on the ‘Endangered Species’ list.

Something had to be done, but where to start from, because there was hardly any research data on the house sparrow. Leading organisations such as the Bombay Natural History Society, Mumbai and the Union Ministry of Environment, Forest and Climate Change, along with concerned citizens, initiated the ‘Citizen Sparrow’ (www.citizensparrow.in) project. The goal is to gather information about house sparrow populations across India and to understand how these have changed in recent times. This was accomplished via an online survey to which all members of the public were invited to contribute. To quote from a summary of their findings, ‘Based on over 10,000 reports from across the country and from different years, some patterns are clear. Sparrow occurrence is reported to be lower at present than in the past, and this is consistent across the country. Sparrow occurrence is lower in cities compared with towns and villages, and this is again consistent in different parts of the country.’

There is however a ray of hope. Recently the sparrows are chirping about a new friend in their midst—Rakesh Khatri, founder of the Eco Roots Foundation (ERF). Rakesh is a documentary filmmaker by profession and an environmentalist by passion. His colleagues

at ERF and he run a flagship programme for the conservation of house sparrows. They design eco-friendly, easy-to-assemble sparrow nests for people to set up so that the sparrows have safe, ready-to-inhabit nesting spots.

Speaking about the campaign, Rakesh calls it one of their most successful and impactful programmes. Believing that sustaining bird habitats is the responsibility of all citizens, ERF reaches out widely to thousands of people. 'We have a hands-on approach. Workshops are conducted to demonstrate an easy method to build a nest. Together with school students, residents of housing societies and employees of corporates, 38,000 jute-based birdhouses and around 40,000 wooden ones have been built and placed in different spots to lure the house sparrows back.'

And the birds have returned to roost! The good news is that sparrows are now reappearing, and their population figures show an upward graph in some cities of the country, although the bulk of their population is now found in Indian villages. IUCN responded to this increase by removing the house sparrows from the 'Endangered Species' list in 2018. This shift is definitely the result of collective contributions by concerned individuals such as Rakesh, other bird lovers, government organisations and non-profit organisations.

ERF's efforts to mobilise communities to help conserve sparrows are recognised by national and international organisations. For example, the International Green Apple Award that recognises international campaigns that promote environmental best practices around the world. ERF received it for sparrow protection. The Limca Book of Records 2019 included ERF for the maximum number of handmade jute-based nests developed, and for the many workshops ERF conducts. Social and

electronic media widely publicised their excellent work. 21 noteworthy organisations have filmed their work. These include the BBC, Down to Earth, and Earth Watch. A special chapter on ERF's sparrow conservation work is included in the ICSE Board textbook for Class IV.

Slowly but surely the sparrow is coming back into the limelight. In 2010, 20 March was declared 'World Sparrow Day'. Since then, every year, there is special focus on these birds and on the need to ensure they have enough space to roost. The state of Delhi declared the house sparrow its State Bird and Mascot in 2012. The state of Bihar also declared it its State Bird in 2017.

Rakesh Khatri

Director

Eco Roots Foundation

6A Pocket 6, MIG, Mayur Vihar, Phase III

Delhi 110096

ecorootsfoundation@gmail.com

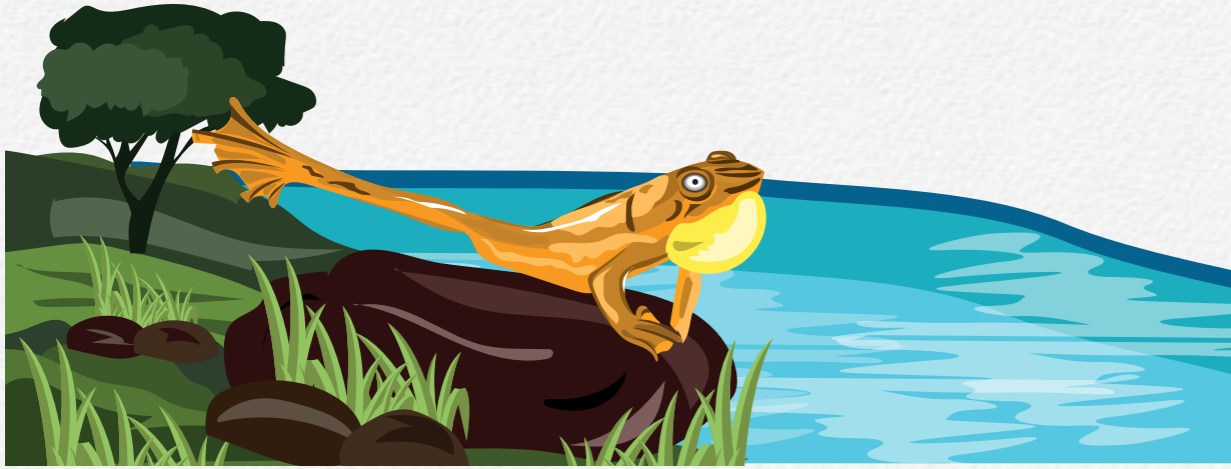
+91 11-22613200; +91 9312626909; +91 8826741891

<https://www.ecorootsfoundation.org/>



The Last Dance?





