ISSN: 2584-2633

VANA PREMI

Nav Se Nawvey Saal Tak Ke Bachhon Ka Saathi

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Vol.26 | DECEMBER - 2025 | No.12

Vanapremi wishes its readers
'A Merry Christmas & A Happy New Year 2026'

Rufous-tailed hummingbird
(Amazilia tzacati)

Photo Sri.K.Praveen Rao, IFS (Retd)

JOURNAL OF THE ASSOCIATION OF RETIRED FOREST OFFICERS, TELANGANA & ANDHRA PRADESH
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TELANGANA FOREST DEVELOPMENT CORPORATION Ltd

DECCAN WOODS AND TRAILS

- A wholly-owned, financially robust State Government enterprise, engaged in the large-scale establishment of plantations to meet the demands of the wood-based industries.
- A watershed approach has been adopted for the development of plantations, ensuring ecological sustainability, social acceptance, and commercial viability, with the long-term objective of enhancing the site quality of plantation areas.
- A major cultivator of Eucalyptus clonal plantations and Bamboo, covering a substantial area of 32,951.39 hectares. The operations are certified by the Forest Stewardship Council Forest Management / Chain of Custody (FSC FM/COC).

- The TGFDC has undertaken the ambitious task of developing Eco-Tourism activities within the State. Existing attractions open to the public include the Botanical Garden, Vruksha Parichaya Kshetram, Virtual Wildlife Safari and Pala Pitta Cycling Park in Kondapur, the Mahavir Nischalvan Eco-Tourism Centre in Vanasthalipuram, Aranya at the Shameerpet Deer Park, and Mrugavani at the Chilkur National Park. These initiatives are proving to be highly appealing, resulting in a growing influx of visitors.
- The TGFDC has also developed urban parks at Lalgadi Malakpet (Vanadrushyam), Thumkunta (Veduru Vanam), Gowdelli (Chandanavanam), and within the Chilkur Reserve Forest (Forestrek Park).
- The TGFDC has introduced new commercial species within the Regional Ring Road region, including Seethaphal, Sandalwood, Red Sandalwood, Rosewood, Teak, and *Casuarina Junghuhniana*, among others.
- Corporate Social Responsibility (CSR) Initiatives 2021–2025: Empowering lives through the distribution of three-wheeler scooters to the differently-abled, support to schools with sports kits and furniture, and establishment of modern pre-fab health sub-centers — driving inclusive growth with care, commitment, and compassion.
- Eco-Tourism projects have been launched at various locations under the brand name of "Deccan Woods & Trails".

Smt. Sunita M. Bhagwat, IFS
Addl. Principal Chief Conservator of Forests
Vice Chairman & Managing Director (FAC)
Telangana Forest Development Corporation Ltd.,
(A Government of Telangana Undertaking)

VANAPREMI

Vol. : 26 **DECEMBER - 2025** **No.12**

An English monthly on forestry, wildlife, environmental issues, and topics of general interest that blends in-depth knowledge with engaging content for all age groups.

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From the Editor's Desk...

Hello dear Vanapremi Readers,

We are into the last month of the year 2025. Time just flies as they say. This is the twelfth issue of this Editorial Board. We are very happy to be completing a year of bringing you articles from a variety of authors on a variety of topics.

November 2025 marks the conclusion of the year-long 150th Birth anniversary of BhagwanBirsaMunda. The Tribal leader was not just a revolutionary but a visionary of environment, forests, wildlife and beyond. His vision on these aspects is brought out in an article on "The forests still breathe".

November end has seen two global events i.e CoP30 at the Amazonian city of Belem in Brazil (South American Continent) and the G20 Summit at Johannesburg, South Africa (African Continent). Though some see the two events as different, I see them as very closely related and I do not know why they were organized so close to each other that many Leaders skipped the former for the later. As feared, the outcome of CoP30 can at best be termed as 'encouraging' and nothing more. The agenda, aspirations and geo-political issues are discussed in one of the articles on CoP30. Integral to the Climate Change is Biodiversity and articles on Soil biodiversity and the key points mentioned at the Environmental and Social Development Association (ESDA) summit, Bangkok highlight some of the concerns and action points.

Nature, especially the Earth, is an epitome of endurance and patience. "Nature teaches us that enduring growth is never rushed" is an article highlighting the virtue of patience and endurance. Performance of people who work with us needs to be judged on a holistic scale with patience rather than on personal likes and dislikes. Lessons on receiving/writing ACR/APR would be very useful to our conservative fraternity.

Elsewhere,Quantum computing area that fetched the 2025 Nobel Prize in Physics gives hope that advances in science could, in the long run, help address some of the most challenging tasks faced by human kind.

Nature is abounding with beauty and variety. The story of the beautiful Hummingbirds of Costa Rica is sure to impress everyone. The Article on 'Human Animal Conflict'suggests that understanding the whole gamut of issues involved in this is essential for an amicable and sustainable long-term solution. One such area is the loss of organisms due to human dominance. Article highlighting the New and innovative genetic methods that give hope to bring back even extinct species puts icing on the cake.

Forests are 'open treasures'. They are used for various purposes by various people including the Dacoits, not to mention the Left-Wing Extremists. Experience of a Range Officer on a strange request by the dacoits is not only nostalgic but also brave. Another piece of nostalgia captures the hilarious experiences from the FC at LBSNAA.

Traditional forestry involved protection of forests and wildlife. In recent times, protection of the forest land itself has emerged as the most challenging task for the forest personnel. The importance of knowing our estates, maintaining all relevant records becomes extremely important as highlighted in an article in this issue.

The centenarian Smt. SaalumaradaThimmakka, the 'Vriksha Maata' passed away recently. A brief biography on her is offered as an Obituary to the brave soul.

The regular articles on Legal Note and Green Quiz would offer knowledge and exercise to the brain, respectively.

Happy Reading…..

Dr.K.Tirupataiah, Editor

"The Forest Still Breathes : Birsa Munda and his Ecological Wisdom"

Dr.H.S.Gupta, IFS (Retd)

On the 150th birth anniversary of Birsa Munda (1875–2025), we return to the world that shaped his vision—a world where forest, river, and sky were not resources but kin.
This passage, drawn from my forthcoming eco-historical novel on the tribal heartland of Chotanagpur,.

The Forest Still Breathes: Birsa Munda's Gift of Belonging

Morning begins before the sun.

It begins in sound—the cough of cicadas, the crack of bamboo cooling after night, the first axe-stroke that tells time better than any clock.

In Ulihatu, smoke rises from low mud houses, thin and blue against the pale-grey sky.

Inside one of them, a woman kneels by the hearth, coaxing fire from yesterday's ash.

Sparks leap, and shadows shape themselves on the wall—a bird, a deer, a hill.

Her child watches, half-awake.

"See?" she whispers. "The forest is drawing for you."

The child is Birsa, not yet the prophet of rebellion—only a boy learning that the world speaks in small, repeatable miracles.

Outside, a rooster crows and another answers from across the slope.

The forest is already at work.

They did not call it labour.

They called it chalna—the day's walking.

Men set out for mahua and sal-leaves, vines that cured fever, resin that glistened like trapped sunlight.

Women went to the stream, washing rice and singing to the rhythm of water against pot:

"River, don't take more than you give…"

Children's voices echoed the refrain until even the Tajna River seemed to hum along.

That was the first lesson Birsa learned—that a forest keeps balance through listening, not through ownership.

When the sun climbed higher, the air filled with sap and smoke.

From beyond Dumbari Hill came the slow beat of a madal drum, someone testing its skin for the evening dance.

Old men sat under the banyan near the sarna grove, discussing rains and which tree would flower next.

They spoke of trees as neighbours—with affection, gossip, and complaint.

For them, ecology was not a subject; it was vocabulary.

On Thursdays, the forest itself walked to market.

There was no road, only a footpath stitched together by memory and dust.

Birsa went with his mother, carrying a bundle of leaf plates.

At every bend, the smell changed—mango blossom, damp stone, crushed bhelwa leaves that stung the nose.

The world was alive in gradients.

The market sat beside the river, its clear water thick with reflections.

Traders from the plains had come with salt, mirrors, and cloth dyed in impossible blues.

People bargained through laughter rather than argument.

Even commerce had a rhythm of kinship.

A woman from another village sold strings of coloured beads.

Birsa's mother chose blue ones and traded two handfuls of rice.

That evening she tied them to a tree near the sarna grove.

"Not every gift is for wearing," she told him. "Some are for remembering."

The forest remembered.

When rains failed, it dropped fruit instead of leaves.

When the Tajna flooded, the fish returned larger.

Its generosity was cyclic, not infinite—and that was its wisdom.

Birsa learned that excess, even kindness taken too far, wounded balance.

The elder Koro-baba said it best while leading the boys to gather firewood:

"Every leaf you lift is a roof for someone smaller. Take what you need, not what you can."

That became the boy's moral compass long before he found political language for it.

He saw that the hill, the river, and the flame were living witnesses.

They remembered both gratitude and greed.

At dusk, fires blinked in the courtyards like red eyes of the forest itself.

Stories began—the tiger who wanted to be human, the woman who turned into a river to escape greed.

Each tale taught reciprocity without sermon.

Birsa listened as others laughed.

He asked quietly, "What if the hill wakes again?"

Koro-baba answered, "Then greet it before it grows angry."

In that answer lay the future leader's creed: reverence before revolt.

Years later, when Birsa Munda stood against the colonial regime that measured hills and taxed rain, these early lessons returned as his true education.

He would say, "The land is not to be owned but to be remembered."

To him, deforestation and faithlessness were the same sin.

Where the British saw property, he saw broken promise.

His vision was ecological long before the word existed.

He understood that freedom could not come from laws alone—it had to live in the soil's memory, in the slow heartbeat of trees.

For him, the forest was not backdrop; it was the very constitution of life.

When the forest burned during his revolt, he wept.

He told his followers, "Do not let the fire die."

He did not mean only rebellion; he meant the fire of belonging.

Standing on Dumbari Hill today, the wind still moves through the sal leaves like slow breathing.

Birdsong carries from one ridge to another.

If one listens closely, the rhythm is the same as in those childhood mornings:

river, drum, wind—each taking and giving in turn.

A century and a half after his birth, Birsa Munda's forest ethic feels startlingly modern.

He spoke of sustainability before the word was written; of community forestry before it was policy.

His was not a protest against progress, but a plea for remembrance—that humanity must grow like a tree, not like a fence.

The Tajna still flows past Ulihatu, quieter now, holding within it both the reflection of the sky and the residue of forgotten songs.

But when thunder rolls over Dumbari, the villagers still say,

"The hill is turning in its sleep."

And for a moment, it feels as if the boy who listened hardest to the earth has returned, reminding us that the forest still breathes—and waits for us to do the same.

Dr H. S. Gupta, former Principal Chief Conservator of Forests (Jharkhand) and former Professor at IIFM Bhopal, writes on forest governance, ecology etc, and also the cultural imagination of India's tribal heartlands. His forthcoming novel re-imagines Birsa Munda's world through the language of the forest.

NOTICE

The 110th General Body Meeting of the Association of Retired Forest Officers of Telangana and Andhra Pradesh will be held on 14th December 2025 (Sunday) at 10:30 AM in Mahaveer Harina Vanasthali National Park VANASTHALIPURAM, HYDERABAD. There will be a live Snake Show & Safari Drive inside the National Park.All the members of the Association are requested to make it convenient to attend the meeting with their families. - SECRETARY

The Agenda, Aspirations and Geo-political Dynamics of CoP30

Dr. D. Nalini Mohan IFS (Retd)

COP30 in Belém: A Turning Point for Climate Action:

The 30th UN Climate Change Conference (COP30), held in Belém, Brazil from November 10–21, 2025,has been a symbolic choice, given the Amazon's central role in climate and biodiversity. It marks a critical moment in the three decades of global climate journey. It is expected to ignite a decade of delivery, following the sobering results of the Global Stocktake and the limited progress at COP29. As the first COP to conclude a full ambition cycle under the Paris Agreement, it carries the weight of translating past promises into transformative action. Despite its urgency, major emitters like the U.S., China, India, and Russia are absent from the Leaders' Summit, raising concerns about global cooperation.

Core Agenda:

At the heart of COP30 is the call for countries to submit new, ambitious Nationally **Determined Contributions (NDCs)** that align with the 1.5°C goal. These updated climate plans must reflect the sobering findings of the Global Stocktake, which revealed that current efforts fall far short of what's needed.

Paris Agreement Ambition Cycle Completion

Countries must submit updated Nationally Determined Contributions (NDCs) that reflect the findings of the Global Stocktake. These plans must align with the 1.5°C goal, which scientists warn is slipping out of reach.

1-Scaling up Climate Finance and Loss & Damage:COP30 aims to operationalize the Loss and Damage Fund agreed at COP28.Discussions include scaling up adaptation finance, with calls for at least $100 billion annually in predictable, grant-based support.Brazil is seeking $10 billion for forest conservation efforts.

2-Ending deforestation and ecosystem conversion: Nature Package and Forest Protection:

A global agreement is expected to halt deforestation and ecosystem conversion. Brazil, home to 60% of the Amazon, is leading efforts to secure this package.

3-Accelerating A just Energy Transition away from fossil fuels:The summit seeks consensus on phasing out fossil fuels and scaling up renewables. In 2024, 90% of new power capacity globally came from renewables, with solar and wind now the cheapest and fastest-growing energy sources. Universal energy access remains a priority, especially for low-income countries.

4-Adaptation and Resilience & Strengthening accountability mechanisms:

Under the UAE Framework for Global Climate Resilience, COP30 will finalize adaptation indicators and promote regionally tailored solutions.

Expected Outcomes: COP30 is expected to deliver:

1-Transformative NDCs from all Parties with clear sectoral targets and equity considerations.

2-Global agreement to end deforestation, especially in tropical regions.

3- Operational Loss and Damage Fund, with transparent governance and accessible finance.

4.Commitments to fossil fuel phase-out, with timelines and support for affected communities.

5.Enhanced accountability mechanisms, including tracking tools and peer review systems.Clearer

pathways for climate finance, especially for vulnerable nations and

The summit is also seen as a launchpad for a decade of accelerated delivery, with the UN Secretary-General emphasizing that renewables are now the cheapest and fastest-growing energy sources globally.

Participation Overview:

Total countries: Around **190 nations** that are parties to the UN Framework Convention on Climate Change (UNFCCC) are represented at COP30 with between **60,000 and 75,000** people, includinggovernment delegates, indigenous leaders, NGOs and civil society, private sector representatives&youth and academic groups are expected to participate in the climate negotiations.

Notable Participants:

- Brazil (Host Nation):Leading efforts on forest protection and climate justice. President Lula da Silva is using COP30 to showcase Brazil's Amazon conservation strategy and push for a global deforestation pact.
- Germany and Spain:Advocating for stronger climate finance mechanisms and fossil fuel phase-out commitments.
- Namibia:Emerging as a leader in Africa's green hydrogen and renewable energy transition.
- finance, and climate justice, given their extreme vulnerability to sea-level rise. Pacific Island Nations (e.g., Tuvalu, Fiji): Vocal on loss and damage, adaptation
- African Group of Negotiators (AGN):Pushing for adaptation funding and equitable energy access.

Who's Missing—and Why It Matters:

Despite the urgency, the absence of key world leaders has cast a shadow over the summit's opening. The United States, China, India, and Russia—four of the world's largest emitters—did not send their heads of state to the Leaders' Summit.

- The U.S. is represented by lower-level officials, with President Trump absent amid his continued scepticism of multilateral climate efforts.
- China and Russia also opted out of high-level participation, limiting momentum for coordinated global action.
- India sent its ambassador to Brazil for the opening, with Environment Minister Bhupender Yadav expected in the second week. Prime Minister Narendra Modi is not attending.
- India's decisionreflects its strategic stance on climate equity and finance. The country continues to advocate for climate justice, emphasizing its low per capita emissions and leadership in renewables.
- India opposed the $300 billion climate finance goal proposed at COP29, calling it inadequate and lacking clarity on delivery mechanisms. It also calls for Scaled-up adaptation finance, especiallypredictable, grant-based funding from developed nations to restore trust and support adaptation.

A Test of Global Will:

COP30 is more than a negotiation—it's a test of whether the world can unite to protect the planet and its most vulnerable people. While the absence of major powers complicates diplomacy, countries like Brazil, Germany, and Namibia are stepping up to fill the leadership vacuum.The road ahead demands courage, cooperation, and clarity. Whether COP30 delivers on its promise will shape the climate trajectory for decades to come. (To be concluded)

(The author is a Former Principapal Chief Conservator of Forests, Andhra Pradesh and can be reached at 94408 10003 and Email: dnmohanifs87@gmail.com)

Natural forests and resistance of Soil Biodiversity

Sri. V.V.Hariprasad, Dy.C.F(Retd.)

Soil is an essential contributor to plant's health. Also, it is home to millions of useful micro and macro-organisms which are beneficial for plants. Not only this, the soil is also a reservoir of minerals, liquids, and gases essential to maintain a plant's wellbeing. Soil has a vital influence on the atmosphere as well. It acts as a natural purification system for the world's water supply. Therefore, it is crucial to maintain soil biodiversity. Soil is a natural home to a plethora of living creatures or microorganisms. Micro-fauna, and flora as well as macro-flora depend on soil for sustenance. In other words, plants, animals, and soil share a symbiotic relationship.

Is Soil Biodiversity Important?

Soil biodiversity has a critical role to play in the environment. It is equally crucial to conserve soil biodiversity to keep a healthy balance between the three, viz., plants, animals, and soil.

