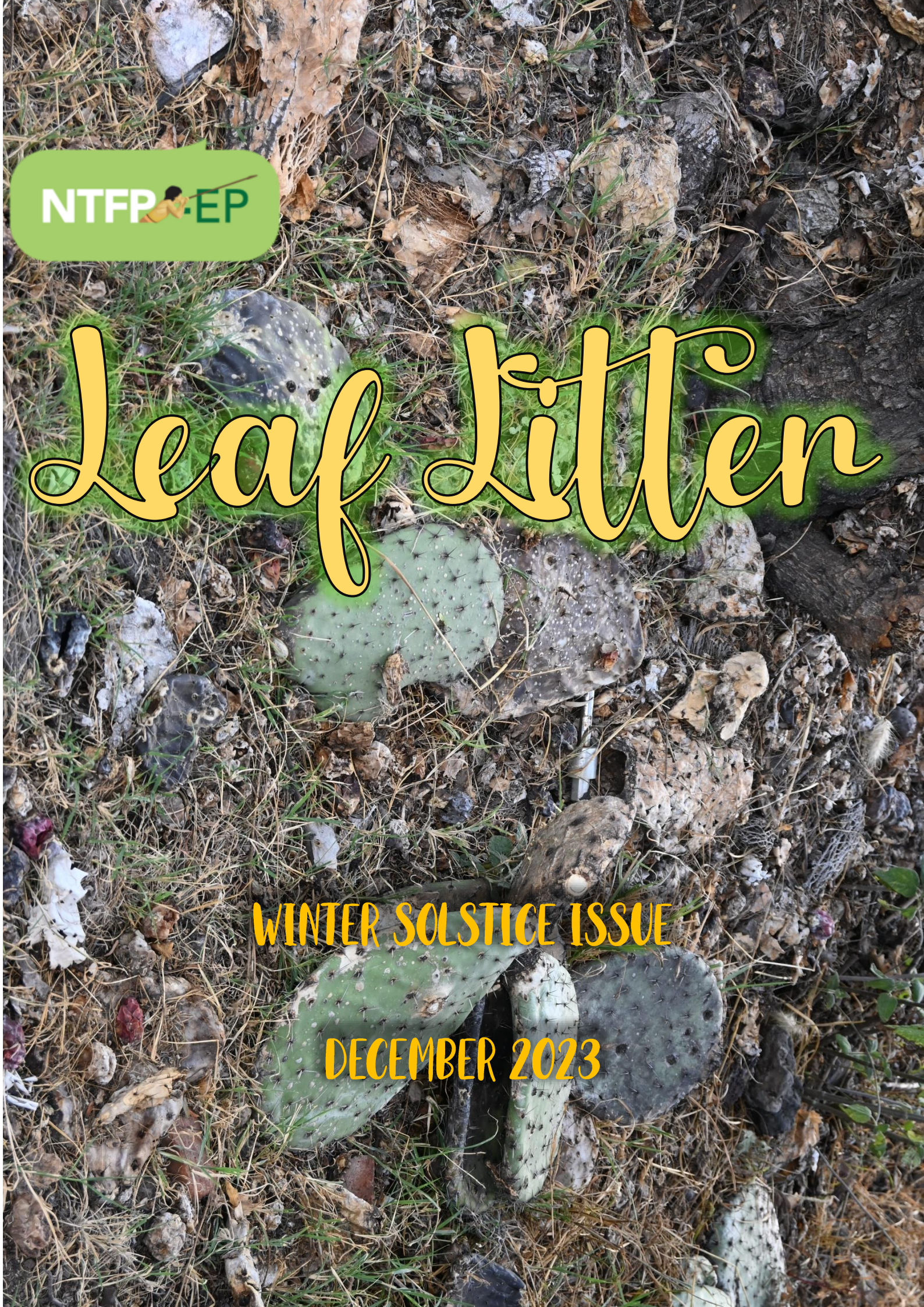
NTFP-EP
Leaf Litter
WINTER SOLSTICE ISSUE
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Cover photo: *Leaves of Opuntia ficus-indica*

The succulent leaves, origin probably central Mexico, a food plant. Now found in many parts of the world, easy to hybridize.

Doing away with the swagger

> **Swag***: ... to sway, lurch or stagger.....Probably the source of swagger to sway or stagger; to bluster; to brag; to behave or walk arrogantly; such a manner of walk.*
>
> The Penguin Book of Word Histories

Something common in most of our world leaders today is the swagger, whether it a bilateral meeting between two nations, or a meeting of leaders from several nations as in the recently concluded COP 28 in Dubai. Even when they are alone, in their own countries, talking to their own people, the swagger has become an inherent part of leader-behaviour which is extremely distasteful.

Not distasteful as an action by itself (which it is) but distasteful as the attitude adopted in dealing with the gravity of the issues they are called to deliberate upon, and find solutions to. The way these leaders go about this business is an insult to most of humanity that puts its trust in these 'chosen' leaders, most of them men!

The cyclones, tornados, droughts and floods that have besieged various parts of the world over the last few decades have called attention to the vagaries of climate, and our inability to cope effectively with such changes. Yet, our leaders are bickering about technology transfer, who owes what to whom, the Global Stocktake, and the year for phase down of fossil fuels. Developing countries do a 'hard bargain' and demand funds before phasing down, claiming that developed countries are to blame for the mess in the first place.

What seems to be lacking in these negotiations is a dose of humility. The humility to realize that the planet is actually talking back to us, responding to the way we are behaving towards her. In the larger scheme of things it matters little which part of the world we belong to at present, as the effects of climate change will impact everyone. It is already doing that. Our leaders need to realize that the problems we are faced with are global ones, of ecology, of our environment, at a scale larger than what we have ever experienced before. Where there is no place for petty nationalistic and personal pride. The current predicament requires a humility to realize that there can be no individual winners, but that we all collectively lose. Perhaps that is too much to expect but that is precisely what we need.

During COP 27, 18 of the 20 sponsors, which included Microsoft and Coca Cola, had links to fossil fuels. It is now known that most of the companies partnering or sponsoring COP 28, which includes Ernst and Young, and the Bank of America, are

not committed to cutting their greenhouse gas emissions. So what are the negotiations about?

The Non-Party Stakeholders, which include women and youth, and Indigenous Peoples, have usually been mentioned in passing in the COP meetings. It is recognized that these groups will be the most affected by climate change but they have seldom been at the forefront of these events.
Furthermore, apart from understanding the environment intricately, Indigenous Peoples are among the finest negotiators. To elucidate, I narrate the resolving of a territorial dispute between two indigenous groups in central India. The dispute concerned the demarcation of their ancestral domains. Over several meetings held in a span of two years the elders and youth sat and discussed the matter. During these meetings they cooked together and shared meals, joked and laughed, inquired about other kinsmen, and kept returning to the matter at hand. They went into details of fishing rights in various streams, gathering forest produce in different tracts of forest, and about living peacefully with each other. Each meeting was a step closer to the solution.

The people spoke no fancy language that obfuscated the meaning, or left “wriggle-room” to escape wrong-doing. Most tellingly, there was no swagger, as there was no individual winner in such a process. They all won as they settled their dispute without either side losing space, or face.

Our leaders could learn a thing or two from Non-Party Stakeholders.

MR

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Carbon silver bullets for Christmas from COP28

Aruna Chandrasekhar

"When we talk about life and nature in climate, part of that is how humanity values its relationship with what we call sacred. When we develop these metrics for understanding the sacred, we're dealing with another system that doesn't want to understand the sacred. So how do we develop a value system for debate? It doesn't exist. In my paranoia in working with COPs these years, the corporations, the financiers, the profiteers are very threatened by the movement of Indigenous Peoples claiming our inherent collective rights, and this why they want to redefine us as local communities. It's a form of termination in North America, but also a trend in the Global South."

> ***Tom Goldtooth, Executive Director of the Indigenous Environmental Network at COP28***

In the weeks leading up to COP28, a host of news outlets reported on a "new scramble for Africa". Here was a firm Blue Carbon, chaired by a member of the UAE royal family, with no previous nature conservation experience, striking carbon market deals across the continent. One deal reportedly spans one-fifth of Zimbabwe's land mass, 10% of Liberia, 10% of Zambia and 8% of Tanzania.

The deals that were just struck were part of a new UN-backed market under Article 6 of the Paris Agreement. Article 6.2 allows countries to trade emission cuts from projects, such as hectares of newly planted forest, with other countries.

Its sister mechanism under Article 6.4 – billed as an evolved avatar of the Clean Development Mechanism (CDM) – is an international carbon market, where projects are carried out by both public and private entities.

In Dubai, rules for these two markets did not pass, despite strong US appetite for carbon trading with the loosest hold. This came as a relief for campaigners, who said a bad deal could have "torpedoed" the Paris Agreement.

But one of the most alarming aspects of bilateral carbon trading, as it stands, is its total confidentiality: countries have complete freedom to mark whatever they like about these deals as confidential, with only barebones, tick-the-box oversight.

This means watchdog groups, journalists, scientists and Indigenous groups will have no way of knowing what these transactions are, whether it has any safeguards and how they hold up against the light.

Markets under Article 6.4, similarly, have not yet developed a grievance mechanism, human rights tools or environmental safeguards, risking the repeat of rights abuses and inflated claims of climate gains without remedy that its predecessor, the CDM, became associated with.

But the lack of rules presents a large loophole for the wild West of the "voluntary" carbon market, the kind that gives your airline an afforestation offset to plant a bunch of eucalyptus trees where they shouldn't be. REDD+ projects, which may not be aligned with UN rules, account for a quarter of all "voluntary" offsets in the world today.

In January, an investigation by the Guardian found that more than 90% of forest carbon offsets approved by the world's leading certifier and used by the likes of Shell and Gucci are "worthless" and could be worsening global warming. Another investigation by SOMO in November unearthed systematic sexual abuse of women at a much-hailed Kenyan carbon offsetting forest and wildlife conservation programme.

To date, according to Carbon Market Watch, only one of these certifiers "provides appropriate recourse" for communities to file their grievances against carbon offsetting projects.

Not only did the voluntary market use Dubai climate talks to varnish their battered image, but they could also set low standards for new Article 6 deals with governments, until UN rules are in place.

As Blue Carbon's land rush shows, the lack of rules has not deterred countries and companies from cutting a spate of Article 6 deals, in anticipation of the market. Over the last year, the first three deals to transfer emissions cuts have been authorised already, including by Ghana to help Switzerland meet its climate targets.

The UAE, the host of this year's climate talks, wants to be seen as the biggest buyer

of African carbon credits, while Kenya's president William Ruto calls carbon credits an "unparalleled economic gold mine".

But missing the woods for carbon is not the only trade in town.

In a world where biodiverse countries are straddled with debt, mounting climate costs, inflation and little money for conservation, debt-for-nature swaps seem like the newest panacea.

In August this year, Gabon signed a deal with the Bank of America, the US International Development Finance Corporation (USDFC) and The Nature Conservancy (TNC) to refinance $500 million in national debt through a "blue bond", channelling $5 million in savings towards marine conservation.

But while promising in theory, there are real fears that these "swaps" could saddle host countries with more debt instead of relief, at the cost of losing sovereignty over conservation decisions and extinguishing the conversation on debt cancellation.

While biodiversity-rich countries have been demanding more public finance and "debt forgiveness" from developed countries to help meet their conservation targets, countries, especially France, the UK and Australia, have been busy promoting "nature markets" in response to a yawning finance gap, offering biodiversity offsets and credits intrinsically tied to the destruction of nature.

In just a year, biodiversity offset and credit markets have grown by nearly $6bn, despite little evidence that markets linked to destroying habitat do better than good old-fashioned environmental regulation, such as no-go areas for industry. Instead "nature-positive", a term still without definition, has become the net-zero of biodiversity: ubiquitous, all- encompassing and impossibly vague.

What trends from this year point to is that the financialisation of nature has come a long way from just payment for ecosystem services, as a broad idea of appreciating what non-human interactions bring to life. The vanilla voluntary carbon market exists in a bubble so big, it could burst under the gentlest prod, taking companies' net-zero virtue-signalling with them.

Instead of examining where 30 years of the same experiment has gotten us, we are now entering a brave new age of carbon and nature markets, where states trade directly in the shadows, and the more endangered the species, the more expensive the biodiversity credit.

Not everyone is taking this lying down. At COP28, Indigenous groups called for a moratorium on all forest carbon trade. Bolivia, meanwhile, put brackets around both carbon markets and supported a moratorium, unless countries gave non-market

approaches and local actors just as much weight. In Australia and Canada, activists and even policymakers are holding the line against carbon and biodiversity offsets, after watching koala habitats and offset plantations go up in smoke.

What started off as placing a value on nature to demonstrate “ecosystem services” in the 1960s became a march towards the commodification of nature. It has now become the de-facto way polluters can pay to continue with business-as-usual and pretend they’re doing their part.

But if tipping points in the Amazon, raging wildfires and plummeting trust in carbon markets are any indication, we cannot offset our way out of this. What are the metrics, then, that we can offer the world to make sense of and protect our relationship with not just what is sacred and inviolate in nature, but what is common sense? What are other value systems we can offer to a jaded generation to cut through the offset jargon, emissions jugglery and shortcuts? The next wave of financial silver bullets pretending to solve the climate and extinction crisis is coming in, and it will need all our vigilance and creativity to burst the bubble.

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Why the Durwa don't have a bottle-opener: a language without nouns for activities fundamental to livelihood

Madhu Ramnath and Imre Szigeti

Introduction

Human conceptual structure is a matter of considerable attention in recent linguistic research. Anthropological approaches tend towards the opinion that every language is an integral part of the culture of any society. Thus, linguistic-conceptual structures cannot be discussed without knowledge of the culture itself.