The Last Dance?

Running along the entire west coast of India are the Western Ghats, a range older than the Himalayas. Whilst not known for its height, the range holds its own as a global biodiversity hotspot. In fact, over three-fourths of India's known amphibians are found in just a narrow strip of rainforest here.

This amphibian biotope is home to some extraordinary species, which include a family of frogs commonly referred to as 'Dancing Frogs'. The creatures are aptly named as the majority of the 24 types of dancing frogs documented in the Western Ghats exhibit 'foot flagging' behaviour akin to dance steps. Typically, a tiny male, often just 13–35 mm long, will stretch out a hind limb, waving its extended webbed foot. The footwork is reminiscent of tap dancing by humans.

In Borneo, similar dances are performed by male frogs to attract the female of their species. However, the foot-flagging of the Western Ghats species is territorial behaviour that warns competing males, 'Stay Out! This is My Space!' A croak could have done the same job. But because of the cacophony of sounds in this teeming environment, individual croaks are often drowned out. Hence, the need for the dancing frogs to supplement their auditory calls with vivid gesticulation.

If a male intrudes into another's territory despite the warning, a kicking match begins between the two. The winner might emerge as the lucky one to attract a female to his reserved space. Then starts what is scientifically referred to as an amplexus. In simple terms, the act of the male holding the female. Together, the couple enter a shallow part of a flowing stream where the female dancing frog uses her hind limbs to excavate a small cavity in the stream bed. Now, it is adieu time as the pair detach, leaving the female to lay her eggs in the 'nursery'. Once reproduction takes place, she protects her precious offspring from predators by covering the spawns with sand and gravel.

Dr Gururaja is a batrachologist whose current research interests are in the fields of amphibian ecology, behaviour and landscapes. He has spent many years in the evergreen Myristica forests of the Western Ghats where perennial swamps prove to be excellent abodes for the water-dependent dancing frogs. Working with peer scientists Dr Doris Preininger and Prof Walter Hodle from the University of Vienna, many hours were patiently spent in carefully observing and documenting what are now referred to as dancing frogs. To date, there is no accurate estimate of how many of these exist. However, what is without doubt is that there is a threat to the survival of the dancing frogs with more and more of their habitat destroyed to make space for agriculture, coffee,

tea, rubber and palm plantations as well as roads. Climate change is also an overarching threat, as are the thousands of hydroelectricity dams in the Western Ghats, which affect rivers and streams, endangering the life cycles of these amazing creatures of the wild.

Dr Gururaja recognises that the work of limited groups of committed scientists is not sufficient to keep the species alive; wider awareness is essential. 'We need to work together to ensure that this species, one that has survived over centuries, doesn't have its last dance in this one,' he says. With this in mind, he has authored a book, 'Pictorial Guide to Frogs and Toads of Western Ghats,' that provides illustrated information on about half of the 156 types of frogs and toads known to exist in the Western Ghats. His book is freely available on the internet. In it you will find information about the habitat, distribution, key identifying features, time of activity and ecological status of frogs and toads in a visual and intuitive manner. Furthermore, an app is being developed to identify frog species based on their unique calls. This Citizen Science project will provide both scientists and lay persons an opportunity to be part of the exercise. Another of Dr Gururaja's initiatives is Frog Watch, a programme available on the Indian Biodiversity Portal. As Frog Watch is placed under Creative Commons licensing it allows people to share their observations with greater ease.

And thus the awareness grows. If you would like to join a trek to see a performance of the dancing frogs, please get in touch with Dr Gururaja.