Benefits of Soil Biodiversity

- Improved and enhanced soil porosity
- Better habitat that promotes healthy root growth
- Increases and optimum water storage and absorption
- Mitigation of destructive organisms that results in higher and better yield

Soil Microbes help in Antibiotics formation

Microbes found in the soil are responsible for developing most antibiotics, hence have vital significance in the field of medicine and biology. Bacillus species is the most predominant soil bacteria as it is highly resistant to endospore formation and produces vital antibiotics such as bacitracin, polymyxin, etc. In this way soil accommodates the formation of various antibiotics and has a crucial role to play in society.

Threat to Soil Biodiversity

Climate change and biodiversity loss due to excessive human activities is a significant threat to soil biodiversity. Along with this, reduction of forests for human settlement and agricultural activities also has a huge negative impact on soil biodiversity. Declining soil's organic matter, soil contamination, soil compaction, and soil salinization are all examples of human interventions causing a threat to soil biodiversity

For instance, the decline in the organic matter of soil is a general effect of tillage agriculture. Similarly, agriculture waste, industrial waste, transport, and management lead to soil contamination in both, rural and urban soils. Soil salinization occurs due to over-abstraction of groundwater, urbanization, seawater intrusion, municipal wastewater, excessive fertilizer use, and even leads to soil erosion.

How to Protect Soil Biodiversity?

Farmers can contribute to increasing soil biodiversity by limiting agricultural production to agricultural land. Following strategies can help conserve soil biodiversity if implemented.

- ✓ Sustainable grazing practices can aid in conserving soil's natural texture.
- ✓ Limited use of tilling practice can avoid soil compaction and soil erosion.
- ✓ Perennial plants protect soil's natural contents.
- ✓ Rehabilitating mismanaged soil allows replenishing soil's original texture.
- ✓ Reduction of chemical inputs is another way soil biodiversity can be maintained.
- ✓ Planting cover crops between major crop cultivation.

Intergovernmental Panel on Climate Change

Intergovernmental Panel on Climate Change (IPCC) has reported that global surface temperature will continue to rise until the middle of the century, and global warming of 1.5°C and 2°C will be exceeded during the century (IPCC, 2021). It is widely accepted that global warming will cause a mass extinction in the coming years, and biodiversity protection is increasingly important. Forests stand for one of the most crucial ecosystems on Earth and reserve a large proportion of the global biodiversity. Unravelling the changes in biodiversity in forest ecosystems under global warming is a challenging field of research in theoretical ecology that remains under-explored in forest ecosystems.

Forest soil is an important living repository of biodiversity, with interactions between microorganisms, fauna, and plants providing multiple functioning and services to human health (Banerjee & van der Heijden, 2023). Soil biodiversity played a vital role in the forest ecosystem, owing to its inherent complexity the traits, sizes, functions, and types of soil organisms, directly or indirectly underpinning multiple functioning and services, such as nutrient cycling, carbon sequestration, vegetation health, plant growth as well as soil stability .Forests distributed in the tropical and subtropical regions are highly concentrated habitats of the Earth's terrestrial biodiversity .However, subtropical and tropical forests are assumed to be more vulnerable to global warming than temperate forests due to the relatively narrow upper thermal limits and temperature variation in subtropical and tropical regions .

To combat global warming, many countries have committed to restoring forest areas. Almost half of the global forest area is set to become plantations of commercial trees. However, several studies have pointed out that the adaptability of soil biodiversity in plantations to global warming might be lower than that of natural forests. Here, we provide several aspects of consideration that natural forests may exhibit higher soil biodiversity resistance than planted forests with respect to global warming, especially in subtropical forests. **Soil biodiversity in natural forests potentially exhibits higher resistance than planted forests under global warming**

Natural Forests vs. Planted forests

Natural forests play a pivotal role in conserving soil biodiversity and maintaining multiple ecosys-

tem functions and services. However, two-thirds of the land area has been set aside for reforestation worldwide (Lewis et al., 2019). Although plantations can contribute to mitigating some of the detrimental impacts of deforestation on soil biodiversity, the resulting soil quality and functions are declining compared to natural forests. Indeed, our previous study found that long-term Cunninghamia lanceolate plantation greatly increased the abundance of plant parasite nematodes, consequently threatening soil and plant health in subtropical China pointed out that the relative abundance of soil-borne fungal plant pathogens increased with warmer temperatures based on a global field survey and a nine-year field experiment. And as a consequence, the impacts of natural forests and planted forests on soil biodiversity raise serious concerns under global warming.

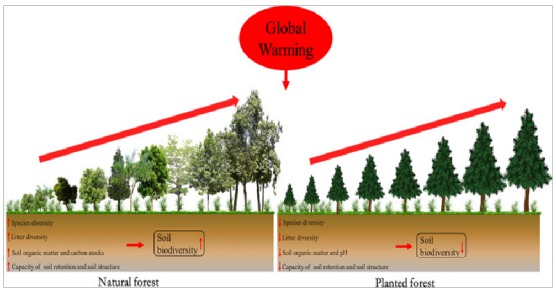
First of all, compared to scarce human disturbance, planted forest development is frequently subjected to regular harvesting and clearing of plantations (Poorter et al., 2016). Once trees were harvested, the land is cleared for massive planting of saplings, and chemical fertilizers and pesticides are normally applied to facilitate the rapid accumulation of standing tree biomass. These plantation management practices possibly lead to forest land degradation, further decreasing soil biodiversity and consequent ecosystem multiple functions in subtropical forests. By contrast, the natural forest possibly increases soil biodiversity by protecting land from fire and human disturbances and thus improving multiple ecosystem functions and services in the subtropical forests .

Secondly, planted forests intrinsically comprise substantially lower tree diversity than native forests. However, to alleviate global warming, ongoing reforestation efforts accelerate the current loss of biodiversity (Carnus et al., 2006). It was previously found that soil nematode abundance significantly increased with forest restoration and improved soil health status in natural forests rather than in planted forests in subtropical regions. This is mostly attributed to the fact that species-rich ecosystems can enhance soil microbial growth and biomass by providing a higher amount of plant-derived resources (e.g., litter inputs and root exudates.) It is commonly established that species-rich natural forests better support biodiversity than planted forests in the tropical zone .

Thirdly, natural forests exhibit higher water use efficiency and soil organic matter storage compared to planted forests (Yu et al., 2019). The conversion of natural forests to planted forests caused substantial declines in soil organic carbon retention by around 60%. Furthermore, carbon capture capacity in planted forests was less stable than in natural forests, particularly in the face of increasing global warming in the tropical zone also highlighted that the quality and temperature sensitivity (Q_{10}) of soil organic matter were higher in the natural ecosystem than in the managed ecosystems in North Eastern India, indicating protecting natural ecosystems is very important to mitigate climate warming. Amoo et al. (2021) revealed that planted forests consistently decreased multiple soil functions linked to soil carbon cycling and nutrient dynamics, and altered the functional profile and activity of soil microbial communities in South Africa. The planted forest can therefore have lasting detrimental impacts on soil biodiversity and health, in addition to posing a significant threat to terrestrial ecosystem functions in subtropical forests (Carnus et al., 2006; Wang et al., 2022a; Zheng et al., 2022). Therefore, greater soil bio diversity is expected in the species-rich natural forests than that in the species-poor plantations, particularly in subtropical forests.

Conceptual graph of the changes in ecosystem processes and variables with forest restoration be-

tween natural and planted forests, in the subtropical zone, under global warming. The red upward arrow represents a positive effect; the red downward arrow indicates a negative effect



The planted forest can therefore have lasting detrimental impacts on soil biodiversity and health, in addition to posing a significant threat to terrestrial ecosystem functions in subtropical forests. Therefore, we expect greater soil biodiversity in the species-rich natural forests than that in the species-poor plantations, particularly in subtropical forests. Therefore, it is generally believed that natural forests can assist to relieve the negative impact of global warming by conserving biodiversity, as well as supporting multiple ecosystem functions and services (Alroy, 2017)..

Soil biodiversity study

Comparatively little is known about the responses of soil biodiversity, with most climate warming experiments concentrating on the aboveground ecosystems. Soil organisms are an extremely diversified assemblage of organisms, which involves soil microorganisms (i.e., archaea, bacteria, and fungi), and soil fauna (i.e., protozoa, nematode). As important components of forest ecosystems, soil organisms undertake a wide range of ecosystem functions and services (Shi et al., 2021; Wang et al., 2023a), such as mediating biogeochemical cycling and ecosystem health maintenance, their responses to global warming are potentially important in subtropical forest ecosystems. However, the impacts of global warming on soil organisms and biodiversity are rather equivocal to date. Therefore, the original authors of the concept encouraged filling this knowledge gap from the perspective of the soil food web to thoroughly understand soil biodiversity, including vegetation resources, soil microorganisms, and soil fauna.

The relationship between soil erosion and biodiversity is extremely multifaceted. Erosion is widely recognized as one of the main threats to soil. Globally, about 2.8 tonnes of soil are lost per hectare annually. Given this, soil loss surely has an impact on the organisms populating this ecosystem. At the same time, the enormous variety of species living in the soil influences both its aggregate stability and water infiltration through their moving and feeding activities. Therefore, soil biodiversity certainly plays a role in soil loss processes. Large-scale assessments of both soil erosion and biodiversity distribution are currently available. Nonetheless, the causal relationships between the distribution of belowground diversity and soil displacement, in both directions, have been poorly explored.

In this context, it was identified that three possible areas of research, require advances in the coming years:

1. Comprehension and quantification of the interactions between soil biodiversity and erosion;
2. Development and integration of a “biodiversity factor” into the models used to assess soil erosion;
3. Assessment of the ecological impact of soil erosion on soil-living communities.

According to the current (limited) knowledge, earthworms can play a key role in reducing soil erosion, mainly due to their burrowing activity that increases soil porosity. Based available

pan-European (11 countries) maps of earthworm richness and abundance, an "Earthworm factor" (Et-factor) was developed to be integrated into soil erodibility (K-factor) calculation.

Conclusion: Overall, to mitigate the adverse impacts of global warming on soil biodiversity, we urge the restoration community, forestry specialists, and legislators to emphasize natural forest regeneration over various tree-planting approaches, thus maintaining soil biodiversity and improving multiple ecosystem functions. Additionally, the scientists call for new theories and technologies to preserve soil biodiversity based on the soil food web to combat global warming in the future. This perspective will emphasize the necessity of strengthening natural regeneration rather than planted forests for maintaining soil biodiversity and ecosystem functioning.

According to the Forest Survey of India (FSI)'s India State of Forest Report (ISFR) 2023,

"While India's total forest and tree cover has increased, there has been a concerning decline in the extent of natural dense forests. The overall growth figures are largely driven by plantations and trees outside of designated forest areas, not by the expansion of natural forest ecosystems".

Decline of natural dense forests

- ✓ The ISFR 2023 shows that 3,913 sq km of dense forests were lost between the 2021 and 2023 assessments. This continues a longer-term trend, with India having lost over 24,651 sq km of dense forests in the two decades since 2003.
- ✓ The report notes that this loss of dense forest cover is most evident in the country's biodiversity hotspots, including the north-eastern states and the Western Ghats.
- ✓ In the Western Ghats Eco-Sensitive Areas, 58.22 sq. km of forest cover was lost between 2013 and 2023.
- ✓ The north eastern region saw a decline of 327.30 sq. km of forest cover overall.

Discrepancy between plantation and natural forest growth

The report highlights that the increase in "dense forest" cover is largely an outcome of plantations rather than natural regrowth. For the FSI, "forest cover" includes all tree patches over one hectare with a canopy density above 10%, regardless of whether they are natural forests or plantations. Between 2003 and 2023, the growth in dense forests was significantly influenced by the reclassification of non-forested land into dense forest, primarily through new plantation activity. Overall forest and tree cover Despite the loss of natural dense forest, the overall figures for India's green cover show an increase, primarily due to commercial and Agroforestry plantations.

Total forest and tree cover: 827,357 sq.km, or 25.17% of India's geographical area.

Net increase: A total increase of 1,445 sq.km, in forest and tree cover since the 2021 assessment.

Categories of forest cover:

Forest Cover: 715,343 sq.km (21.76% of geographical area).

Tree Cover: 112,014 sq.km (3.41% of geographical area).

(The author is a retired Deputy conservator of Forests who was awarded VANAMITRA and a gold medal along with a cash reward of Rs 50000/- on 15-08-2000 by the then Hon'ble Chief minister Of AP for the reportedly excellent watershed development works carried out in Nellore district when he was on deputation to DRDA Nellore .He can be accessed at 7893673767,source: Internet)

Keynote Address – ESDA World Summit 2025, Bangkok Dt.10.11.2025

" Biodiversity Conservation Principles, Best Practices & Conflict Mitigation: A Call to the World"

Dr.K.Thulsi Rao

Distinguished delegates, respected colleagues, young leaders, and friends from across the world—

I stand before you today at the Environmental and Social Development Association (ESDA) World Summit 2025 in Bangkok with a heart ignited by purpose and a spirit guided by decades of service in the forests, mountains, and communities of India.

We gather at a historic moment. The planet is not merely calling us—it is warning us. From the thinning cry of the Great Indian Bustard to the silent retreat of amphibians in tropical forests, biodiversity loss is the greatest unspoken emergency of our era. Yet, amid this uncertainty, *we hold the power to reverse the tide*.

I. Biodiversity Conservation: Principles to Anchor the Planet

1. Nature First – Every policy, plan, and development agenda must begin with ecological wisdom.

2. People-Centric Conservation – Communities are not obstacles; they are guardians. When empowered, they protect ecosystems better than any fence or law.

3. Science-Driven Decisions– Conservation without data is guesswork; science must guide every intervention.

4. Restoration over Exploitation– Forests, rivers, grasslands, and coastlines must be healed, not extracted.

5. Resilience & Climate Adaptation – Biodiversity is the planet's immune system; its protection is our survival strategy.

These principles are not theories. They are tools—tested, proven, and essential.

II. Best Practices from India: A Model for the World

India's conservation story is a tapestry woven with innovation, perseverance, and the courage of communities.

1. Eco-Development as a Catalyst

From Nagarjunasagar–Srisailam Tiger Reserve to remote tribal landscapes, eco-development has transformed conflict into cooperation.

We learned that when communities earn with dignity, forests breathe again.

2. Species Recovery Programs

From crocodile breeding and successful releases to bustard conservation and florican monitoring, India has demonstrated that science, patience, and community trust resurrect species believed lost.

3. Ecological Knowledge Parks & Biodiversity Corridors

Creating spaces where science meets society, where youth meet nature, and where ecosystems regenerate

naturally—these models must be replicated across continents.

4. Low Investment, High Impact Models

The Indian conservation ethos teaches us:

“Simplicity creates sustainability.”

With modest resources but profound dedication, entire landscapes have rebounded.

III. Conflict Mitigation: Bridging the Divide between People and Wildlife

Human–wildlife conflict is not a battle of survival—it is a dialogue misunderstood.

Conflict mitigation requires:

* Early-warning systems and landscape-level planning
* Habitat restoration to reduce animal movement into villages
* Alternate livelihoods rooted in ecology
* Youth-led community monitoring
* Respectful engagement with indigenous knowledge

We have seen leopards return to forests peacefully, elephants follow restored corridors, and communities become protectors rather than victims.

IV. A Call to the World: Youth, Rise

To the youth of the world—this is your century.

Not the century of technology alone, but the century of "ecological awakening."

You will inherit the rivers we pollute, the forests we degrade, and the species we lose.

But you will also inherit the power to rebuild.

I call upon you:

Wake up to your responsibility.

Wake up to your potential.

Wake up to the reality that conservation is not a profession—it is a duty.

Let your actions be bold.

Let your choices be sustainable.

Let your voice be uncompromising.

Let your leadership define the future of this planet.

V. The Road Ahead

Let Bangkok be the city where the world pledged not only promises but practical solutions—solutions born from India’s forests, Africa’s savannas, America’s national parks, Europe’s woodlands, and Asia’s rich biodiversity.

The world must unite with unwavering resolve to:

* Restore degraded ecosystems

* Protect endangered species
* Reduce the human-nature divide
* Integrate biodiversity in every sector
* Build climate-resilient communities
* Empower the next generation

Conclusion: The Flame of Responsibility

Friends,

The forests have taught me one truth:

“When man protects nature, nature protects mankind.”

Let this summit ignite a global movement—

a movement of wisdom, courage, and compassion.

A movement that future generations will celebrate.

A movement that begins " 'here', 'today', 'with us'."

Let us rise together for biodiversity.

Let us rise for humanity.

Let us rise for the planet.

Thank you.

The author is a forest scientist, presently Director and Consultant at Forestry, Biodiversity, Environment & Climate Change ,Kundhi Global Biodiversity Solutions, Visakhapatnam, Andhra Pradesh, M-85007 82528

Forgive and be Free: Forgiveness sets us free and sets the offender free. It cuts the chains that impede the move to reconciliation, and there is hope of the common good emerging, of new relationships formed, and of a future in which particular angles have become history, not reality.

-Justin Wellby, Archbishop of Canterbury

Nature teaches us that enduring growth is never rushed!

"We may feel a number of times 'a single day is a drag', yet pass by 'decades in the blink of an eye', and therein lies the amazing paradox of nature."