For the purposes of this paper, we focus on the Durwa people and their language.The Durwa people inhabit the forest in the central-eastern tract of Bastar district in Chhattisgarh state, India. These people have also been referred to as Parjas by some scholars[1] and administrators but here we use the term Durwa as done by Thusu[2]. In fact, Burrows states that they have 'retained the traditional designation of the tribe, Parja, though it may well be argued that the name by which the people call themselves, Durva, would be more appropriate. The term Parja is of course no tribal name but merely of the Sanskrit *praja,* meaning subjects…..'. Later he goes on to add that 'Doubts have been expressed as to the antiquity of the term Durva. The older residents of the state are unanimously of the opinion that Durva is a new-fangled term, and in the old days one only heard of Parjas. ……. However, the term 'Durva' seems to be identical with the name of Durweh Gonds, a distinct section of the Gond tribe living in Chanda, as opposed to the Raj Gonds living in Hyderabad and other places. On the other hand the Gonds of Bastar…… who render Parja by *Kap* render Durva by Dorar (pl) and this, however the forms are to be reconciled, certainly suggest that we are dealing with an old indigenous name.' In the recent UNESCO's Atlas of Endangered Languages, it is a Critically Endangered language with only 51,216 speakers (2001 census[3]). However, one of the author's experience in the area estimates that the figure is exaggerated, and the actual number of 'good' Durwa speakers to be far less, perhaps in the region of 30,000.

The Durva people hunt, gather wild foods, and fish to procure a substantial part of their food. Cultivation is done on the hill-slopes as well as in the cleared forest patches; most agriculture is rain-fed and the crops grown are rice, millets and maize, and various pulses. For the purposes of this paper we will look into the terms used in hunting, gathering and fishing. As they have been the most fundamental activities of the Durva community for a very long time they may reflect some original conceptual development that we are interested in.

[1] Burrows and Bhhatacharya, 1953

[2] Thusu, K.N., 1965

[3] The 1931 census gives the number of Durwa speakers as numbering 12,363

Durwa verbs and actors

There are 9 verbs related to hunting,[4]6 verbs related to fishing and 8 were actions specific to gathering. These 23 verbs most describe the Durwa lifestyle directly pertaining to the procurement of food, even though some of them may also be used in other contexts. However, none of these verbs have a corresponding noun that describes the actors who perform these actions. To elucidate, there is no *single word* for the 'waiter of porcupine', a *katan manja*;[5] similarly, there is no word for 'the chaser of monkeys', *a walitan manja*; no word for a 'pluck-er of leaves', *a koyuran manja.* But there are words that denote collective action, for 'those who wait for porcupine' (*chedir kataner*[6]), 'those who chase monkeys', (*muikul walitaner*) and for 'those who pluck leaves' (*yevul koiraner*).

What the above section goes to show is that there are no terms for individual actors, specifically *nouns* like hunter, gatherer, or fisherman, even though most members of the Durva society hunt gather and fish for a major part of their lives. It is implicit that there is no specialist 'leaf pluck-er or 'waiter of porcupines' though there are collective terms for them. To enforce the point, we have no single specialist but a *collective of specialists*. For instance, on a hunt, it may be said that if a certain person joins in, the chances of bringing back some meat increases. Yet, this does not make the rest of the group inferior, or the person asked to join, superior than the rest. The special person, the expert, merges within the collective.

Language forms

Durwa, like Hungarian and Tamil, is an agglutinative language. It means that its words are easily divided into separate segments with separate grammatical functions[7]. To give an example from Durwa, 'chen' is *go*, 'chendan' is *I go,* 'chenmom' is *we go,* 'chenama' is *we don't go,* 'chennimettom' is *we had been,* and so on. Tense, plurality and gender are agglutinated to the root 'chen'. Halbi, another language spoken in central India and in Bastar, is not an agglutinative language but has also no actor nouns, just like Durwa; but Hungarian and Tamil, both agglutinative languages, one Slavic[8] and the other Dravidian, both have actor nouns.

[4] The terms are elaborated in the appendix

[5] 'manja' refers to 'person'

[6] The -er suffix to these words pluralises the term, suggesting collective action

[7] The opposite is an 'inflecting' language in which words distinguish grammatical categories whose realizations cannot or cannot easily be separated

[8] Hungarian is Finno-Ugric, at least this is the most accepted view of it. Slavic languages are all inflectional.

Language forms usually reflect specific views about things we use, or the way we structure the world around us. Moreover, grammatical meaning of words arise by a connection between language signs and an underlying concept, the latter linking abstract ideas and words.

It is not the language *form* that determines whether actor-nouns exist or not in a language; rather, it is the state of differentiation of tasks within a society that uses the language. In the case of the Durwa, *all* the people of that community perform *all* the actions that pertain to the business of life - occasional deviations occurring due to age or gender – and without any class of people within the community that specialize in any particular task. The only two nouns that have been incorporated into the Durwa language are the words for ‘blacksmith’ and ‘potter’ – *lohar* and *kumhar* – from the Hindi or Halbi, on whom the Durwa people depend for their axes, ploughshares, arrowheads, knives, pots and other earthenware.

Conclusion

The fact that most skills are equally distributed within a society dissuades the formation of ‘guilds’ and ‘castes’ which are usually based on professional expertise. Specialization, even in a facet of an activity, almost inevitably leads to mechanization. One comes across this phenomenon commonly, in simple matters such as pottery, or in more subtle areas such as music and art: most drum beats and rhythms are available through digital systems, and much art is already programmed and available at a stage closer towards the finish! In essence, the common skill of pottery or drumming can be replaced, first by specialists and then by a machine, as easily as a plough by a tractor. The potter, the drummer and the farmer are observers of this transition.

In societies that have no specialists – rather, where everyone is a specialist – the question of being replaced does not occur. The mechanization is unnecessary and the machine does not get invented.

Where everyone can open a bottle, there is no need for a professional bottle-opener!

Appendix of terms used in food collection

Hunting

There are 9 specific actions possible and used to hunt game:

chularana (to wander), alone or in a small group, usually for small game. The route and purpose can change according to circumstance. Tools: bows, arrows, axe, often with dogs.

katana (to wait), usually in a small group and at night; this is quite a specialized skill when concerning porcupines as it entails entering their burrows. Tools: bows, arrows, axes, torch.

walitana (to chase), to go after monkeys, civets and giant and flying squirrels, but can also be used when chasing wounded game. Tools: bows, arrows, axes, always with dogs.

kedh pathitana or *uirana* (invoking the ceremonial hunt), through an area of forest that the community 'owns', an annual affair; it is obligatory for all men to participate. This is for big game (sambhar, spotted deer, wild boar, occasionally bears) but anything will do. All the meat is shared according to specific rules that may vary from place to place. Tools: bows, arrows, axes.

kotrana (to dig), usually for rats, also for eels, sometimes for shrews and monitor lizards that hide in tree hollows. Tools: spade, axe.

kantana (to search), for game and animal tracks, but habitually confined to rat snakes and monitor lizards, both difficult to spot in the wild. Tools: bows, arrows, dogs.

aikurana (to shoot), with bow and arrow, and used always in the hunting of bigger animals, such as wild boar and deer. Though other animals too are shot there are complementary activities involved that tend to overshadow the act of shooting, for instance, in *walitana* it is the chase that is given importance, not the shooting.

tudrana (to burn or set on fire), as when something is smoked out, like rats from a burrow or bees from a hive, or when driving away wasps from a comb to get the larvae. Tools: rope or rope-ladders, fire, smokers.

wattel tondurana (to set traps), often set to catch hare or mongoose, occasionally also monitor lizards.

Fishing

There are 6 verbs to describe actions pertaining to fishing:

olshurana (to bail), a common method of catching fish; this is usually a team-effort with which small streams are diverted and diked, and the pools emptied. The bailed water is passed through a meshed basket where the fish are trapped. Tools: various baskets, especially the odi-gappa, choli, munda.

kollurana (to stun), as done by using plant poisons, using the leaves of katkuccha or the fruit of kuvva.[9] The gills of the fish are blocked and they float on the surface. Tools: plant poisons, baskets.

meenchub tintana (hook and line), used with a bait for either fish or crab; baits are either lizard or earthworm. Tools: bamboo rods, bait, basket.

jari (net), used either across a river or stream, or cast and drawn back. Tools: nets, choli, munda.

aikurana (to shoot), using arrows with 2-3 prongs, made of bamboo or iron; a method of fishing in clear pools and shallow waters. Tools: bow, arrows, basket.

oiguranai (to feel), for fish but more often crabs, under rocks at the edge of streams and rivers. *Chumarana*, to catch, is a related term used specifically for crabs.

Gathering

8 verbs decribe the actions used in gathering:

koyurana (to pluck), as with leaves from a branch, using only the hand; also used when harvesting rice (with a sickle), or in the harvest of cocoons (for which a bamboo pole with a forked end is used. Tools: hand, sickle, bamboo pole, baskets.

pedrana (to pick up), from the ground, as with mushrooms, fruit, flowers, seeds. Tools: hands, baskets.

rundaitana (to collect or bring together), as with grain, scattered seeds. Tools: hands, broom, winnow.

kantana (to search), for cocoons or for something specific like a medicinal plant. Tools: bamboo pole, axe, basket.

kuthkurana (to cut, severe), as with a sickle or knife, the way millets or grass is harvested. Tools: sickle, knife, basket.

chekrana (to scrape), or to plane, the way resin is collected from tree-barks. Tools: axe, knife, basket.

pintana (to break off), as with bamboo shoots, or the claws of a crab.

titkurana (to shake vigorously) from side to side, as when handling an ants nest, (or other insects that creep/crawl), to drive away the adults and procure the eggs and larvae.

[9] *Cansjhera rheedii* and *Randia dumetorum* respectively

Apiculture for biodiversity conservation and livelihoods

S. Muthusamy

Introduction

Ayyalur Reserve Forest in the Eastern Ghats is an International Hotspot (East longitudes 770 13' and 780 29' North latitudes 100 0' and 100 39'), located adjacent to the northern slope of Ayyalur hills and surrounding Ghats sections in the Dindigul, Tiruchirappalli and Karur districts of Tamil Nadu.

This forms part of the Eastern Ghats, which are a chain of small hills and forested highlands spread across a distance of more than 200 km. The region is ecologically important because of its location (which meets with the Western Ghats at some locations) and its species diversity. This region hosts the greatest number of species of animals and plants in India. For this reason, it is also an environmentally important hot spot in terms of declining biodiversity of both flora and fauna, due to social and economic needs of the communities.

Ayyalur Forest is habitat to the Slender loris which is declining fast dueto poaching for medicinal and other uses, killed by pesticide poisoning, deforestation, grazing, forest fire, road accidents due to roads that run through the forest and loss of trees and nesting space. The fringe communities are involved in small farming, using high doses of highly poisonous chemical pesticides and fungicides which also kills thefragile loris, due to toxicity in water and soil. Tree felling and logging also destroy the habitat of the loris and affect all other mammals and species in the forest. The State Government of Tamil Nadu has recently declared Ayyalur forest region as a " **Protected Sanctuary for Slender loris Habitat."**

Honey bees are responsible for pollinating about 80% of all flowering plant species and at least 1/3 of the world's agricultural crops rely on pollinators


A native plant nursery (lft) and a family enjoying honeycombs

for their pollination. Therefore, the lesser the bees, the lesser the biodiversity. Since bees are the most important pollinators, without thebees a lot of the food which we eat today will not be produced fast enough to feed the world's population. If bees become extinct, so will many speciesof plants. If bees are destroyed, the food chain will be broken as some plants will not be able to grow due to lack of pollination. Production of seeds, nuts, berries and fruits are highly reliant on pollination too. Among all pollinators, honeybees have a distinct feature of flower constancy and bee keeping is the rational way of increasing crop yields.

SEEDS Trust is implementing various programmes for Biodiversity conservation particularly of the grey Slender loris (*L. lydekkerianus*), but also conservation and livelihood development of forest dependent families in 30 villages including tree planting, training in organic cultivation of tree crops, vegetables and food grains, safe and sustainable collection and value addition of NTFP, Apiculture outside the forest areas and farmers fields adjacent to the forest areas in order to reduce the dependency of the community on forest resources, collecting and selling of honey from the tree hives (mainly Apis dorsata and Apis florea and also a significant amount of wild nesting Apis cerana indica colonies) in the adjacent forest areas. Traditionally, these families hunt for honey on the branches of big trees, inside tree cavities

and also in hillock caves. In recent times, with reduced forest cover, climatechange and government restrictions, it has become increasingly difficult for these tribes to collect wild honey.

In order to reduce the collection of wild honey and therefore protecting and regenerating forest resources, we have selected women and men interested in bee keeping and have trained them in developing their skills to collect and process the honey in a scientific way which can add to a sustainable income generation.

Skill Development Training on Honeybee rearing with beehive boxes

Skill development training in Honeybee rearing and honey production was conducted f 550 women beneficiaries, by engaging experts. In the training, technologies for bee rearing, types of honeybees, bee hive management, and handling of bees were imparted to the participants. Demonstration of beehive management, and handling of bees and seasonal honeyharvesting, was done to enhance the skill of the beneficiaries.

Distribution of Bee hive boxes and accessories

Bee hive boxes and accessories were distributed to the 550 trained beneficiaries. Each beneficiary was also provided with one container, a pair of gloves and a protective veil for honey collection. The 3 boxes were given to them with honeybees' colonies of Apis cerena and the remaining 2boxes without the honey bee colonies. These boxes were used to housethe divided colonies.

Training was given on safe collection of honey from the beehives, processing and packing of honey in bottles through practicaldemonstrations. The following are the key points discussed in the training programme:

- Before opening the box for honey collection the bee keeper has to wear the protective veil and gloves.
- Using a smoker, penetrate smoke into the beehive box through the bee gate. After 2 minutes remove the outer lid and keep it in inverted position.

