



PANCHTATVA PARIVESH



पंचतत्व परिवेश

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SRISHTI- THE ENVIRONMENT SOCIETY
P.G.D.A.V. COLLEGE (EVE.)
(UNIVERSITY OF DELHI)



Pictute Credit- NIPUN RAJ
BA PROGRAMME

25/1111

The Cockatiel is a friendly, crested bird native to Australia that is widely kept as a legal, popular exotic pet in India. It is easily recognized by its bright orange cheeks and is loved for its ability to mimic tunes and bond deeply with humans.

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Ms. Mahejabi Naaz (Student Editor)

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Panchtatva Parivesh- Quarterly Published Bilingual Magazine of Environment Society

P.G.D.A.V. College (Evening), University of Delhi

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Environment Committee (2025-2026)



Prof. R. K. Gupta
Principal



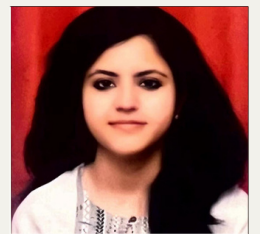
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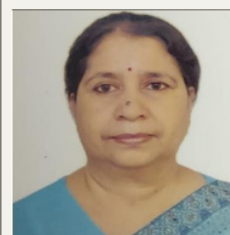
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PRINCIPAL'S MESSAGE

Dear Reader,

It is an illustrious occasion to celebrate the release of Panchtatva Parivesh and I take the pleasure to speak to you at this momentous occasion, presiding as the Principal of P.G.D.A.V. College (Evening), University of Delhi. In my official capacity, I would like to acknowledge the commitment and passion exhibited by the students at Srishti towards gaining deeper awareness and understanding of environmental consciousness.

Panchtatva Parivesh is a tribute to the academic and creative efforts of our students and faculty in the form of an invaluable platform for the distribution of knowledge and constructive discussion of crucial issues in the domain of the environment. The bilingual publication of the magazine has ensured the distribution of this priceless knowledge to as many people as possible.

The readers will be exposed to a wide range of articles, infographics, and reports that showcase not only innovative solutions and the need for solutions, but also the impending need for conservation of the environment. The academic rigor of the publication is not only pensive but inspiring as well, urging the readers to apply these principles in their own lives as well. Srishti – The Environment Society has been an integral part of our institution's mission and agenda and has spread the importance of Environment in every possible manner.

This is to conclude with gratitude extended to the students, who are the essence of the intellectual force 'Panchtatva Parivesh'. Lastly, heartfelt thanks are also extended to the entire editorial staff for their dedicated work on this magazine publication, as well as all the writers for their invaluable contributions.

Thank you.

Prof. R. K. Gupta
Principal



Convener & Editor-in-Chief's Desk

To My Valued Readers,

It gives me great pleasure and fills me with a sense of responsibility as I bring you the latest copy of the quarterly magazine, Panchtatva Parivesh, which is published in two languages and is brought out quarterly by Srishti – The Environment Society of P.G.D.A.V. College (Evening), University of Delhi, and has been my privilege as the Convenor & Chief Editor of the magazine.

Panchtatva Parivesh is our collective pledge towards comprehension and addressing the major environmental concerns of the day. Through its bilingual publication, we attempt to enable dialogue irrespective of language barriers. This publication is representative of the vast notions expressed by our committed members.

The articles, essays, and reports published in these pages are the result of rigorous research work. The writers have chosen to focus on various issues like innovative methods for sustainable living, critical analysis of environmental policies, as well as important issues related to ecological ethics. The purpose of this edition is to make the reader ponder over his or her relationship with nature and make proactive steps in the direction of sustainability. It is hoped that this edition shall be able to impel the reader, be it a student, an educator, or an average citizen, to make more efforts in this direction.

Thank You

A handwritten signature in black ink, reading 'M Pandey'.

Dr. Mayank Pandey
(Editor-in-chief)



PRESIDENT'S MESSAGE

प्रिय प्रकृति प्रेमियों,
पंचतत्व परिवेश का हर संकलन एक यात्रा की तरह है, जो हमें पर्यावरण, हमारे समुदाय और स्वयं को गहराई से जोड़ता है। इस नए अंक के साथ, पी.जी.डी.ए.वी महाविद्यालय (सांध्य), दिल्ली विश्वविद्यालय की सृष्टि पर्यावरण समिति, एक बार फिर सतत विकास के लक्ष्यों की प्राप्ति के लिए समर्पित आवाज़ों, विचारों और रचनात्मक अभिव्यक्ति को एक साथ ला रही है।

सृष्टि के अध्यक्ष के तौर पर, मुझे आपके साथ पंचतत्व परिवेश त्रैमासिक पत्रिका साझा करते हुए बहुत खुशी और गर्व हो रहा है, जो हमारे समाज को पर्यावरण के प्रति जागरूक और ज़िम्मेदारी को बढ़ावा देने के जुनून को दिखाता है। इन पन्नों में, आपको पर्यावरण चेतना के स्वर के साथ-साथ हमारे विद्यार्थियों द्वारा लिखे गए कुछ सबसे ज़रूरी पर्यावरणीय मुद्दों पर जानकारी भरे लेख मिलेंगे।

मेरी हार्दिक कृतज्ञता संपादकीय टीम, योगदानकर्ताओं और कलाकारों को है जिनकी लगन सृष्टि की भावना को ज़िंदा रखती है। आपके लगातार समर्थन से, मुझे विश्वास है कि हम सब मिलकर उस स्थायी और सामंजस्यपूर्ण दुनिया को बना सकते हैं जिसकी हम सभी इच्छा रखते हैं।

PRANAV BIJEWAR
President

GUEST ARTICLE**The Lush Greens into Flaming Reds: Forest Fires in Tehri**

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*“In the hills when I woke
saw clouds of ash and
endless smoke,
creeping fire
on the ground
with a slow
but hungry sound”*

After loads of tiring months, I had planned and visited Tehri in Uttarakhand for a family vacation a few weeks back. It was a serene spot with fine weather during the week. The resort was almost at a secluded place in the hilly forests of Tehri district. Geographically, forests of Tehri spread over around 2000 square kilometres across the western part of the state.



During my stay, one fine morning I had a sight of fire and smoke from my room's balcony which worried me. Our vehicle was parked on the sandy but narrow track just behind this resort.

The housekeeping staff appeared cool and informed that these fires were a regular phenomenon there in the summer months. As a temporary measure, the guard sprinkled water on the grassy boundaries of the track to stop it from spreading.

That whole day I kept thinking about nature as a game of snakes and ladder. Few decades ago, it was water through the Tehri dams and now the fire, But do you know the reality? The dice has always been in the hands of man. Some curiosity crept into me to know more about these fires and I started talking about this with the locals. Got to know that the villagers make a heavy broom tying the branches with thick green leaves and beat the flames on the ground when it reaches their land to obviate its further spread. Also, they defragment the bushes and dry leaves into heaps at a distance so that the fire does not spread further.

After coming back to pavilion, I started digging up some information and came across surprising facts and data followed up by some unanswered questions relating to this sensitive geographic ecosystem. District Tehri Garhwal is prone and vulnerable to this fury. This personal experience examines the inter-related factors responsible for the forest fires in Tehri, analyzes their multiple impacts on local biodiversity and community livelihoods. It is an attempt to reiterate that how anthropogenic factors supplemented with climate anomalies and the institutional misses make the ecosystem vulnerable.

Background

The Garhwal Himalayas are known for their rich variety of plants and animals and for being an important source of water. In recent years, however, this fragile ecosystem has been badly affected by frequent and uncontrolled forest fires. According to the Forest Survey of India, Uttarakhand experiences a large number of forest fires every year during the dry season, and Tehri Garhwal is one of the most affected districts.

Although forest fires have always occurred naturally and play a role in maintaining healthy forests, the number and intensity of fires in Tehri have increased beyond sustainable levels. It is important to understand the causes of these fires and their environmental impacts so that effective, climate-resilient forest management and conservation policies can be developed.

Key Reasons

The occurrences of fire are not evenly distributed but scattered across specific hot spots. The proliferation of these fires is due to the following biological, physical and anthropogenic factors:

1. Biological Factors

In the past, much of the region was covered with oak forests, which were naturally more resistant to fire. Over time, many of these forests were replaced with Chir Pine plantations for commercial purposes. Every year, from March to June, Chir Pine trees shed large amounts of resin-rich needles. These needles do not rot easily and gradually build up on the forest floor, forming a thick layer of dry material.

Pine needles catch fire very easily because they contain natural oils and resin that ignite at low temperatures. During the hot summer months, these oils evaporate and create a layer of flammable gases just above the forest floor. Even a small spark, such as from a discarded cigarette, a campfire, or lightning, can quickly ignite this layer and cause a forest fire to spread rapidly.