Gururaja KV

Faculty

Srishti Institute of Art, Design and Technology

Yalahanka New Town

Bengaluru 560106

Karnataka

gururaja.kv@srishti.ac.in

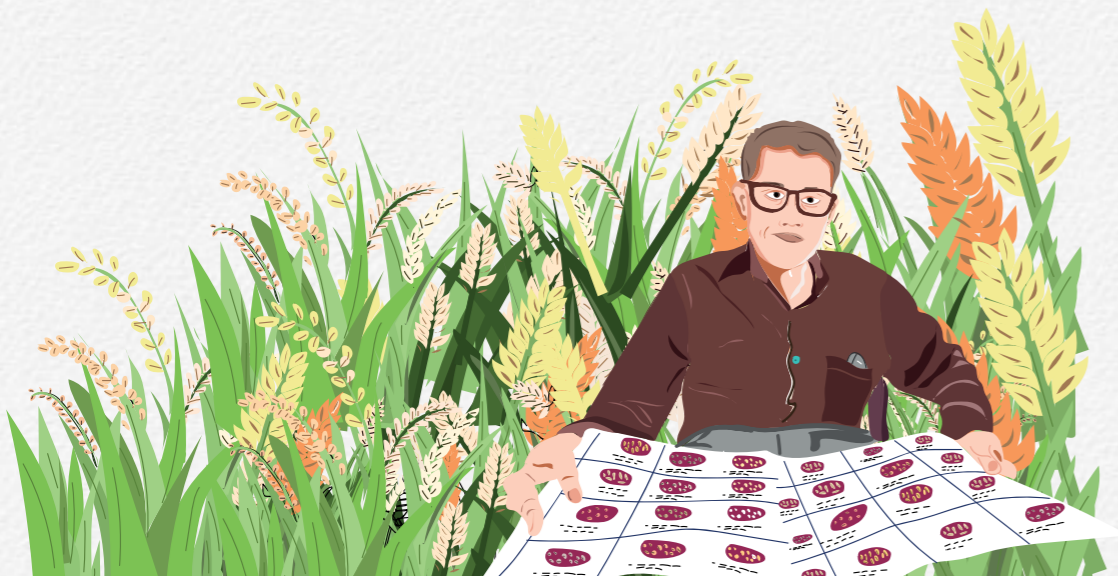
+91 9480187502

<http://www.gururajakv.net/>



The Seed Man





The Seed Man

Better India introduces Babulal Dahiya of Sarjana Samajik Sanskrutik Sahityak Manch (Sarjana) so well. ‘About 30 km from Maihar lies Pithaurabad village, in the Unchehara block of Satna District in Madhya Pradesh. What is unusual about it is the 2 acres of land where you will find 110 varieties of rice grown. The farm belongs to 72-year old Babulal Dahiya, who has been collecting these varieties since 2005. He has also grown 100 varieties of pulses, grains and vegetables on another 6 acres.’

What is so special about Babulal’s work that the President of India conferred upon him one of the country’s highest honours, the Padma Shree, in 2019?

Babulal’s village is in a tribal area with fragmented farm holdings, the majority of which are paddy fields. His ancestral farms are spread over two different locations. During his childhood, he would walk from one to the other, crisscrossing fields on either side of the narrow path. He remembers the collage the small farms made with their many different varieties of rice—some short, some tall, some with a light-red tinge, others yellowish and so on. He had heard his grandmother speak about the good old days when over 1,00,000 varieties were grown. That was not something to dismiss as just a hazy memory of an elder because even the Sarpanch (Headman) proudly proclaimed that till recently, 10,000 varieties of rice were cultivated in the village.

Over the years, the higher yields promised by hybrid varieties led farmers to switch to these. Walking down the same path many years later, the changed vista, a result of the Green Revolution, struck Babulal. Each field was a replica of the other. Crops grew uniformly at the same height and were of the same hue.

However, going hybrid turned out to be a penny-wise, pound-foolish decision. While the harvests initially increased, the huge volume of water the new varieties needed, combined with scant rainfall patterns soon had farmers dealing with serious water scarcity conditions. In addition, the vast amounts of chemical fertilisers and pesticides that were now required by the crops proved to be a financial nightmare. Many fields turned bare as the soil had become barren owing to the overuse of chemicals. Poverty had struck the area. A huge mistake had indeed been made. ‘Why had they abandoned the traditional varieties of rice that absorbed and retained moisture in their pores and thus were better equipped to withstand droughts? What foolishness made them

turn away from paddy-growing that needed just cheap, home-produced, organic manure?’ were questions that haunted many of the farmers.

All they could do was reminisce about the good old days when traditional varieties typical of the area flourished in their fields. The Kalawati that is black in colour; the Galri, named after a local bird as it has a bird’s eye mark on every grain; the Bhalu (bear), which sprouts hair-like wisps; the Keraphul (a local name for bananas), whose stalks have clusters on them; the Dhania, which resembles a coriander seed; the Lokharpuchhi (fox), whose thorns sprout hair making it look like a fox’s tail; amongst many others.

The villagers decided to cut their losses and revert to planting traditional rice varieties. That was easier said than done, for where were the seeds to sow? None of the shops sold the traditional seeds, nor was information on earlier varieties readily available.

That is when Babulal decided to help his fellow villagers pull themselves out from the morass. It would be a mammoth task to develop seed stocks but Babulal was determined to do so. His first source of information was his grandparents’ generation. Each of them bemoaned the fact that their children did not heed their warnings before making the switch to hybrids. Nodding his head in agreement, he asked for their assistance to help reverse things. Sitting on a charpoy (bedstead) in a courtyard, he would listen with rapt attention and take notes as elders provided information on the previously grown varieties. The regret was mutual as they recalled harvests that earlier yielded the most fragrant crops for wedding feasts, the particular variety that needed less fuel to cook and how they were envied by others who were not fortunate enough to have such bountiful harvests in their villages.