- If the super chamber and brood chamber are firmly stuck together by bee wax, remove it slowly with the help of a sharp knife or screw driver or lever.
- Only after sealing most of the super chamber with bee wax, the honey has to be extracted.
- Honey must be harvested **only from the super chamber without disturbing the brood chamber to avoid provoking of the queen bee which can lead to the shifting of the colony** (*absconding*) thus emptying the hive. Protection from **predators** like ants by spreading the ant killer powder, vinegar and coffee or tea ground waste, cleaning the wax capping that fell in the box to prevent wax moth, regular observation in order to find and save the hive from predators.
- Keep sufficient honey in stock for the bees while extracting honey.
- The tools used for extracting honey should be kept clean.
- Split the upper layer of the super chamber with a knife.
- While extracting honey from the super chamber rotate the extractorslowly in the beginning and increase the rotating speed gradually.
- Distill the extracted honey with a clean filter.
- While collecting honey from the super chamber wearing gloves andusing clean accessories is a must.

Methods of processing and preservation of honey

In order to avoid the taste of honey becoming sour due to yeast, filter pollengrains and moisture control, the raw honey has to be processed. Raw Honey is processed in the following methods:

Natural method

- Pour the extracted raw honey in a broad bowl and tie it with a nicecloth and keep it in sun light for 2 or 3 days.
- After 2 or 3 days, pack the honey in bottles (packed when sucrosecontent is above 76%) or quality plastic vessels with tight lidwithout penetration of air and moisture.

Artificial Method

When there is no sunlight;

- Pour water in a bowl and heat it in an oven with a dim flame up to 60degree centigrade. Put the honey filled bowl inside the bowl with

heated water for 30 minutes. Due to this process, the moisture contents will be removed.

- Honey should not be heated directly as the alkaloid contents will be destroyed and the fragrance, taste and quality of honey will be changed. Further there is danger of beeswax combustion leading to Hydroxyl Methyl furfural formation. This will be prevented when drying with water bath. Fruit sugar contents in the honey will be decomposed into Hydroxy Methyl furfural. If the fruit sugar content is more than 40 mg. in 1 Kg. of honey, quality of honey will come down.
-

Through these income generation activities of bee-keeping, honey collection and marketing these families fetch an additional income of Rs.5000/- per box per year. This additional income is used for providing nutritious food and quality education to their children.

Marketing of honey

The marketing of honey is done through the following sources:

- Local people
- Local Shops
- Super markets

Federation of NTFP Gatherers

A federation of NTFP gatherers is formed with representatives from the NTFP gatherers from each cluster village. Marketing arrangements are being made to expand the marketing avenues for the value added products.

Present status of Bee keeping in our target area

Last year (2022) climate and seasonal rains were favorable for bee keeping and honey harvest. In the current year (2023) due to the failure of the summer monsoon, the climate was not favorable for the blooming of flowers and therefore the honey yield. In spite of the lower honey yield and income the women are keen to have more bee colonies. Now, we are maintaining the beehive boxes through the artificial feeding of bees and the formation of a queen gate to check on the exit of the bees in search of feeding outside. Awareness on the ill effects of chemical pesticides has increased among farmers.

Future Plans

1. 10,000 families will be engaged in bee keeping covering 24000 ha. In which the Agroforesty project will be implemented. In these lands of forest dependent communities, flowering plans will be planted which are helpful in feeding honey bees throughout the year.
2. Promotion of chemical pesticide free agriculture among farmers in the target area.
3. Bee Keeping programme will be expanded to the nearby forest fringe villages as the people are willing to take up bee keeping as an additional income generation activity.

S. Muthusamy works with SEEDS Trust based in Dindigul, Tamil Nadu

Sacred flora and fauna of the northern Sahayadris

Vijay Sambare

The Sahyadri mountain ranges are known world wide as the Western Ghats. The Sahyadri covers a total of six states and creates a rich biodiversity and an ancient bio-cultural heritage. The rivers Godavari, Krishna, Bhima, Pravara and other tributaries originate from the northern part of the Sahyadri and serve as a precious water facility for rural and urban areas and also to the huge irrigated cropping system on the Deccan plateau, which is a semi arid zone within the rain shadow region.

The main ranges of the Sahyadri are home to an ancient civilization of Adivasi and other forest dweller communities, such as the Mahadev Koli, the Thakar and the Katakari who have a timeless relationship with forest ecology. “The whole nature is our god” is a great supposition of local forest based community.

The Bhimashankar-Kalasubai landscape is a hub of these indigenous peoples. For the past six hundred years indigenous communities have created a great bio-cultural heritage where they give respect to key species of plants and wild animals. The creation of *Ban* and *Rai*, sacred groves, is a famous old tradition of the Adivasi, where they protect patches of primary forest where a wealth of different types of their deities reside. These deities are the owners of the forest. Sacred groves are sustainably managed by local people using customary protocol. The Adivasi peoples have also declared parts of the river as sacred ponds, where fishing is restricted. Some mountains have also been declared as a holy place.

All Adivasi people have a totem in the form of plants and wild animals. Different families worship their totem in different ways .both ways family / ancestors level and public place too.

An overview of the sacred wild animals and the sacred plants:

Sacred wild animals

The Tiger is an important wild animal in the northern part of the Sahyadri, locally called Waghya. Now it has become rare and a sighting is unusual. The local community has a different approach regarding the tiger, they know the importance of the tiger to maintain forest health. This bio-cultural relationship is reflected in the folk stories and songs of the local Adivasis and the statue of Waghya is worshipped in every village.

The Monitor Lizard / *Ghorapad* is another sacred animal for the local Adivasi community. Mainly the Mahadev Koli community have declared the monitor lizard as their totem and they do not hunt or eat it. There is a temple devoted to Ghorapada devi on the bank of the river Pravara, where there are various rock pools in the river bed, this area is also declared sacred and there is no fishing allowed.

The Red Crab is locally known as *Dev Khekada* (God's crab) in the north of the Sahyadri in the state of Maharashtra. The local Adivasi peoples are not hunting it but despite that the number of these crabs is far less than that of other crab species. Dev Khekada has a niche identity and sacredness because of his redish-saffron color also.

Fish from sacred ponds are strategically protected by the Adivasi communities. Most of the rivers originate from the north Sahyadri and they have rock holes and ponds found in the river bed. Many ponds are related to a specific deity and the local myths regarding these are very strong. Fishing or using water from these sacred ponds is prohibited.

The Peacock (Pavo cristatus) is a key bird and the national bird of India. Local people do not hunt or eat the meat as this bird is loved and respected. peacock. Moarachi Chincholi is a village near Pune which has declared that it will protect the peacock forever.

Ants and ants nests / formicary (Warul) are sacred for the Adivasi community, especially for the Mahadev Koli. Some villages have declared their sacred groves to be for the ants formicary, locally known as Hegoba Ban and they protect and worship the formicary and the ants in the sacred grove.

Sacred plants

Umbar *(Ficus racemosa)* is a sacred plant of the local Adivasi. It is worshipped and is not used as fuel wood. Some Adivasi families have declared it to be their totem.

Mango *(Mangifera indica)* is a crucial wild fruit (NTFP). Mango trees usually grow near houses and some non Adivasi people have declared the tree a family totem and they worship it on the occasion of marriage.

Varas *(Heterophragma quadriloculare)* is a small tree, and is sacred for every Adivasi community. Varasubai is a female deity who lives in the Varas tree, and so this tree is kept carefully in the sacred groves, common forest and farm land too.

Yehala/ Behada *(Terminalia bellerica)* is a major NTFP of the Sahyadri mountain landscape. As many Adivasi from the Kalasubai-Bhimashankar landscape have

proclaimed it as a totem, they do not harvest the fruit or cut the tree for domestic purposes.

Awala *(Phyllanthus emblica)* is a medicinal plant and well known for its fruit. The local community from the Sahyadri worships the Awala plant and some families have declared it as a totem.

Rui *(Calotropis gigantea)* is a small plant. There are two subtypes of Rui found in Maharashtra, one has a white flower and another one has a blue flower. Both plants are sacred to local Adivasi and other forest dwellers. It has medicinal properties and is used for livestock and human.

Durva Grass (Cynodon dactylon) … a common grass species that has uncommon medicinal and fodder value. The locals people conserve it for multipurpose use. But it will be harmful for agriculture crop as a weed.

Darbh Grass *(Desmostachya bipinnata)* is a grass found in the wetland of river and ponds. Darbha is used in religious rituals. Some peoples are making Darbhasan to pray to god.

Apata (Bauhinia racemosa) is a medium size tree found in dry deciduous forest. Locally called a Sid nad golden leaf. The leaves are mostly used for worship during the Vijayadashami festival and to make bidis for smoking purpose.

Nachani / Ragie *(Eleusine coracana)* is a major mountain millet crop, locally famous as a divine crop or god gifted crop. There are many types. The red and white ragie are mostly grown in the shifting cultivation fields in the Sahyadri. Local Adivasi from Nashik district celebrate Kansarimata (Ragie corn worshiped as a deity) festival thrice a year. Hence they only consume ragie as a sacred food and don’t sell it or use it for value addition.

These were just a few examples of sacred fauna and flora which illustrate the important and wonderful bio-cultural relation between humans and nature in the Sahyadri landscape.

We are reminded of the meaningful poem by Joyce Kilmer (1886-1918)

I think that I shall never see
A poem lovely as a tree

A tree whose hungry mouth is prest
Against the earth's sweet flowing breast

A tree that looks at God all day
And lifts her leafy arms to prey

A tree that may in summer wear
A nest of robins in her hair

Upon whose bosom snow has lain
Who intimately lives with rain

Poems are made by fools like me
But only God can make a tree

Modi's G20 Push For Green Credit Scheme Wants PrivatePlantations To Replace Forests, Rejected By His Own Experts

Aditi Vajpeyi and Mridula Chari

Prime Minister Narendra Modi is pushing a vaguely worded programme —first proposed 15 years ago when he was Gujarat chief minister—thatencourages the replacement of government and community-governed forests by private plantations as part of India's climate-change commitments. Over five years, the idea of such private run plantations has been opposed at least three times by one of his own ministries andby a Supreme Court committee. In June, the environment ministry suddenly cut short mandatory public consultation, and in September Modi urged G20 nations that his green credits plan be considered globally.

Himachal Pradesh/Mumbai: Prime Minister Narendra Modi is pushing the world to adopt a vaguely worded environmental programme that hefirst proposed as chief minister of Gujarat 15 years ago but has been conceptually opposed three times by one of his own ministries and by aSupreme Court committee.

The idea: that, as part of India's climate-change commitments, private plantations run by companies could replace swathes of India's forests, currently governed by either local communities or the government and over which communities that depend on these forests have legal rights.

On 9 September 2023, while speaking at the G20 Summit session, Modiproposed that countries of the group start working on a "Green Credit Initiative", a plan to create a competitive market system that would reward "environment-positive" actions in the form of "green credits".

Thirteen days earlier, on 27 August while addressing the Business 20 India 2023 summit in New Delhi, Modi announced that India has prepared "a framework for green credits businesses", even as "everyonehas been caught up in carbon credits, and some are even benefiting from them".

Countries and businesses use permits called carbon credits to offset their carbon

emissions by reducing carbon in other places through treeplantations or using renewable energy. Companies can trade carbon credits on exchanges, allowing them to emit a certain quantity of greenhouse gases, which contribute to warming the planet.

Like carbon credits, green credits could be bought or sold on a domestictrading platform, which does not yet exist; they cover a wider range of eight sectors, including tree plantation, water conservation, mangrove restoration and sustainable agriculture.

A green credit would be given by the ministry of environment based onthe nature and scope of an "environment-positive" action. But the draft rules do not clarify how such an action in one sector is meant to cancelout actions that are harmful to the environment, as carbon credits claimto do.

With the notification of the draft green credit programme on 26 June2023, India will adopt two credit mechanisms, carbon and green.
The Carbon Credit Trading Scheme was notified on 28 June, two days after the notification of the Draft Green Credit Programme Implementation Rules.

Carbon credits have a certification system to prove reduction in carbon emissions, though these have often been accused of being vulnerable tofraud and leading to exploitation of indigenous rights and ecosystems.

With green credits, however, the meaning or value of a credit itself is notyet clear, but it is conceivable, said Soumitra Ghosh, an activist with an advocacy group called the All India Forum of Forest Movements, that companies may make misleading claims in the absence of technology ormethods to verify such credits.

"You can do any activity and can claim it green and earn a credit for it,"said Ghosh. In 2023, Ghosh and a group of independent lawyers, researchers and others submitted a critique of the green credit programme to the union environment ministry, recommending "immediate withdrawal of the scheme".

"Green credit focuses on planet-positive actions," said Modi during theG20 summit, urging businesses to "associate with green credits and make it a global movement". The programme literature itself claims nodirect climate benefits.

> And whereas, an environmental activity generating Green Credits may have climate co-benefits such as reduction or removal of carbon emissions. An activity generating Green Credits under Green Credit Programme may also get Carbon Credits from the same activity under carbon market.

Preamble of the Draft Green Credit Programme Implementation Rules2023 says the programme "may have climate co-benefits"

"It is clear that this programme is for the domestic market, but it does notclaim that the programme is a climate-mitigation programme to reduce emissions," said Souparno Lahiri, senior climate and biodiversity advisor at the Global Forest Coalition, an advocacy. "I am not sure why this programme is developed if it is not aimed at climate benefits in the firstplace. What is it for?"

India's policy changes around forest laws and policies are associated with climate mitigation, after India updated its Nationally Determined Contributions commitments to the United Nations Framework on ClimateChange in 2021 and goals in 2022.

No country has a green credit programme like India's. An exception, China, has an unrelated policy of such credits for banks that ensure responsible environmental risk management systems when they issueloans.

A Long, Troubled History

Countries that signed the Paris Agreement in 2016, a legally binding international treaty on climate change, have committed to climate actionplans that aim to cut carbon emissions through their nationally determined contributions.

One of India's updated commitments is to absorb 2.5 to 3 billion moretons of carbon dioxide from the atmosphere than it currently does by planting more trees and forests by 2030.

The question then is, how India plans to achieve this target, given thatindustries and the state continue to push for deforestation?

One way the Indian government has been doing this is through government schemes for afforestation, such as the Compensatory Afforestation Fund, managed by forest departments and run on funds received from user agencies to compensate for loss of forests,including mass afforestation schemes run by states.