In addition, pine needles have a high amount of carbon and a low amount of nitrogen. They also contain a large quantity of lignin, a natural substance that is very difficult to break down. Because of this, soil microorganisms cannot decompose the needles quickly. As a result, the needles do not rot easily and continue to accumulate on the forest floor year after year, forming a thick layer of dry material that can easily catch fire.

Further, the pine needle has a thick, waxy outer coating that helps the tree retain water. After the needles fall to the ground, this waxy coating prevents them from absorbing moisture from the air or light rain. As a result, the fallen needles remain dry for a long time, making them easy to catch fire even when the weather is slightly humid.

2. Climatic Chaos

Tehri's mountainous and steep terrain naturally aids the rapid upward spread of surface fires. Furthermore, climate research highlights a direct correlation between spiking summer temperatures, dropping relative humidity levels, and the frequency of fire incidents. Long stretches of drought following the winter monsoon dry out the mountain soil. This creates an ideal environment for rapid ignition and makes fire suppression exceptionally difficult.

Climate change is actively shifting weather patterns across the Garhwal Himalayas, turning what used to be a predictable, short fire season into an extended, high-risk period. Disturbed Western Disturbances cause winter precipitation and snowfall in Tehri to become erratic. The normal climatic pattern used to keep the forest floor damp well into the spring.

When there is very little rain or snowfall during winter, the period from February to June becomes unusually dry. The soil loses its moisture much earlier than normal, causing the dry season to start several weeks in advance. As a result, the forest floor becomes dry and highly prone to fire from as early as March, and the risk of forest fires remains high until the arrival of the summer monsoon.

Increasing temperatures make the situation even worse. The heat causes water to evaporate more quickly from the soil and plants, drying the forest even further. Fallen leaves, pine needles, and other dry plant material become easy to ignite. Once a fire starts, it can spread rapidly from the ground to the tops of the trees, turning into a large and difficult-to-control forest fire.

3. Man-made and Socio-Economic Drivers

Although dry weather and the large amount of flammable forest material create favourable conditions for forest fires, human activities are the main reason for these fires in Tehri Garhwal. To understand why these fires occur every year, it is important to study how local communities interact with the surrounding forests. Most forest fires in this region are not started intentionally to cause damage. Instead, they are often linked to traditional farming practices, the collection of forest resources, and changes in the way land is used.

The people of Tehri Garhwal mainly depend on farming and livestock rearing for their livelihood. However, the widespread growth of Chir Pine forests has created problems for them. The fallen pine needles form a thick layer on the forest floor, blocking sunlight and preventing grass from growing. To solve this problem, villagers often set small, controlled fires during late spring, April to May to burn away the dry needles. This helps fresh grass grow after the monsoon, providing food for their livestock.

Farmers also burn leftover crop residues and weeds along the edges of terraced fields near forest areas. However, because of sudden changes in wind direction and the absence of proper firebreaks, these controlled fires sometimes spread into nearby forests and turn into forest fires.

Many local people earn their living by collecting timber and other forest products such as medicinal plants, mushrooms, moss, and honey. To make it easier and safer to move through the forest, especially on steep slopes covered with dry Chir Pine needles and thick bushes, some people deliberately set small fires to clear the forest floor before collecting these products.

In addition, Chir Pine trees are tapped to collect resin, which provides income and employment for many local people. However, if resin is collected carelessly, it can accumulate around the base of the trees and increase the risk of fire. In some cases, fires are also started intentionally to hide illegal resin extraction or timber cutting, as the damage becomes difficult for forest officials to detect after a large fire.

4. Infrastructure Development and The Edge Effect

The growth of unregulated camping sites and homestays across Tehri's scenic ridges has introduced new fire hazards. Unattended campfires, cooking fires, and outdoor waste disposal near forest fringes pose an increasing risk during the dry summer peak. Geospatial mapping shows that fire incidents in Tehri are highly located in proximity to national highways, link roads, and expanding rural settlements.

Debris and dry brush left behind during hill-cutting for road expansions are frequently cleared using fire. Additionally, discarded lit while smoking by travellers or unchecked roadside trash burning regularly ignites the dry pine needles lining highway slopes.

In the past, mountain communities had a close and caring relationship with native oak forests because they provided a reliable source of water, fodder, and other essential resources. However, when the government promoted the large-scale plantation of Chir Pine for commercial purposes, this relationship gradually changed.

Since Chir Pine forests are owned and managed by the government, local communities receive very little direct benefit from them. As a result, many villagers no longer feel responsible for protecting these forests. This has reduced the traditional practice of community-led fire prevention and firefighting. Today, forest fire management is largely the responsibility of the Forest Department, which often faces shortages of staff and resources.

The Consequences

Forest fires seriously disturb the natural balance of plants in Tehri. Research shows that areas affected by repeated fires lose many young trees because the heat destroys their seeds and seedlings. At the same time, fast-growing invasive plants spread quickly and occupy the empty spaces left behind. Forest fires also damage the soil. The high heat reduces important nutrients like organic carbon and potassium, making the soil less fertile. It also destroys the roots that hold the soil together on steep mountain slopes. As a result, the risk of soil erosion and landslides increases during the monsoon season.

Forest fires cause serious harm to the rich biodiversity of the region. During the peak fire season in April and May, many slow-moving animals, nesting birds, and insects are killed because they cannot escape the flames. Fires also destroy and break up their natural habitats. As a result, many surviving wild animals move into nearby villages and towns in search of food and shelter. This increases the chances of conflicts between people and wildlife.

Smoke from forest fires in the hills of Tehri contains harmful pollutants such as fine dust particles, carbon monoxide, and other toxic gases. This polluted air can cause breathing problems, eye irritation, and heart-related health issues for people living nearby as well as in areas where the smoke spreads. Forest fires also affect the livelihoods of local families. Many people depend on forests for timber, firewood, and fodder for their animals. When forests are damaged, these resources become scarce, leading to financial difficulties. On a larger scale, forest loss and land degradation also reduce the contribution of agriculture and forestry to India's economy.



Remedial Measures: Shift from Preventive & Curative to Proactive approach

Legacy strategies of the State Government towards fire management focussing resources on purchasing firefighting tools or manually clearing temporary firelines fail to address the root causes of wildfires such as high fuel accumulation, climate strain, and community alienation. To break the destructive annual cycle of wildfires in District Tehri Garhwal, state-level forest management must act toward a proactive, community-driven preventive approach. An integrated, multi-pronged strategy target both fuel loads and governance models.

One of the main reasons for forest fires in Tehri is the large amount of dry Chir Pine needles, locally called ***Pirul***, that collect on the forest floor. These needles contain resin, catch fire very easily, and do not decompose quickly. Therefore, they need to be collected and removed

regularly to reduce the risk of surface fires. If *Pirul* is used to make useful products or generate income, local communities will have a strong reason to collect it, helping to keep the forests cleaner and safer.

The government should set up and financially support village-level collection centres run by local women's Self-Help Groups (SHGs). It should also provide a fixed minimum price for every kilogram of Chir Pine needles (*Pirul*) collected. This will encourage local people to regularly collect the dry needles, reducing the risk of forest fires while providing an additional source of income for rural and economically weaker families.

The collected Chir Pine needles can be compressed using hydraulic press machines to make bio-briquettes and pellets. These are clean and eco-friendly fuels that can be used instead of coal and charcoal in industries and households.

The success of this initiative depends on creating a strong market for pine needle products. This can be done by connecting village collection centres with industries that can use them as fuel. The government can also require brick kilns, biomass power plants, and factories in the nearby plains to use a certain percentage of pine needle pellets along with their regular fuel. This will create a steady demand for the collected pine needles and support both forest fire prevention and rural livelihoods.

The Forest Department alone cannot effectively manage forest fires because it has limited staff. Local communities should be given a bigger role through *Van Panchayats* (Community Forest Councils). The government should provide funds to these councils for fire prevention, safety equipment, and hiring local fire watchers. Van Panchayats should also have the authority to penalize people who start fires through negligence. In addition, trained village youth can form rapid-response teams to detect and control small fires before they spread.

Quick detection is essential to control forest fires in the remote hills of Tehri. Modern technology such as satellites can identify fires at an early stage, even at night or under dense tree cover. This information should be sent immediately through SMS to forest officials and Van Panchayat leaders so that they can respond quickly. In addition, solar-powered sensors can monitor dry conditions in forests and provide early warnings when the risk of fire becomes high, allowing preventive action to be taken in time.