Dr. B.Raghotham Rao Desai, IFS (Retd)

Exordium:

Staying in the Midwest State of Nebraska (of the United States) for a couple of months from July 2003, we had just emerged from the harsh winter where temperatures touch freezing point, making outdoor activities nearly impossible. As October arrived, the weather began to ease, and we had also shifted to the Eastern coast's Long Island ,NewYork—-the impatient part of me wondering why winter couldn't disappear a bit earlier and spring come in a bit sooner! Then I paused to reflect : Nature does not rush—-it moves in slow cycles, indifferent to our impatience, yet full of wisdom for those who observe : the transition from winter to next season doesn't happen over night; it unfolds gradually, minute by minute, day by day, and even week by week!

The principle involved:

And in that quiet persistence lies a profoundles son :a number of times we feel like a particular month or year or even a single day is 'a drag', yet decades pass by in the blink of an eye—-and therein lies the amazing paradox of nature! Often, when we're stuck in difficult phases, we act hastily, trying to force a change—-if it does not happen, we consult an astrologer who suggests a solution which happens to coincide with aturninthe cycle for the better : but just like the seasons, life too moves in cycles, few experiences teaching one about life's highs and lows more than cycling through mountainous terrain! With patience and equanimity, even the harshest periods pass, giving way to renewal!

Take the amazing case of the giant redwood trees (Sequoia sempervirens: formerly Taxodiaceae, presently Cupressaceae, an evergreen, long-lived, monoecious tree, being the tallest living trees on earth, also among the longest living) native to groves of the Sierra Nevadamountain range of California (USA): some of them living for more than four thousand years. During a visit to a museum in Oct, Nov, 2003 at Washington DC, we stood in a we before the massive trunk of one such tree, which was around three thousand years old—-these trees growing slowly over a number of years, reaching majestic heights (272' above mean base; base circumference 102'; mean base dia, 34'; dia of largest branch 7'), and growing massively in width & volume (6,00,120 board feet, with estimated weight of 6,167 tons—-trunk 5,602 tons; root system 375 tons; limbs 178 tons; bark 7 tons; foliage 5 tons. [In terms of familiar comparisons: its diameter is greater than the ordinary home; a limb larger in dia. than most of the trees in the Rocky mountains; weight equals 4,000 automobiles; contains enough lumber to make 45 room bungalows;and enough wood to make a box large enough to contain the largest ocean-liner ever built].

Conclusion:

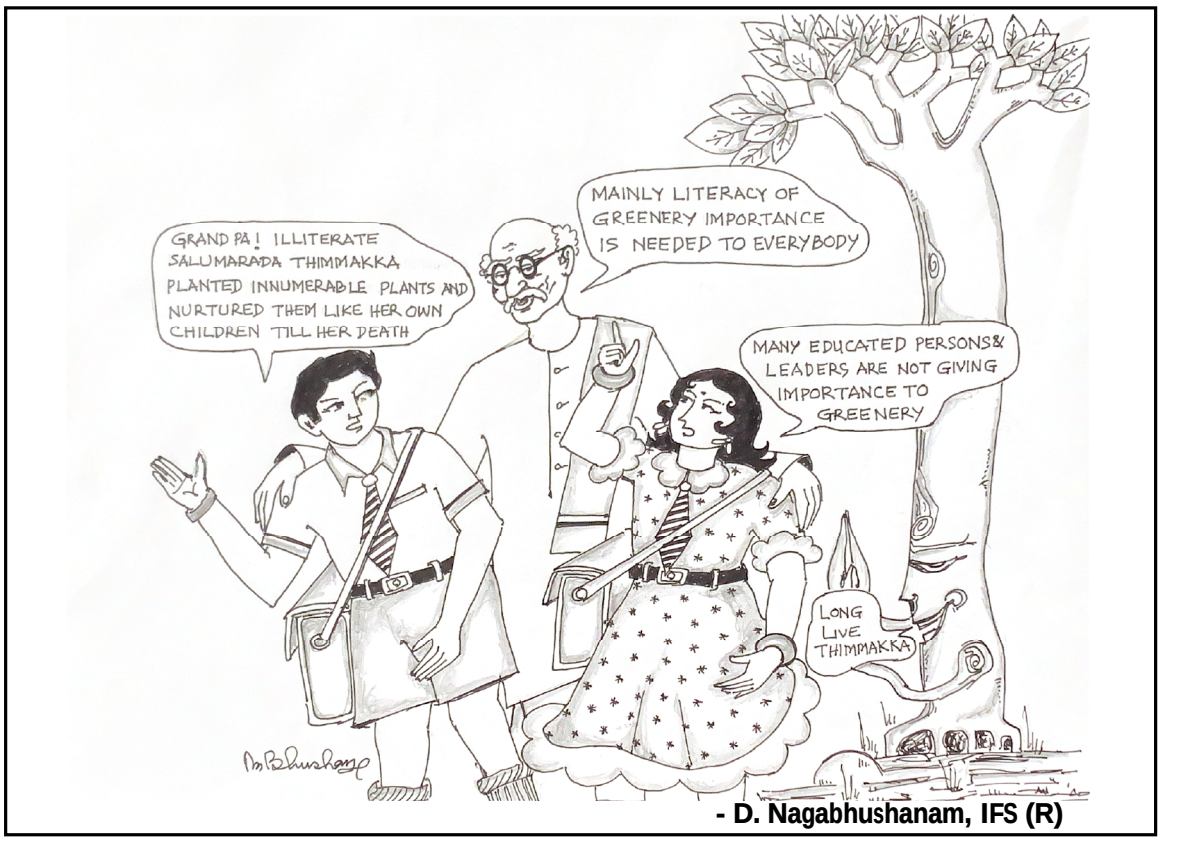
Contrast the above with our desire to double our money in three months—-while that may be

unrealistic, what is possible is multiplying wealth manyfold: provided we have the discipline to wait it out for a long time and resist the urge to tamper with our investments in moments of market-volatility anxiety.

Nature teaches us that enduring growth is never rushed—-it's cultivated with patience, resilience, and time. Nature operates on its own timeline: seasons change, plants grow, and life unfolds without force or haste—-which teaches the value of aligning one's actions with the natural order rather than rushing towards goals. By embracing this approach, individuals can achieve their objectives without unnecessary struggle—-implying that rushing often leads to stress and failure, while a calm and steady approach allows for natural progress ion and fulfillment : underscoring the interconnectedness of all things. Just as nature functions inabalancedway,humansshould also seek balance in their lives, recognising that everything has its time and place.

Harmonious existence is advocated—-individuals trusting the process of life and allowing things to unfold naturally: this wisdom encourages a deeper understanding of time, effort, and the natural world, promoting a more peaceful and fulfilling approach to life's challenges.

The author is a retired IFS officer of Karnataka cadre and the Chief Editor of 'VanaVikas', a quarterly magazine of the retired forest officers of Karnataka. M-9886157158.



- D. Nagabhushanam, IFS (R)

PHYSICS NOBEL PRIZE 2025–QUANTUM COMPUTING 13,000 TIMES QUICKER THAN SUPERCOMPUTER

Sri.B.K.Singh, IFS (Retd)

Century old Quantum Mechanics can explain how a single sub-atomic particle crosses the energy barrier through tunneling, be located at multiple places simultaneously, occupies discrete energy levels and emits energy in quanta as it moves from higher energy level to lower energy level. Three US Physics Professors; namely John Clarke, University of California Berkeley; Michel H. Devoret Yale University, New Haven CT and University of California, Santa Barbara and John M. Martinis University of California Santa Barabara, were awarded this year's Physics Nobel Prize.

Quantum mechanics has advanced from single particle to macroscopic level, and during 1984 and 1985, these Professors have conducted experiments wherein quantum behavior has been observed at macroscopic level, where billions and trillions of Cooper particles (two electrons closed system) are involved. The Professors had discovered macroscopic mechanical tunneling and quantized energy level in a system large enough to be kept in hand. When they made this discovery in 1984 and 1985, Martinis was a PhD candidate, Devoret was a post-doctoral fellow and Clarke was their professor and supervisor. Two of the three Laureates have links with Google. Besides his professorship,Devoret is Chief Scientist of Google Quantum AI, while Martinis headed Google's Quantum AI lab till 2020.

How Quantum Mechanics is different from Classical Mechanics? We have seen in our day today life that when a ball is thrown against a wall, it rebounds on the same side and never crosses to the other side of the wall. In sharp contrast to this, atomic particles under quantum mechanical principles cross the barrier through tunneling, located at multiple positions simultaneously and can occupy discrete energy levels.

In 1973 Physics Nobel Prize was won by Brian Josephson for discovering the flow of electric current between two superconductors separated by an insulator. This has been a very useful finding and'superconductor-insulator-superconductor junction' has been used in various experiments like measurement of fundamental physical constants and magnetic field etc. and is commonly called as 'Josephson junction'. This set-up was utilized by Nobel Laureates in the series of experiments they conducted in 1984 and 1985,meticulously isolated the set-up from its environment and ensured that the quantum effects are not destroyed by interference. They were successful in demonstrating the flow of electron through the set-up and also found the electrons exhibiting quantum mechanical behavior.

The superconducting chip separating another superconductor by an insulator had electric current flowing without any resistance. The electrons coordinate and move together in a single wave. The voltmeter reading showing zero initially starts showing value corresponding to a discrete energy level confirming that the particle has crossed the wall (the insulator) through tunneling. Though the scientists have not been able to conclude the maximum size of the system exhibiting the quantum behavior, the experiments conducted in 1984 and 1985 by the Nobel Laureates have confirmed that the system as large as the set-up chosen by them did show quantum behavior. The discovery led

to the building of 'quantum-bits' (qubits) – unit of information in quantum computers.

The discovery has been extensively used in mobiles, cameras, transistors in computer microchips and optic cables etc. that are part of our lives these days. The next generation quantum technology such as quantum cryptography, quantum computers and quantum sensors are the way forward from these inventions.

These discoveries have far reaching consequences and have been providing breakthroughs in many fields of medicine, chemistry and environment etc. The quantum behavior in superconducting circuits has led to the creation of superconducting qubits, the building blocks of quantum computers and can perform intricate calculations far beyond the reach of a classical computer, marking the dawn of a new computational era. 'Google Sycamore processor', co-developed by Martinis has already demonstrated quantum supremacy by solving problems faster than any existing supercomputer.

The implications extend far beyond computing. In cybersecurity, quantum technology challenges current encryption models, driving innovation in post-quantum cryptography to safeguard credentials, financial data, and national digital infrastructures. If appropriate innovations are not done, our personal data, bank accounts etc. can be hacked using quantum computers. Quantum key distribution (QKD) further enhances data privacy, allowing secure communications based on unbreakable principles of Quantum Physics.

In industrial applications, quantum enhanced sensors can detect minute changes in temperature, magnetic fields or vibrations, revolutionizing areas like predictive maintenance, manufacturing quality control and energy management. These sensors could form the backbone of quantum secure industrial networks, protecting critical systems from cyber threats while improving performance and efficiency.

We are aware that information is stored in any normal computer as bits, which are either 0 or 1. Quantum computer uses qubits that can be understood to be behaving like a spinning coin in air with 0 and 1 at the same time. Group of qubits can become linked indicating that when we learn about the one we get to know something about the other too. The two traits are utilized in a quantum machine and bring out several possibilities in parallel.

Google's quantum AI team has recently reported that its 'Willow Superconducting chip' has run a new test and obtained 13,000 times faster result as compared to the result from top supercomputer. This test is called Quantum Echoes and can be repeated and checked using other quantum machines. Google calls it as 'verifiable quantum advantage'. Earlier quantum advantage demos produced 'one off random results' and thus, were not verifiable. Quantum Echoes, however, measure the number called 'out of time order correlator' (OTOC), which would again emerge when another quantum computer follows the same step. Thus the number is specific irrespective of the quantum computer used. The similar output can be obtained after redoing/ rechecking and hence it is 'verifiable'.

We encounter chaos in natural processes, which is generally characterized by the high sensitivity of a system towards small perturbations. The notable examples being weather patterns, wherein a small change in initial conditions leads to different outcomes over time and population dynamics where a small shift in local population can affect the entire ecosystem. Chaos is also found in quantum systems, like dynamics of magnetization in atomic

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Files and Forests: Reading between the Lines

Dr. Padam Parkash Bhojvaid, IFS (Retd)

By the time I became Principal Chief Conservator of Forests, I had learnt that the true measure of bureaucracy lies not in the weight of its files but in the silences between their noting. Each margin remark and underlined adjective carries more than assessment — it records the moral weather of an institution. Like the rings of a tree trunk, our appraisal reports reveal not just performance but the climate in which one grew — some rings wide with expansion, others narrow with drought or quiet endurance.

Among the many seasons that shape the rhythm of Indian bureaucracy — the transfer season, the budget season, and the monsoon of circulars — one stands apart for its quiet tension: the Appraisal season. Once called the Annual Confidential Report (ACR), it was written in ink that could decide destinies. The reporting officer was both judge and biographer; the reviewer, a philosopher; and the accepting authority- the arbiter with a final flourish of pen.

Over the years, this ritual was renamed and softened into the Annual Performance Appraisal (APR). It now begins with the officer's own self-assessment — a polite exercise in modest self-praise. "I have performed my duties to the best of my ability," is bureaucratese for "I moved mountains, but let's stay humble." The file then climbs up the administrative canopy like a vine seeking light — occasionally trimmed, sometimes allowed to flower.

In my early years, most seniors were promoted officers — practical, earthy, and indulgent toward young recruits in crisp uniforms and fluent English. A poor rating was rare. Later, when I returned from overseas study, I assumed my record remained spotless — until 2007, when curiosity led me to revisit my dossier, that sacred folder of judgments running back to 1983. Inside was a bureaucratic autobiography in carbon copy — pages of typed assessments, signatures, and seals.

To my surprise, every report from 1998 to 2007 gleamed with a perfect 10 out of 10. What amused me most were the remarks — unexpectedly warm, even lyrical. Officers known for restraint had written of me as "innovative," "committed," and "a model of integrity." Perhaps they meant it. Or perhaps, in the strange alchemy of official prose, the pen had a kinder heart than the tongue.

That day I realised something important: bureaucracy, for all its rigidity, allows space for unseen fairness. Senior officers sometimes corrected harsh judgments quietly, restoring dignity without favour. Beneath the myth of hierarchy survives a moral order — a silent consensus that good work deserves recognition.

Years later, when I began writing reports for others, the circle completed itself. I remembered that old glow — and tried to let my own pen carry both kindness and precision, a balance bureaucracy seldom teaches but life insists upon. Confidentiality may guard a document, but genuine respect never remains secret.

Every bureaucracy, like every forest, has its biodiversity. Among its most fascinating species is the reporting officer: the Enthusiast who floods reports with adjectives; the Economist whose

remarks barely stretch to "Good"; the Poet who compares diligence to a candle in the wind; the Surgeon who dissects errors with clinical precision; the Schoolmaster forever writing "Needs to improve…"; the Bureaucratic Monk who hides behind safe neutrality — and, most rarely, the Statesman, who balances fairness with grace.

In the end, the art of writing remarks mirrors the art of leadership itself — to correct without wounding and to praise without exaggeration. **For young officers awaiting their annual verdicts, my only counsel is this: work as if no one were writing, and write as if everyone were watching.**

Because when the ink fades and the paper yellows, what endures are not the remarks — but the forests you leave greener, and the institutions you leave fairer. In that quiet permanence lays the only appraisal worth keeping.

The author is a retired IFS officer and former PCCF (HoFF), Haryana. M-70879 56657

Birthday Greetings

We wish the following born on the dates mentioned

A Very Happy Birth Day

S.No.	Name of the Member	D.O.B.
Sarva Sri		
1.	Satish Chandra	06-12-1939
2.	B. Naganath	08-12-1949
3.	Ch. Iylaiah	08-12-1949
4.	P. Satyanarayana	10-12-1953
5.	A.V. Govinda Rajulu	11-12-1945
6.	S.D. Mukherji	14-12-1940
7.	A. Venkateshwarlu	15-12-1958
8.	S.K. Das	17-12-1947
9.	P. Ravinder Reddy	19-12-1946
10.	P.V. Raja Rao	20-12-1962
11.	V. Santhasheela Babu	21-12-1947
12.	G. Krishna Murthy	25-12-1954
13.	G. Ravinder	30-12-1958
14.	G. Raman Goud	01-01-1949
15.	K.S. Moses	02-01-1959
16.	Y. Nageshwar Rao	04-01-1946

S.No.	Name of the Serving Officers	D.O.B.
Sarva Sri		
1.	Kavitha Narayandas	11-12-1980
2.	M. Nagabhushanam	14-12-1964
3.	Dr. B. Prabhakar	16-12-1966
4.	Vinay Kumar Sahu	27-12-1980
5.	V. Venkateshwara Rao	01-01-1966
6.	Binod Kumar Singh	02-01-1964
7.	Mrs.V.V.L.Subhadra Devi	03-01-1982
8.	V. Tirumala Rao	04-01-1964
9.	G. Ramalingam	05-01-1965

- SECRETARY

Any Omissions and Commissions in the Names / Dates may kindly be informed to the Editor over WhatsApp or Email.

Hummingbirds of Costa Rica

Sri. K.Praveen Rao, IFS (Retd)

Hummingbirds are one of the most beautifully coloured birds in the world. These are native to North and South America. They derived the name hummingbird, as the humming sound is created by flapping the wings at a very high frequency. The beating of the wings was of the order of 12 beats per second to about 100 beats per second, depending on the size of the bird. Smaller birds beat their wings faster than the bigger ones. These are nectar feeding birds and have developed a specialized long beak, but they also consume small insects for protein intake.

fiery throated hummingbird

Hummingbirds were initially placed along with swifts and treeswifts in scientific classification. But the hummingbirds were later elevated to a separate order Trochiliformes. There are about 450 species of hummingbirds listed so far next only to Passeriformes or perching birds.

green crowned brilliant

Hummingbirds are the smallest known flying bipeds. The smallest one, being about 2 inches in size known as 'bee hummingbird', is found in Caribbean. Scintillant hummingbird is the smallest in Costa Rica.