The union government is also pushing for afforestation by private parties, an approach with a long, troubled history that is closely intertwined with the green credit

programme. From forest rights activists,to a Supreme Court committee and the tribal affairs ministry, there has been consistent opposition to the concept of private afforestation.

The green credit programme is a part of a move to restructure the entirearchitecture of forestry and forest rights in India by diluting laws that protect forests from being cut down and introducing policies that encourage private players to manage tree plantations.

Article 14 sought comments from union environment minister BhupenderYadav, minister of state Ashwini Kumar Choubey, environment ministry secretary Leena Nandan, and environment ministry joint secretary Nameeta Prasad over email, phone calls and messages to their offices.

An official at the ministry of consumer affairs, where Choubey has additional charge, said that his official Parliament email and his environment ministry email were both inactive. We also sent an email toChoubey's personal email. Prasad was in a meeting when we contactedhim on 27 September.

On the same day, Article 14 sent a follow-up email to Choubey’s consumer affairs ministry email account, as well as a WhatsApp message to the manager of his media cell. There was no reply, nor to another email sent to secretary Leena Nandan. Officials did not reply toat least three attempts to call Yadav at his office on 27 September.

The programme comes in the context of implementing mission LiFE or Lifestyle for Environment, a concept Modi unveiled in 2021 to promotea mass movement of people and entities to lead environmental conscious lifestyles in response to climate change.

"This article was originally published in Article 14 and has beenrepublished here with permission."

“What the green credit programme does materially is not about whetherit improves ecological outcomes on the ground,” said Vijay Kolinjivadi, apostdoctoral fellow at the Institute of Development Policy at the University of Antwerp. “It is markets and

financialisation that are drivingthe green credit programme, not ecological devastation and ecological breakdown on a scale unseen in human history."

1. Short Title and Commencement – (1) These rules may be called the Green Credit Programme Implementation Rules, 2023.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Objectives of the Green Credit Programme – (1) The main objectives of the Green Credit Programme (herein after referred as 'Programme') are as follows: -

a. Create a market based mechanism for providing incentives in the form of Green Credits to individuals, Farmer Producer Organisations, cooperatives, forestry enterprises, sustainable agriculture enterprises, Urban and Rural Local Bodies, private sectors, industries and organisations for environment positive actions;

b. Create mass movement around environment positive actions and realise the vision of **"Mission LiFE"** through pro-planet-people and entities.

The Draft Green Credit Programme Implementation Rules has twoobjectives: to create a market and a mass movement to promote "environment positive actions"

The Green Credit Programme unfurls along two timelines. One is the recent path that it has taken after its announcement in the budget speech in February 2023. The other originates in 2008 in Gujarat, duringModi's tenure as chief minister.

Consultation Time Is Cut

The ministry of environment, forests and climate notified the Draft Green Credit Programme Implementation Rules on 26 June 2023, with a standard 60-day consultation period for receiving comments and responses from the public.

The consultation period was scheduled to end on 24 August. On 18 July,the ministry issued another notification cutting short the deadline for public consultations to 31 July, "in order to give effect to the final notification for promotion of voluntary environmental actions". This left only 14 more days for public responses.

In the 18 July notification, the ministry said that the draft notification hadbeen released "for the information of the public likely to be affected" and"to receive objections and suggestions from any person". The ministry also said "several consultations had already been undertaken with the concerned stakeholders" and between ministries before they issued therules.

Two days later, on 20 July, the Indian Council for Forestry Research andEducation (ICFRE), an autonomous council under the ministry of environment, named as the

administrator of the green credit programme, published a vacancy advertisement for “senior consultants” to draft guidelines, methodologies and standards.

The call for consultants focused on two sectors: tree plantation-based green credits and water conservation-based green credits, revealing thegovernment’s focus. According to the draft rules, tree plantation-based credits would be given for activities that boosted the number of trees.

Water-based credits include water conservation, water harvesting andincreasing water-use efficiency.

Tushar Dash, an independent researcher who works on forest rights andgovernance, alleged the green credit programme was a cover to “institutionalise a complicated legal and political architecture for privatisation of forests and facilitating the entry of market institutions in afforestation programs”.

No. 1-69/2022/BCC/ICFRE/ Green Credit
Indian Council of Forestry Research and Education
(An Autonomous body of the Ministry of Environment, Forest and Climate Change, Government of India)
P.O. New Forest, Dehradun – 248 006 (Uttarakhand), INDIA

Dated: 20/07/2023

Subject: Advertisement for the engagement of *Senior Sector Experts/SeniorConsultants (i.Tree Planation based Green Credit;ii)Water Conservation based Green Credit and iii)Green Credit Registry, Verifiers, Auditors and GCP portal*) on contractual basis at Indian Council of Forestry Research and Education (ICFRE), Dehradun

Ministry of Environment Forest and Climate Change (MoEFCC) is developing the Green Credit Programme (GCP) with the objectives to enhance and to incentivize positive environmental actions through domestic voluntary market mechanism. The Indian Council of Forestry Research and Education (ICFRE) shall be the Administrator for the GCP and responsibility of developing guidelines, methodologies, standards, registration process, verification mechanisms, accreditation of green credit registry, trading platform, data platform, etc. for GCP and valuation across different sectors is entrusted with the Administrator.

Applications are invited from Indian nationals fulfilling the eligibility criteria for engagement of ***Senior Sector Experts/Senior Consultants (i.Tree Planation based Green Credit, ii. Water Conservation based Green Credit and iii. Green Credit Registry, Verifiers, Auditors and GCP portal*)** on contractual basis initially for a period of one year at Indian Council of Forestry Research and Education, Dehradun on payment of consolidated remuneration of Rs. 1,25,000 per month.

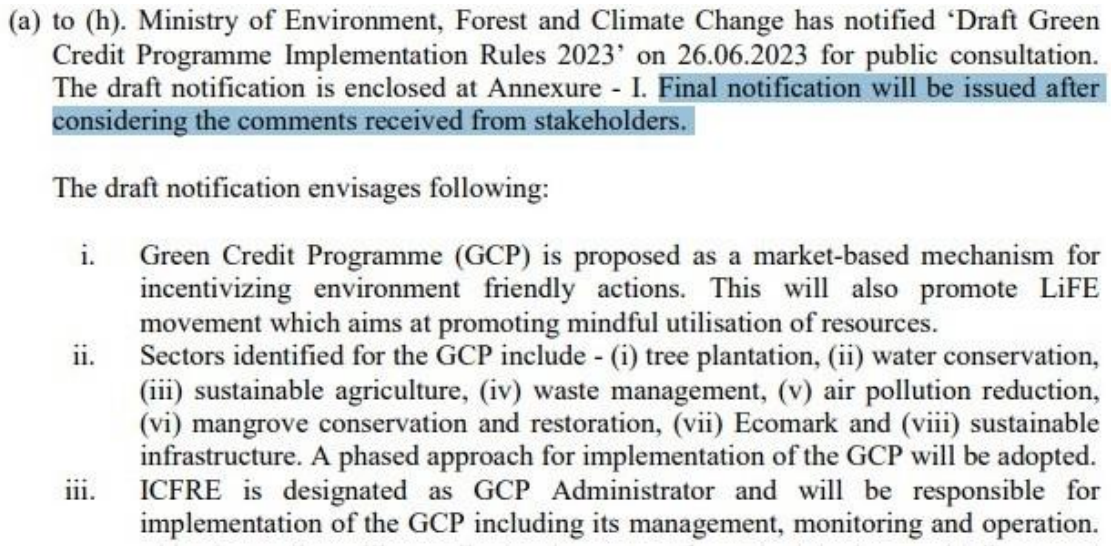
Interested individuals possessing required qualifications and experience should submit their applications in the prescribed proforma (Annexure-I) along with self-attested supporting documents by hand/ by post/ by email on or before 18 August 2023 (3:00 PM) to the address given below:

Assistant Director General (Biodiversity and Climate Change)
Room No. 42
Indian Council for Forestry Research and Education
P. O. New Forest Dehradun -248006, Uttarakhand (INDIA)
Tel: +91-135-2224823, Tele Fax: +91-135-2750296
Email: adg_bcc@icfre.org, Website: www.icfre.gov.in

Two days after the Modi government cut short the consultation process, the Indian Council of Forestry Research and Education issued a call for consultants to draft rules for the green credit programme.

“Instead of dispensing with the consultation process altogether, it was carried through a truncated exercise,” said Kanchi Kohli, an environmental law and policy researcher. For ICFRE to then start hiringconsultants, she added, “can unfortunately give the impression that the call for comments was never meant to influence the outcome of the draftrules”.

On 24 July, while responding to a question in Lok Sabha on green credits, union minister of state for environment Ashwini Kumar Choubeysaid a “final notification” would be issued after considering stakeholder comments. The notifications do not clarify who these stakeholders were.



(a) to (h). Ministry of Environment, Forest and Climate Change has notified ‘Draft Green Credit Programme Implementation Rules 2023’ on 26.06.2023 for public consultation. The draft notification is enclosed at Annexure - I. Final notification will be issued after considering the comments received from stakeholders.

The draft notification envisages following:

i. Green Credit Programme (GCP) is proposed as a market-based mechanism for incentivizing environment friendly actions. This will also promote LiFE movement which aims at promoting mindful utilisation of resources.
ii. Sectors identified for the GCP include - (i) tree plantation, (ii) water conservation, (iii) sustainable agriculture, (iv) waste management, (v) air pollution reduction, (vi) mangrove conservation and restoration, (vii) Ecomark and (viii) sustainable infrastructure. A phased approach for implementation of the GCP will be adopted.
iii. ICFRE is designated as GCP Administrator and will be responsible for implementation of the GCP including its management, monitoring and operation.

On 24 July 2023, the environment minister said that the ministry wouldissue final notification of the green credit programme after consideringstakeholder comments

Responding to another Lok Sabha question on 7 August on financial support to the green credit programme, Choubey said that the ministryhad allocated Rs 1 crore in-principle to the ICFRE to develop the programme.

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI ASHWINI KUMAR CHOUBEY)

(a) to (e) The Green Credit Programme (GCP) is envisaged as a market-based mechanism for incentivizing environment friendly actions. Sectors identified for the GCP in a phased manner include - (i) tree plantation, (ii) water conservation, (iii) sustainable agriculture, (iv) waste management, (v) air pollution reduction, (vi) mangrove conservation and restoration, (vii) Ecomark and (viii) sustainable infrastructure.

Green Credits will be made available to individual and entities, engaged in selected pro-environment activities for trading on a domestic market platform.

The Indian Council of Forestry Research and Education (ICFRE) is designated as Administrator of the Green Credit Programme. In-principle approval of allocation of Rs. 1 Crore has been accorded to ICFRE for Programme Management Unit (PMU) towards operationalisation of the GCP, which includes development of methodologies and infrastructure for GCP.

Ministry of Environment, Forest and Climate Change has notified 'Draft Green Credit Programme Implementation Rules 2023' on 26th June 2023 for public consultation. The draft notification is enclosed at Annexure - I.

On 7 August 2023, the environment minister said that the ministry hadallocated Rs. 1 crore to the Indian Council of Forestry Research and Education, the designated administrator for the Green Credit Programme.

On 25 and 27 September, when Article 14 sought comment, over emailand phone calls and messages to his office, on why public consultation was cut short, Choubey was not available for comment.

'Not Even Aware Of Scheme'

"How can the government claim that stakeholder consultation has beendone when no gram sabha or community member in our state is even aware of this scheme?" asked Gopi Maji, state convenor of
the Campaign for Survival and Dignity, a national advocacy forum oftribals and forest dwellers, based in Odisha.

“The government only cares to consult with the big corporations and hasmade a mockery of the public consultation process,” said Maji. “We are already witnessing this in the case of the Forest Conservation Amendment Bill, where in spite of responses and objections being raisedfrom all across the country, the government ignored it all and passed theBill.”

In 2022, the environment ministry introduced a Forest Conservation Bill that proposed amendments in the Forest Conservation Act of 1980,limiting its applicability to certain types of forest land. On 4 August 2023 , the Forest Conservation (Amendment) Act was notified by Parliament.

Lifting protection for forests on certain categories of land from being cutfor “development”, the amendments allow “linear projects”—referring tohighways, railways, canals and dams—mining leases, creation of land banks without forest department approval.

These exemptions violate the Forest Rights Act of 2006, which recognise rights of communities that depend on forests for livelihood onall types of forest land and require consent of gram sabhas before such“diversion”, to use the official term.

Ignoring opposition, on 4 August, the ministry notified the Forest (Conservation) Amendment Act of 2023 without any discussion in Parliament.