Conclusion

The increasing number of forest fires in Tehri requires a shift from simply controlling fires to preventing them through active community participation. Instead of treating these fires as unavoidable natural events, efforts should focus on addressing their root causes. This can be achieved by turning dry pine needles into a source of income, strengthening the role of *Van Panchayats* in forest management, and using modern technologies such as satellite-based early warning systems. Protecting forests of Tehri is not only important for the environment but also for the livelihoods and well-being of the people who depend on them.

*“Some acts are done
that let the life shaken
when flames spread in mesh
make all greens as trash
burnt layer after layer
leave poison in the air*

*But still we have a hope
to undo this rope
Come, let’s do our conscious duty
to save the precious booty”*

References

- Forest Survey of India (FSI). *State of Forest Report: Analysis of Fire-Prone Landscapes in Northern India*. [ResearchGate](#).
- Pant, M., & Sharma, K. *Pattern and hotspots analysis of forest fires in district Tehri of Garhwal Himalayan Region, Uttarakhand*. [ResearchGate](#).
- Singh, R., et al. *Forest Fire in Uttarakhand: Historical Causes, Ecological Consequences, and Community Forestry Legacies*. [NIE India Journal](#).
- ARPA Foundation. *Forests on Fire: Governing Uttarakhand’s Forest Fire Crisis Under a Governance Debt Framework*. [ARPA Policy Brief](#).
- Kumar, A., & Bhatt, V. *Impact of forest fires on vegetation composition and soil properties in the Pinus roxburghii ecosystems of Western Himalayas*. [ScienceDirect](#).
- The Energy and Resources Institute (TERI). *Valuing the Economic Cost of Forest Loss and Ecosystem Degradation in Tehri Garhwal*. [TERI Publications](#).
- The Hans Foundation. *Safeguarding Uttarakhand’s Forests: Community Mobilization and Early Intervention Impacts*. [THF Reports](#).

METHODS OF AFFORESTATION

Santosh Pradhan

25/2723, B.Sc. Mathematics (Hons.)

Transforming barren wastelands into productive landscape is more than just planting trees; it is about sustaining communities. Afforestation offers a powerful bridge between environmental conservation and human livelihood. By integrating trees into agricultural landscape (agroforestry) or establishing community-managed timber and fodder reserves, we can revitalize exhausted soils while boosting local economies. This article delves into the practical, humancentric methods afforestation, demonstrating how strategic planting empowers communities to build climate resilient futures.

Afforestation introduces trees to non-forested land. The best methods depend on the goal and local conditions. Key techniques to afforestation include the Miyawaki Method, Direct Seeding, Tree and Seeding Planting, Agroforestry, Shelterbelt Technique, etc.

Miyawaki Method

The Miyawaki method is a Japanese afforestation method developed in the 1970s by botanist Akira Miyawaki. It involves planting native, indigenous trees extremely close together (3-5 saplings per square meter) to create dense, biodiverse, and self-sustaining ecosystems that grow ten times faster than conventional forest.

We can use following steps to plant trees using this method: -

- Identify native species: select 30-40 native, indigenous tree and shrub species that naturally grow together. Categorize them into four layers: shrub, sub-tree, tree and canopy.
- Prepare the soil: Excavate the ground to a depth of 1meter. Mix the soil with organic matter like compost, biomass to enhance water retention and fertility.
- Ultra-dense planting: Plant 3 to 4 sapling per sq. km. Mix the different layers randomly to encourage vertical growth and root competition for sunlight.
- Mulching: Cover the soil with a thick layer of straw or dried leaves to retain moisture and suppress weeds.

- **Initial Maintenance:** Water regularly and remove weeds for the first 2-3 years. After this period, the forest becomes 100% self-sustaining and requires no human intervention.

Direct Seeding

Direct seeding is a cost-effective afforestation method where seeds are sown directly onto the planting sites rather than transplanting nursery-grown saplings. It is highly efficient for covering large or inaccessible areas, lowers labour and transportation cost and allow the tree's natural taproots system to develop without damage.

Key techniques include:

- **Dibbling:** Manually creating small holes at specific intervals to drop seeds, ensuring precise depth and placement.
- **Broadcast Sowing:** Randomly dispersing seeds over prepared site, usually by hand or from the air.
- **Line or Patch Sowing:** Planting seeds in systematic, predetermined rows or small cultivated patches.

Tree and seedling Planting

Planting trees and seedlings requires careful site preparation, proper hole sizing and correct placement to ensure the root flare sits slightly above ground. Practical use includes ecological restoration, organic food production and property enhancement.

Steps used in this method: -

- **Dig wide not deep:** Dig a bowl-shaped hole 2-3 meter wider than the root ball, but only as the root system itself.
- **Find the root flare:** Identify the root collar (where trunk flares out into the roots). This must sit slightly above or perfectly level with the ground, never buried deep.
- **Handle the roots:** For potted seedlings, gently loosen the root ball and make several vertical cuts if the roots are tightly circling. For bare-root seedling, gently spread the roots outward.
- **Backfill & tamp:** Fill the hole using the excavated soil. Tamp it down gently to remove large air pockets, but do not aggressively compact the wet dirt.

- **Water & mulch:** Water the site thoroughly to settle the soil. Apply 2-3 inches of organic mulch 6 inches away from the trunk to prevent rotting.

Agroforestry

It is an eco-friendly land use practice that integrates trees & shrubs into farming systems with crops or livestock. It maximizes land productivity, improve soil health and boosts biodiversity by allowing plants and animals to thrive together synergistically, ultimately reducing the need for synthetic fertilizers.

Steps to implement it: -

- **Alley cropping:** Plant your regular crops in the open space between widely spaced rows of trees.
- **Windbreaks:** Plant dense rows of trees along the borders of your field to protect sensitive crop from harsh winds and reduces soil erosion.
- **Silvopastures:** Combine forestry with livestock grazing by allowing animals to forage beneath the shade of managed trees.
- **Border planting:** Grow multipurpose trees around the edges of your property to utilize unused space.

Conclusion

The successful expansion of forest cover hinges on moving away from a ‘one size-fits-all’ approach and utilizing tailored afforestation methods. While traditional tree planting remains standard, integrating technique like agroforestry, natural regeneration, and the Miyawaki method ensures higher survival rates and long-term ecological resilience. Ultimately selecting the appropriate method based on specific sites conditions and local community needs is essential for restoring degraded lands, capturing atmospheric carbon and securing a sustainable future.

References

- <https://climateseed.com/blog/arr-projects>
- <https://www.upforestcorporation.co.in/>

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[Picture Credit -<https://warliworld.blogspot.com/>]

In the rugged mist shrouded terrains of the north Sahayadri mountain range sweeping grandly across the Palghar and Thane district of Maharashtra lives one of India's most ancient resilient and culturally profound indigenous communities, the Warli tribe. Globally celebrated for their minimalist geometric white pest wall paintings, the Warlis are deeply misunderstood if viewed merely as visual artists or creators of folk aesthetics.

The tribe lives in close harmony with the nature. Their livelihood is based upon farming, care for cattle, and providing protection to their forests and land. These activities are not business centric but are based on their spiritual understanding of the nature. They believe in interconnectedness of individuals and the environment and believe it as a circle of life.

Ritualizing the pastoral life

Nothing in the daily seasonal or generation life of Warli occurs without the expression of ritualistic gratitude. Their animals are not treated as property but are given the highest human-like respect integrated fully into the social fabric of the clan.

Before the heavy water-logged fields are ploughed for the labour-intensive process of paddy transplantation, a beautiful quiet ritual takes place at the edge of the muddy field. The eldest woman of the household representing the maternal ancestral lineage and fertility of the earth steps forward and ties a bunch of leads from the sacred wild tree to the wooden handle of the heavy blow vermilion sindoor (sacred red powder) is then gently applied to the broad foreheads of the working bulls and on to the beam of the wooden plough itself.

The animals are looked in the eyes and thank formally as equal partners in human survival and communal sustenance before they are asked to take a single exhausting step into the deep thick mud.

When the long labour farming cycle concludes and the golden winter harvest finally arrives, the entire village gathers for a harvest festival. However, before any human being partakes in the celebratory grand feast, a sacred sequence is followed. Cattles are brought out, wash out, decorated and fed first with the very first grains of the fresh harvest festival. This act serves as a direct, holy offering to *Kansari*, the revered goddess of agriculture and grains.

Ecological wisdom for the future

The profound lesson that the Warli tribe offers to the modern climate-anxious world is simple yet deeply transformative: humanity does not own nature, we belong to it. Their daily practices, intricate agricultural methods and communal lifestyle where choices are not designed around short term profits, personal greed or maternal access but around continuity, shared effort and an unbreakable generation respect for the living Earth.