The beautiful colours of hummingbirds come from both pigments and structural iridescence. The pigment melanin is responsible for the general colour of the bird. Whereas nanostructures in the feather barbules and their interaction with light reflect shining iridescence.

green hermit hummingbird

The distribution of the hummingbirds is restricted only to Americas and not the other parts of the world. It is mainly

because of their evolutionary history. They originated in America during Miocene period. The formation of Andes Mountains in South America and the expansion of ecological niche into North America gave an ample opportunity for their diversification. The diverse habitats like high altitude regions of Andes, Humid tropical forests of Central America helped in wide distribution of different species of Hummingbirds.Coevolution of particular species of flowering plants they feed on developed a special relation between them and the nectar yielding flowering plants. The geographical barriers and lack of comparable bird families elsewhere outside the Americas have restricted hummingbird populations only to Americas.

rufous tailed humming bird

Morphologically their compact body, sharp sword like and long wings enables it to fly like a helicopter staying stable in the air and move in all directions. The males are brightly coloured compared to the females. The birds mature in one year and will be ready to mate. The nests are built by females. The nests are cup shaped made of plant fibres, spider web, lichens, moss etc. Humming birds lay two eggs that are hatched in about two to three weeks. They are fed by regurgitation and the chicks fledge in about three weeks.

volcano hummingbird

I happened to visit Costa Rica for birding. Costa Rica is part of Central America and has a chain of volcanic mountains in the middle running from north to south. On the south eastern side of the country lies the Caribbean Sea and on the south west is the Pacific Ocean. It experiences tropical climate throughout the year. The country boasts of rich biodiversity. The bird diversity of Costa Rica is very rich and has around 806 species of birds.Amongst them, the Hummingbird species are 54.

scintillant hummingbird

The author is a former Principal Chief Conservator of Forests; Ex-chairman, Committee on materials, NBA, Chennai, M-9411052235

Human-Animals' Conflicts in Karnataka

Sri. B.M.T Rajeev, IFS (Retd)

Sometimes, wild animals come in contact with humans' interest causing considerable damages to natural resources, humans' properties and physical harm to humans and earn the wrath of the people who retaliate and cause injuries/death to animals and agitate for the relief- is called 'human-animals conflicts' (HACs), which are as follows.

'Damage to natural resources' is destruction of forests, pollution to water resources and elimination of some species of wildlife-flora & fauna.

'Damage to humans properties' are serious problems since herbivores raid the farmlands, forage, trample and destroy not only annual crops in sowing/fruiting seasons but also the perennial crops-like plantations/gardens; and damage to properties like pump houses, residential houses etc. The carnivores cause loss by praying/killing of cattle.

'Physical damage to humans' involves attacking humans causing injury/deaths by herbivores, carnivores and reptiles.

'Retaliation by humans' to wild animals such as killing by spears, gunning down, snaring, poisoning, electrocution, planting bombs in food and mob chasing and killing etc are detrimental to the wild animals but are dealt with seriously as per the law.

There are many reasons/causes for the HACs like overuse/abuse of forests beyond their sustaining power causing degradation, fragmentation and reduction of the wildlife habitats due to occupation of forest lands for farming, housing and developmental activities like transportation routes, transmission lines, dams and other development projects and mining causing loss of forests in terms of wealth and area- the very home-livelihood of wildlife.

On the other hand, the population of wild animals is improving considerably due to corrective measures undertaken against hunting and trade in wild animals' parts with the enactment of Wildlife (Protection) Act, 1972 (WLPA) and declaration of wildlife potential forests/ecosystems as Protected Areas (PAs) with scientific/strict management practices.

The pressure on wildlife habitats from the people living close to the forests/PAs, where wild animals lived earlier is spontaneous indulging in illegal fetching of forest produces, cattle grazing and encroachments; in addition to legal diversion of forests by the government for farming, infrastructure developments and mining etc to meet the demands of ever increasing human population causing displacement of wild animals from the forests to forests; such displaced animals and the over populated wild animals in the PAs have to have sufficient food, water, shelter, space for the dispersal of their gene pool; if any species of wild animal or a animal finds any one of the facilities is in stress, to meet such bonafide requirement for survival; they/it will move out into other forests, if no such forests to move (corridor) exist, then they/it will enter into the human habitations, some times crops in farm lands too lure herbivores to raid crops…thus indulges in conflicts with humans-HACs.

HACs have to be addressed by the wildlife management-ie forest department (FD) as a

policy in the best interest of the wildlife and the people living in and around forests/PAs-wildlife habitats. The states and central government take the responsibilities to fund and resolve the HACs.

The wild animals involved in conflicts in Karnataka are elephants, tigers, leopards, wolves, hyenas, wild boars, sloth bears, black bucks, gaurs, sambars, chitals, monkeys, pea-fowl, pythons, crocodiles and poisonous snakes etc and the mitigating measures in operation in the state are as follows as on 2025.

1.Human-elephants conflicts: It is a very serious problem in the state affecting the people living along the interstate border abutting Tamil Nadu/ Kerala since the 1990s and it is spreading into the Western Ghats and plains with the dispersal of elephants to meet their bonafide requirements.

To resolve this, the wildlife management started creating barriers between wildlife habitats and human habitations first with the elephant proof trench (EPT), Solar pulsating fence (SPF), Rubble stone walls, Size stone masonry wall in Cement Mortar, combination of all barriers and now old rails fence (ORF), RCC pillars/ structures across streams etc and even chain link mesh between the ORF and also scaring and driving back of the elephants whenever found entering/ entered in to the human habitations.

The ever increasing elephants in population continue to move into new forest areas along the Western Ghats and into human habitations-especially coffee/tea plantations being attracted by the fodder, jack fruits, banana and wash of arrack brews in the coffee estates and water/shade facilities during summers e.g.Coorg, Hassan & Chikkamagaluru Districts.

To check this menace the state did translocation of the strayed out bull elephants and small herds into big PAs/forest regions but some makhnas/ bulls returned back to the forests where they were caught and cause still severe problems in new areas. (The people in the Coorg allege that elephants have settled in their coffee estates and even breeding too and they never return to the forests.)

The Government of Karnataka (GoK) is planning to create a rescue centre in wilderness of Bhadra TR limits over 5,000 ha or 50 Sq km to house and nurse the trouble causing elephants after translocation into the wild close to the back waters of the Bhadra Reservoir. It has to be seen how best it will resolve the HECs.

The toll of the humans and elephants due to HECs in Karnataka is severe. As per the statement of the CM of Karnataka in Aug 2024, the state had registered 2,500 cases of HECs in the past 10 years resulting in 350 human deaths.. Karnataka created 9 task forces and set aside a budget of Rs 150 crore to mitigate the HECs during the year. About 63 elephants died due to HECs during 2020-2024 alone…speaks about the gravity of the problem in the State.

2.Human-Tiger Conflicts: It is still a serious problem in the tiger-concentrated Tiger Reserves (TRs) like Bandipur, Nagarahole and Bhadra where tigers

create a lot of fear among the villagers residing near to PAs by entering their habitation and scaring them, preying on cattle

and mauling humans to death etc. The strategy to resolve this problem is to capture the man-eater tigers with baits or combing by deploying men & elephants to rehabilitate in zoos or shoot out-if Tigers avoid capturing and by create more problems.

In 2025, the problem of tigers straying out of Bandipur TR and mauling/ killing humans in farm lands has seen an increase…It is a problem due to increase in the population of tigers in the PAs and pushing out of the new recruits or the aged ones to the fringes of the TR to find their home ranges which indulge in the HTCs- a severe problem. (The people in Coorg allege that tigers have settled in the coffee estates and even breeding too.)

In the past 10 years, 34 humans have been said to have been mauled and killed by the tigers and unnatural deaths of tigers in the same period was said to be several dozens with poisoning and snaring as retaliation against HTCs.

The FD has planned to create a Task Force for HTCs to see that no tigers come out of forests into the farm lands and cause damage to cattle or humans.

The HTCs in Bandipur TRs (BTR) are severe since it harbours more tigers. BTR is 1036.05 sq km in area which comprises 872.24 sq km of Core zone or NP and 163.81 sq km Buffer zone as on today (2025). It has a tiger population of 154 tigers as per 2024 census which works out 6.72 sq km of home range (HR) per tiger…which is a restricted HR for each tiger against the normal HR of 10 sq km with good food-prey base for its free life habits against the HR of 20 to 400 sqkm in the vast PAs and forest areas.. Since the prey base is dense in BTR, the tigers are living within HR of 6.72 sqkm-a bare minimum area for sustenance.

When the tiger population further surges with new recruitments, such new recruits will be pushed to the fringe forests to establish their new HRs- if they found area comfortable- they will establish their HR and live-if forest area or a corridor to move further is not available, then such young tigers in confusion enter into the human habitations adjoining the TR/ PA and cause conflicts with humans by preying on cattle or humans thinking as animal to fetch their food and cause HTCs.

E.g. 4 incidents of tiger attack on farmers happened in Oct. 2025 and on Nov, 7th resulting in 3 deaths and one severe injury in the limits of Hediyala Sub-division-in the farm lands of Saragur tq causing public outcry against the officers & the BTR.

As a remedial measure, 2 tigresses- sub adults have been caught and two culprit tigers are evading. During this situation another two tigers appeared in the farm lands out of which one young tigress was caught and translocated to the Rescue Centre and its mother is at large.This is the situation in the BTR.

Analysis: If a Wildlifer analyses this situation with reference to the incidents that happened earlier… it reveals that the tigers coming out of the BTR causing HTCs generally occurred during October & November months which is autumn and a mating period of tigers (Tigers mating period is not marked but observed to be in the BTR). During autumn all herbivores have good fodder after monsoon with bright Sun, water and comfortable weather to feed on succulent grasses to grow and put on fat to withstand severe cold during winter in India. All dogs mate during this period. Tigers-big cats too are good breeders provided all the facilities for them are good and available in their habitats. Tigresses too found to be weaning their cubs to plan for next procreation-mating during the autumn. If not, how come the 3 tigers trapped during a month in HTCs in the BTR are only

young tigresses and not infirm or injured tigers to become man-eaters for preying on the farmers in the humans habitations-Saragur Tq this autumn?.

Solution to look for: 4 cases of HTCs with 3 human deaths + one serious human injury in the Saragur Tq of BTR's adjoining farm lands cannot happen in the autumn of 2025 without increase in the population of tigers and throwing out of the new recruited tigers to the fringe forests to find their own HRs; which could not find forests and were forced to enter into human habitations to establish their HRs and indulged in HTCs and got trapped…

BTR has no corridors for its tigers to spread to E, N, and NW, whereas forests adjoining South and SW off BTR are PAs in Tamil Nadu and Kerala states to where tigers and animals have free range.

BTR has reached its saturation point of its carrying capacity in terms of tiger population which has to be scientifically analyzed and the maximum population fixed and excess to be translocated of the TRs where tiger population is low with good prey base or to give to tiger safaris and to zoos … if not, start tubectomy to tigresses and vasectomy to the tigers to maintain tiger population within its maximum limit of its carrying capacity.

For the above scientific plans, the National Tiger Conservation Authority (NTCA) & the Wildlife Institute of India (WII), Dehradun have to work jointly and resolve the tangle of HTCs in the famous BTR which has lived with fame and hoisted the flag of 'best managed TR in India' since its inception in 1973.

The HTCs are causing public rage against tigers-the national animal. Even 5 tigers were killed in the MM Hills-WLS in June, 2025 by poisoning the tiger kill. The BTR has faced humiliating situations with agitating farmers when human death takes place with HTCs…a comprehensive measure agreeable to the public/environmentalist/animal lovers/govt has to be taken before the public rage goes out of control against the BTR.

3* Humans - Leopards Conflicts: Leopards' population in Karnataka is more than that of tigers and the former have spread into human habitations

by taking shelters in sugarcane fields, big gardens of Areca/coconut and bushes in waste lands and small hillocks in the plains. Leopards are fond of dogs and occasionally raid cattle sheds and kill more sheep and goats up to 20-25 in a raid as a sadist predator with stray incidents of man eating in Karnataka; most of them are caught by setting trapping cages with baits and left into deep forests.

Leopards live with adjustment to the presence of humans in the open forests/gardens with more activities during nights but once surfaced to humans eyes in the open, the people force the authorities to capture and translocate into rescue centers or to the far of PAs/ forests. There is a task force to control HLCs in the state. HLCs too are severe in Karnataka as per a study report of 2018 which said in the past 3 years about 145 human deaths occurred and 65 leopards were killed in the HLCs indicating the problem in the state.

4* Wolf: The population of wolf in dry belt-NE belt of Karnataka is thriving well with preying on ungulates in the wild and sheep/goats of the people. Some time they too create problem by attacking children and the aged. There was an outrage in the past about the menace of child lifting by wolves in the Pavagada tq of Tumakuru dist in about 3-4 decades back. However, it is under control.

5* Wild boars crop raiding: The crop raiding by wild boars is very severe around the famous Bandipur, Nagarahole, BRT Hills and Bhadra TRs and in the forests of Western Ghats. The wild boar is a prolific breeder and it is a prized prey of tigers and a sourced food for humans but not permitted as it is a Schedule-II animal. The wild boars raid crops in hundreds and destroy during sowing and fruiting seasons. Wild boars have caused 32 human deaths in the past 10 years in the state.

The wildlife management has started putting even chain linked mesh along boundaries to check its' menace along the north fringe of the Bandipur TR. The farmer community is trying with change in crops that do not attract wild boars; some have left growing food grains close to forests due to wild boar menace or they even leave lands fallow or sell to the rich for building home stays with tree farming since they are fed up with going to PAs for crop compensations etc

A day is not far to the FD to have a controlling measure on the wild boars. I am of the opinion for permitting seasonal harvest of wild boars when found in the crop lands 2-3 km away from the PAs/ forests to check their population and crop damage.

6* Sloth Bears: problem is not severe and the bears are driven back to forests with the help of the public by the forest department in plains like Hassan, Kolar, Tumkur, Chitradurga and Bellary Districts. The compensations are paid when they cause human injuries/deaths. In the past 10 years bears have caused 36 humans deaths in conflicts.

7*Gaurs, black bucks, sambhar, spotted deer: These are all herbivores which indulge in foraging the crops herds when they raid but are not destructive like elephants and wild boars. Compensations are paid for their crop damages.

8*Monkeys crop raiding: It has become a problem in the plains after the massacre of the old avenue trees of Ficus, mango, tamarind and jamun etc while widening the National Highways. The monkeys were/are translocated by the FD and also public from the plains into the Western Ghats.. The apes have started begging for food along Highways running through the Western Ghats. It is a problem for the survival of the apes in WGs since the bearing capacity of forests too is declining due to many adverse factors.

The FD should have plans to raise fruits bearing trees in the WGs for the apes translocated, if not, they will perish. The monkeys are Schedule-I animals and they have the right to live in nature to play their role with many advantages to humans. The State has to plan a scheme to conserve apes as they are important in nature.

9* Pea-fowls: Pea-fowls cause crop damage around Bankapura Peacock Sanctuary in the Haveri district, Tumkur Division especially during sowing season. The farmers are unhappy with loss of crop once sown in the rain fed areas.

Sometimes they poison the grains and spread for pea-fowls or sometimes the seeds treated against pesticides cause death to pea-fowls when fed such sown seeds in the field.

Eg; 20 pea-fowls died in the Madhugiri Tq of Tumkur Dvn in farm land during sowing season in the year 2025.

10* Snake bites: There are poisonous snakes like king cobra, spectacled cobra, Russell's viper and kraits known for biting and causing human deaths if someone fails to visit hospitals in time and take medicine. Snakes are prolific breeders with a hatch of 30-90 depending on spp of snake. The predators for them are some spp of snakes, lizards and birds. If not, they multiply fast. Earlier, snakes

used to be caught & killed for their skin and now

people conserve them rather than killing like earlier days.

Among snakes many are Schedule reptiles. Hence, the people who die with snake bites need to be paid with ex-gratia as given for the death of humans caused by other scheduled animals.

*Attack by reptiles: The pythons and crocodiles are known for attacking and killing cattle and even humans.

11. Remedial Measures:

In addition to the barriers created between the elephant habitats-PAs and human habitations, the FD has the following measures to tackle HACs.

a.Compensations: The Govt of Karnataka has a policy to pay compensation for the crops foraged, damaged and destroyed by the herbivores and birds and to the human injuries and deaths caused by wild animals in the areas other than PAs & TRs where entry of humans/ cattle are restricted by law.

The ex-gratia compensation for human death was in 1980s-Rs 2K; in 1990s- Rs 25K; in 1995-96-Rs 1.00L; in 2008-09-Rs 1.50 L; in 2010-11 Rs 2.00 L; in 2011-12 Rs 3.00 L; in 2013-14 Rs 5.00 L; in 2018-19 Rs 7.50 L; in2020s Rs 10.00L and in 2023 Rs 15.00 lakh and Now it is Rs 20.00 lakh for human death as forced in Oct, 2025 in the Bandipur TR incidents.