He continued recording oral history. Babulal is an expert in the local Bagheli language spoken by the tribal community. His work documenting Bagheli folk literature for the Madhya Pradesh Adiwasi Lok Kala Academy connected him to Bagheli songs, proverbs, folk tales, legends and myths that extolled the many varieties of rice traditional to the area. This proved to be a rich source indeed.

Babulal went from house to house, asking people to open old trunks or other containers to see if any forgotten seeds lay hidden in them. Luckily some elders had saved seeds for sentimental reasons, to remind them of these precious miracles of nature that had fed their families for so many generations.

The hard work struck gold. Starting with 10–15, he ended up collecting around 100 varieties of rice seeds from Rewa district alone. These formed the first deposits in the newly formulated Seed Bank that is managed by the community. In 2017, the Madhya Pradesh State Biodiversity Board supported his visiting 40 districts of Madhya Pradesh for the Save Seeds, Save Agriculture campaign.

Today, 203 varieties are safely stored in the community-managed Seed Bank. These are now grown in over 50 villages of Satna District. Babulal has also set up a Seeds Museum in his farm. Affectionately referred to as ‘The Seed Man,’ Babulal has extended his good work to other crops such as maize, millets and vegetables as well and is now working to persuade the state government to set up a research farm to document agricultural knowledge so that it is never lost again.