As modern society grapples with soil degradation biodiversity loss and the ethical failures of industrial food systems the humble vanvasi diary of the Warli tribe stands as a beacon of hope it reminds us that true progress lies not in how effectively became conquer and dominate the earth, but in how gracefully creatively and respectfully we can walk within it.

Modern evolution and global recognition

The transition of Warli art from the walls of remote mud Huts to international arts galleries in Paris and Tokyo is a significant chapter in India's cultural history. Spearheaded in the 1970s by the legendary artist Divya Soma Mashe who was awarded the Padma Shri the art form transitioned on two paper, canvas and textiles. Today Warli motifs are found on modern designer garments, urban murals, corporate logos and high and home decors, turning a localized ritual language into a globally recognised symbol of sustainable folk aesthetics.

Challenges and cultural preservation

In the contemporary era, the Warli tribe stands at a critical crossroads. The rapid encroachment of the industrial zones, highway expansions and urban migration threaten to uproot their traditional lifestyle and sever their link with ancestral exploitation by third party manufacturers who copy their designs without providing economic returns to the actual tribal artisans.

However, through modern institutional support, GI (geographical indication) protections and a renewed global interest in sustainable, indigenous ways of living, the Warli community is actively fighting to preserve their language, protect their forest grazing livestock and ensure that their sacred geometric canvas continuous to tell the story of the Earth for generations to come.

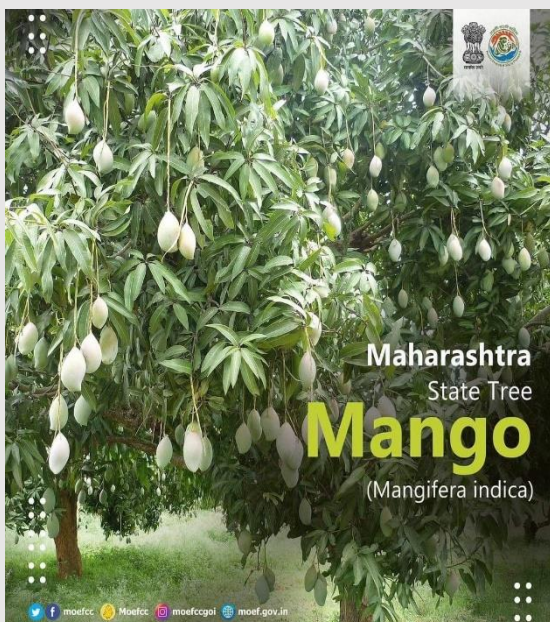
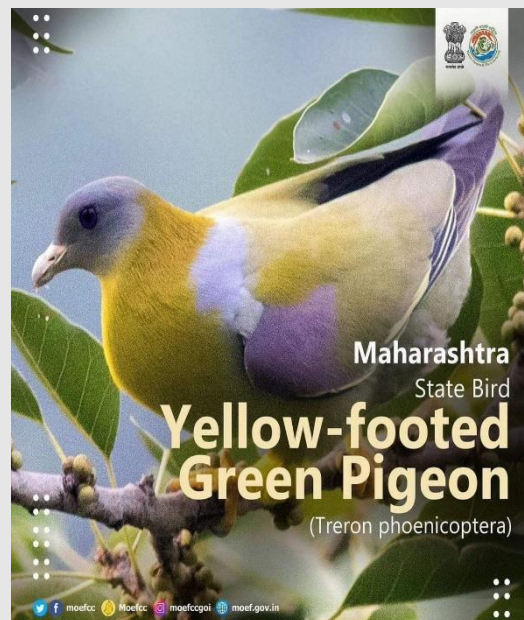
References

- Pereira & Seabrook (2013), book-: Asking the Earth: The Spread of Unsustainable Development
- TRTI Maharashtra: trti.maharashtra.gov.in (Official Tribal Research Institute)
- Ministry of Tribal Affairs: tribal.nic.in (Central Government Union Ministry)
- Anirudh Kumar Singh (Agricultural scientist): - Agricultural biodiversity heritage sites, *Asian agri history*, page no.257 to 270

KNOWLEDGE CHECKPOINT

KNOW OUR STATE/UT

MAHARASHTRA



State Symbols of Maharashtra (Source: Ministry of Environment, Forests and Climate Change)

MAHARASHTRA: A BRIEF ACCOUNT

Santosh Pradhan
25/2723, B.Sc. Mathematics (Hons.)

Declared as state	1 May, 1960
Area & coordinates	3,07,713 sq. km. & 15" 37' N to 22"6' N latitude, 72"36' E to 80"54' E longitude
Population (2011 census)	112.4 million Male: 58,243,056, Female: 54,131,277
Density (per sq. km)	370 per sq. km
Sex ratio (as per 2011 census)	923 females per 1000 male
Literacy rate (Male)	88.38 %
Literacy rate (female)	75.87%
Capital	Mumbai
Important cities	Mumbai, Pune, Nagpur
Districts	36
Official Language	Marathi
State Emblem	A circular state seal featuring a traditional Samai Diya lamp , 16 lotus blossoms , and a Sanskrit motto
State Flower	Jarul
State Tree	Mango Tree
Legislature	Bicameral state legislature
Legislative Assembly Legislative Council	288 members 78 members (Total 336 members)
Parliamentary Constituencies	Lok Sabha – 48 Rajya Sabha 19
Famous personalities	Chatrapati Shivaji Maharaj, Dr. B. R. Ambedkar, Sachin Tendulkar, Lata Mangeshkar
High court	Bombay High Court
Neighbouring STATES/UT	Gujarat, MP, Chhattisgarh, Telangana, Karnataka, Goa
Neighbouring countries	None
Rivers	Godavari, Krishna, Tapi
Highest peak	Kalsubai Peak
Dams	Koyna, Jayakwadi , Ujjani, Bhatsa, Mulshi, Khadakwasla, Bhandardara , Gangapur, Gosikhurd, Upper Wardha

Waterfall	Thoseghar, Lingmala, Vajrai, Randha, Devkund, Bhivpuri, Kune, Umbrella, Pandavkada, and Nanemachi Falls.
Lakes	Lonae Lake, Rankala Lake, Veena Lake etc.
Wildlife protected areas & Ramsar sites	National Parks: -Sanjay Gandhi, Tadoba, Navegaon, Gugamal, Chandoli, Pench (Maharashtra). Major Wildlife Sanctuaries: - Bhimashankar, Koyna, Radhanagari, Karnala, Tansa, Phansad, Nagzira, Bor, Melghat, Yawal, Rehekuri, Great Indian Bustard (Nannaj), Kalsubai–Harishchandragad, Sagarashwar, Painganga. Ramsar Sites: -Nandur Madhmeshwar, Thane Creek Flamingo Sanctuary, Lonar Lake.
Main crops	Sugarcane, Cotton, Soybeans
Major industries	Auto mobiles & Evs, IT, Textiles, etc
Major deposits	Coal, Iron Ore, Manganese, Bauxite, Limestone etc.
Major handicrafts	Pithani sarees, Kolhapuri chapals, Bidri metalwork etc.
Major folk songs and dances	Povada & Koli
Main cuisine	Sorghum and Pearl millet
Important festivals & fairs	Ganesh Caturthi, Makara Sankranti, Asadi Ekadashi, Gudi Padwa etc.
Scheduled Tribes	Bhils, Gonds, Thakars, Varlis, Pawras etc
UNESCO world heritage	Ajanta caves, Ellora caves, Elephanta caves, CSMT etc.
Tourism	Shaniwar Wada, Gateway of India, Matheran, Ganpatipule etc.
Hill stations	Mahabaleshwar, Matheran, Lonavala
Ek Bharat Shreshtha Bharat Pairing	Maharashtra – Odisha

MAHARASHTRA: HISTORY, GEOGRAPHY AND ADMINISTRATION

Abhishek Patgiri

23/5404, B.A. Political Science (Hons.)

HISTORY

The state of Maharashtra came into existence on 1 May 1960. Earlier it was a part of the bilingual Bombay State which later got separated on linguistic lines and forms today's Maharashtra and Gujarat. The Name Maharashtra is believed to be derived from ancient terms of *Maharatta* or *Maharashtraka*, mentioned in early inscriptions and literary works. Its history belongs back to 3rd century BCE when it was the part of the Mauryan Empire under Emperor Ashoka, whose rock edicts at Sopara indicates its connection to the empire. After the rule of the Mauryas, the region was ruled by the Satavahana dynasty which was a major power in the Deccan and controlled trade, agriculture and cultural development. The Satavahanas were then succeeded by the Vakatakas, Chalukyas, Rashtrakutas and Yadavas of Devagiri. Then in the era of 17th century, the region was ruled by the Great Maratha Empire under the leadership of Chhatrapati Shivaji Maharaj under whom the kingdom established strong military and efficient governance. The region thereafter came under the control of the British Empire after the Third Anglo-Maratha War (1817-1818) and became the part of Bombay Presidency. After independence, Maharashtra remained within the Bombay State until the Samyukta Maharashtra Movement that led to the formation of the present state.