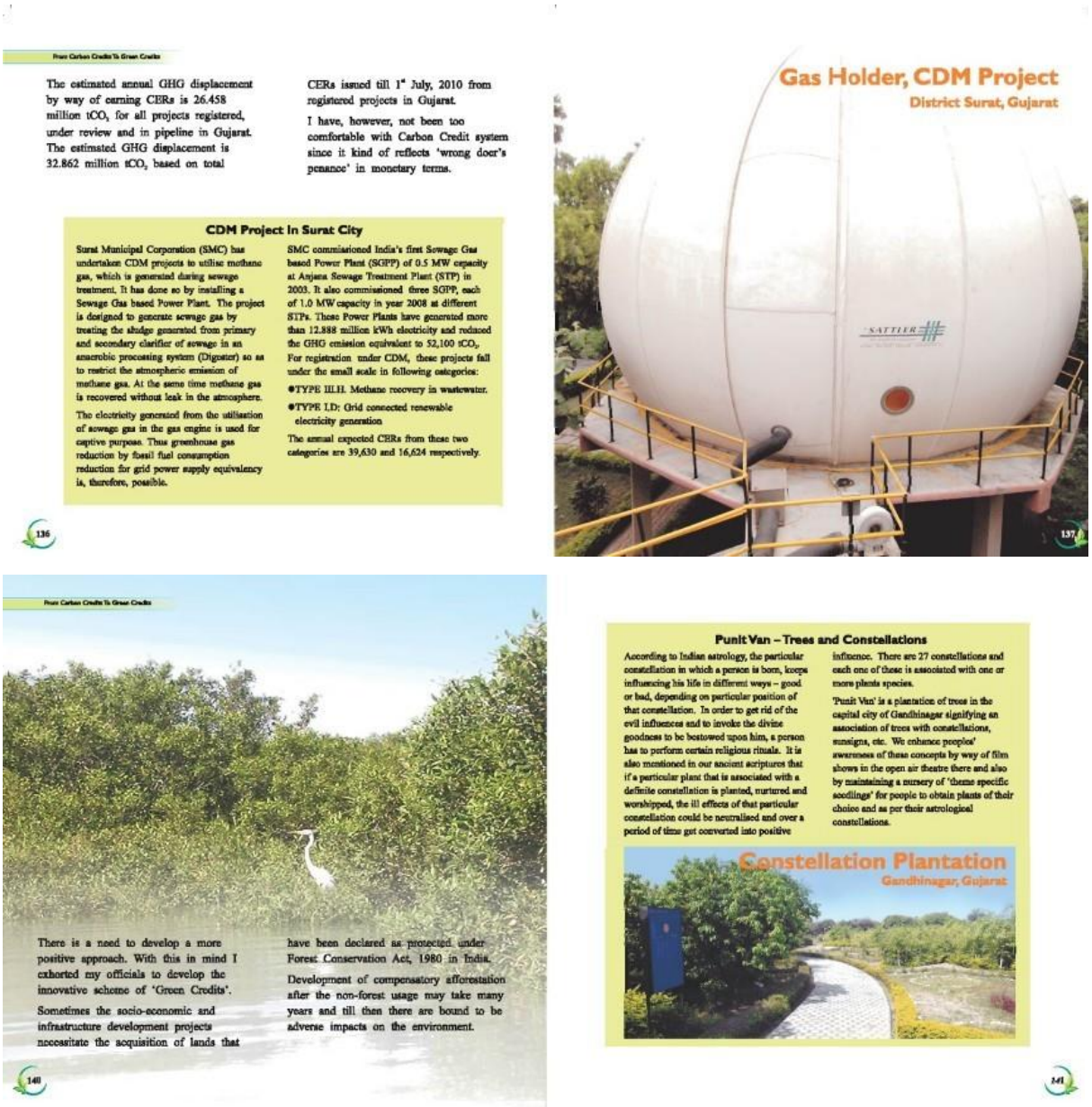
Troubled History & Politics Of Green Credits

The history of green credits runs parallel to the history of attempts toprivatise forests. This began not in New Delhi but in Gujarat in 2008when Modi was chief minister.

In December 2008, Modi announced that "Gujarat has moved forward byadopting the strategy of Green Credit, which is a step ahead beyond theCarbon-Credit". He said that the proposal had already been approved by the United Progressive Alliance government of the time.

When Gujarat set up a department for climate change in February 2009, it announced a "Green Credit Movement", similar to carbon credits.

In 2011, Modi mentioned, in an illustrated book by him on climate change, his discomfort with carbon credits because they "reflect wrongdoer's penance in monetary terms". He also spoke about greencredits in this book.



From Carbon Credits To Green Credits

The estimated annual GHG displacement by way of earning CERs is 26.458 million tCO_2 for all projects registered, under review and in pipeline in Gujarat. The estimated GHG displacement is 32.862 million tCO_2 based on total CERs issued till 1st July, 2010 from registered projects in Gujarat.

I have, however, not been too comfortable with Carbon Credit system since it kind of reflects 'wrong doer's penance' in monetary terms.

CDM Project In Surat City

Surat Municipal Corporation (SMC) has undertaken CDM projects to utilise methane gas, which is generated during sewage treatment. It has done so by installing a Sewage Gas based Power Plant. The project is designed to generate sewage gas by treating the sludge generated from primary and secondary clarifier of sewage in an anaerobic processing system (Digester) so as to restrict the atmospheric emission of methane gas. At the same time methane gas is recovered without leak in the atmosphere.

The electricity generated from the utilisation of sewage gas in the gas engine is used for captive purpose. Thus greenhouse gas reduction by fossil fuel consumption reduction for grid power supply equivalency is, therefore, possible.

SMC commissioned India's first Sewage Gas based Power Plant (SGPP) of 0.5 MW capacity at Anjana Sewage Treatment Plant (STP) in 2003. It also commissioned three SGPP, each of 1.0 MW capacity in year 2008 at different STPs. These Power Plants have generated more than 12.888 million kWh electricity and reduced the GHG emission equivalent to 52,100 tCO_2.

For registration under CDM, these projects fall under the small scale in following categories:

- TYPE III.H. Methane recovery in wastewater.
- TYPE I.D: Grid connected renewable electricity generation

The annual expected CERs from these two categories are 39,630 and 16,624 respectively.

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Gas Holder, CDM Project
District Surat, Gujarat

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From Carbon Credits To Green Credits

There is a need to develop a more positive approach. With this in mind I exhorted my officials to develop the innovative scheme of 'Green Credits'.

Sometimes the socio-economic and infrastructure development projects necessitate the acquisition of lands that have been declared as protected under Forest Conservation Act, 1980 in India.

Development of compensatory afforestation after the non-forest usage may take many years and till then there are bound to be adverse impacts on the environment.

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Punit Van – Trees and Constellations

According to Indian astrology, the particular constellation in which a person is born, keeps influencing his life in different ways – good or bad, depending on particular position of that constellation. In order to get rid of the evil influences and to invoke the divine goodness to be bestowed upon him, a person has to perform certain religious rituals. It is also mentioned in our ancient scriptures that if a particular plant that is associated with a definite constellation is planted, nurtured and worshipped, the ill effects of that particular constellation could be neutralised and over a period of time get converted into positive influence. There are 27 constellations and each one of these is associated with one or more plants species.

'Punit Van' is a plantation of trees in the capital city of Gandhinagar signifying an association of trees with constellations, sunsigns, etc. We enhance peoples' awareness of these concepts by way of film shows in the open air theatre there and also by maintaining a nursery of 'theme specific seedlings' for people to obtain plants of their choice and as per their astrological constellations.

Constellation Plantation
Gandhinagar, Gujarat

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Pg 136 and 140 of book "Convenient Action - Gujarat's Response toChallenges of Climate Change" where PM writes about both carbon credits and green credits, in 2011.

The green credit scheme at this time proposed that the forest department would identify possible private or degraded lands forafforestation. Private applicants could plant trees on these lands.

"Since 2014, project developers have been asking the government to ensure easy ways of getting land for compensatory afforestation," said

Dash. The green credit scheme idea is one of the solutions the government has proposed. A critical requirement for a developer that wants to use forest land is to get approval from the environment ministry.At the first stage of clearances, the forest department has to identify andallocate land to this project. Developers also have to pay the forest department a certain amount for compensatory afforestation. Only then will the developer receive a clearance.

“If companies can be given the option to raise their own plantations andtrade them off, that is another way of getting faster clearances,” Dash said.

With the green credit scheme, user agencies could purchase creditsfrom other private players who have already planted trees on privateland. This could mean that private tree plantations could end up replacing forests.

9.3.3 Policy support

- Exploring scope of convergence of developmental programme in areas within forest and fringe forest areas from Rural Development, Tribal and Social Welfare, Health & Education, Power Department for holistic development of forest dependent communities.
- Forests, on their own, cannot sustain the load of unemployment of Forest Dependent Communities; hence, other sectors should be explored to divert the pressure.
- The Green Credit scheme proposes that the Forest Department would identify in advance possible lands and prepare a blue print for their afforestation. They would then sign a Memorandum of Understanding (MOU) with potential user agencies which in turn would provide funds at the disposal of the former for afforestation. Since this afforestation will take place on private lands under the controlled, supervision and monitoring of the Forest Department they then would provide credits (certificates) for this which could later be used by the user agency at the time of making an application under the Forest Conservation Act, 1980 for the use of forest land for non-forest purposes. The Green Credits scheme could be enhanced to focus not just on the area being afforested, but also give weightage to the type of plantations undertaken, its yield in terms of biomass and associated carbon, among other benefits. Planting genetically improved varieties would provide more yields. On the other hand, planting local varieties that are also used by local communities could provide for better livelihood opportunities.

Gujarat State Action Plan on Climate Change: draft report (page 119)

The concept mentioned in Modi's book was reiterated in a 2014 draft report on the Gujarat State Action Plan on Climate Change, whichalso said green credits would account not only for the area of afforestation but the value of the plantation, biomass yield and capturedcarbon.

Green Credit Idea Moves To Delhi

Once Modi became prime minister, the union government began its pushfor green credits. The government of Gujarat made a presentation on green credits at a meeting chaired by the secretary of the environment ministry in December 2014. Officials at the meeting decided to constitute

a committee under the additional director general of forest conservationto prepare a similar scheme for the union government.

Comments of FP Division

1. In a meeting chaired by Secretary, EF&CC on 18.12.2014, a presentation on Green Credit Scheme was made. The proposed scheme is mainly focused on compensatory afforestation under FCA and involves swapping of plantations raised on non-forest land in lieu of compulsory compensatory afforestation and a little incentive in form of reduction in NPV liable.
   It is decided in the meeting to constitute a committee under chair of ADG(FC) to prepare a scheme involving private people in growing tree plantation on private land, plantation on degraded forest land, whether a component can be added in Compensatory Afforestation scheme to add/adjust plantation/ forest grown on private lands or incentivizing advance tree plantation raised in advance to be adjusted against CA requirement in future against diversion of forests, specific incentives for persuading people residing near forests etc.

2. On 14.01.2015 the committee discussed a draft concept note prepared in this regard. On 26th June, 2015 a presentation was made before Secretary, EF&CC on private participation in afforestation on degraded forest land including Green Credit and Tree Credit Certificate. It was decided in the meeting that PPP on afforestation of degraded forestlands should be finalized first. Accordingly, Guidelines for Participation of private sector in afforestation of degraded lands have been prepared and approved by HMEF&CC. A draft of Green Credit Certificate Scheme has been submitted for approval on 24.08.2015 but there is no approval by HMEF&CC on record.
3. No further action on proposed 'Green Credit Scheme' is on record of Forest Policy Division.
4. Forest Conservation Division may examine the proposed Green Credit Scheme in light of FCA Act, 1980, CAF Act, 2018 and rule made there under as it may deem fit.
5. In view of the above, it is submitted that the matter of Green Credit Scheme is a part of the Parliament Assurance for Rajya Sabha Unstarred Question No. 938 dated 17.07.2014 is pending since long.

The committee formed under the additional director general of forest conservation recommends public-private partnerships for tree plantations and also prepares a draft of the green credit programme.

On 26 June 2015, the committee made a presentation on private participation in afforestation before the secretary of the environment. Theministry approved afforestation guidelines that allowed companies and

people to plant trees on private “degraded land”. It also submitted aconcept note for green credits to the ministry in August 2015.

In 2014, Prakash Javadekar, then the environment minister, told the Rajya Sabha that the Supreme Court would need to approve the scheme. In 2020 , the Indian Express quoted Jaipal Singh, a senior Gujarat forest official, as saying, “The Central Empowered Committee ofthe Supreme Court looked at the scheme and found the proposal untenable. There has not been any movement on the plan since.”

GREEN CREDIT SCHEME
6th August, 2014

LSQ 4028

SHRI ANTO ANTONY
SHRI NARANBHAI KACHHADIA
SHRI RAMSINH RATHWA

Will the Minister of **ENVIRONMENT, FORESTS AND CLIMATE CHANGE** be pleased to state:

(a) whether the Government has introduced/proposes to introduce ‘Green Credit Scheme’ (GCS) in the country;
(b) if so, the details, present status and the salient features thereof;
(c) whether the Government has received any proposal from any State Government in this regard including Gujarat; and
(d) if so, the details thereof and the response of the Government thereto, State-wise?

MINISTER OF STATE (INDEPENDENT CHARGE) FOR ENVIRONMENT, FORESTS AND CLIMATE CHANGE (SHRI PRAKASH JAVADEKAR)