Babulal Dahiya

President

Sarjna Samajik Sankratik & Sahitiyak Manch

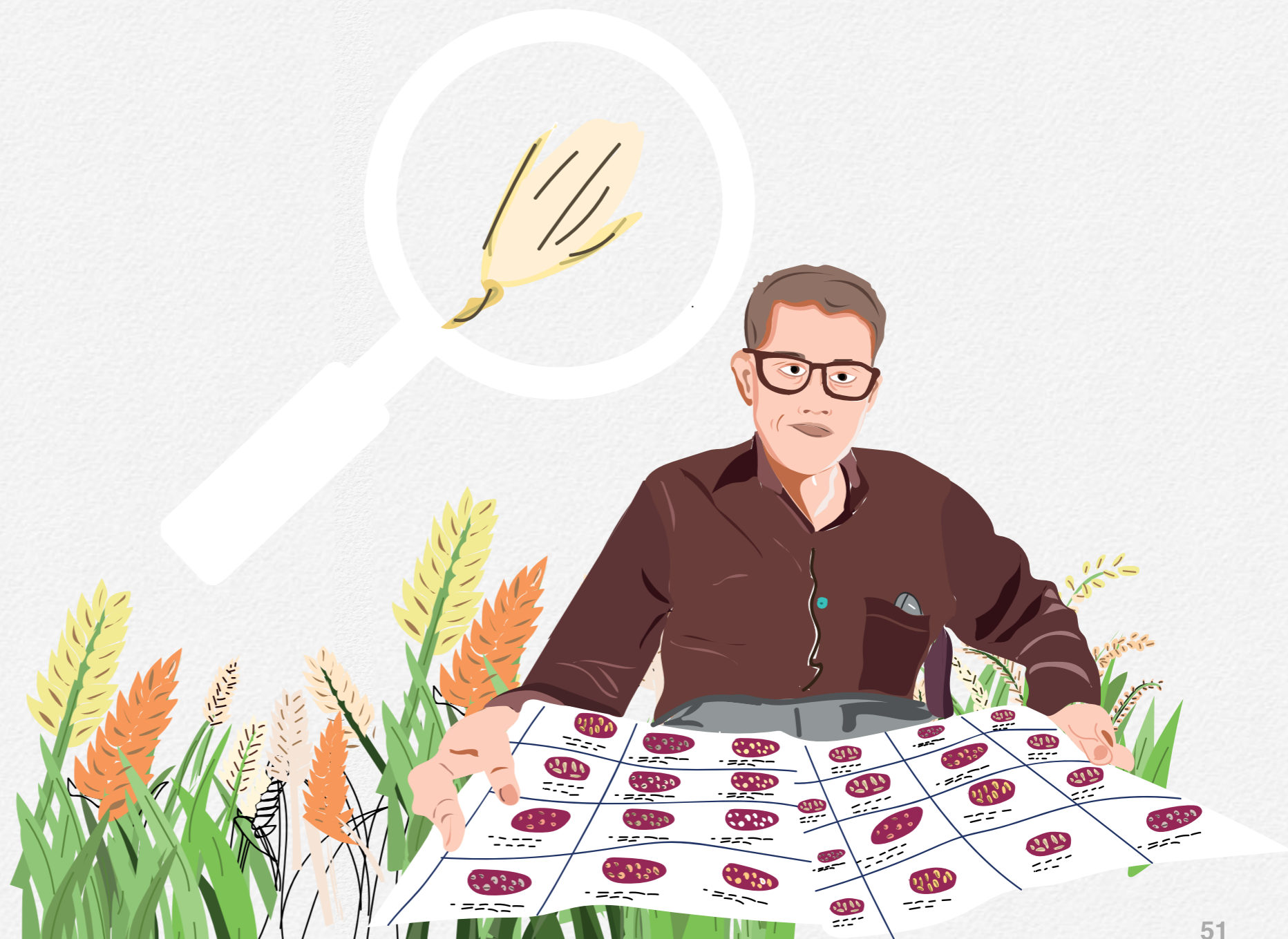
Village Post Pithourabad

District Satna

Madhya Pradesh

babulaldahiya@gmail.com

+91 9981162564



Traditional Healers





Traditional Healers

Since ancient times, India's rich repository of herbal plants has been used in traditional health systems. Most of us remember the taste of those herbs we took to cure common ailments such as coughs, colds, stomachaches and listlessness. But these had to be procured, sometimes with difficulty, and then pounded in the right proportions to make the healing potions. Instead, today traditional healers package and sell complex formulae, making natural cures easily available.

Of the 8,000 herbal species documented by the Botanical Survey of India, around 1,500 grow in the state of Chhattisgarh. A proliferation of vaidyas (healers) in the state is but natural. Till recently, the vaidyas worked in isolation with secret knowledge passed down by word of mouth from one generation to the next. This changed recently with the formation of the Traditional Healer Association Chhattisgarh (THAC). This is an organised body of vaidyas that has made it their

mission to promote traditional healing and to ensure that knowledge doesn't remain the purview of a mere handful. Secretary of THAC, Nirmal Kumar Awasthi, says, 'A modest beginning was made in 2002 when I used certain herbs to cure a patient of snakebite. As it was effective, I decided to codify the formula and not keep it just within my family but share it widely. I then reached out to fellow vaidyas and appealed to them to do likewise so that the collective data can be used for the benefit of humanity.'

In 2014, THAC's efforts were internationally recognised with the very prestigious Equator Prize. The citation for the award said, 'In a region plagued by hunger and malnutrition, poor water and hygiene and high communicable disease rates, the Traditional Healer Association, Chhattisgarh at Bilaspur is taking an inventive approach to reduce infant mortality, improve maternal health and facilitate ready access to medical care. The association empowers 'village botanists' to serve as agents of positive community-level change by enlightening them on the use of traditional medicinal plants to meet modern medical needs. Work also focuses on attaining formal scientific certification for traditional medicines that are proving effective to treat fevers, colds, arthritis, malaria, gastro-intestinal diseases and a range of public health concerns. Health services are provided to more than 50,000 families across 500 villages in 12 districts and the average medical cost in the communities served has been reduced by 70%. More than a million trees and half a million medicinal seedlings have been planted in 100 villages, restoring rare and threatened flora and fauna and improving local health and livelihoods in the process.'

How did THAC achieve all this?

The organisation operates under the principles of ‘document, standardise and go digital’, which translates into cataloguing plant species, documenting procedures and effectively utilising electronic media.

THAC is the first to meticulously document every medicinal plant grown in Chhattisgarh. This was imperative as there was no comprehensive inventory of all those that existed. Nor was there any record of their quantifiable efficacy or details of how and when they should be planted. Many areas were very remote or difficult to access. Regardless, the members trooped on till they could announce with confidence, ‘We have mapped the entire state.’ Based on the study, a well-illustrated catalogue is now available for wide dissemination. This was followed by numerous in-depth training workshops on ways to cultivate the easy-to-grow plants for kitchen gardens and village commons, as well as for those that need special fields for cultivation.

Almost 40% of the population of Chhattisgarh is categorised as ‘poor’. Ailments compounded by poverty leave many in a pathetic state. THAC addresses this problem with affordable herbal remedies. Furthermore, it trains the local population to be ‘citizen botanists’ by providing them adequate knowledge about each herb and also entrepreneurial know-how to run their own businesses, bringing herbal medicines from fields to sales counters. They went a step further to set up cooperatives so that even the smallest unit could benefit from the collective power of mass marketing conducted successfully thanks to the establishment of ePortals. For the benefit of the general public, THAC has already distributed, 2.2 million medicinal plant saplings free of cost with the hope that more and more people take up the profession. Thus, growing herbs expanded from being just an affordable, home remedy to an occupation

that brought in much needed additional income. THAC even set up ex situ farming. This protected natural habitats as collectors no longer had to enter forests in search of wild herbs. Developing spots in different areas also assured that changes in weather did not affect a continuous supply of raw materials. Nirmal is happy to say that many of the rural women and youths trained are today proud first responders to patients with common ailments and also work to improve public health in far-flung, underserved villages.