GEOGRAPHY

The state of Maharashtra is located in the western part of India and lies between 15° 37' N to 22° 6' N latitude, 72° 36' E to 80° 54' E longitude. It covers almost 3,07,713 sq. km which makes it India's third largest state by area after Rajasthan and Madhya Pradesh. The state is bounded by Gujarat and the Union Territory of Dadra and Nagar Haveli and Daman and Diu to the northwest, Madhya Pradesh to the north, Chhattisgarh to the east, Telangana to the southeast, Karnataka to the south, Goa to the southwest, and the Arabian Sea to the west.

The physical features of Maharashtra is unique and diverse as the Western Ghats run parallel to the western coast and separate the narrow Konkan Coastal Plain from the Deccan Plateau. In the north lies the Satpura Hills, while the eastern region is marked by the forests of the Vidarbha Plateau. Also, the Deccan Plateau's fertile black cotton soil makes Maharashtra one of India's leading agricultural states. Rivers like the Godavari flows from the state which is the

longest river in peninsular India originates in the Nasik district. Other rivers include Krishna, Bhima, Tapi (Tapti), Wardha, Wainganga, Penganga, and Koyna rivers, which support the state's irrigation, drinking water, and hydroelectric projects.

The climate of Maharashtra varies from tropical along the coast to semi-arid in the interior. Monsoons bring heavy rain while summers are generally hot and winters are mild to cool. The annual rainfall varies over 3,000 mm to 700 mm.

Forest Cover of Maharashtra (in sq. km)

Class	Area (sq. km)	% of Geographical Area
VDF	8,347	2.71
MDF	20,990	6.82
OF	21,077	6.85
TOTAL	50,414	16.38
SCRUB	4676	1.52

Administration

Maharashtra consists of 36 districts, each headed by a District Collector (District Magistrate), who is responsible for revenue administration, implementation of government policies, and maintaining law and order in coordination with the Superintendent of Police (SP).

For efficient administration, the state is divided into 6 revenue divisions, and the districts are further subdivided into 358 tehsils (talukas). This multi-tier administrative structure ensures effective governance and smooth implementation of government programmes across the state.

References

- <https://mahadma.maharashtra.gov.in/>

PROTECTED AREAS OF MAHARASHTRA

Shubham Kumar Singh

24/810, B.Com. (Prog)

Table 1 : National Parks of Maharashtra

S. No	Name	Location and Area	Notable Features
1.	Tadoba National Park	Chandrapur district (116.55 sq. km)	It forms the core of the Tadoba Andhari Tiger Reserve, known for its high density of Bengal tigers, teak forests, and the central Tadoba Lake. Established in 1955, making it Maharashtra's oldest National Park.
2.	Sanjay Gandhi (Borivali) National Park	Mumbai Suburban district (103.84 sq. km)	Uniquely located within the bustling metropolis of Mumbai. It is famous for its leopard population, rich flora, and the 2,400-year-old rock-cut Kanheri Caves nestled within the park's basalt rocks. Established in 1969 and re-dedicated as Sanjay Gandhi National Park in 1981.
3.	Pench (Jawaharlal Nehru) National Park	Nagpur district (257.26 sq. km)	Straddling the border of Maharashtra and Madhya Pradesh, this tropical dry deciduous forest is famously known as the inspiration for Rudyard Kipling's <i>The Jungle Book</i> . It is a crucial tiger habitat. Established in 1975.
4	Nawegaon National Park	Gondia district (133.88 sq. km)	Located in the eastern Vidarbha region, it features a large forest lake built in the 18th century. It is a haven for migratory birds, panthers, and a diverse range of central Indian flora and fauna. Established in 1975.
5	Gugamal National Park	Amravati district (361.28 sq. km)	Situated in the Satpura range, it forms the core of the Melghat Tiger Reserve. Characterized by dry deciduous forests, it is critical for tiger conservation, sloth bears, and the endangered forest owlet. Established in 1974.
6	Chandoli National Park	Sangli, Satara, Kolhapur, and Ratnagiri districts (317.67 sq. km)	Part of the Sahyadri Tiger Reserve in the Western Ghats. It protects a crucial catchment area for the Warna dam and boasts a mix of moist deciduous and evergreen forests, sheltering tigers and gaurs. Established as a sanctuary in 1985 and upgraded to a National Park in 2004.

Table 2 : Wildlife Sanctuaries of Maharashtra

S. No.	Name	Location and Area	Notable Features
1.	Ambabarwa Wildlife Sanctuary	Buldhana (127.11 sq. km)	Located west of Melghat, it forms a crucial habitat and corridor for tigers moving through the Satpura landscape.
2.	Andhari Wildlife Sanctuary	Chandrapur (509.27 sq. km)	Combines with Tadoba NP to form the Tadoba-Andhari Tiger Reserve; dominated by bamboo and teak forests.
3.	Aner Dam Wildlife Sanctuary	Dhule (82.94 sq. km)	Shares boundaries with Madhya Pradesh, protecting the catchment area of the Aner river and local scrub forests.
4.	Bhamragarh Wildlife Sanctuary	Gadchiroli (104.38 sq. km)	Features dense, unfragmented broadleaf forests and serves as a vital habitat for leopards, wild boar, and avian life.
5.	Bhimashankar Wildlife Sanctuary	Pune/Thane (130.78 sq. km)	Created primarily to protect the habitat of the Indian Giant Squirrel (Maharashtra's state animal) in the Western Ghats.
6.	Bor Wildlife Sanctuary	Wardha (61.10 sq. km)	A designated tiger reserve known for its dry deciduous forest surrounding the Bor Dam drainage basin.
7.	Chaprala Wildlife Sanctuary	Gadchiroli (134.78 sq. km)	A riverine ecosystem near the confluence of the Wardha and Wainganga rivers, protecting the Giant Indian Squirrel.
8.	Deulgaon Rehekuri Wildlife Sanctuary	Ahmednagar (2.17 sq. km)	A small but significant sanctuary dedicated to the protection of the Indian Blackbuck in a dry, scrubland environment.
9.	Dhyanganga Wildlife Sanctuary	Buldhana (205.21 sq. km)	Encompasses the Dhyanganga river and provides habitat for leopards, sloth bears, and diverse avifauna.
10.	Gautala Autramghat Wildlife Sanctuary	Aurangabad/Jalgaon (260.61 sq. km)	Located in the Ajanta-Satmala hill range, it preserves Southern tropical dry deciduous forests and local wildlife.
11.	Ghodazari Wildlife Sanctuary	Chandrapur (159.58 sq. km)	Acts as an important ecological corridor strengthening the movement of tigers in the broader Vidarbha landscape.

12.	Great Indian Bustard Wildlife Sanctuary	Solapur/Ahmednagar (8,496.44 sq. km)	A massive semi-arid grassland sanctuary conserving the critically endangered Great Indian Bustard (Maldhok).
13.	Isapur Wildlife Sanctuary	Yavatmal (37.80 sq. km)	Situated around the Isapur dam, providing a vital watering hole and habitat for local and migratory bird species.
14.	Jayakwadi Bird Wildlife Sanctuary	Aurangabad (341.05 sq. km)	Comprising the Nath Sagar reservoir islands, it attracts thousands of migratory birds including flamingos and cranes.
15.	Kalsubai Harishchandragad Wildlife Sanctuary	Ahmednagar (361.71 sq. km)	Encompasses the highest peak in Maharashtra (Kalsubai) and protects rugged Western Ghats biodiversity.
16.	Karanja Sohol Black Buck Wildlife Sanctuary	Washim (18.32 sq. km)	A specialized undulating grassland reserve ensuring the survival and breeding of the Blackbuck antelope.
17.	Karnala Bird Wildlife Sanctuary	Raigad (12.11 sq. km)	Centered around the historic Karnala Fort, it is a haven for over 222 species of birds within moist deciduous woodlands.
18.	Katepurna Wildlife Sanctuary	Akola (73.69 sq. km)	Known for its four-horned antelope (Chousingha) population and the reservoir that draws numerous waterbirds.
19.	Koka Wildlife Sanctuary	Bhandara (92.34 sq. km)	A critical forest corridor situated between the Wainganga River and the Nagzira Wildlife Sanctuary.
20.	Koyna Wildlife Sanctuary	Satara (423.55 sq. km)	A deeply forested buffer of the Sahyadri Tiger Reserve, protecting the catchment of the Koyna Dam in the Western Ghats.
21.	Lonar Wildlife Sanctuary	Buldhana (3.83 sq. km)	Protects the ecosystem surrounding the ancient Lonar meteorite crater lake, known for its unique saline and alkaline microbial life.
22.	Malvan Marine Wildlife Sanctuary	Sindhudurg (29.12 sq. km)	Maharashtra's only marine sanctuary, protecting coral reefs, marine flora, and the historical Sindhudurg fort waters.
23.	Mansinghdeo Wildlife Sanctuary	Nagpur (172.86 sq. km)	Acts as an essential buffer to the Pench Tiger Reserve, aiding in