For crop/other damage compensations used to be Rs 100/- Rs 1,000/ and Rs 15,000 ranges increased up to Rs 25,000/- and Rs 50,000 to Rs 75,000/ or more depending on the gravity of the damages to the crops/cattle/properties.

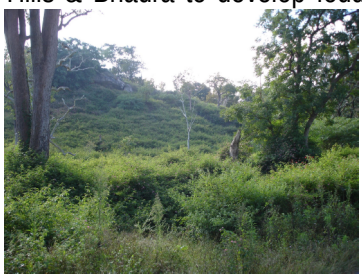
But the snake bites are left over from paying ex-gratia compensation which has to be paid in the interest of conservation of snakes as they are scheduled animals and their victims- are rural innocents. The Agriculture Dept. pays Rs 2.00 L as compensation for snake bite deaths-a solace to the farmers but not an ex-gratia for the snake bite deaths.

b. Task Forces: The Karnataka government has established task forces, such as the Elephant Task Force/Tiger TF/ Leopard TF/ Bear TF etc to respond to human-animal conflict incidents and implement mitigation measures.

c.Technology-Based Solutions: The use of technology, such as radio collars and early warning systems are helping to track animal movements and alert humans in potential conflict zones.

h. Community Engagement: Educating local communities about animal behaviors and the importance of coexisting with wildlife is in the interest of wildlife and the ecosystems that nurture humans has to be done by the FD-through PAs to gain the confidence of the people to reduce conflicts with the animals.

d. Habitat Management: Restoring and protecting natural habitats, as well as creating corridors for wild animals moments will only help reduce human-animal conflicts. The PAs managements are engaged in controlling invasive exotic weeds like Lantana camara and Senna spectalebis to develop fodder resources to the herbivores in the Tiger Reserves like Bandipur, Nagarahole, BRT Hills & Bhadra to develop fodder resources and



to improve the regeneration of local timber tree spp since 2022. Pic:. Severity of exotic weed – Lantana in the

BandipurTR

e. Research and Monitoring: Continuous research and monitoring of human-animal conflicts dynamics can help invent effective management of strategies to reduce HACs. The S&T play a very important role in this modern era of humans; it should be explored to resolve the HACs with special orientation to the problem creating species of wild animals.

The Forest Minister, Karnataka said in a function in the Aranya Bhavan, Bengaluru in Oct, 2025 that the HACs are serious and a challenge to FD; and the FD is planning to see that there will be no human or animal deaths due to HACs in the state in future. Further he said an Artificial Intelligence based camera command centre will be set up in Bandipur TR on trial basis to monitor movement of animals outside the TR to take preventive measures-shows the gravity of HACs in Karnataka. Scientific research/mitigation measures for the problems discussed above are only the solutions.

"Animals cannot speak,

But can you and I not speak for them and represent them?

Let us all feel their silent cry of agony and

Let us all help that cry to be heard in the world".

Rukmini Devi Arundale

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nuclei subjected under magnetic field varying with time and flow of electrons on high temperature superconductors. Quantum computers are ideal for simulating such chaotic systems. A quantum computer simulating OTOC signals from a physical system in nature such as molecules, whose system parameters are not fully known can be compared with OTOC signals against the real world data about the physical system and observe when they best agree. A more precise estimation of system parameter can be made as compared to any other technique.The echo number thus, can track any small disturbance spreading through the material and has tremendous scope in guiding the design of alloys, cleaner catalysts and zero-in on a chemical battery that can last longer.

The physics of Nuclear Magnetic Resonance (NMR) is being extensively used in Medical Science especially in MRI. Google has shown that how Echoes paired with NMR data can act like a molecular ruler. Structural features of real molecule can be compared to find how a drug might bind to a protein making a clear scope for quick discovery of drugs. It opens the way for examining the complex quantum behavior and possibilities of breakthrough in climate technology, environment, electronics and Chemistry.

Quantum precision measurement is advancing medical imaging, environmental monitoring, and even space exploration, opening new frontiers in scientific discoveries.

B K Singh is a retired Head of Forest Force, Karnataka and a 'Physics' post-graduate

Why is protecting, preserving and conserving wildlife needed?
Part 5: Role played by Biobanks in the Conservation of Wildlife

Sri. Hemanth Kumar, R. IFS (Retd)

Emergence of the concept of Bio-banking.

The 'Frozen Ark Project' is a pioneering initiative in the field of biobanking, dedicated to preserving the genetic material of endangered species before they disappear.

Biobanking involves collecting and storing DNA, tissues, and viable cells, ensuring that even if a species goes extinct, its genetic blueprint remains available for future research and conservation efforts.

The Frozen Ark acts as a genetic repository, safeguarding biodiversity by collaborating with zoos, research institutions, and conservation organizations worldwide. This stored genetic material can be used for scientific studies, cloning, and potential species revival, making it a crucial tool in combating biodiversity loss.

Primarily, the Frozen Ark is a biobank for endangered species, ensuring their genetic heritage is not lost forever. It's a fascinating intersection of conservation, genetics, and future-proofing biodiversity!

The Frozen Ark concept emerged from the urgent need to preserve the genetic material of endangered species before they vanish forever. It was founded by Professor Bryan Clarke, Dr. Ann Clarke, and Dame Anne McLaren as a collaborative effort between the Zoological Society of London, the Natural History Museum, and the University of Nottingham. The idea was inspired by the realization that traditional conservation efforts alone could not keep pace with the accelerating rate of species extinction.

The project began with the preservation of Partula snails, which were rapidly dying out due to ecological disruptions. Scientists recognized that storing DNA and living cells could safeguard genetic diversity for future research and potential species revival. Over time, the Frozen Ark expanded into a global initiative, collecting and storing genetic material from animals in zoos and those threatened in the wild.

Partula Snail (Photo Credit: islandbiodiversity.com)

This initiative is often compared to a "genetic Noah's Ark", ensuring that even if species disappear, their genetic information remains intact for future generations. It serves as a beacon of hope in the fight against biodiversity loss, providing a valuable resource for conservation and scientific study.

CBD and frozen ark:

The Frozen Ark Project and CBD (Convention on Biological Diversity) share a common goal: preserving biodiversity.

The CBD, an international treaty, focuses on conservation, sustainable use, and fair sharing of

genetic resources. The Frozen Ark, on the other hand, is a biobanking initiative that stores genetic material from endangered species to safeguard their genetic diversity.

While the CBD promotes policies and frameworks for biodiversity conservation, the Frozen Ark provides a practical solution by preserving DNA, cells, and tissues of species at risk. This genetic repository can support conservation efforts, research, and even potential species revival in the future.

Essentially, the Frozen Ark complements the CBD's mission by ensuring that even if species disappear, their genetic information remains available for scientific study and conservation strategies. It's a fascinating intersection of policy and science working together to protect life on Earth!

BIOBANKS/ GENETIC RESOURCE BANKS (GRBs):

Genetic Resource Banks (GRBs) are essential for the conservation of endangered wildlife species. They are organised collections of stored germplasm, primarily cryopreserved spermatozoa, from individuals whose contribution to the gene pool is too valuable to lose. GRBs help preserve genetic diversity, assist in the genetic management of rare populations, and provide a source of new knowledge for research. They are developed in a coordinated manner to benefit biodiversity conservation and are essential for mitigating the impacts of inbreeding on the fitness and survival of populations.

Biobanks are often likened to a 21st-century Noah's Ark. They are the genetic repositories and are the animal equivalent of a national seed bank for conserving plant genetic resources.

Biobanks are an essential tool in wildlife conservation, which can help preserve biodiversity and support species recovery efforts. The San Diego Zoo Wildlife Alliance's Frozen Zoo® is a prime example, storing cells from endangered species like the Przewalski's horse, which was successfully cloned after decades of preservation.

The intriguing quote in San Diego Zoo Wildlife Alliance's Frozen Zoo® is, "You must collect things for reasons you don't yet understand." This goes well with the concept of a biobank.

The story goes like this:

In 1980, the cells of a male Przewalski's horse (Equus przewalskii) living at the Minnesota Zoo were stored in San Diego Zoo Wildlife Alliance's cryobank, the Frozen Zoo®. The cells would remain frozen—dormant but alive—for more than 40 years, sustaining hope for recovering a species that was once extinct in the wild. The proactive effort to bank these cells was rewarded in 2021 with the birth of a foal named Kurt, a clone generated from the cells stored in the Frozen Zoo®. His birth restores valuable genetic diversity that has not been adequately incorporated into the extant population. A second cloned foal born in 2023 further supports the goal of restoring the greatest possible extent of the species' genetic diversity in the managed population. It will benefit the restoration of the species in its native habitat.

These foals are a testament to the power of assisted reproductive and genetic technologies. Equally important, they also exemplify biobanking's necessity and immense potential in conservation.

Some Other Examples in Action

A) The Northern White Rhino: The northern white rhino's fate seemed sealed with only two females left. However, biobanks have stored genetic material from several northern white rhinos, and there are ongoing efforts to create viable embryos using IVF techniques.

B) Black-footed Ferret: This species was once thought extinct until a small population was discovered.

Biobanks have since played a pivotal role in their recovery by providing genetic material to support captive breeding programs and reintroduction into the wild.

C) The Pyrenean Ibex: Once declared extinct in 2000, the Pyrenean Ibex was "revived" in 2003 through cloning. Though the cloned ibex survived for only a short period, this effort marked a significant milestone in de-extinction science, highlighting the potential of biobanks.

D) The Przewalski's Horse: Native to Mongolia and once considered extinct in the wild, the Przewalski's horse has made a remarkable comeback, thanks to biobanked genetic material that supported breeding programs. Today, over 300 of these horses roam the Mongolian steppes.

E) The Bornean Orangutan: Faced with habitat destruction and dwindling numbers, the conservation of Bornean orangutans has been bolstered by biobanks storing their genetic material. This has aided genetic research, fostered better breeding programs and ensured genetic diversity.

F) The Cheetah: Cheetahs are in a precarious position with a small gene pool and high infant mortality rates. Biobanks have been instrumental in genetic research, improving breeding techniques to enhance genetic diversity and bolster population numbers.

These examples underscore the immense value of biobanks in conservation efforts. They provide a lifeline for endangered species and contribute to a broader understanding of genetic diversity and resilience. These success stories highlight the immense potential of biobanks in conservation.

New Initiatives in the field of Biobanks:

1.Inter-species Somatic Cell Nuclear Transfer (iSCNT) is a fascinating technique used in conservation biology to clone endangered or extinct species by transferring the nucleus from a somatic cell of one species into an enucleated egg cell of another closely related domestic species, which acts as the recipient species. This technique is primarily used in domestic cattle and replicated in a few wildlife species.

While adopting this technique in wild animals, scientists got mixed results. Some of the experiments done in this field are:

Donorspecies	RecipientSpecies	Outcome (livebirthsand survivability)
Gaur(*Bos gaurus*)	Domesticcattle(*Bostaurus*)	Onelivebirthdiedonday2 post calving
Mouflon sheep (*Ovis orientalismusimon*)	DomesticSheep(Ovisaries)	Oneliveberth
Africanwildcat (*Felissilvestrislybica*)	Domestic cat (*Felis silvestris catus*)	2/17kittenssurvived
Graywolf(*Canislupus*)	Domesticdog(*Canisl.familiaris*)	3/6pups survived
Sandcat(*Felismargarita*)	Domesticcat(*Felissilvestris*)	5/14livebirths,alldiedbyday 60 post parturition

Pyreneanibex (*Caprapyrenaicapyrenaica*)	Domesticgoat (*Capraaegagrushircus*)	1/5survivedbutdiedshortly after birth
Esfahanmouflon (*Ovisorientalisisphahanica*)	Domesticsheep(*Ovisaries*)	2livebirths that died post parturition
Coyote(*Canislatrans*)	Domesticdog(*Canisfamiliaris*)	5 livebirths
Wildbuffalo(*Bubalusarnee*)	Domestic buffalo (*Bubalus bubalis*)	1 live calf
Bactrian camel (*Camelusbactrianus*)	Dromedarycamel (*Camelus dromedarius*)	1 live birth but died on day 7 post-parturition
Przewalski's horse *ferus* (*Equus przewalskii*)	Domestichorse(*Equuscaballus)*	1live birth
Black-footed Ferret(*Mustelanigripes*)	Domestic ferret (*Mustela putorius*)	1 live birth

2. Usage of Artificial Insemination (AI) technology using frozen-thawed semen for wildlife conservation:

This is the most extensively applied technology used in the conservation and genetic management of threatened wild species. Several wild species have benefited from this technology using cryopreserved semen. This technology is used in fertilizing eggs of Leopard Cat, Ocelot, Cheetah, Addax, Gaur, Scimitar-horned oryx, Mohor gazelle, Blackbuck, Eland, Banteng, Gerenuk, Spanish ibex, Red deer, Cheetal, Eld's deer, Fallow deer, White-tailed deer, Wapiti deer, Black-footed Ferret, Giant panda, Pacific white-sided dolphin, Bottlenose dolphin, Beluga whale, African Savanna elephant, Rhinoceros, etc. CCMB-LaCONES, India, attempted Artificial Insemination in Blackbuck.

Biobanks:

Oliver Ryder and Elyan Shor, in their article titled "Biobanks: Safeguarding Biodiversity and Preserving Hope," mentioned that:

Biobanks are treasure troves of genetic material that play a crucial role in conserving endangered animals. These repositories store DNA, gametes (sperm and eggs), embryos, and even animal tissues, ensuring that species' genetic diversity is preserved for future generations.

By preserving species' genetic blueprints, they offer hope for maintaining biodiversity and potentially reversing some of the damage caused by human activity. Their role in conservation is indispensable and continues to evolve with advancements in science and technology.

Armed with innovative genetic tools and techniques, conservation biologists and veterinarians in India are banking away genetic resources of wild animal species, especially those at risk of becoming extinct soon.

Biobanks play complementary roles in preserving endangered species and their genetic diversity. Biobanks provide the necessary resources to maintain genetic diversity, support breeding programs, and ultimately help secure the future of

endangered species. Together, they form a robust strategy for biodiversity conservation.

Biobanks serve as a repository for vital genetic materials, providing critical tools to enhance the effectiveness of conservation programs. They help ensure the survival of endangered species and the maintenance of biodiversity.

Here's how biobanks contribute to conservation breeding:

Biobanks are facilities that store biological materials, such as DNA, reproductive cells (sperm and eggs), tissues, and even whole organisms. These materials are collected from various species, often including endangered ones.

Role of Biobanks in Conservation Breeding

1. Genetic Material Preservation

Cryopreservation: Biobanks utilize cryopreservation techniques to store genetic materials at very low temperatures. This helps maintain the viability of sperm, eggs, and DNA for long periods, allowing for future breeding opportunities.

• Biobanks store a variety of biological samples, including:

(a) Sperm: Collected from individuals for artificial insemination or in vitro fertilization. This is particularly valuable for species that are difficult to breed in captivity.

(b) Oocytes (Eggs): Female reproductive cells can also be preserved for future reproductive efforts.

(c) Somatic Cells: Including skin or muscle cells that can be used for cloning or stem cell research

2. Genetic Diversity Maintenance

Captive Breeding Support: By storing genetic samples from a wide range of individuals, biobanks help ensure that breeding programs maintain genetic diversity, which is crucial for species health and resilience.

3. Facilitating Breeding Programs

Assisted Reproductive Technologies: Biobanks can provide materials for advanced reproductive techniques, such as artificial insemination, in vitro fertilization, and embryo transfer, which can enhance breeding success.

4. Research and Conservation Planning

Genetic Studies: The genetic materials stored in biobanks can be used for research to understand the genetic health of populations, assess relatedness, and develop effective conservation strategies.

5. Supporting Captive Breeding Programs:

Biobanks help captive breeding initiatives by:

 Enhancing Breeding Strategies: Data from biobanks can support selective breeding programs aimed at enhancing specific traits or improving overall genetic health.

 Providing Alternatives for Difficult-to-Breed Species: For species that are challenging to breed in captivity, biobanked genetic materials can enable reproduction without the need for natural mating, increasing the likelihood of success.

6. Long-Term Conservation Planning:

Biobanks are essential for developing structured conservation plans:

 Planning for Unexpected Events: If a population declines due to disease or habitat loss, biobanks safeguard against total extinction

by providing genetic material that can be used to restore populations.

 Integration with Conservation Strategies: Genetic biobank materials can be strategically used for habitat protection and restoration.

7. Reintroduction Programs

 Support for Reintroduction: Biobanks can provide genetic materials crucial for breeding programs to reintroduce species into their natural habitats, ensuring that these populations have a healthy genetic foundation.

 Reproductive Technologies: Techniques such as artificial insemination or cloning can utilize bio-banked materials, providing additional options for reintroducing species into their natural habitats.

8. Backup for Natural Populations

Insurance against Extinction: By maintaining a repository of genetic material, biobanks serve as an insurance policy against the loss of species in the wild due to threats like habitat destruction, climate change, or disease.

9. Collaboration and Networking

Global Resources: Biobanks often collaborate with zoos, conservation organizations, and research institutions, creating a network that enhances global conservation efforts and knowledge sharing.