Besides plants grown to cure everyday ailments, those in high demand by large natural medicine manufacturers, are also promoted. These include: giloy (*Tinospora cordifolia*), brahma manduki (*Centella asiatica*), tulsi (*Ocimum tenuiflorum*), satavar (*Asparagus racemosus*), amongst others.

What started as a small-scale initiative has blossomed into a movement with new healers added each year. ‘Members of healers’ associations in Chhattisgarh’s blocks, talukas and districts number about 3,280,’ says Nirmal Awasthi. He further states, ‘This rapid increase indicates the depth of demand for health services in rural areas. The movement is now not limited to Chhattisgarh. We regularly share our successful training and entrepreneurship models with interested groups in the neighbouring states of Madhya Pradesh, Odisha and Jharkhand. Even groups from Rajasthan and Uttarakhand have come to us to learn the best ways to replicate similar systems in their areas.’

THAC members continue their philanthropic roles of ambassadors for medicinal plants. Should anyone want to grow these, please get in touch with them.

Nirmal Kumar Awasthi

Secretary

Paramparagat Vanaushadi Prachikchit Vaidhya Sangh

Traditional Healers Association of Chhattisgarh

Near Prema Sishu Mandir, Kasturba Nagar

Bilaspur 495001

Chhattisgarh

nirmalkumarawasthi@gmail.com

+91 9685441912; +91 9770271612



Victims of Misconceptions





Victims of Misconceptions

The fishing cat (*Prionailurus viverrinus*) is a feline species with many traits unlike those of domestic cats. Have you noticed how cats abhor getting wet? On the other hand, the fishing cat's preferred habitats are wetlands. An adept swimmer, it happily treads water to catch fish and is even known to dive in and grab its meal! Its paws are partially webbed to aid swimming and its unsheathed claws are ready to hook and kill fish. Its double-coated fur repels water.

The fishing cat is the State Animal of West Bengal where it is particularly found in the marshes of the Lower Gangetic Floodplains, the UNESCO Heritage Site—Sunderbans and in the reed-growing areas of Howrah District. Albeit far smaller than the famous Bengal Tiger, locals who have caught a glimpse of it say that its similar blotches and stripes could make one mistake it for a young tiger.

The fishing cat presently faces a high threat of extinction in the wild and is thus listed as 'Vulnerable' on the IUCN Red List. The primary reason for this is the loss of its habitat. Although India is a signatory to the Ramsar Convention that mandates the protection of wetlands, problems arise when wetland habitats are not clearly designated. The areas that fall in the nebulous category often get classified as wastelands, opening them to developmental activities. Other reasons for the species' dwindling numbers include intolerance and apathy from locals. Small-scale fishermen have no insurance against loss of livelihood. In bad times, it is easy to blame the creature, who in their minds compounds the problem, for the fishing cat's diet is the very fish they want to catch. In addition, horizontal nets that guard the surface of the water from swooping attacks by cormorants and kingfishers become deathly traps for fishing cats. And then there are the killer roads!

Tiasa Adhya co-founded The Fishing Cat Project (TFCP) to help the species. While on a tiger census in the Sunderbans, she chanced upon fishing cat paw prints and developed an interest in the nocturnal species. The first task, as she saw it, was to advocate resistance to the degradation of the fishing cat's habitat and simultaneously have locals feel proud of their State Animal.

To protect fishing cat habitats (some of which are not notified areas), TFCP, working with partner organisations, has focused on getting more areas notified Biodiversity Heritage Sites, for example, the lowlands in Howrah District. The marsh reeds cultivated here are a source of livelihood for the locals. The fishing cat safely scampers around, hidden in this tall vegetation. Adhya says, 'Working with the local community, a Biodiversity Monitoring Committee was formed under

the State Biodiversity Board. Regular meetings brought to the fore the vast potential for conservation of the area. Armed with this knowledge, the Committee members approached the West Bengal Biodiversity Board with a request to designate the area as a Heritage Site. In support of their submission, a People's Biodiversity Register with data covering the spots was also presented to the Board.

Hopes are alive to receive the requested official order soon. This will benefit both the fishing cat and the locals. While the fishing cat's habitat will be safe from exploitation, the tagged area will likely attract government investment for the cultivation of reeds, an occupation that is no longer as lucrative as it once used to be.'