			the overflow and safe passage of tiger populations.
24.	Mayureshwar Supe WLS	Pune (5.14 sq. km)	A small but well-maintained grassland tract dedicated to the conservation of the Chinkara (Indian Gazelle) and local avian fauna.
25.	Melghat Wildlife Sanctuary	Amravati (778.75 sq. km)	A major component of the Melghat Tiger Reserve network, heavily forested with teak and steep Satpura ridges.
26.	Nagzira Wildlife Sanctuary	Bhandara/Gondia (116.54 sq. km)	Known as the "Green Oasis" of Vidarbha, it supports healthy populations of tigers, leopards, wild dogs, and gaurs.
27.	Naigaon Mayur Wildlife Sanctuary	Beed (29.90 sq. km)	Specifically established to protect large populations of the Indian Peafowl (Peacock) in scrubland environments.
28.	Nandur Madhameshwar Wildlife Sanctuary	Nashik (100.12 sq. km)	Known as the "Bharatpur of Maharashtra," this wetland sanctuary is a Ramsar site supporting immense waterfowl diversity.
29.	Narnala Wildlife Sanctuary	Akola (12.35 sq. km)	Wrapped around the historic Narnala fort, this sanctuary is an extension of the Melghat ecosystem with dense vegetation.
30.	Navegaon Wildlife Sanctuary	Gondia (122.76 sq. km)	Adjoining the Navegaon National Park, it expands the protected area for panthers, sloth bears, and wetland avifauna.
31.	New Bor Wildlife Sanctuary	Wardha (60.69 sq. km)	An added extension to the Bor landscape, solidifying the tiger habitat and preventing forest fragmentation.
32.	New Bor Extension Wildlife Sanctuary	Wardha (16.31 sq. km)	Further expands the protected buffer zone of the Bor Tiger Reserve ecosystem.
33.	New Maldhok Bird Wildlife Sanctuary	Solapur (1.55 sq. km)	An extension sanctuary to provide additional undisturbed breeding grounds for the Great Indian Bustard.
34.	New Nagzira Wildlife Sanctuary	Bhandara (151.33 sq. km)	Supplements the original Nagzira sanctuary, ensuring a larger, continuous corridor for central Indian wildlife.

35.	Painganga Wildlife Sanctuary	Yavatmal (324.62 sq. km)	Bordered by the Painganga river on three sides, protecting dry deciduous flora and serving as a tiger dispersal route.
36.	Phansad Wildlife Sanctuary	Raigad (52.71 sq. km)	Protects a unique pocket of coastal Western Ghats forest, preserving diverse amphibians and woodland ecosystems.
37.	Pranhita Wildlife Sanctuary	Gadchiroli (119.00 sq. km)	A riverine sanctuary along the Pranhita river, primarily known for protecting populations of the Mugger crocodile.
38.	Radhanagari Wildlife Sanctuary	Kolhapur (351.16 sq. km)	Maharashtra's first declared sanctuary, serving as the primary habitat for the Indian Bison (Gaur) in the southern ghats.
39.	Sudhagad Wildlife Sanctuary	Raigad (77.10 sq. km)	Surrounds the Sudhagad fort, preserving the evergreen and semi-evergreen forest patches of the Sahyadri mountains.
40.	Tamhini Wildlife Sanctuary	Pune/Raigad (108.20 sq. km)	Located along the Mulshi dam, noted for its heavy monsoon rains, waterfalls, and rich amphibian biodiversity.
41.	Tansa Wildlife Sanctuary	Palghar (304.81 sq. km)	Encompasses the catchment area of Tansa lake, providing water to Mumbai and sheltering leopards and barking deer.
42.	Thane Creek Flamingo Wildlife Sanctuary	Mumbai Suburban (16.90 sq. km)	A vital mangrove wetland ecosystem shielding Mumbai's coast and hosting massive flocks of migratory flamingos.
43.	Tipeshwar Wildlife Sanctuary	Yavatmal (148.63 sq. km)	An isolated but highly successful tiger conservation area featuring a hilly, dry deciduous landscape.
44.	Tungareshwar Wildlife Sanctuary	Palghar (85.70 sq. km)	Acts as a vital ecological stepping stone connecting the Sanjay Gandhi National Park with forests to the north.
45.	Umred Karhandala Wildlife Sanctuary	Nagpur (189.30 sq. km)	A globally recognized tiger corridor that links the Tadoba and Nagzira reserves, vital for genetic exchange.
46.	Wan Wildlife Sanctuary	Amravati (211.00 sq. km)	A dense forest sanctuary forming the southeastern part of the Melghat Tiger Reserve complex.

47.	Yashwantrao Chavan Sagarashwar Wildlife Sanctuary	Sangli (10.87 sq. km)	A unique, artificially cultivated forest sanctuary managed actively by the local community to protect deer populations.
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Table 3 : Ramsar sites

S. No	Name	Coordinates	Location	Area (in hectare)	Site No.	Designation Date
1.	Nandur Madhameshwar	20°01'18"N 74°06'24"E	Nashik District	1,437 ha	2410	21 June 2019
2.	Lonar Lake	19°58'33"N 76°30'30"E	Buldhana District	427 ha	2441	22 July 2020
3.	Thane Creek	19°05'55"N 72°59'31"E	Mumbai Suburban District	6,521 ha	2490	13 April 2022

Table 4 : UNESCO World Heritage Sites of Maharashtra

S. No	Name	Location	Area	Inscription Year	Notable Features
1	Ajanta Caves	Aurangabad District	8,242 ha	1983	Features 30 rock-cut Buddhist cave monuments dating from the 2nd century BCE to the 6th century CE. Renowned for their ancient murals, expressive paintings, and sculptures depicting the life of Buddha.
2	Ellora Caves	Aurangabad District	-	1983	Consists of 34 monasteries and temples (Hindu, Buddhist, and Jain) carved sequentially into a basalt cliff face. Famous for the massive monolithic rock-cut Kailasa Temple (Cave 16).

3	Elephanta Caves	Elephanta Island (near Mumbai)	-	1987	A network of intricately carved rock-cut cave temples dating back to the 5th to 8th century CE, primarily dedicated to Lord Shiva. Most famous for the colossal Trimurti sculpture.
4	Chhatrapati Shivaji Terminus	Mumbai	2.85 ha	2004	Formerly known as Victoria Terminus, it is a historic railway hub showcasing a seamless blend of Victorian Gothic Revival architecture with traditional Indian palace architectural influences.
5	Western Ghats	Sahyadri Range (across MH)	-	2012	A natural heritage site older than the Himalayas. Recognized as one of the world's eight "hottest biodiversity hotspots," supporting incredibly rich endemic flora, fauna, and mountain ecosystems.
6	Victorian Gothic and Art Deco Ensembles	Mumbai	66.34 ha	2018	A remarkable collection of 19th-century Victorian Neo-Gothic public buildings and 20th-century Art Deco buildings bordering the Oval Maidan, illustrating the architectural evolution of Mumbai.
7	Maratha Military Landscapes of India	Various Districts	-	2024/2025	An extraordinary network of strategically constructed historic forts (such as Raigad, Shivneri, and Pratapgad) that showcase the guerrilla warfare tactics and military architecture of the Maratha Empire.

MINERALS AND MINES OF MAHARASHTRA

Rashi Singhal
24/1221, B.Com. (Hons)

Maharashtra is one of India's leading mineral-producing states and plays an important role in the country's mining sector. The state is a major producer of manganese, limestone, bauxite, and coal, which support industries such as steel, cement, aluminium, and power generation. Coal mining is concentrated in the Nagpur, Chandrapur, and Yavatmal districts, while manganese deposits are mainly found in Nagpur and Bhandara. Limestone is extensively mined in Chandrapur, Yavatmal, and Nanded, supporting the state's large cement industry. Maharashtra also has deposits of iron ore, copper ore, dolomite, silica sand, and fluorite. Mining contributes significantly to the state's economy and employment but also poses environmental challenges such as deforestation, land degradation, and pollution, highlighting the need for sustainable mining practices.