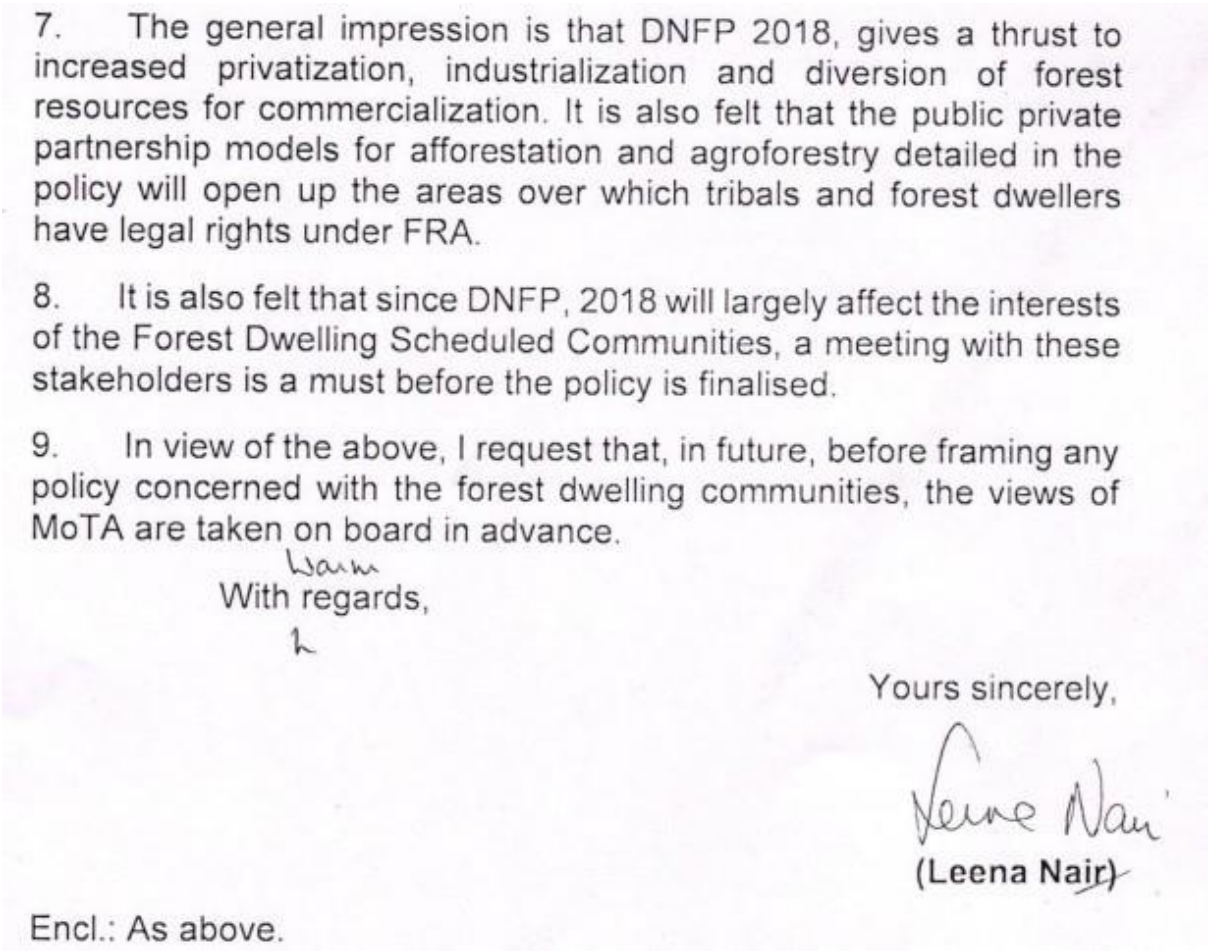
(a) to (d) The Central Government has not introduced Green Credit Scheme in the country. However, the Central Government has received the proposal by the name ‘Green Credit Scheme’ from the State Government of Gujarat. This proposal envisages advancing the obligatory compensatory afforestation in cases of diversion of forest land under the Forest (Conservation) Act, 1980. The proposal has been examined in the Ministry and requires approval of the Hon’ble Supreme Court of India. The State Government of Gujarat has been advised to approach the Hon’ble Supreme Court of India for obtaining further directions.

The environment ministry in 2014 said that the government of Gujarathad been advised to approach the Supreme Court to implement the green credit scheme.

Despite rejection by the Supreme Court committee, the environment ministry continued to pursue the idea of privatised tree plantation. In 2016, the draft national forest policy proposed “production forestry” to

facilitate a “forest industry interface”. In 2019, amendments to the IndianForest Act of 1927 proposed the involvement of the private sector to create “production forests”.

However, both suggestions were withdrawn after widespread opposition, including from the ministry of tribal affairs in 2018. Critics argued that opening forests to such public private partnership schemeswould impact the Forest Rights Act, 2006, which recognises rights of Adivasis and other traditional forest-dwelling communities on all forest lands.



7. The general impression is that DNFP 2018, gives a thrust to increased privatization, industrialization and diversion of forest resources for commercialization. It is also felt that the public private partnership models for afforestation and agroforestry detailed in the policy will open up the areas over which tribals and forest dwellers have legal rights under FRA.

8. It is also felt that since DNFP, 2018 will largely affect the interests of the Forest Dwelling Scheduled Communities, a meeting with these stakeholders is a must before the policy is finalised.

9. In view of the above, I request that, in future, before framing any policy concerned with the forest dwelling communities, the views of MoTA are taken on board in advance.

With regards,

Yours sincerely,

(Leena Nair)

Encl.: As above.

Letter from the ministry of tribal affairs to ministry of environment forestsand climate change opposing commercialisation of forests envisaged by the Draft National Forest Policy 2018

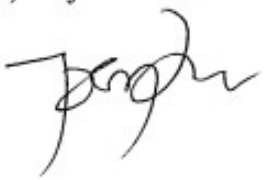
Despite the tribal affairs ministry pushback, the idea resurfaced onceagain under the label of the Green Credit Programme in 2019.

On 6 July, 2019, as a part of the Indo-German Development Cooperation Project the environment ministry issued a call for proposalson "Operationalizing Green Credit Programmes in India".

The forest advisory committee, which scrutinises requests to divert forestlands to non-forest uses, in December 2019 said that private plantations in non-forest areas would help India meet its sustainable development goals and nationally determined contributions to mitigate climate change.It added that such plantations would be accepted as compensatory afforestation and recommended that the environment ministry issue guidelines.

Decision of FAC:

FAC deliberated on the issue and appreciated the scheme in principle. After thorough deliberation and discussion FAC recommended that such plantation shall be accepted on non-forest area. FAC believes that such schemes will encourage plantation by individuals outside the traditional forest area and will help in contributing towards meeting the International commitments of the country such as Sustainable development goals(SDGs) and Nationally determined contributions (NDCs).All such established plantations may be accepted for the purpose of CA(Compensatory afforestation) subject to the standard conditions, such as, the



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CA land is mutated and notified as PF/RF.MoEF&CC may work on the modalities and issue specific guidelines in this regard.

The Forest Advisory Committee in 2019 says that the green creditprogramme would encourage individuals to plant more trees.

For a year after, there was no evident movement on the scheme. In a June 2021 right-to-information-act response accessed by the writers, theministry even said that it had “decided not to take any further action on the proposal of ‘Green Credit Scheme’ in the form as was proposed by Government of Gujarat”.

Enter Registration Number	MOENF/R/E/21/00711
Name	P Ashish Kumar
Date of filing	22/06/2021
Public Authority	Ministry of Environment, Forest and Climate Change
Status	REQUEST DISPOSED OF
Date of action	14/07/2021
Reply :- A scheme, namely the "Green Credit Scheme" was received in the Ministry for its examination and further consideration. The purpose of the scheme was to consider plantations raised by private persons/authorities in lieu of the compensatory afforestation which is a mandatory requirement against any diversion of forest land. The proposal of the Government of Gujarat was further examined in the Ministry in the light of new and broaden opportunities emerging out of various international and national commitments of the country. Accordingly, the Ministry of Environment, Forest and Climate Change has decided not to take any further action on the proposal of "Green Credit Scheme" in the form as was proposed by Government of Gujarat.	

A 2021 RTI response shows that the environment ministry had no intention of taking action on the Green Credit Scheme as proposed bythe Gujarat government.

Green Credits@2023

All the background work to push green credits finally became evident asIndia took over the G20 presidency in December 2022.

In January 2023, the environment ministry notified guidelines for aprogramme similar to the green credit scheme envisioned by the government of Gujarat, calling it "accredited compensatory afforestation".

Accredited compensatory afforestation allows private companies and people to plant trees on any land, which would then be counted as compensation for the diversion of forest land. The guidelines said that compensatory afforestation by the state faced problems of delayed fundsand unavailability of forest land, which is why private landowners and

government institutions should be encouraged to plant trees outsideforest lands.

Meanwhile, finance minister Nirmala Sitharaman announced a green credit programme in her budget speech on 1 February 2023. The green credit programme establishes a direct link between green credits and accredited compensatory afforestation by requiring those involved in such afforestation to register under a green credit registry. This way it makes any kind of accredited compensatory afforestation eligible for earning and being allocated green credits. The ACAs will become compensatory afforestation and then can be traded against the diversionof land for non-forest purposes.

Delhi-based environmental lawyer Puja, who uses only one name, stressed that the government is “promoting marketisation of the environment, ecosystems and forests by seeking to incentivise such activities… which can fall under the green credit programme”. Puja saidit was “the duty of the state” to protect the environment and prevent environmental pollution.

Instead, the state, said Puja, puts the burden on “consumers to be conscious towards the environment and Adivasis to be the service providers of environmental services without any corresponding rights”.

Maji of the Campaign for Survival and Dignity alleged the concept of credits would help corporate and industrial interests to “bandage” theirdestruction of ecosystems.

“I am from the Gond tribe. We have lived, managed, and conserved theforests and ecosystems for generations,” said Maji. “We don’t need to earn credits through any credit scheme. The Forest Rights Act of 2006 already recognises our rights and vests them in us, but these privatisation and credit schemes are now trying to interfere with ourrights and our lands.”

This article was originally published in Article 14 and has beenrepublished here with permission.

Aditi Vajpeyi is an independent researcher and writer based in HimachalPradesh and Mridula Chari is an independent journalist based in Mumbai.

Getting lost in Brazil

Pandurang Hegde

I was doing slow travel of 2000 kms from Salvador Bahia, the old capital of Brazil to Belem in the confluence of the Amazon. After an overnight travel I got stuck in Petrolinia.

Getting stuck in an unknown place is always miserable. Not knowing what to do, where to go and how to spend time, an entire day.

As soon as I realised this I searched for contacts in the town on Couchsurfing, a site I use that hosts people all over the world. Only two were active, so I sent a message to both of them. Icaro, a young lecturer in the Federal University replied requesting me to come to his house.

He is teaching remote sensing in Agronomy. Author of 3 books on the impact of mining, hydel dams and wind energy on the environment, he gave me an in-depth understanding of the ecological issues in the region and the background of two large hydel dams on the San Francisco river that irrigates a huge agricultural area and produces energy.

Petro means 'stone ' but the city of stones has become a hub of large agro industries, all the famous multinational seed and pesticides companies have their presence here. Bayer,s Brazilian subsidiary owns 4000 acres of mango orchards. I wanted to see this, but we could not get permission. But my friend said we can still see similar plantations by driving through a rough road in that area, as it's a public road, no problem to drive and take pictures.

He organised a taxi to visit mango and grape plantations.

What an amazing sight!

Thousands of acres of mango orchards all around as if you are in mango country. What more, they harvest mangoes round the year! I saw trees laden with mangoes as

well as flowers in the same tree! Something strange for an Indian as we rarely see this on such a huge scale. It was all fenced with barbed wire and I could see huge filters to irrigate these orchards. Of course I could smell pesticides and a portion of mangoes covered with lime powder.

I was under the impression that it's some kind of pest repellent. But the taxi driver, whose father also owns 2000 mango trees explained that it's for protection from hot sun so that the right colour is maintained. Mangoes are exported to Europe and America throughout the year, shipped in refrigerated containers.

Mangoes originated in India but now with the use of high tech industrial production Brazil is the leader in mango production and export. And I was stuck in this mango country!

Don't ask me about food miles that need to be added to the costs and the huge amount of fertilizer, pesticides, and hormones used to produce these huge quantities of mangoes at such a magnanimous scale, which is unimaginable in India.

You know why big companies like Bayer and Monsanto have a huge presence in Brazil?

My friend clarified that it's safe because it meets all the standards of the EU and the USA for importing these mangoes and other agricultural products from this region.

In fact his department and University are supported by large projects sponsored by both Bayer and Monsanto! Through remote sensing, they evolve methods to identify the pests and diseases at micro level of any farm and plantation in the area. He even showed me how this is done on his lap top. Amazing development in remote sensing and its use in modern industrial agriculture!

We are talking of ecological practices of food production? At least in Brazil, the biggest food exporter, it’s already taken over by Corporate Agri Barons and we have no idea of their control over these processes of production.

Brazil is the hub of the world's food production. China, the USA, Europe and most other countries depend on Brazil to provide GM Soya, Corn and other agricultural products that feed the world's population.

Despite this my friend assured me that the organic farming movement is strong in Brazil with CemTerra known around the world as Landless Movement who produce organic food on small patches of land. Frankly speaking I never saw such communities, may be they exist but I wasn't able visit them?

Overall, I saw an obese Brazillian population, fed on coke, Pepsi and junk food.

Most surprising is that even though they produce large quantities of food and fruits to feed the world's population, they suffer from malnutrition and obesity! The contradictions are so obvious when I see the way they over consume meat and soft drinks.

Anyway, the challenge of spending a day turned out to be a great opportunity and exposure to Brazilian agriculture and ecology.

This is like striking gold in an unknown place! To add to that my friend gave me aged *Cachacha,* liquor made from sugarcane as a parting gift!

People do ask me how does this happen so often and that too in unknown places?

What else do you need in life?! Moments of joy and fulfilment of meeting strangers who become friends and provide a deep insight into their way of life.

These meetings with strangers who become intimate friends is the ultimate goal of slow travel.

Pandurang Hegde is with Prakruti, based in Sirsi, Karnataka

The Palni Hills Spring Conservation Project: a brief report

Mark Antrobus and S.Antonysamy

Introduction

The Palni Hills Conservation Council (PHCC) Spring Conservation Project is taking place in the highly consequential Palani Hills, an eastern off-shoot of the Western Ghats which is a watershed for millionsin the Plains of Southwestern Tamil Nadu in South India.

The direct effect of the project inputs directly with communities across the hill villages of Thamaraikulam and indigenous ‘Colony’ villages in theAdukkam Village Panchayat, with activism around natural waterbody (streams, marshes, and springs) restoration, conservation, and outreachdownstream.

Reflections of a spring?

The outcome of this work yields positive impacts on communities and the natural environment within and beyond the formal target area, and atmany levels. For example, compared with former years there is less apparent conflict along communal lines as a result of water disputes according to anecdotal reports by members of the Adukkam Panchayat.

In an era of water stresses due to intermittent drought and destructive cyclones under the reign of Climate Change, the activism of the springconservation project has facilitated the restoration and protection of many standing water-bodies in these rural forested areas.

When marshland and springs are degraded due to poor embankment support, or silted up (by cyclones and agri-erosion) wildlife and populations remote from centralised amenities suffer the sullying or evencomplete loss of this basic natural resource.

As open water-bodies are now PHCC maintained—springs bunded withstones and replanted with well-rooted native flora—ostensibly for humanuse, wildlife like elephants, deer, gaur, leopard, wild boar and other smaller species are also well-served; and because of the strong fortifications a corresponding outcome is that wildlife (as well as pack ponies and farm animals) cannot damage the embankments as before.

Since the outcome of regular PHCC surveys outside the target area helplink up communities distant from one another, this generates serious andhealthy discussions between communities and Government bodies (Panchayat, Horticultural Dept.) on water sharing and issues of chemicalpollution (e.g., in the hills and in mango orchards downstream).