A few bio banks of repute

S.No	Name of the Institution	Located at
1	AmbroseMonellLaboratory,AmericanMuseumofNatural History	NewYork,USA
2	FrozenZoo,SanDiegoZooInstituteforConservation Research	California,USA
3	SmithsonianConservation&ResearchInstitute,National ZoologicalPark	Virginia,USA
4	WhiteOakConservationCentre	Florida,USA
5	CryobiologyResearchGroup,Inst.ofRes.AppliedNatural Sciences, The Univ. of Luton	Luton, UK
6	MuseumofNaturalHistory	London,UK
7	ZoologicalSocietyofLondon	London,UK
8	NorthofEnglandZoologicalSociety	Chester, UK
9	SchoolofBiology,TheUniversityofNottingham	Nottingham,UK
10	MetroTorontoZoo	Canada
11	MuseumNationald'HistoireNaturelle	Paris, France
12	Universityof Sassari	Sardinia,Italy
13	ExperimentaldeZonasAridas	Almeria,Spain
14	Antwerp Zoo	Antwerp,Belgium
15	ZoologicalParkofBuenosAiresBuenos	Aires,Argentina

16	CheetahConservationFund	Otjiwarongo, Namibia
17	WildlifeBiologicalResourceCentre,EndangeredWildlife Trust	Pretoria,South Africa
18	ConservationGenomeResourceBankforKoreanWildlife	Seoul,SouthKorea
19	AnimalGeneStorageResourceCentre,MonashUniversity	Melbourne,Australia
20	GiantPandaBreedingandResearchBase	Chengdu,China
21	KingKhalidWildlifeBreedingResearchCentre	Thumamah,Saudi Arabia
22	ArkofLifeatTelAviv-RamatGanSafari	Israel.
23	TheNationalWildlifeGeneticResourceBank(NWGRB), housedattheLaboratoryfortheConservationofEndangered Species (LaCONES)	CCMB,Hyderabad, India
UpcomingFacilityinIndia		
23	PadmajaNaiduHimalayanZoologicalPark	Darjeeling

Biobanks in India:

Biobanks in India are increasingly recognized for their vital role in biodiversity conservation, medical research, and public health. Biobanks in wildlife conservation are a new addition to our endeavour to preserve our precarious wildlife from becoming extinct.

In this context, as a pilot project, CZA has identified six zoos across the country to join a Consortium of Indian Zoos for Biobanking of Wildlife Genetic Resources with the National Wildlife Genetic Resource Bank (NWGRB), which is housed at the Laboratory for the Conservation of Endangered Species (LaCONES).

The six participating Zoos in this endeavour are the National Zoological Park, Delhi; Bannerghatta Biological Park, Karnataka; Padmaja Naidu Himalayan Zoological Park, West Bengal; Nehru Zoological Park, Telangana; Sakkarbaug Zoological Park, Gujarat, and Sephahijala Zoological Park, Tripura.

The primary objective of this project would be to preserve the biological materials of wild animals from zoos by:

- Creating a consortium of zoos that would participate in the program that advances biobanking of wildlife genetic resources.
- Providing basic facilities in participating zoos to enable the rescue of the targeted genetic resources from wildlife.
- Creating capacity in zoos for the collection and preservation of biological materials.
- Creating a network with participating zoos through an e-newsletter on the bio-banking of wildlife and increasing awareness under the aegis of the Central Zoo Authority

Under this initiative, this institute has developed primary cells for the species like Barasingha,

Barking Deer, Bison, Blackbuck, Chowsingha, Mouse Deer, Swamp Deep, Sambar, Hog Deer, Nilgai, Spotted deer, Thamin, Wild Ass, Wild Buffalo (all ungulates), Jungle cat, Jaguar, Leopard, Lion, Tiger (all felids), Indian Wolf, Wild Dog, Hyaena, Black Bear (all canids), LTM, Rhesus Macaque, Chimpanzee (all primates), and Palm Civet, from the tissues collected during postmortem and are stored in the National Wildlife Genetic Resource Bank at CCMB-LaCONES.

Biobank at Padmaja Naidu Himalayan Zoological Park, Darjeeling:

The Biobank lab in the Darjeeling Zoo (Photo: Padmaja Naidu Himalayan Zoological Park)

Darjeeling's Padmaja Naidu Himalayan Zoological Park has established India's first zoo-based biobank and animal museum. The biobank, launched in July 2024 in collaboration with CCMB, preserves genetic materials from endangered species using cryogenic storage. As of February 2025, the biobank has collected genetic materials from 60 animals across 23 species, with a focus on those at the highest risk of extinction. The goal is to create a long-term genetic repository that can aid conservationists in preventing species loss.

This facility is going to play a vital role in genetic research, enabling scientists to study wildlife diseases, population genetics, and breeding techniques.

Specific conservation projects using biobanking?

Biobanking has been integrated into several conservation projects worldwide, helping safeguard genetic diversity and support species recovery efforts. Here are some notable initiatives:

- Revive & Restore Biobanking Project: In partnership with the U.S. Fish and Wildlife Service, this project focuses on biobanking endangered species in the U.S. It aims to preserve genetic diversity, inform wildlife management, and enable genetic rescue.

- San Diego Zoo Wildlife Alliance's Frozen Zoo®: This initiative has successfully preserved genetic material from various species, including the Przewalski's horse, which was cloned after decades of storage.

- Biobanking Grant Program: This program provides funding to enhance conservation efforts for endangered species through biobanking and related research. It has supported projects involving black-footed ferrets, red wolves, and Mexican wolves.

These projects and the efforts highlight the growing role of biobanking in conservation, ensuring that genetic diversity is safeguarded for future generations. Biobanking continues to evolve, offering hope for species on the brink of extinction.

I sincerely hope the conservation movement will make great strides by extensively applying the concepts associated with biobanks in the future.

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Dacoits, Drama & the Thakur of Chiriyapur
How a Forest Rest House Became the Venue for a Most Unlikely Farewell Party

Dr. Padam Parkash Bhojvaid, IFS (Retd)

Nestled like a forgotten stanza in a forest ballad, the Rasiyabad Forest Rest House (FRH) stands stoically on the Haridwar–Nazimabad Road—an 1889 relic that smells of damp earth, old timber, and untold stories. With two-foot-thick mud mortar walls, ceilings that graze the memory of colonial hauteur, and verandas shaded by sal and jamun sentinels, it is less a rest house and more a sentient relic—a moss-draped guardian of whispers that echo through time.

Perched on the edge of the Jhilmil Jheel Reserve, Rasiyabad overlooks floodplain grasslands where Barasinghas strut like marshland nobility and egrets embroider verses across the sky. The swamp doesn't speak—it sings. Each reed, each rustle, every gust of wind is a syllable in a melancholic raga that nature hums in her minor key.

It was into this lyrical wilderness I wandered one sodden monsoon evening in 2014—more as an exhausted forest officer than romantic naturalist. I had just returned from a rain-swollen inspection, my boots heavy with history and the scent of sodden humus, when a knock interrupted the weary drone of the ceiling fan.

At the door stood Mr. Singh—retired Assistant Conservator of Forests, former Range Forest Officer of Chiriyapur, and quite clearly, the unofficial Shah of Shikar Stories. Eighty-three, yet upright as a Deodar and twice as sharp, he entered with the self-assurance of a man who had once parleyed with leopards and left with the better end of the deal.

Mr. Singh saluted smartly and offered a remedy for my post-inspection fatigue: steaming cup of tea and aged tales. He sank into the vintage armchair as if it owed him rent. Then, with the air of a bard who had long since fact-checked his myths, he began:

"Sir, you may find this hard to believe—but let me take you back to 1965…"

It was a morning that could slice bread—cold, crisp, and unapologetically clear. Singh, then the RFO of Chiriyapur, was halfway through a ghastly cup of boiled tea when three strangers arrived at his doorstep. They wore grand turbans, grander moustaches, and an air of cinematic confidence. Their leader, Jorwar Singh, looked like he bench-pressed buffaloes before breakfast.

With surprising decorum, they made a request—to book Rasiyabad Forest Rest House for a farewell party. The guest of honour: a police sub-inspector transferred to nearby Nazimabad. The hosts? Not bureaucrats. Not villagers. But dacoits. Yes—rifle-toting, horse-riding, Tarai legends of the underworld.

These weren't the petty pickpockets of folklore. These were outlaws with the etiquette of zamindars and the foresight of wedding planners. They brought names, dates, and even a handwritten menu. Goat biryani was non-negotiable.

This wasn't unusual. Between 1950 and 1965, the Tarai forests were a living theatre of such tales, Mr. Singh exclaimed. The famous names of Sultana Daku and Bashira fluttered like gunpowder ghosts

across police files and jungle folklore. Their legend was stitched into the very undergrowth, and it was not uncommon for dacoits to take over abandoned forest infrastructure during the deluge of the monsoon. When the skies broke open and roads turned to rivers, the forest staff would retreat to safer towns, leaving behind quarters that transformed into seasonal havens for the gun-bearing aristocracy of the underworld.

"They came to me because I was the Thakur of Chiriyapur," Singh said with a smirk. "We knew each other. They crossed lines, but they never erased them."

He declined their request, of course. With a shrug of polite fiction, he told them the cook was missing, the furniture eaten by termites, the roof prone to theatrical collapse. But between us, he chuckled, "I just didn't trust them to leave my valuables untouched."

The room filled with laughter, and as the aroma of dal and rice drifted in from the kitchen, I asked him—what if he'd said yes?

He raised his cup with a conspiratorial glint. "Then, Sir, I would've been the chief guest at the most lawless farewell party in forest history."

But as the chuckles settled, something quieter took root in the silence. Mr. Singh looked past the lamp-lit veranda into a memory only he could see. "There were days," he murmured, "when the forest whispered. Now it howls. We knew our deer, our tigers—even our dacoits. They respected boundaries. Today, the lines are gone. What's left is just noise."

Neither of us spoke for a while after that. Outside, Rasiyabad stood in timeless stillness, its weathered walls absorbing one more story, one more confession. Somewhere in that twilight fog, perhaps Jorwar Singh still waited with folded hands and a plate of biryani, unaware that history had already made room for him at its cluttered table.

Because in Rasiyabad, even the dacoits came with manners. And the forest, like an old grandmother with too many secrets, simply smiled and said nothing.

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Make a Rainbow: We play many roles in our lives; if they get mixed up, it becomes dark, like when you mix all the colours. Play each role distinctively side by side, like the colours displayed side by side form a rainbow.

-Sri Sri Ravi Shankar

Hill Queen Summer of 1989

Sri. Anirudh Dharni, IFS (Retd)

In April 1989, after getting 'brewed' during our IFS professional training- for nearly twenty months atthe Indira Gandhi National Forest Academy (IGNFA), Dehradun, at 640 m above MSL- we were catapulted to the LalBahadurShastri National Academy of Administration (LBSNAA), Mussoorie- at 2000 m above MSL- against the force of gravity by an even more ubiquitous force of bureaucracy, for the remaining four months. I categorize the force of bureaucracy as more potent because gravity is unidirectional while the former can spring you up to dizzying heights, send you shunting on the sidelines or suck you in the vortex of anonymity. In Mussoorie we felt at the top of the world- or nearly at the top of almost anything around. At this height I was once again reminded of the encouraging welcome we had got when we had entered IIT, Delhi in 1978 after the gruelling JEE (Joint Entrance Exam) - "You came out on top. You are the cream of the nation." It was an anti-climax when one cynic had scribbled under it- "The scum too comes out on top".

Mussoorie is the Queen of Hills and we thought of ourselves nothing less than kings with our kingdoms in some part of the country waiting for us to govern. Prime youth, good health, unhindered flight of imagination- life in those days was like an ongoing engrossing movie with the fun part packed in the beginning.

First thing I noticed when I occupied LBSNAA hostel room was that there was no ceiling fan. There was no need for a fan in Mussoorie those days and even in summer we would be using blankets at night. There were attendants allotted to each wing who would clean the room, make up the bed and put everything in perfect order while we were busy attending our daily program.

A day in LBSNAA started at six A.M. when all probationers had to gather with our mattress at the cemented ground below the hostels for half an hour for aerobic PT, bending and stretching yogic exercises under the watchful eyes of the trainers. Yoga is known to keep your body flexible but I realized much later that a flexible backbone is actually a very helpful accessory for any bureaucrat. I observed that many IAS probationers used to crib about this morning regime but all forest officers found it a smooth sail as we had been through a tougher physical routine in the earlier part of our training at Dehradun. In fact, a couple of us were so crazy that after PT we used to run, not jog, daily to Library Point and back covering four kilometers with Budstar, a batch mate from Meghalaya, who ran like a stallion beating the rest of us on every single day by quite a distance. Yet, we had our own consolation when we were often hailed enthusiastically by early morning walkers during the run. Mussoorie's drinking water had a lot of calcium causing stomach upsets among many probationers but our vigorous exercise kept us in fine fettle.

Our kingly dominion extended to the dining table too and we followed the dictum - 'Eat your breakfast like a king.' Unlike in Dehradun mess, there was no rationing in Mussoorie and one could eat as much as one wanted. It reflected in the monthly mess bill that consumed one third of our salary. The mandatory butter cube on each breakfast plate that was disdainfully looked at by lady probationers was passed on to me if I happened to be sharing the table with them. I joyfully mixed all the pooled butter with a lot of milk, cornflakes and a dash of fruit jam in a bowl making it a pinkish heady calorie bomb. Those ladies in the batch can thank me for

helping them keepin shape, apart from the effort of the PT instructors. After all, he also served who silently consumed! Pateria, another batch mate of mine, had a tendency to gain weight and while parting with his share of butter he used to look at my recipe with awe especially when it had no impact on my body weight as the days passed by.

In the evenings after the classroom sessions were over, I used to go for horse riding. LBSNAA was maintaining a stable and many of us took to horses as fish to water. Pardon the mix up of phrases but our familiarity with horses originated from Indian Military Academy's horse riding training attachment for two weeks in Dehradun. One IPS officer, ShriRanjitDalal, was the faculty member in LBSNAA during our stay there and he was incidentally in charge of the stable too.

One day a new horse was added to the stable. ShriDalal surprised us in his class when he asked in everybody's presence Budstar's permission to give his name to the new horse. The silent Budstar agreed to his proposal smilingly. I am not sure how long the newly christened Budstar carried the future probationers on its back but the original Budstar really worked like a horse in Assam-Meghalaya cadre for years.

In hind sight, speaking about our familiarity with horses - it seems it extended only one way. The horses had a different view point. Impressed by our expertise in handling horses, the trainers raised the bar for riding enthusiasts one day. We were instructed to fold both the stirrups by crossing them over the horses' neck and ride while holding the balance by the grip of our knees on their body flanks. In my misplaced confidence I followed the instruction to the tee. As soon as my horse ran over a curve of the oval riding ground, I fell flat on my back like a sack of potatoes and the horse kept on running without as much as a second glance. So much for the claimed familiarity with horses! What a fall from grace! One moment I was seated like a king at 2001.5 m MSL and the next moment I was literally licking the dust at 2000 m MSL.

There was a searing pain in my back but I gathered myself quickly to avoid getting trampled by other horses running on the same track. After picking up my riding hat and dusting myself I walked off the ground sheepishly. My only consolation was:

गिरतेहैंशहसवारहीमैदान-ए-जंगमें।वोतिफ़्लक्यागिरेगाजोघुटनों केबलचले। (Those who dare, stumble sometimes. How will you learn without risking and failing?)

The harsh truth was that I had not fallen on any maidan-e-jung (battleground) but only from a piddly horse.

In a couple of minutes my back became very stiff and by late evening it made me panic. I went to the campus doctor and narrated the whole incident. I asked him anxiously whether it was a case of slip disc. The doctor looked at me coolly and informed that had my disc slipped I would not be able to walk up to the clinic. His assurance brought me immediate relief; the impact of the prescribed medicines followed slowly.

Shri Muthuswamy was another faculty member in those days at LBSNAA and his each and every class used to be a blast. Much before my unhappy incident he had told us in the class that he preferred yoga to horse riding because managing one's own body was more important and easier than controlling a horse's body. Needless to say that I followed his advice strictly thereafter and kept a safe distance from horses till the bug bit

me again in Kerala about which I have written in another write-up.

The four months stay at LBSNAA was meant to give us a basic grooming in Indian history, Constitution, Law, Economics, Political Science and Sociology. Unintentionally we also learnt how bureaucracy keeps its errant officers in control. There were many 'memos' that were issued for misdemeanours that were not expected to be repeated. Misconduct cases in that rarefied arena were simple - absconding from class, misbehaviour with other course mates or employees, inappropriate attire, not returning library books in time etc. All government servants are already aware that memos were less offensive than their more dangerous close cousins called 'charge memos' that were encountered while in actual service. For those who are not familiar with the official lingo, the harmless memos could be described as a preface of an old LucknowNawab when he starts mildly demanding an apology for a wrongdoing to him and utters in chaste Urdu, "GustakhimaafJanaab. Agarche……". Because of the frequent use of memos by the administration against us, the word had entered our sub-consciousness in those days with a disastrous consequence to me personally.

One very pleasant thing in LBSNAA was our exposure to the celebrities in various fields- art, science, jurisprudence, cinema, politics, government, dance and drama. Almost like a clock-work we had a weekly face to face talk with one dignitary or another. We met ShriBirjuMaharaj, Justice V R Krishna Iyer, NaniPalkhivala, ProfChandrashekhar Singh of Indian Institute of Public Administration, Dr. S Z Qasim of Antarctica expedition, Shri L M Singhvi, Jurist, Shri B D Sharma, Chairman of SC/ST Commission and many more. One probationer used to be attached to the visiting dignitary as an 'escort' so that he/she could be properly looked after. Obviously, it was an engrossing duty to engage with such stalwarts intellectually.