To address the misconception that fisherfolk have of this species, Adhya says, 'We explain to the people that the fishing cat is not the major culprit of their reduced catches. Other factors are far larger contributors, for example, climate change and increased pollution levels. To support the fisherfolk in times of lesser hauls of fish, 10 kg of fish seedlings were distributed among 40 fishermen. In return, they were called upon to help monitor camera traps so that the real extent of fish loss blamed on fishing cats could be revealed. The data brought out the truth—the fishing cats were indeed not the large predators people thought them to be. The locals also grumbled about fishing cats running away with livestock and poultry. To circumvent this, we worked with community organisations to create seed goat banks so that goats lost are replaced. Getting the community to participate in monitoring the goat predation has helped put an end to the exaggerated claims of fishing cats attacking goats, for only five cases were reported over the year. Seeing facts with their own eyes has helped reduce some of the unfair negativism toward the fishing cats.'

And so efforts continue to help this species, often accused without substantiated reasons, survive and win pride of place in the hearts of the fisherfolk.

Tiasa Adhya

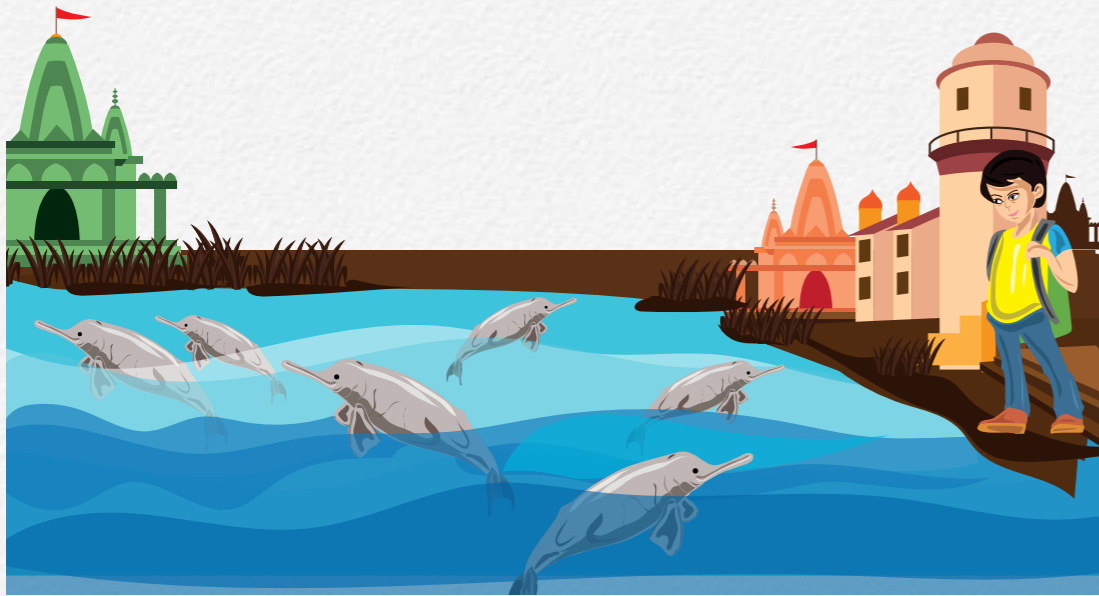
Founder

The Fishing Cat Project
11F New Ballygunge Road
Kolkata 700039
West Bengal
adhyatiasa@yahoo.com
+91 9903693999



Water Quality Inspectors





Water Quality Inspectors

Most Indians can easily name the Bengal Tiger as the country's National Animal, and the peacock as its National Bird. But how many know that the Gangetic River Dolphin (*Platanista gangetica gangetica*) is the National Aquatic Animal of India?

This dolphin, also referred to locally as Susu in Uttar Pradesh, is a strong indicator of the purity of water because it can only exist in unpolluted fresh water. In rivers, this flagship species is at the apex of the food chain and plays a vital role in maintaining the essential balance of the ecosystem. Till recent times, from the banks of the Ganges in Varanasi, you could catch sight of these pink-tinged creatures frolicking in their natural habitat. They delighted bystanders as they emerged at regular intervals to fill their lungs with air. These water inspectors had certified the river waters as pure so there was no hesitation for people to dip their hands in the river and splash

themselves with the refreshing water. After all, it had been tested by the very best of nature's laboratory technicians!

Over the years, this scenario has changed. Rising pollution levels have forced the Susu to abandon this habitat and move upstream with the hope of finding purer waters somewhere. But where? Unfortunately, the Ganges is today said to be the second most polluted river in the world. Even if they did find clean havens, their population is not safe as Susu are hunted for their oil. Is it any surprise then that today their numbers are down to just 2,000?

In 1972, the Gangetic River Dolphin was placed in Schedule I of the Wildlife (Protection) Act of India. Taking cognisance of this, the Government of India initiated a series of programmes to conserve this endemic and charismatic mega-fauna that is found only in the Indian subcontinent. The NGO Vikas Evam Shikshan Samiti India (VESS) rallied to support the official efforts to protect the Susu in and around Varanasi. It initiated a Dolphin Conservation and Education Programme with the aim to reach 50,000 students from schools located within a 5 km radius of the river.