Distribution of major minerals and their approximate share in India's reserves/production are:

- Manganese – 27%
- Fluorite – 20%
- Bauxite – 10%
- Limestone – 8%
- Coal – 7%
- Silica Sand – 6%
- Iron Ore – 5%
- Dolomite – 4%
- Copper Ore – 2%

Important minerals that occur in the state are: -

- **Manganese Ore:** Manganese ore deposits in Maharashtra occur at an arcuate belt that passes through Kandri-Mansar area of Nagpur district, which forms the middle portion of the belt- Dongri Budruk and Sitasaongi in Bhandara district. Maharashtra is one of the leading manganese ore producing state in India.
- **Coal:** The state of Maharashtra is endowed with large deposits of coal. Coal deposits in the state occurs in the areas of Nagpur, Chandrapur, Yavatmal and Wardha districts.

- **Limestone:** Extensive deposits of limestone occur in Yavatmal and Chandrapur districts of the State. Limestone is used for manufacturing cement, as flux in iron and steel industry and in the industries like paper, sugar, textile etc. The estimated reserves of limestone in the State are 1371.425 million tonnes.
- **Bauxite:** Bauxite is the chief ore of aluminium. It occurs as capping on the hills of Kolhapur, Ratnagiri, Raigad Satara and Thane districts. The total reserves of Bauxite in the state are estimated at 112.951 million tonnes. Bauxite produced in the state is utilised for manufacture of aluminium by the HINDALCO & other private entrepreneurs in the state.
- **Iron ore:** Iron ore occurrences in the state are confined to the districts of Gadchiroli, Chandrapur, Gondia and Sindhudurg. Out of the total estimated reserves of 260.824 million tonnes of iron ore, the Gadchiroli district alone accounts for 178 million tonnes, the rest 75.38 million tonnes being from areas of Sindhudurg & 2.18 million tonnes Chandrapur districts.
- **Dolomite:** Extensive deposits of dolomite occur in the districts of Chandrapur, Yavatmal and Nagpur. Some of the dolomite produced in the state is at present utilized as flux in the iron and steel industry, as dust in the coal mines and for manufacture of mosaic tiles, etc.
- **Copper:** Copper ore occurrences have been observed at Thanewasna, Dubarpeth in Chandrapur district, Pular-Parsodi, Ranbori-Kolar-Tambekhani, Ranmangli, Kitari, Thutanbori, etc. in Nagpur district.

AZADI KA AMRIT MAHOTSAV



PARAMPARA

Shivani

23/5447, B.A. Political Science (Hons.)

Dr. Vandana Shiva



[Picture Credit - <https://centerforneweconomics.org/people/vandana-shiva/>]

Dr. Vandana Shiva (born 5 Nov 1952) born in Dehradun, Uttarakhand is an Indian scholar, environmental activist, author and fierce advocate for sustainable agriculture. Widely recognised for her work in biodiversity conservation, food sovereignty and ecological sustainability, she is a leading global voice for environmentally responsible development. Her lifelong commitment to protecting indigenous knowledge and farmers right has earned her international recognition and the title “Gandhi of grain ”

Dr. Shiva's deep appreciation for nature was saved early on by her family. Her father worked as a forest conservator and her mother was a farmer growing up amidst the Himalayan forest inspired her lifelong dedication to the environment.

Environmental activism and impact: Dr Shiva core work explores the intersection of agriculture, ecology and social justice. She has driven change through the two major foundational pillars:

- **RFSTE (1982):** founded the research and science, technology and ecology to pioneer sustainable development and environmental protection.

- **Navdanya (1991):** launched this nationwide movement to conserve native seeds and promote organic farming. To protect biodiversity, Navdanya has established numerous seed banks across India helping farmers break away from a dependent on commercial monoculture.

Contribution and global legacy:

Dr. Vandana Shiva has written more than 20 books covering biodiversity, food security, genetic engineering, intellectual property rights and environment ethics. Her work also contributes significantly to the global eco feminist movement, emphasizing the distinct and powerful role women play in environmental conservation and food security. She also contributes towards policy making and help the government, international organisations, civil society groups on agriculture and ecological policy.

Global recognition:

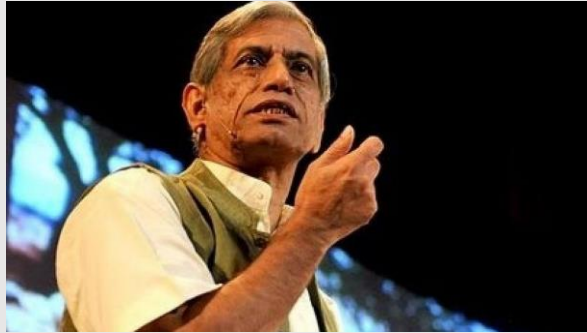
In recognition of her efforts to promote biodiversity and sustainable agriculture, she was honoured with various awards over times. Some of her awards include Right Livelihood Award 1993, Sydney Peace Prize in 2010, Dosh Bridgebuilder Award, Calgary Peace Prize, etc

Today, Dr. Vandana Shiva continuous to inspire grassroot environmental movement worldwide, championing traditional knowledge system, and shipping global conversation on the future of food security.

References

- <https://humansandnature.org/>
- <https://centerforneweconomics.org/>

Anupam Mishra



[Picture Credit - <https://www.indiawaterportal.org/>]

Anupam Mishra (1948 -2016) was a visionary Gandhian thinker, author, journalist and environmentalist who revolutionized how India perceives its traditional water systems. By blending rigorous field search with deep grass roots engagement, he proved that centuries old indigenous wisdom holds the key to solving the modern ecological crisis.

Reviving the wisdom of water

While the modern world leaned heavily on massive technological projects, Mishra looked to the ingenuity of the past. He travelled across the villages of Rajasthan, Madhya Pradesh, Maharashtra and Uttar Pradesh to document traditional rainwater harvesting structures like *Talaab* (Ponds and Tanks), stepwells and *Johads* (earthen check dams).

He championed the idea that local communities had already perfected sophisticated systems tailored to their unique climates. For Anupam Mishra, true sustainability relied on community ownership and respect for nature rather than large scale, top-down engineering.

Timeless literature for the public good

Anupam Mishra transformed his extensive field research into highly influential books that served as environmental textbooks for the nation. Some of his important contributions are :

- ***Aaj bhi khare Hain talab*** (ponds are still relevant 1993): An eight- year labour of love documenting how generations of Indians managed their water it was translated into multiple languages including braille.
- ***Rajasthan ki Rajat boondein*** (the radiant raindrops of Rajasthan): a profound look at how communities in one of the world's driest desert regions thrived through meticulous water management.

Chronicler of Chipko movement:

Anupam Mishra's ecological lens extended beyond water. In the 1970s alongside environmentalist Chandi Prasad Bhatt, he became one of the earliest chroniclers of the historic Chipko movement in the Himalayas. His writing brought crucial national concerns to the front lines of forest conservation, explicitly highlighting how local community especially women, were indispensable protecting nature from commercial greed.

Honors and global impact

Anupam Mishra's unique expertise resonated far beyond rural India, earning him immense national and international acclaim. Some of his important contributions and achievements are

The Global stage: In 2009 his TED talk, "The ancient ingenuity of water harvesting," introduced the global audience to the brilliance of India's traditional water management systems.

Prestigious Accolades: For his selfless service he was honoured with several of India's top environmental social awards including:

- *The Indira Gandhi Paryavaran Puraskar*
- *The Jamnalal Bajaj award*
- *The Amar Shaheed Chandrashekhar Azad National award*

Anupam Mishra lived exactly as he wrote with humility, simplicity and a quiet dedication to community driving solutions. Though he passed away in December 2016, his philosophy remains more relevant than ever. His life stands as a timeless blueprint proving that development and environmental responsibilities can beautifully coexist when guided by local participation and ancestral wisdom.

References

- <https://kalpavriksh.org/anupam-mishra-a-small-tribute/>
- <https://www.indiawaterportal.org/>

QUESTIONS FROM COMPETITIVE EXAMS

BASED ON ENVIRONMENT

Ayush Kumar

23/5416, B.A. (H) Political Science

स्रोत –Madhya Pradesh Public Service Commission (MPPSC) GS paper 1 (2025)

प्रश्न 1.) भारत वन स्थिति रिपोर्ट (ISFR) 2021 के अनुसार, मध्यप्रदेश के इनमें से कौन-से जिले में वन आवरण 10 प्रतिशत (जिले के भौगोलिक क्षेत्रफल का %) से कम है?

(A) अशोकनगर

(B) मुरैना

(C) भिण्ड

(D) गुना

सही उत्तर: (C) भिण्ड

प्रश्न 2. मार्च 2023 तक भारत में इनमें से कौन-से राज्य में सौर ऊर्जा की स्थापित क्षमता सर्वाधिक थी?