PHCC activism has resulted in the Horticultural Department taking yetmore aggressive stance on its promotion of organic alternatives in agriculture to safeguard public health.

Desilting a spring in the hills

Considering environmental impacts, cyclones, drought, human diversions (roadworks, building) and wildlife depredation, the PHCC team survey of water-bodies in the target areas serves to track changesand select out water-bodies in need of urgent care, as well as those in use year-round by human and wildlife populations. These surveys serveto link with remote farms and result in positive outreach for a more scientific and ecological approach to preserving water-bodies.

Springs frequented so often and by so many folks and animals for different uses are vulnerable to i) laundry products and agri-pollutants, ii)cyclone siltation iii) agricultural soil erosion iv) open defecation and drainage from dwellings and v) animal degradation.

The PHCC spring project results in strengthening the isolated villagers and farmers' relationship to ecological and community-based solutions inwater issues in a time of climate change. To continue to be useful and safe for various purposes, water-bodies require ongoing care. All these vulnerabilities are discussed and constructive solutions mooted in ongoing engagement with the communities.

Testing the water

PHCC team efforts in engaging community action for desilting the springs, planting and re-planting marsh plants results in purifying the wildwater and reducing erosion of the soil.

In the target area villages, much of the agriculture is dedicated to coffeeplantation which requires native species' shade trees. PHCC encourages coffee growing as native shade tree preservation is a positive for the environment. Generally, the crop is a pleasant flavoured lower caffeine *Arabica* which does not require pesticides (unlike the highcaffeine but less smooth *Robusta* prone to berry infestation). But if the *Arabica* plants are too crowded black fungus (mai-noy) results and planters are urged to spray copper-sulphate or 'Bordeaux mixture'. This pollutes streams affecting fish and amphibians. In Kerala five-legged frogs have been discovered due to Bordeaux mixture stream pollution.
Fungicides such as this impact soil quality, as subsoil fungi are vital for the uptake of minerals to plants. Coffee planters taking PHCC advice about proper coffee plant spacing and the real enemies to crops and soilhas resulted in less use of this toxic fungicide.

Farmers mix open-sky vegetables and fruits such as beans, passion fruit, chow-chow and ground crops with coffee growing. PHCC advisesbest practices in crop rotation and fallowing essential to maintain the health of the soil. The PHCC team conducted workshops to raise awareness about the need for crop rotation resulting in an increase in the practice of crop rotation in the region among coffee/vegetable farmers.

The PHCC team conducted a bee-keeping workshop at PHCC's Fr Mathew Environment Centre Genguvarpatti in which twenty (20) womenfrom plains and hills participated. In this workshop, experts trained women in beekeeping, processing related products (beauty-care) and inmanufacturing beeswax candles and this has strengthened women's development and livelihood options.

The workshop communicated and reiterated that the use of toxic pesticides, fungicides, and herbicides severely impact all pollinators, notleast bees, but also humans directly.

Since bee health is directly impacted by the bee-foraging environmentand that immediately surrounding the hives this instruction to the

workshop participants is to result in further understanding of the dangersto health.

The workshop women participants were introduced to organic farming and its benefits in general and how critical it is not only for the bees butfor human health.

PHCC conducted a workshop for organic agriculture training at Fr. Mathew PHCC centre, Genguvarpatti. This included a visit to an organic coconut plantation at Kamakapatti, Manjular Dam basin. Several farmersin the area, with PHCC urging are picking up on natural products such as neem cake applications, *Pseudomonas*, *Trichoderma* etc., offered gratis or at subsidy by the Horticultural Department and promoted by PHCC. In this women farmer workshop, the participants were introducedto nursery raising, medicinal plants cultivation and preparation, their uses along with beauty products manufacture, and this has strengthenedwomen's development and livelihood options.

Women from the Adukkam, Thamaraikulam area were provided exposure to composting, creating manure from goat droppings and vermi-composting. These practices make their own farming and health oftheir families more sustainable without extra investment or efforts.

In conservation efforts, PHCC continued water-testing of major springsacross fourteen parameters. Twelve monthly test results were shared with communities of the areas surrounding the water-bodies to deepentheir understanding of water issues.

Based on the results, lower levels of pollution in rainy months, and higher levels of pollution in summer months, agricultural and pesticide wastes in the water and the need to address open defection near springs emerged. The water testing team's efforts at publicising their results raised awareness within the target community and for concernedactivists about pesticides and farm waste and this has increasingly discouraged open defecation among the communities.

In conclusion the PHCC Spring Conservation Project has improved conditions for the local community and wildlife. Changes would be to expand into neighbouring areas and increase lobbying for these causesto line departments.

For the past two seasons due to the attention paid, this once-seasonal spring unexpectedly became active all year round; Thamaraikulam villagers praise our work allowing them to obtain life-giving water from thespring even in the dry season.

The Adukkam village is one of the oldest on the south side of the hills withdwellings closely packed with little space to accommodate toilets and septic tanks. The PHCC team and community staff from this village conducted awareness meetings to reduce the common habit of open defecation at the village roadside. We instilled a sense of self- consciousness about this unsanitary practice, and made it clear with thehelp of Health Department information that this practice is known to intensify cases of intestinal reinfections, and the threat of foecal-borne diseases like hepatitis, cholera, and typhoid. Due to our sermonizing on hygeine, roadside defectation has reduced drastically with many folks unexpectedly remodelling houses with toilets and efforts to upgrade the existinfg almost unused Panchatyat public toilet.

Working with folks heavily conditioned in patriarchal ways, it is a challenge to engage women for uplift from tribal communities. Their communities actively discourage them from leaving home to interact withoutsiders. The PHCC team has been working on encouraging these women to participate and learn about alternative livelihood opportunities.

A major challenge in the past year has been attrition among female staff in the team. Selecting, encouraging and nurturing women from the very communities that PHCC serve is vital to our work. Time and resources totrain and facilitate the professional development of these women to be leaders and bring a sense of ownership to conservation efforts in their regions involves a well-spent investment of time and funds.

However, in the past year, as mentioned, a few women have had to relocate outside of Kodaikanal/Adukkam area after their marriage or for their children’s education. Their efforts and contribution were critical to the work of PHCC. Contending with their departure and finding new staffto train has somewhat inhibited our work.

Another major challenge for our work has been a deep shift that has taken place in the way people gather post the COVID-19 pandemic. People are still reluctant to gather in groups. It has become difficult toconduct awareness meetings in villages with more than a few people,

also due to heavy and continuous rains over the last year. In the hills,most farms and households are spread out, farmers taking out time totravel to gather has been important. Ever since the pandemic, fewer people are open to putting in the effort.

PHCC thus pivoted to more meetings with smaller groups of people. This simultaneously has increased the workload of the team and slowed down our work and reach.

Another challenge faced is that the expectation for people participatingin these meetings has risen and often involves monetary compensationfor work time lost. Often awareness and knowledge in the area of conservation for its own sake are insufficiently valued.

There was a crisis at a PHCC-developed public spring where the water was repeatedly disappearing for no apparent reason. The people aroundwere very upset at their loss of a vital resource. What could be the causeof the vanishing water? Upon investigation PHCC team discovered that a neighbouring farmer below the small spring had inserted a pipe at the bottom of the spring and was continually irrigating his crop with water meant for public use.

The challenge for PHCC was to head off an ugly confrontation and mediate between this spring beneficiaries and the rather self-important farmer. Good training for any future such clashes in this time of ClimateChange.

PHCC Micro-Forestry Protected Tree Planting Program

The long-term goal of PHCC native Protected Tree Planting for the Palnihills is to extend the slopes' forest cover thereby creating a biodiversity Green Belt around the degraded foothills of the Palni Range: this is being done to control erosion, alleviate drought, extend the reach of the watersheds to maintain and improve natural habitats and biodiversity of flora and fauna, and provide a favourable microclimate for all. The planting program this year (2023) is of 50,000 trees of above forty (40) species, it must be emphasised, which originate purely from PHCC teamefforts in native seed-collection and PHCC nurseries by dedicated arboriculture experts. PHCC native saplings are planted in protected areas, as always, to directly empower both wildlife and local Tribal and

Farming communities not least of all with life-giving cooling micro- climates. Furthermore, PHCC's protected tree program raises knowledge and awareness of what can be done to alleviate the effects locally of Climate Change. There are offshoot benefits besides of incomegeneration with employment in nursery tree raising programmes and planting.

The PHCC micro-forestry tree planting program is to generate a self- sustaining bio-diverse habitat to benefit environment and society as a whole by 1) ameliorating water stresses (via root percolation) in the age of climate change, and 2) increasing forest habitat micro-climate in degraded foothills. Such type of afforestation contributes to carbon sequestration, reduction of local temperature, while carbon dioxide is absorbed and oxygen produced for animal life forms while habitat loss is reversed.

Water-wise trees especially at the foot of the forest extend the benefitsof cooling to the plains and represent food and shelter—a lifeline, basically—for a wide variety of pollinators from bees, wasps, butterfliesto birds and mammals who are natural seed spreaders.

The program area on the north side of the Palni range is an ancient corridor for the Indian Elephant. It is to be noted that the region is visitedby the endangered Bengal Tiger. As suggested, many other mammals great and small, associated reptiles, insects and amphibians and endemic birds are ready to take up residence in these once pristine but now degraded foothill areas on the fringes of Kodaikanal Wildlife Sanctuary. The outcome of native species in protected tree planting canonly bring back areas deforested and degraded over many decades, increasing the range of critical wildlife, indicators of a healthy atmospheric template around the Hills.

The program outcome is to improve tribal and local farming community'sforest-based livelihood options alongside the encouragement of associated species of flora and fauna. Native trees under protection helppromote bio-diversity and regulate our ecosystem and its services.
Furthermore, the PHCC team conducts awareness programs to localcommunities on the importance of environmental conservation and sustainable development involving folks in conservation action.

Implementing the Protected Planting Program communities are sensitised to tree felling, to curtail illegal wildlife trade, poaching, and hunting. The goodwill around this Program is palpable and the community feedback and enthusiasm is highly encouraging for the futurein such a vital endeavour.

Mark Antrobus and S. Antonysamy are with the PHCC, Kodaikanal

Tamil: not just a classical language but an eco-language too

Satheesh Muthu Gopal

I recently read a book titled *Tamil oru soozhaliyal mozhi* (Tamil is an eco language) written by Mr.Nakeeran. There are many environment-related books that have been published in recent years in Tamil which is a welcome move. Thisbook is very unique because it explains how the Tamil language is very well connected with nature and why the regional languages are most important in the conservation of nature. There are thousands of books in Tamil that manifest the pride of the language. Similarly, there are thousands of books available in the market that talk about nature and the environment in various languages. But this particular book connects these two different factors and depicts the uniqueness of this book. It is not an easy job for the writer to connect these two factors and explain them in an understandable way for everyone. But he successfully did thiswhich helps one understand why Tamil is an eco language.

The author starts by describing “A language can hold its eco status only until the nativity of the language is not ruined” which helps to understand how the Tamil language evolved by inheriting the ecological values since *Sangam* literature andalso how the language is affected today with various external factors. He also explains how the damage to the language created gaps between the people and the nature of their own land.

Though the author likes the Tamil language very much, he doesn’t deny the importance of science, environment, and evolution. But he strongly denies the factor that “Tamil is the first language” as there is no evidence for that. Such factors add more ethical value to this book. He explains why Tamil is an eco language by quoting many examples from *Sangam* literature. The references help to understand how people are connected with nature very well for centuries.At the same time, he also blames the Tamil kings who were not concerned aboutnature much with some examples.

There are many poems in *Sangam* literature that describe the flowers, trees, birds, etc.. along with the story. There are many people who challenge that suchdetails about nature are not necessary for the story. But the author explains heresuch poems are not only written to explain the story but also to capture the

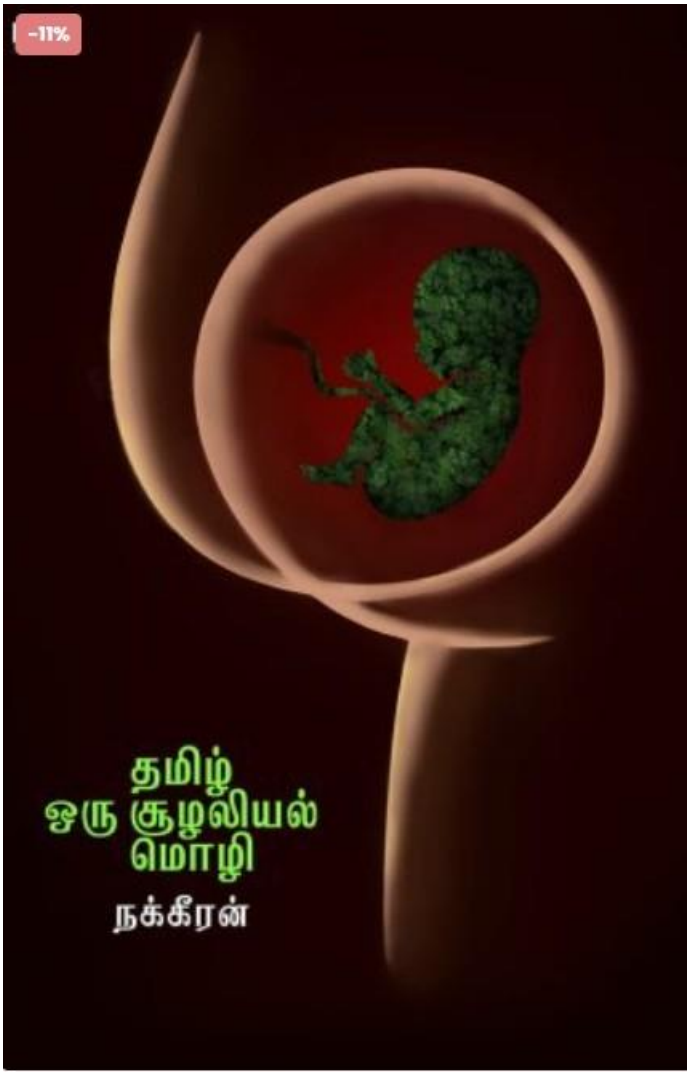
nature of the land. For example, the poem called *Narai*
Narai from *Puranano**o**ru* written by *Sathimutha Pulavar* is explained by the authorin detail. The poem not only explains the color of the bird but also explains the shape of the bird. That's not exciting. The poem describes a poor man asking thebird to pass the message to his wife as the bird is migratory. Based on all these explanations, the author is able to manifest the bird as a White stork.