VESS chalked out a meticulous plan to achieve the set target. Keeping in mind that teachers have a strong influence on young minds and could be the channels to awaken understanding, concern and care for the Susu, VESS chose to initiate the campaign with 'Train the Trainer' workshops for teachers of these schools. In most cases it was the biology teacher that the schools nominated to attend the workshops. The investment paid rich dividends with a Susu Samooh (Dolphin Club) formed in each school for students from Classes VI to IX. An intensive programme of awareness building was begun to inspire the youth

to become stewards that bring back the dolphins. Along with traditional methods of teaching, innovative strategies such as specially designed games were utilised. The members of the clubs were then encouraged to widen awareness by educating at least five of their peers. For hands on experience, the students were taught ways to test the pollution level of the river waters. After the initial awareness-building in schools, Gangetic River Dolphin Resource Centres were formed, one for each cluster of schools, to ensure the continuous implementation of the programme. To take advantage of the spirit of competition among the youth, Mitra Puraskars were annually awarded to the school that displayed the best efforts.

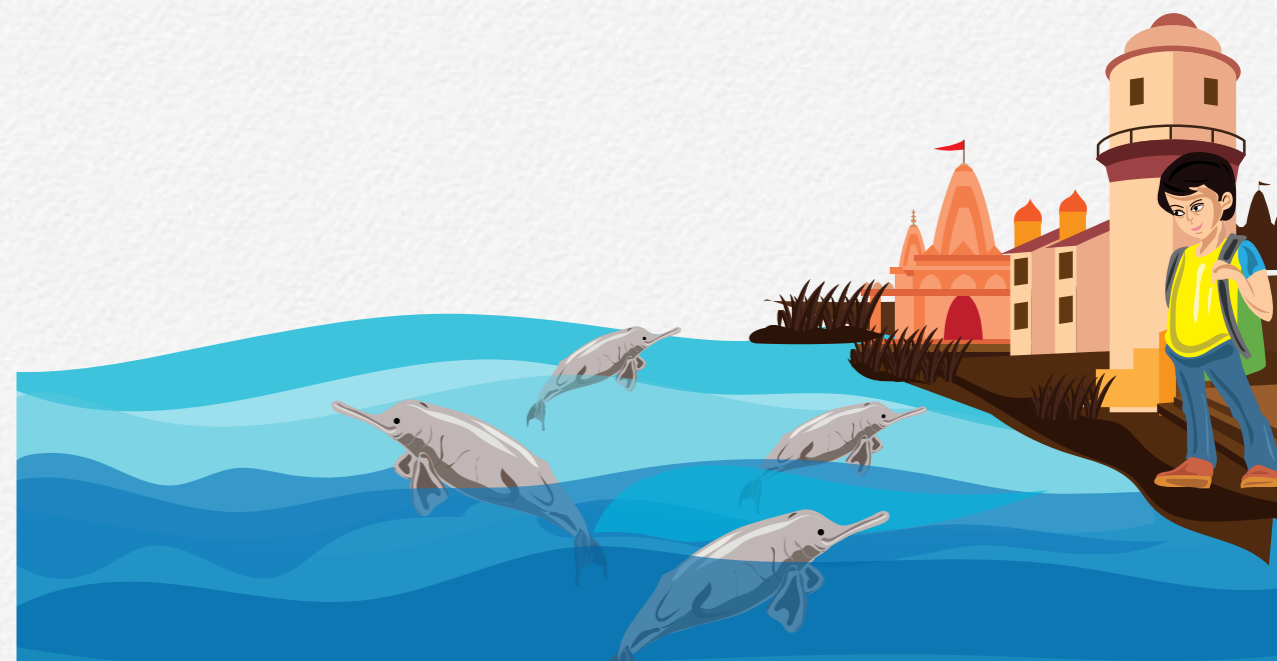
The initiative now goes beyond school campuses. Nukkad nataks (street plays), games, and dolphin melas (fairs) are regularly organised for the general public, in particular around areas where fisherfolk reside. Radio and TV talks by members of VESS add to building awareness as also the large reportage by media of the many rallies for the dolphin that are held.

The result is there for all to see. Speak to the people of Varanasi and see how well informed they are today about the Gangetic River Dolphin and its importance. Students speak with pride about the National Aquatic Animal being in their area. 'Seeing the success of the project, I am convinced that our method of involving youths in helping conserve threatened species is something that can be replicated in other parts of the world,' says Dr Rajesh Srivastava, Director of VESS.

Rajesh Kumar Srivastava

*Former Director, Dolphin Conservation and Education Project
Director*

Vikas Evam Shikshan Samiti
D-59/314, A-4 Shivpurwa
Mahamoorganj, Varanasi 221010
Uttar Pradesh
vessinida95@gmail.com
+91 9451525673



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