One day, as a part of a cultural evening, one European troupe visited us to perform a puppet show in LBSNAA. I was anchoring the program and after the brief introduction the show began in the hall packed with IFS and IAS probationers. It was indeed a colorful and mesmerizing performance that kept us spellbound for more than an hour. At the end, I appeared again on stage to propose a vote of thanks and I was also expected to invite the leader of the troupe on stage and receive a memento from our faculty member as a token of appreciation. Everything was going on as planned till I blurted, "I now request our Chief Guest to grace the stage once again and receive a memo from our……" I could not even complete the sentence before everyone in the hall erupted in a big laughter. I realized the faux pas but despite my voracious appetite I could not eat my own words. Somehow, I mumbled an erratum immediately while the two gentlemen walked into the spotlight to complete the formality. I beat a hasty retreat.

It was indeed a silly slip of tongue and everybody enjoyed. This time I had fallen flat on my face- figuratively speaking- and the fall was even more embarrassing. Yet, one always has few good friends around for such occasions to boost the sagging spirit. They rushed to me once I was off stage and congratulated me, "Yaar, majaaagaya. You have a good sense of humour!" I smiled rather meekly in response and cursed my obsession with memos.

Post Script: ShriRanjitDalal retired as Director General, Police in Haryana. He was Superintendent of Police when posted as a faculty member in LBSNAA.

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National Museum of Natural History

The National Museum of Natural History(NMNH), a subordinate office of Ministry ofEnvironment, forest and Climate Change,Government of India, was open to public on5th June, 1978 at Mandi House with an objective to create environmental awareness on natureand environment through non formal mediumsuch as thematic galleries, exhibitions, filmshows and educational activities to all massesof society in respect to promote environmental awareness.NMNH, New Delhi has its four Regional Museums of Natural History (RMNH) in different parts ofthe country viz. Mysuru, Bhopal, Bhubaneswar and RGRMNH, Sawai Madhopur. Another RMNHat Gangtok is under construction to cover the North-East region..

Objectives:

• to develop the NMNH in the country'sCapital to achieve the highest levelof quality to promote environmentaleducation at the national level;

• to develop Regional offices (regionalmuseum of natural history)in variousregions of the country in order to extendits activities at the regional/local levels;to develop museum-based educationalprojects at the level so as to help schoolcurriculum on environmental education(EE);

• to develop EE resource materials (suchas audio-visual aids, low-cost teachingaids, school loan kits, etc.) to promoteenvironmental education (EE);

• to undertake museum and collectionbased research consonant with the scopeand resources of the museum;

• to extend professional help to otheragencies/ organizations regarding naturalhistory collections / museums;

• to develop national and internationalcooperation/ collaboration with other organizations/professional bodies/museums related to natural history/EE.

Activities undertaken:

• The NMNH and its Regional centreshave been undertaking Environmentaleducational programmes/ activities through out the year to all sections of the society such as online Summer VacationProgramme, World Wetlands Day, WorldWater Day, World Forestry Day, Earth Day,International Day of YOGA, International Tiger Day, Van Mahotsav, World ElephantDay, international Day for Disabled, World Environment Day, International Ozone Day, and Wildlife Week, Orientation Workshopfor Teachers, Awareness programmes on Mission LiFE, Swachhata Hi Sewa SpecialCampaign, Cheetah Reintroduction Awareness Campaign, Awareness Programme on Combating Air Pollutionfrom Vehicles, various online/ offlinenational level competitions like Painting competitions, NukkadNatak Competition,Story Writing Competition, workshopson Climate Change for MCD Schools, and collaborative programmes with other organisations, etc.

• NMNH and its regional centres set upthematic/ temporary exhibitions suchas Coral Realm, Life of House Sparrow,Hornbills of India - Social Bird,

MeriLiFE– Lifestye for Environment.The winning entries of the Inter-School PaintingCompetition were displayed at JuhuBeach,Mumbai during G20 Mega Beach Cleanup and MotaAnaj – Healthy Food, An Exhibition of Paintings at Vigyan Bhawan during celebration of World EnvironmentDay, "Millets – A HealthyLifestyle". Selectedbest Paintings of National Level Painting Competition were also displayed during"Global Tiger Day 2023" Celebration Eventat Corbett Tiger Reserve, articipation instate level exhibitions and under Exhibitof the month by regional museumsdisplaying different animal species ofinterest for general public to enhance thei rknowledge on environmental awareness and sensitisation.

In addition to the above, there was also participation in

• The MoEF&CC Pavilion on #Mission LiFE at"BHARAT PARV 2023" – Red Fort(26th to31st January, 2023) :

• The National Climate Conclave 2023at Lucknow

(10th& 11th April, 2023)and collaborated with Directorate ofEnvironment, Government of UttarPradesh in organizing The Youth Conclave(11th April, 2023)

• Mega Beach Clean-up Event for 3rdEnvironment and Climate SustainabilityWorking Group Meeting (ECSWG) atMumbai on 21st May, 2023

• 'Ek Tareekh Ek Ghanta Ek Saath' (One Date, One Hour, Together)

• Swachhata Hi Sewa Campaign – GarbageFree India (1st October, 2023)

• Shramdaan for Swachhata

Progress/Innovations:

A total number of 3,08,362 people visited theRegional Centers (Mysore, Bhopal, Bhubaneswarand SawaiMadhopur) during the referenceperiod. Important Cumulative achievements• NMNH, and its regional museums locatedat Mysuru, Bhopal, Bhubaneswar, SawaiMadhopur have organised 18 Temporary/Thematic Exhibitions, 5 Teacher TrainingWorkshops, 40 Competitions, 54 alks/ Lectures, 22 Mass Awareness Campaigns,21 Exhibits of the month, 4 Series ofWorkshops on Climate Change.

Major publications:

Information Desk Calendar on "Lifestyle forEnvironment".

(Source: MoEF7CC Annual Report 2023-24)

Research in Environment

Environmental Research and DevelopmentProgram (ERDP)

The Environment Research and Development Programme is under the revamped Scheme "Environment Education, Awareness, Research and Skill Development" which was erstwhile known as "Decision Support System for Environmental Awareness, Policy, Planning and Outcome Evaluation". Under the new revamped Programme, the main objective would be to promote Environmental Research on critical areas/gaps, as identified by the Ministry, through reputed institutions; Government funded institutions and professional organizations(including NGOs) along with the existing the maticareas of R&D Scheme. This would facilitatedecision making for policy and planning of theMinistry's programmes and activities.The ERDP is open to all institutions in thecountry with expertise in identified thematicareas to undertake specific projects on specificareas of concern and priority and/ or urgencyof the Ministry in meeting Ministry's objectivesof environmental protection and conservationof natural resources. Institutions availing suchfunding under the Scheme will be provided agrant for the project duration.

The major thematic areas for funding are:

i. Biodiversity Conservation including Issuesof Alien and Invasive Species and HumanWildlife Interface.

ii. Ecosystems Conservation & Management

(Mountain, Forest, Coastal, Wetlands,

Pastoral, etc.)and Evaluation of Ecosystem Services.

iii. Socio-economic issues of environment and Sustainable Development.

iv. Conservation and Management of Landscapes and Ecologically sensitive areasincluding issues of sustainable livelihoods

v. Sustainable Management of NaturalResources.

vi. Climate Change: Vulnerability & RiskAssessment, Process, Mitigation andAdaptation.

vii. Pollution Prevention Clean Technologiesand Processes, Cleaner Production, 3Rs,Resource Efficiency, Waste Minimizationand Management, etc.

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Perils around survival of great Indian bustard (battameka pitta) (Ardeotis nigriceps)

Sri. C.Ramakrishna Reddy

1.Introduction:

The great Indian bustard's(BattaMekapitta–Telugu) survival is in peril and it may soon lead toextinction since the number is precariously low in India. Their latest count is just 150 only. It disappeared from ROLLAPADU sanctuary nearer Nandikotkur town in Nandyal District in Andhra Pradesh in view of loss of grasslands in the sanctuaryon which it survived but now it disappeared since the habitat is disturbed irrevocably. It is, therefore, proposed tosustain the population by introducing artificial fertilization, rear the chicks to adulthood incongenial and protected enclosures and release them later into grasslands in India. If need be thesuitable grasslands are to be created for its sustenance.

2.Appearance :

The Great Indian Bustard is a large sized bird. It has a long white neck. Around the neck are black andwhite feathers giving it an attractive appearance. The back portion of the bird has golden and wheatish color.On the head it has a cap like structure with blackish colour feathers giving it a fashionable and gripping appearance. It runs fast like anaero plane on theground for certain distance and rises up flying like aeroplane with its large wide wings make a solo flight in the air of space which is fascinatingand a specialty of its kind.

3.Occurrence:

The rare Indian great bustard is facing extinction facing lot of perils for its very survivalin India. At many places it has already disappeared.During 2008, the bustard was found inRajasthan, Gujarat, Maharashtra, Andhra Pradesh and Karnataka. About 300 birds werecounted which has now dwindled to just 150. Among these 150 most birds are confined to Rajasthan only. There are 20 types of bustards in the world whereas in India only four types are found.

4. one meter height 15 kilos weight:

Andhra Pradesh state is famous for the existence of the Indianbustards. This bird has one meter height and weighs 15 to 20 kilos. It has a long neck.Itlays only one egg in a year in heavily shrouded bushes and sits on the egg for 27days tohatch chicks. The bird generally lives for 12 years. In its lifetime, a female bird laysonly about 5 to 6 eggs.Whatever is available in grasslands, the bird eats.Agriculture grains, the stumps after harvest of crop, roots, insects, butterflies, chameleoncreatures generally serve as food for this bird. It is recognised as a good heavyflying bird but because of loss of suitable habitats it is facing extinction.

5.Protective measures for the survival of birds:

This great Indian bustard is a rare species in existence in India. The government is takingprotective measures to save the bird with not so impressive results. The efforts are endingin failure even in sanctuaries created for its survival. The bird's sighting is not as perthe expectations leading to less appearance for sighting. As per the esteemed opinionof forest officers, they sighted two birds at Siriguppa locality near Bellary city and one bird at Bidar

in Karnataka state. Afterwards, these birds were not sighted. In Andhra Pradesh, a sanctuary with 600 hectares of plain grassland was created for the birds at Rollapadu near Nandikotkuru town in Nandyal district. Therewere birds present in initial stages but over a period of time they have disappeared. Themain reasons for its disappearance are:

A.hunting-hunters spread nests, catch them and kill them for their food.

B. The disappearance of grasslands in its habitat.

C.Death in flight due to coming in contact with wind mills and electric lines.

D. Unbearable sound produced by vehicles

6.Loss of grasslands in its habitat:

The grasslands play a crucial balancing act in theenvironment and the key for the survival of the great Indian bustard. These grasslands arealso required for all domestic animals on which they feed and survive. These grasslandsare the source of oxygen production maintaining ecological balance. These grasslandsprevent erosion of soil from heavy rains and floods on the most refractive soils. The loss of grasslands is the mainreason for the near extinction of Indian great busted. There is a loss of 25% grasslands as perthe opinion of experts. Apart from the expansion of agriculture, over- crowding ofanimals feeding on grasslands leading to the lands becoming barren is a matter of great concern.

7.Artificial fertilization: Captive breeding appears to be the only ray of hope for augmenting the population of this bird whose natural production capacity is very limited. The Government of India is giving guidelines to allstate governments to create sustainable, good large areas of grasslands for the birds. Withartificial fertilizations the birds are to be created, the chicks are to be reared up to adult stage inprotective places, simultaneously, creating grasslands for releasing the adult birds fortheir survival in the wild.

With this foremost idea a “national conservation breeding center” was established atJaisalmer in Rajasthan state wherein the eggs of the birds were artificially fertilized, chicks were put in protective centers for rearing and for later release in adult stage into grasslands and takeeffective protective measures for its substance.This process has been initiated recently. Let us hope that it will fructify giving good results, in course of time.

8. Supreme Court directions/Judgments: The Supreme Court's judgments on the Great Indian Bustard have evolved from a strict 2021 order for all power lines to be underground in habitats, to a more balanced 2024 order that appointed an expert committee to assess feasibility on a case-by-case basis. The court recognized the conflict between conserving the endangered bustard and the need for renewable energy development, opting to leave the specific policy decisions to expert analysis in different areas.

April 2021 judgment:

The court initially ordered that all high-tension power lines in identified GIB habitats in Rajasthan and Gujarat be laid underground within a year, citing the bustard's near-extinction due to collisions with power lines.

For lines that could not be immediately undergrounded, it mandated the installation of "bird diverters" to make cables more visible to

birds.

This was based on expert advice that the bird's lack of frontal vision made it vulnerable to power line collisions.

March 2024 judgment (modification of the 2021 order): M.K.Ranjitsinh et al vs Union of India et al.

The Supreme Court modified its blanket undergrounding order after the government highlighted the potential impact on solar power projects and the need to balance conservation with climate goals. It restricted the undergrounding requirement to a specific "priority" area of approximately 13,163 square kilometers, with feasibility to be determined by an expert committee.An expert committee was formed to assess the technical feasibility and extent of undergrounding in different areas, including those outside the priority zone.

This ruling acknowledged the trade-off between conservation efforts and the national imperative to expand renewable energy infrastructure.

Subsequent developments:

The court has acknowledged the need for a more refined approach, such as creating power corridors to consolidate transmission lines.

The government has emphasized its commitment to conservation while also highlighting the success of past species conservation projects in India.

As of November 2025, the Supreme Court had reserved its verdict after hearing final submissions from the parties, following the completion of the expert committee's task, according to Law Trend.

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viii. Use of remote sensing technology for inventorisation, assessment and monitoring of country's natural resource ssuch as land, water, forests, wetlands,glaciers etc. and for environmentalconservation and protection on areasgiven above.

ix. Taxonomy.

Major objectives:

i. Promotion of Research & Development in various facets of ecology and environment for the conservation and protection of environment and natural resources of the country. To plan, support and co ordinate environmental research in public interest for enhancing the understanding of environment and ecology and devising strategies and solutions for environmental protection and management for achieving the overarching objectives of sustainable development.

ii. The research projects will enable theMinistry to build database of Research projects and their findings in identified problem areas for finding practical solutionsto issues concerning environmental protection and management and togenerate information and knowledge from outcome of R&D projects for developing policies, strategies, action plans, and integration of such outputs in Ministry's on-going Schemes and Programmes and inbetter management and conservation ofnatural resources.

(Source: MoEF&CC Annual Report 2023-24)

GREEN NEWS

CoP30 Belem and Hyderabadi

Hyderabad boy Master Sharan Teja Penta, a grade ten student of Johnson Grammar School participated in CoP30 on the invitation of the UNFCCC to serve as a global representative. Teja co-developed the 'Children's climate manifesto' at the summit. The document highlights youth driven recommendations aimed at shaping sustainable climate policies. His goals include a plan to set up a sustainable NGO in Hyderabad and to open a chapter of 'This is Zero Hour', a youth-led international climate action movement. Let us wish him all the best.

TG Pollution Control Board puts its foot down

The TGPCB has ordered the shutdown of 305 industries for failing to comply with pollution control norms. Notices were issued to 1,234 industries after reviewing 2,069 industries. Orders of shutdown were reviewed and revoked in case of a further 697 industries that complied with pollution control norms. Some of the innovative initiatives by the TGPCB include: A 24/7 online monitoring cell to continuously monitor emissions and pollutants from 501 highly polluting industries; A task force committee to review industry pollution norms and report; computerized allocation of inspections of industries; setting-up a toll free helpline-10741 and a mobile app "Janavanikalushyanivarini" and taking up night patrolling in industrial zones.

Nehru Zoological Park, Hyderabad bags ISO certificate for a record 'sixth consecutive time':

The Nehru Zoological Park (NZP) Hyderabad received ISO 9001-2015 Certification for a record 'sixth consecutive term' in nov 2025. Thus it became the only zoo in India to get this honour. This certificate is given for the scientific management of the Zoo.

Climate change and Coastal areas:

Sea levels around coastal India are expected to rise by 0.5-1.0 meter by the year 2100. A study by the Hyderabad city based Indian National Center for Ocean Information Services (INCOIS) report says that increased greenhouse gases concentrations in the atmosphere are continuing to warm the Earth's surface causing rapid land ice melting and sea water to expand 'thermally' causing rise in ocean volume.

Climate change induced hazards like storm surges, waves and tides may significantly contribute to end-of-century Extreme Sea Level (ESL)at specific locations along the coastline. Tidal amplitudes are likely to cause sea rise in Gujarat coast while climate extremes are likely to cause sea rise in Visakhapatnam areas. These scenarios may lead to beach retreat and erosion, permanent flooding of coastal areas and loss of marine biodiversity.

India's extensive coastline of over 11,098 kms with several coastal areas lying within five meters of MSL like the deltaic region of the Bay of Bengal, parts of Lakshadweep islands, expansive inter-tidal zones in Gujarat are extremely vulnerable. Over 350 million people live along the coastline and depend heavily on the marine economy. Climate change and its consequences make these populations highly susceptible for disasters.