(A) तमिलनाडु

(B) गुजरात

(C) राजस्थान

(D) कर्नाटक

सही उत्तर: (C) राजस्थान

प्रश्न 3. इनमें से कौन-से चक्रवात ने नवम्बर-दिसंबर, 2024 में तमिलनाडु के तटीय भाग को प्रभावित किया था?

(A) असना

(B) दाना

(C) बिपरजॉय

(D) फेंगल

सही उत्तर: (D) फेंगल

प्रश्न 4. वर्ष 2024 में भारत में निम्नलिखित में से कौन-से परमाणु ऊर्जा केन्द्र की स्थापित क्षमता सर्वाधिक थी?

- (A) काकरापार
- (B) कैगा
- (C) कलपक्कम
- (D) कुडनकुलम

सही उत्तर: (D) कुडनकुलम

प्रश्न 5. मध्यप्रदेश में काली मिट्टी के संबंध में इनमें से कौन-सा कथन सही नहीं है?

- (A) यह दक्कन लावा के अपक्षय से निर्मित हुई है।
- (B) इस मिट्टी में नाइट्रोजन, फॉस्फोरस एवं जैव पदार्थों की मात्रा अधिक होती है।
- (C) इस मिट्टी में नमी धारण करने की क्षमता अधिक होती है।
- (D) यह मिट्टी मुख्यतः राज्य के पश्चिमी भागों में पाई जाती है।

सही उत्तर: (B) इस मिट्टी में नाइट्रोजन, फॉस्फोरस एवं जैव पदार्थों की मात्रा अधिक होती है।

प्रश्न 6. 2020 में SDG इंडिया इंडेक्स 3.0 में मध्यप्रदेश का समग्र SDG (सतत विकास लक्ष्य) स्कोर कितना था?

- (A) 56
- (B) 58
- (C) 60
- (D) 62

सही उत्तर: (D) 62

प्रश्न 7. राष्ट्रीय पृथ्वी विज्ञान अध्ययन केन्द्र (NCESS) किस राज्य में स्थित है?

- (A) आन्ध्र प्रदेश
- (B) केरल
- (C) तमिलनाडु
- (D) कर्नाटक

सही उत्तर: (B) केरल

***FLORA
FROM
THE
COLLEGE***

FLORA FROM THE COLLEGE: False Ashoka (देवदार)

Sagar Chaurasiya

24/1581, B.Sc. Mathematics (Hons.)



(Picture Credit: <https://greenverz.com/false-ashoka-tree/>)

False Ashoka (*Polyalthia longifolia*), commonly known as False Ashoka, Mast Tree, or Indian Mast Tree, is a tall evergreen ornamental tree widely planted in India. It is admired for its narrow, symmetrical shape and drooping green leaves, making it a popular choice for gardens, colleges, parks, and roadside plantations. Besides its ornamental value, the tree also helps reduce air pollution and noise while providing shade and improving the environment.

Botanical Profile

- Family – Annonaceae (Custard Apple family)
- Genus – *Polyalthia*
- Species – *Polyalthia longifolia*
- Height – 10–20 meters
- Leaves – Long, narrow, glossy green, evergreen, and drooping
- Fruits – Small, oval, purple to black when ripe
- Flowers – Small, greenish-yellow, fragrant
- Distribution – Native to the Indian subcontinent; widely cultivated in tropical and subtropical regions
- Bloom Season – February to April
- Origin – Indian Subcontinent

Nutritional profile - False Ashoka (*Polyalthia longifolia*) is an ornamental tree and is not a nutritional tree or used as a source of nutrition.

***VIHANG -
THE FLYING
VISITORS
TO THE
COLLEGE***

Purple Sunbird

Shivani

23/5447, B.A. Hons. Political Science



(Photo credit: <https://ebird.org>)

Scientific Name: *Cinnyris asiaticus*

Common name: Nectar-feeding bird

Hindi name: Shakkarkhora

Description: The purple sunbird (*Cinnyris asiaticus*) is a small, iridescent bird found in South Asia, known for the striking metallic blue and purple plumage of the male. Female are drabber with olive-green coloring. This species thrives in a variety of habitats including garden, forest, and scrublands. Purple sunbird feed mainly on nectar, but also consume insects and spiders. Their long, curved bills are well-adapted to their feeding habit.

Habitat: They are highly adaptable, inhabiting thin forest, scrublands, cultivated areas, and urban garden across South Asia

Food: it feed mainly on nectar, they also consume small insects, spiders, and occasionally berries to get protein.

Nest: Small, hanging, purse-shaped nests, often utilizing spider silk to bind vegetation, bark, and human-made waste (plastic or paper) together.

Breeding season: Before the monsoon, typically from April to June and in northern India.

IUCN status: Least concern

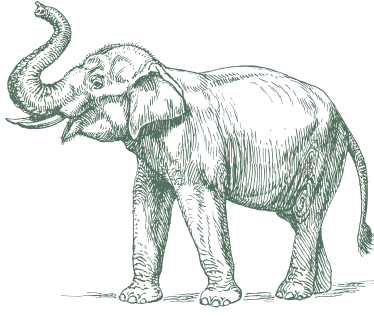
Reference:

- <https://ebird.org>, <https://animalia.bio>

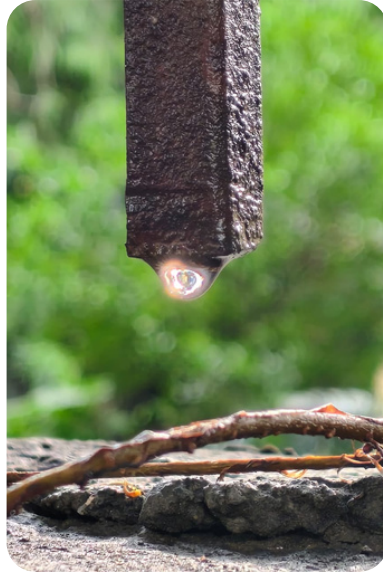
QUARTERLY REPORT

1. **Bird Watching at Okhla Bird Sanctuary:** Vihang – the birding club under Srishti – the Environment Society organized a bird-watching exercise at Okhla Bird Sanctuary on January 17, 2026. Students observed near 30 species of birds and recorded on e-bird app.
2. **Change Maker Award 2025-26:** National EduTrust of India awarded Change Maker Award 2025-26 to the college and college principal for incorporating sustainable initiatives.
3. **World Wetlands Day 2026:** nearly 15 student members of the environment society participated in an event organized by Yamuna Biodiversity Park on February 02, 2026 on the occasion of World Wetlands Day. Eminent speakers like Prof. C.R. Babu discussed about the importance of wetlands and aquatic ecosystem for the environment.
4. **Campus Bird Count 2026:** like every year, college participated in the Campus Bird Count, an international event organized for creating awareness about the avian diversity, on February 16, 2026. Student members of Vihang observed nearly 25 species of birds on the basis of physical recognition and their calls, within the college campus.
5. **Know the Bee Workshop:** Srishti – the environment society, Institution's Innovation Council (IIC) and Skill Innovation and Entrepreneurship Cell (SIEC) jointly organized 'Know the Bee Workshop' on Apiculture (Honey-bee Keeping) in collaboration with Golden Hive Foundation and Sunder Nursery Management Trust at Mughal Pavilion Sunder Nursery, New Delhi from 10:30 am onwards on February 23, 2026 (Monday). Mr. Rakesh Gupta, Chief Advisor, Golden Hive Foundation was the resource person of the event who gave insights and hands-on exposure about the beekeeping to produce honey at the individual and/or community level. Mr. Rakesh Gupta gave detailed descriptions about different types and species of honey bees, threats before the bee species due to climate change, anthropogenic activities, pollution, habitat loss etc., basic infrastructural requirement for the bee-keeping, developing green entrepreneurial skills for the bee-keeping and issues & challenges related with the apiculture. The participants were also informed about different types of honey produced in different seasons and tasted the same. Total fifteen students and faculty members (Dr. Mayank Pandey, Dr. Sonika Nagpal and Dr. Rimmi Jain) attended the workshop.

6. **Green Bharat 2-weeks Eco Challenge:** National EduTrust of India conducted two-weeks Eco Challenge competition for the college students. Thirty students of our college participated in the challenge and successfully completed day-wise challenge offered by the organizers from March 16 – March 31, 2026 and the final report was submitted with the organizers. Certificate of Appreciation was awarded to the college, college principal, nodal officer (Dr. Mayank Pandey), two coordinators (Dr. Sonika Nagpal and Dr. Jaipal) and thirty students. Environment Society and SIEC/IIC of the college participated in the competition.



CLICKER'S ZONE



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ART WORK



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