While explaining the bond between the Tamil language and the land of Tamil, theauthor explains that Tamil is not against any other languages. Also, he explains that Tamil is still alive despite too many invasions of other languages because of the special characteristics of the language which is nothing but it is an eco language. Tamil is one of the languages which has multiple words for the same species. For example, Elephant has hundreds of words in Tamil and each word is fit to the animal in various ways. Due to it's black color it is called *Kari*, due to it's big foot *Pongadi*, Due to the dots on its face *Pugarmugam*, Due to size of the animal *Peruma*, and many more names explaining the characteristics of the animal. By explaining all in detail, the author worries as most of the kids in Tamil Nadu commonly call the animal an Elephant. He compares the influence of foreign language in Tamil to the hunt of the predator on its prey. He blames the parents of the present generation of creating a gap between the language and their kids by not teaching them Tamil.

The author is referring to the book "Language Death" written by David Crystal and quotes that every society in this world is connected with the local environment. If the society is losing its natural wealth, that will create a big impacton the society. Such loss will create an impact on language too. The author applies the theory on Tamil as well. We use the word *thumbikkai* in Tamil which means the trunk of the elephant and he questions what would happen if the animal became extinct from the land. We wouldn't lose only the animal but we would also lose the word *thumbikkai*.

The author has referred to many poems from the *Sangam* literature to explain thelink between the language and the ecosystem. There are thousands of poems in Tamil that were written two thousand years before including *Thirukkural, which* is clearly evidence of how Tamil evolved by inheriting the nature surrounding it.
However, there is one reference that I like the most in this book. The authorrefers to *Tholkappiyam* which says *uyarthinai* for people. Though it
uses *uyar* (which means top/up) for people it doesn't use the
word *thazhthinai* (bottom/down) for all other living things. It uses the
word *agrinai* which means other than *uyarthinai.* This adds more ethical values

to the language. A human speaking language doesn't want to hurt any other creature on this planet. Can you believe it? Yes, that's the beauty of Tamil. Tamilis not only a classical language but an eco language too…



Satheesh Muthu Gopal is an independent writer and naturalist

Pilgrim Planet

Alan Johnson

On a hot day, tar melts and gums up shoes, so visitors prefer a nighttime ascent. We are six, toiling up the mountain, glad for the cool darkness. We come upon clumps of pilgrims every hundred meters or so: tottering grandmothers leaning on their adult children; happy hikers singing *bhajans* to the Goddess, Shree Mata Vaishno Devi; an elderly couple carried on uncovered palanquins (a costly option).

Solo pilgrims, too. A middle-aged woman, barely visible on the dimly lit road, is rolling lengthwise—rolling *up* the road, that is, determined to reach the cave shrine by this supreme act of self-mortification. We give her a wide berth and watch with a mix of admiration and bemusement.

My companions, three postgraduate students and a fellow academic, have different reasons for walking to the ancient shrine, a trek that begins at the hill's base in the town of Katra. All are Hindus, mostly the modern, casual type: dutiful with major rites, devoted to their parents, reverential of family deities. Pilgrim-ish, I think to myself. Only one, a young postgraduate from Maharashtra, seems a true pilgrim. Through the night, whenever he has gathered enough breath, he proclaims his love for Vaishno Devi and all her avatars, from Mahalakshmi to Durga, whose praises he intersperses with bursts of adulation for his other passion, basketball ("Jordan is a god!"). I am the lone agnostic.

But I've had a growing sense from my years of visiting mausoleums and cathedrals, temples and henges, that my touristic desire to see sacred places is not entirely unlike the religious desires that drive pilgrims. They, too, have long carried in their minds a picture of the site. They, too, must engage in the worldly tedium of buying train and bus tickets, of the hot journey, of haggling with vendors selling Chinese-made souvenirs. Many pilgrims are also sightseers like me, finding satisfaction in showing selfies to friends back home. Another landmark to chalk off the list.

This is not to belittle the unique alloy of inducements to true pilgrimage. The woman rolling and rolling up to the ancient cave, for instance, knows the Devi will recognize her penance and answer her prayers. And the retirees seeking this once-in-a-lifetime *darshan* are rounding the arc of their lives. I respect them from a distance.

But I think most modern pilgrims squeeze such visits into the crowded timetable of their lives. Once reached, the name of the shrine fades on Google Calendar, along with sojourns to malls, parks, hill stations. All of which entail the business—big business—of pilgrim tourism: bus and train tickets, hotel and food tabs, guide fees and overpriced mementos.

Governments have taken note, using their political and monetary muscle for infrastructure projects to make it easier for the increasing numbers of visitors to key pilgrimage sites. Robert Macfarlane points out, for instance, that in 1985, 2,491 people completed the nearly-500-mile Spanish pilgrimage route known as Santiago de Compostela, sacred to Christians for a thousand years. By 2010, more than 270,000 had completed it, of which a notable percentage were non-religious tourists. This increase in traffic is typical of places across the globe. And the planet has noticed, as if to mock our puny human efforts.

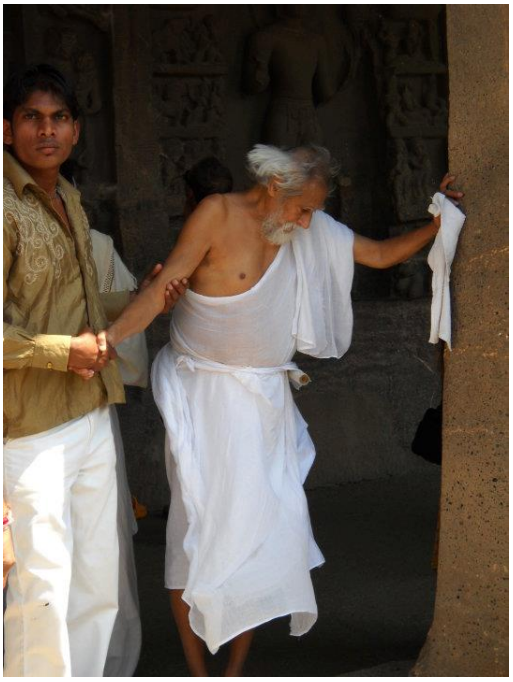
Anthropologist Kiran Shinde has written of the pilgrim tourist business's damaging effects on the environment. She describes her own participation in a "car-based package-tour" of a famous pilgrimage route in northern India. Such "car-yatra[s]," she says, "[break] the connections with the landscape," which effectively removes the relationship between that land and the stories that have helped nurture it. A 2011 article on the website Tourism Review tells us that "Religious travel is estimated at a value of US$18 billion and 300 million travelers strong. Major faith-based destinations such as Israel, Italy and Saudi Arabia have developed large industries that provide services for people on pilgrimage."

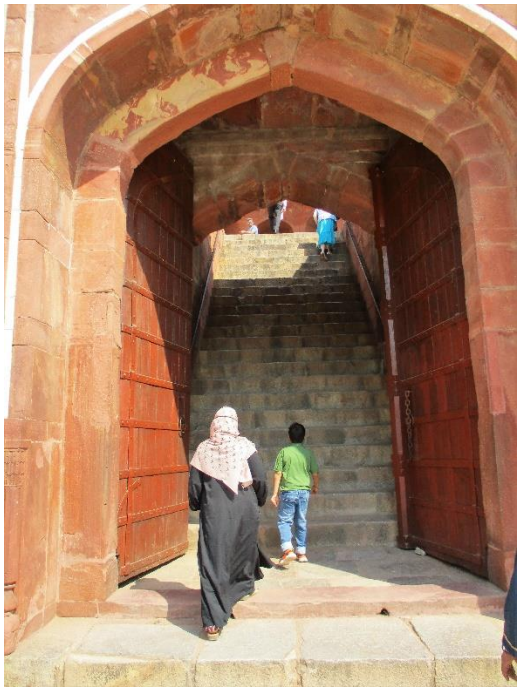
Governmental investment in pilgrimage is clearly not due to altruism. The current Char Dham National Highway Project exemplifies this. The 889-kilometer road through the delicate Himalaya ecosystem, at a cost of some 12,000 crores, will connect the four *dhams*, Kedarnath, Badrinath, Yamunotri, and Gangotri. Bureaucrats and courts, nudged by higher-ups, have finessed existing laws so that forest sanctuaries and mountains in the route's path can be axed and tunneled. Mainstream news stories on the recent Silkyara Tunnel collapse in Uttarakhand focused, understandably, on the plight of trapped miners, with some harsh words for the hired engineering firm. Hardly a word about why the earth is rebelling.

To ask if such developments amount to the Disneyfication of pilgrimage travel is to assume that pilgrimage has until recently been driven by the kind of dedication evident in the woman penitent rolling her way to an empowering blessing. But we don't have to look far to see that many have been driven by other urges, as recounted in witty verse in *The Canterbury Tales*, composed in the late-1300s by, fittingly enough, a civil servant named Chaucer. Even at the time, pilgrimage was costly. Chaucer's pilgrims have to pay for their horses—the medieval version of a car yatra. But the number of visitors then pales in comparison to today's.

I am guilty of joining the party. After we had reached the Shree Mata Vaishno Devi shrine and stood in line for the pundit's blessing, we paid for the short helicopter flight down the mountain, unmindful of the cost, whether monetary or environmental. Whether or not my guilt leads me to forego future bucket list visits remains to be seen.

Three photos of pilgrims by Alan:





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Challenges of increasing forest cover in Karnataka

Pandurang Hegde

Karnataka Chief Minister Siddaramaiah recently stressed the need to protect forests and wildlife and called for 'to expand the forest area from 20 per cent to 33 per cent in order to reduce the impact of climate disasters'.

This is a pro active move from the head of the government which clearly recognises the link between maintaining forest cover to provide ecological and livelihood security not only for human beings but also for wildlife.

However, the question is: is it possible and feasible to increase state forest cover and if so does the forest department have the willingness and capacity to achieve such a high target in the coming years?

In comparison to other states, Karnataka has the distinction of increasing the forest cover from 19 to 21 per cent as reported by the biennial India State of Forest Report conducted by the Forest Survey of India in 2021. Environmentalists are sceptical about this increase and point out that the satellite imageries have included the tree cover in plantation crops like areca, coffee, rubber and trees on farmland as forests.

Whatever the truth, it is obvious that over the last seventy years the forest department has an unique experience of establishing plantations. Unfortunately the emphasis was always on raising commercially viable spices like teak or eucalyptus. In many regions the bio diverse natural forests were clear felled to make way for these monoculture plantations.

In order to increase the forest cover the state has accessed large fundings form the World Bank for social forestry in 1980, aid from the British government for the Western Ghat Forestry Project in 1990, and a loan from Japan to create forests in the Eastern Plains. The Central government is providing funds under the Compensatory Afforestation Fund.

Most of the forests are in the hill regions of the Western Ghats that receive ample rainfall and have good soil conditions that favour growth of tree cover. Over the years establishing monoculture plantations has had an adverse impact on flora and fauna as they are not suitable for local conditions.

Chipko leader Sunderlal Bahuguna called these 'not forests but timber mines' as they were clear felled after 15 years. It is not possible to grow forests with this short term vision. The state has 2 lakh acres of acacia plantations, which might reduce the pressure on natural forests, but has an adverse impact on wildlife and watersheds.

Prof Madhav Gadgil, an expert of the Western Ghats has stated that the natural forest cover is less than 10 per cent, and most of it is plantations. Thus, in reality in order achieve the target set by Chief Minister; the state would have to double the forest cover.

With the threat of constant encroachment upon forestlands for extension of coffee, areca plantations and growing food crops, it is a Herculean task to maintain the existing tree cover. Most politicians, irrespective of their party affiliations back these encroachments. Will the Chief Minister go against these politicians in order to implement his goal of increasing forest cover?

Old growth or natural forests play a crucial role in enhancing flora and fauna, maintaining watersheds that provide a perennial water source for our rivers and conserves biodiversity. They also provide security against climate disasters like landslides and floods.

Despite these fundamental contributions, we are not in a position to recreate or regenerate natural forests. Ironically we are decimating the existing forest cover through linear infra structure projects like construction of new railway lines or diversion of rivers. A recent study has calculated that 24 lakh trees will be cut in the fragile Western Ghats region for such projects.

With the recent dilution in the Forest Conservation Act by the central government, there is going to be more pressure to divert forestland without any impact assessment. Governments have not learnt lessons from recurring floods and landslides in most regions of the Western Ghats.

Instead of destroying the natural bio diverse forests the government should prioritise to conserve whatever is left and evolve a road map towards greening the barren land. Planting crores of saplings and setting target for more plantations is not going to increase the forest cover.

The need of the hour is to plant species according to local micro climate and soil conditions which build soil, conserve water and provide a livelihood base for birds and wildlife who contribute in their own way towards dispersing seeds to regenerate indigenous forests species.

Is this possible in the present political and bureaucratic set up to double the forest cover? Is forest department willing to shift its focus from the commercial objective of fast growing monoculture plantations to ecological objective of building the basic capital of mankind, the soil, water and air?

Pandurang Hegde is with Prakruti, based in Sirsi, Karnataka

Nature Notes:

Butterflies of Mexico

Heliconius chraritonius, the state butterfly of Florida. Found across South and Central America, as far north as southern Texas and peninsular Florida.

Siproeta stelenes (malachite), named after the mineral malachite due to the bright green on the wings. Distributed between Central and northern South America.

Greta oto, also called Glass-wing, found in Central and South America, north as far as Mexico and Texas, south to Chile.

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