(Source: The Hindu newspaper, 26th Nov 2025)

Green Quiz – December 2025

Quiz Master: Dr. K. Tirupataiah, IFS (R)

1. What marine species found in the cold, deep waters of the Oceans is the largest isopods in the world?
2. Helostomatemmincki are fresh water fish. They exhibit a unique behavior to show territorial aggression and a contest for dominance that actually looks otherwise?
3. It's a robotic tail attached to elderly in Japan to help them with more balance and not fall down. What name is given to the robotic tail?
4. In Mahabharat, Kadruva, mother of Serpents, bets that the tail of Uchaishravam (white Horse) is balck. She asks her sons to wind around the horse's tail. All refuse but one obeys to make his mother win. Name the serpant.
5. Which Asian city has a building called 'Elephant building' with three towers looking like the legs and trunk. It houses offices, residences, shopping centers, etc?
6. Developed at the Integral Coach Factory, Chennai India's Hydrogen powered train is scheduled to run between which two stations in North India.
7. The moon looks 'Blood Moon' due to a physical effect of light scattering. By what name is the effect called?
8. It was a 'super continent' that had S.America, Africa, Antarctica, Australia, India and the Arabian Peninsula. What name did Austrian geologist Eduard Suess give it?
9. Name the Physicist and Meteorologist who retired as the DDG of IMD in 1976 and is called the "Weather Woman of India"?
10. By what name is the waterfall near Jabalpur, MP known for its mist/smoke created by its strong flow?

For Students

1. The 8th Schedule of the Constitution of India had 14 languages. Which language was added to the list in 1967 making the total 15
2. Emperor Akbar got FatehpurSikri built as his capital. He abandoned it within a few years and moved the capital to Lahore. What was the main reason?
3. Most of the cultural centers run by the Ministry of External Affairs are named after Swami Vivekananda but the one in Kaula Lumpur is not. After who is it named?
4. Which British-India collaboration film holds the Guinness World record for "most extras in a single scene" with over 3,00,000 extras participating?
5. What word became the "Word of the Year " as per the Cambridge Dictionary 2025?

Answers on page no :55

Sing a Song: Every heart sings a song, incomplete, until another heart whispers back. Those who wish to sing always find a song. At the touch of a lover, everyone becomes a poet. -Plato

Importance of Forest and Revenue Records in Forest notifications

Dr. Akula Kishan IFS (Retd)

The lands without any encumbrances are generally proposed for notification as Reserved Forest Block. The proposals are generally initiated by Forest Department in coordination with Revenue Department, who furnish the Area statement indicating the survey Numbers and the extent in each village included in the proposed Forest Block. After scrutiny of the documents and after approval by the District Collector, the proposals are submitted to the Government for issue of a notification in the State Gazette as well as the District Gazette. After publication of the Gazette notification, details of lands included in the Forest Block are to be recorded, in revenue records, as "Forest" and also to be included in the "Prohibitory Order Book" (POB). If the above procedures are followed, the boundary disputes would not arise, as the land is declared as Reserved Forest after the proposals pass through the Revenue Department.

The existing Revenue system in Andhra Pradesh and records to be maintained is extensively discussed by the Hon'ble Justice C.V. Nagrajuna Reddy in the case of G. Satyanarayana Vs Government of Andhra Pradesh {(2014) 4 ALD 358= (2014) 3 ALT 473}. The Hon'ble High Court of Andhra Pradesh was dealing with a batch of Writ Petitions, with common cause as to what documents determine title and ownership to land. While some petitioners claimed their rights based on entries in revenue records, others based their claims on long standing possession as evidenced by registered sale deeds. The Government refused the claims based on entries in Re-Survey and Re-Settlement Register (RSR) and Town Survey Land Register (TSLR). The Hon'ble Court observed that there is no statutory enactment which clearly establishes as to what constitutes "Title" as to land records. With the above background the Court proceeded to trace the history of land tenures.

The Hon'ble High Court in the above mentioned orders held that a Patta granted under BSO – 27 constitutes absolute title and further discussed various situations wherein the title to the land can be arrived at.

The evidentiary value of RSR was discussed in P. Suresh Vs State of Andhra Pradesh(WP No.24170 of 2008 dated 25.03.2009) and it was held that the entries made in the RSR in the year 1909 without taking into consideration the evidence for subsequent period such as registered sale transactions cannot be taken as conclusive proof of evidence.

In G. Satyanarayana case mentioned supra, it was held that RSR is not a standalone document and entries therein cannot be taken as conclusive proof to determine title. RSR constitutes one of the many revenue records which have to be considered to determine the title

Common issues of friction between Forest and Revenue Departments

1. The extent of land included in a Forest Block – the Revenue Department insists that a particular extent of land only included as per Survey Numbers and extent, and they assert that land is included in execs of the notified land, and desire the excess land to be returned.

The words used in Section 4(1) of the A.P. Forest Act,1967 show that the land proposed to be

constituted as Reserved Forest may be specified, as nearly as possible, the situation and limits of such land. It was further clarified in the explanation that it shall be sufficient to describe the limits of the land by any well-known or readily intelligible boundaries such as roads, rivers, bridges and the like.

As can be seen from the above, the extent of land included in a Forest Block is not of primary concern to Forest Department whereas Revenue Department insists for the same.

2. Entries in Revenue and Forest Records – after the issue of notification under Section 4 or 15 of the Forest Act, the revenue records are to be modified accordingly. But, in most of the cases, the notification details of lands included in the Forest Block are not entered in revenue records and they continue to be shown as Government land or Poramboke. Such an entry by Revenue Department indicates that the same is available for assignment or any other use. Generally, the Forest Department is not aware of the changes made in the revenue records and it comes to the Knowledge of Forest Department only when the assignee or other person who is allotted the land comes to take possession of the same. In most of the cases the Forest Department enters in to correspondence for cancellation of the land allotment orders. But the cancellation orders, generally, do not come in reasonable time. Meanwhile, the assignee or other person approaches the Courts of Law and obtain interim orders, and the case is kept pending for many years.

The Hon'ble Supreme Court in the case of State of UP Vs Deputy Director of Consolidation (1996(5) SCC 194) held that a notification issued declaring a particular area as Reserved Forest is binding on the Consolidation Authorities, in the same way as decree of Civil Court, therefore, rights cannot be claimed under different provisions of Law

3. Availability of Records – it is understood that preservation of records was taken up during 1980s and in most of the cases the land records are available. Comparatively the records are not properly maintained in Forest Department, though the notification records are to be preserved at Range, Division, Circle and Head Office Levels. In the absence of records, defending the title is becoming almost impossible. In some cases, 'copies'of notifications are available and the 'original' is missing. To overcome the legal impediments regarding existence of notification, Section 68 A is included in the Forest Act, by way of Amending Act, No.15 of 2016. Wherever required this new provision is to be utilized to save the forest land.

4. Conflict between Departments – in situations as mentioned above, the Forest Department proceeds to file Writ Petition against the Revenue Department on their inaction in correcting the land records. But, such action is deprecated by the Hon'ble Supreme Court of India in the case of Chief Conservator of Forests, Govt. of A.P. Vs. the District Collector, Mahaboobnagar(AIR2003SC1805 = (2003)3SCC472; [2003]2SCR180) wherein it was observed that under the scheme of the Constitution, Article 131confers original jurisdiction on the Supreme Court in regard to a dispute between two States of the Union of India or between one or more States and the Union of India. It was not contemplated by the framers of the Constitution or the C.P.C. that two departments of a State or the Union of India will fight litigation in a court of law. It is neither appropriate nor permissible for two departments of a State or the Union of India to fight litigation in a court of law. It was suggested for the StateGovernments to set up a Committee consisting of the Chief Secretary of the State, the

Secretaries of the concerned departments, the Secretary of Law and where financial commitments are involved, the Secretaryof Finance. The decision taken by such a committee shall be binding on all the departments concerned and shall be the stand of the Government.

5. RoFR issues – though RoFR Act has a sunset clause, the identification of beneficiaries is still being taken up by the concerned departments and the objections raised by Forest Officials are not heeded to. The names of beneficiaries and extent of land being given to the beneficiaries is not informed to Forest Department. The record is mostly with Tribal Welfare Department. The loss of land from Forest Blocks is to be recorded to arrive at the extent of land still remaining in the Forest Block.

6. Estate / Inam Abolition Acts- Most of the Forest Blocks were formed by including lands received from Zamindar and Invaders and as there was sudden activity in receiving the lands and notifying them under Forest Act, many discrepancies on description of land have taken place. And at this distant point in time, it is difficult to ascertain, the omissions and commissions in the notification of Forest Blocks,

Conclusion – The Revenue Records are mostly made by the executive Authority and whereas the Forest notifications are issued under Statute and should be binding on all authorities. The general plea by Revenue Department is that a copy of Gazette notification was not furnished to them. Such an excuse is not correct, as publication of Gazette means that it has received wide publicity and the authorities should take notice and incorporate the details in the notification in Revenue Records. It is advisable that Forest Department takes up the drive to trace all the records, notifications and where they are not available, they should be reconstructed. The absence of records with Forest Department will give adverse finding in Courts of Law and the Forest Department has to concede the land claimed by others, which is not proper.

The author is a retired IFS officer/CF, Telangana State. He authored many books on Forest Act and Allied Acts, the Forest Code and drafted various amendments. He is a practicing advocate in the AP/TG High Courts.M- 70930 06261.

Answers: 1.Giant swimming Louse (Bathynomousgigantens),2.Chinese Kissing Fish,3.Arque, 4.Karkotaka,5. Bangkok, Thailand, 6.Jind and Sonipat, 7.Ray Leigh Scattering, 8.Gondwanaland; 9.Anna Mani, 10. Dhuandhar waterfalls

For School Students: 1.Sindhi, 2. Water shortage at FatehpurSikri, 3. Subhash Chandra Bose, 4. Gandhi, funeral scene, 5. Parasocial

LEGAL NOTES

Sri. K. Buchiram Reddy, IFS (R)

Sri Sandilla Ramesh Kumar GowdVs. State of Telangan and others

(This case in W.P. No. 14337 of 2024 relates to a complex land dispute posed to the High Courtinvolving two private parties, two villages and three Government departments of YadadriBhuvanagiri district)

The petitioner Sri Sandilla Ramesh Kumar Gowd claimed that he purchased land measuring Acs. 4.00 inSy.No. 31/E of Timmapur village, TurkapalliMandalofYadadriBhuvanagiri district. He seeks by the writ petition, directions to the forest officers not to interfere with his possession and enjoyment of the said land in Timmapur village. It is alleged that the interference by the forest officers is uncalled for,un-guided,un-sustainable and illegal.

The forest officers by counter affidavit opposed the claim and urged the court to dismiss the petition as the land claimed is in reserved forest. Reference was made to W.P. No. 38164 of 2015 filed by Marri Rami Reddy and MarriPrathap Reddy of Rangapur village, BommalaramaramMandal of YadadriBhuvanagiri district whereby the petitioners claimed that they are the owners of the land of an extent of Acs.10.04 inS.Nos. 31/A, 31/AA, 3 1/E & 31/EE which were renumbered as 31/1&31/2 of Thimmapuram village, TurkapallyMandal ofYadadriBhuvanagiri district. The W.P. is said to be still pending. The D.F.O has addressed the Additional Collector on 05.06.2023 and 14.06.2024 to set right the matterby addressing the Chief Commissiner, SS& L.R.. As a matter of fact, land claimed by Marri Rami Reddy & others is part of Veerareddipalli – II Reserved Forest, which is under the control, continuous possession, conservation, protection and management of Forest Department. The land in question tallies with the village map of Veeraredddipalli . It is submitted that the petitioner'sclaim is false and deserves to be dismissed.

The Government Pleader for Social Welfare department representing Respondents 7 & 8 submitted that there was a joint inspection of the disputed land on 28.05.2018 by the officials of the forest department and survey department. It was noted that S.Nos. 31 and 32 of Tirmalapuram village are claimed to be patta lands. Map of 1355 F. was referred. The land claimed, according to the map prepared in 1337 F., is overlapping the reserved forest. There is consensus that the problem needs to be resolved by the Commissioner, SS &LR in fixing the boundary between Thirmalapuramand Veerareddypalli, and fix up boundary of Veerareddypalli – II R.F.

The case was heard by The Hon'ble Justice Mrs. Surepalli Nanda and it was disposed by directions to the Respondents to initiate steps for fixing up boundaries of Veerareddypalli – II Reserved Forest, Veerareddypalli village and Tirumalapur village by giving notice to the petitioner and Forest Department and all concerned within six weeks from the date of receipt of the order.

The writ petition is disposed with directions on 27.01.2025

The author is Dy.C.F (Rtd). He is on Phone 966 609 7788; and E-mail ID ; keesrabuchiram@gmail.com

Vriksha Matha – Vriksha Mitra

"PADMASHRI SAALUMARADA THIMMAKKA"

Sri. K.Buchi Ram Reddy, IFS (Retd)

I feel privileged to write about the Tree Grower and Tree Lover Smt.Thimmakka whom I visited a few years ago along with friends during our visit to Bangalore. The trip was kindly arranged by Sri R.D. Reddy, I.F.S.It was not a simple visit but a pilgrimage to VanaPremi and VanaDevata incarnated in human form. She was in perfect health at that time. I felt sad when I came to know that she passed away in a hospital at Bengaluru due to age related disabilities on November 14, 2025at the age of 114. She was deservingly cremated with state honours by the Government of Karnataka. Thimmakka planted and nurtured 385 Banyan trees on a 4.5 km stretch of highway between Hulikal and Kudur in Ramanagara district. Planting technique was methodical; 10 grafts on the first day, 15 grafts on the second day, 20 on the third day and so on. The work increased day after day – planting and watering until they established. Because of raising huge number of trees with the help of her husband, she became popular as Saalumarada Thimmmakka. 'Saalumarada' in Kannada means 'row of trees'. It has become her surname.

Thimmakka was born in a tiny village on June 30, 1911 in Gubbitaluk oferst while Mysore state. She was married to Chikkaiah, a native of Hulikal village of Magaditaluk of Ramanagara district. Inher early years she worked as a labourer in a quarry in the village nearby. She did not have any formal education. The couple had no children. Thimmakka got an idea and that is, they should plant a few trees and raise them as their children. That was a good idea, of course! And Chikkaiah agreed at once.

Planting was done zealously and the plants were protected by fixing thorny twigs. During summer the plants were watered. We can imagine the care and attention the couple had given. Even after death of her husbandin 1991, Thimmakka zealously continued her mission. Her work of raising trees along the highway caught the public attention not only in India but also other countries. " SaalumaradaThimmakka featured in a BBC News Article and Video report in 2016 as one of the BBC's 100 most influential women for lifelong dedication to planting trees. BBC highlighted her story of turning grief into a green legacy by planting thousands of Banyan trees along highway in Karnataka and she was rewarded for her environmental activism." Another quote: "A U.S environmental based in Los Angeles and Oakland, California established what is called "Thimmakka's Resources for Environmental Education" is named after her."The Central University of Karnataka had announced an honorary doctorate for her in the year 2020. This is one of the greatest achievements of Thimmakka. One would be pleasantly surprised to know that a poor, helpless,illiterate widow was conferred with Padma Shriin 2019. She received the award from the then President of India Sri. Ram NathKovind.

SaalumaradaThimmakka was an inspiring personality. Her immense love for trees, dedication and a lifetime service,stand as a symbol of commitment. Thimmakka did not limit herself to planting trees on the highway; she is believed to

have planted 800 other trees. She also contributed to rain water harvesting by constructing of water storage tanks. She may have left us but her legacy stays in our minds forever.

A Trust was established to support her vision, including her dream of constructing a hospital. Besides Padma Shri award, she got many other recognitions like Nadoja Award from Hampi University in 2010;National Award in 1995;Indira Priyarshini Vriksha Mitra Award in 1997; Veera Chakra Prashasthi Award 1997; Certificate of Appreciation from the Indian Institute of Technology, Bengaluru, Karnataka ; Kalpavalli Award 2000; Godfrey Phillips Bravery Award 2006; and so many others.

Thimmakka was suffering from breathing problem. She was admitted to hospitals many a time. She breathed her last and left for heavenly abode on November 14, 2025. The members of the Executive Committee of the Association of the Retired Forest Officers of Telangana and Andhra Pradesh, the EditorialBoard of the Monthly Journal "VanaPremi" and all other members of the Association mourn the loss of MathaTimmakka and convey their condolences to the adopted son of the late Thimmakka and the large number of her off-springs, the Banyan and other trees, birds and other forms of wildlife of the State of Karnataka.

May the Lord grant her Sadgathi.Jai Mathaji.Jai VrikshaMitra.Thimmakka Amar hai.

The author is a retired IFS officer, M-96660 97788

1st Butterfly & Moth Survey, Eturnagaram WLS, Nov 2025
Photo-Indaram Nageshwar Rao, OWLS

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Saalumarada Thimmakka

Photo: Twitter

Registered with RNI R.No. Teleng/2000/2185
Postal Regn. No. D/RNP/HCD-1154/2024-2026
Posting at BPC-IV Patrika Channel, Nampally, Hyderabad-500001

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Venu Graphics, Hyderabad. & 92463 32717

If Undelivered, Please return to: Editor, VANAPREMI, Office of the Principal Chief Conservator of Forests, Aranya Bhavan, 5th Floor, Room No.514, Saifabad, Hyd - 500 004, T.G.

Date of Publication-26/11/2025; Total Pages: 60; Date of Posting: 4th or 5th of Every Month.
Printed & Published by **Qamar Mohd. Khan** on behalf of **Association of Retired Forest Officers**,
Printed at **Venu Graphics**, D.No.2-1-392/1/6, Fever Hospital Signal, Nallakunta, Hyderabad-500044 and
Published from Room No. 514, 5th Floor, Aranya Bhavan, Hyderabad-500004.
RNI Regd. No. Teleng/2000/2185 | **Editor: Dr. Kota Tirupataiah, IFS(R)** | Email: tirupataiah.tsfa@gmail.com | Ph: 88855 32021