



# TEACHING ABOUT FORESTS IN THE LABORATORY OF THE REAL WORLD

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The middle-stage science curriculum introduces students to India's most iconic conservation models. What do students learn from rural stories about the real-world impacts of these models on ecosystems, wildlife, and forest-dependent communities?

In Chapter 2 ("Diversity in the Living World") of the Grade VI science textbook (NCERT, Reprint 2026-2027), students learn that: *"The population of the Bengal Tiger, Cheetah, and Great Indian Bustard has declined in India due to loss of natural habitats caused by human activities. The Government of India has initiated several projects to conserve our biodiversity. 'Project Tiger' was initiated in 1973 to protect the declining population of the Bengal Tiger. The 'Cheetah Reintroduction Project' was initiated in 2022 to restore the population of the Cheetah. Similarly, habitats of the Great Indian Bustard have been declared as Protected Areas in the states of Gujarat, Rajasthan, and Maharashtra."*<sup>1</sup>

During a discussion with middle-stage students, we were stopped mid-flow by a student who had seen ghost villages on a recent safari in a national park. *"It is good there are no people inside the park. The tiger population will increase and hunting will come down."*

This observation became an opportunity to examine the complex relationship between conservation and communities in the classroom.

## Exploring real-world rural stories

I start by sharing an overview of our forests: they cover a fifth of the country's land and are highly diverse in nature. Adivasi communities have lived in and around them for centuries, caring for and guarding the trees and animals that feature in their art and songs. I also share that an estimated one hundred million Indians depend on forests for minor forest produce (such as resins, flowers, fruits, leaves, and firewood) for their daily livelihoods.<sup>2</sup> With this context, we look at the examples in the textbook in more detail.

(a) **Project Tiger:** I start by confirming that tiger numbers are reported to be increasing across India.<sup>3</sup> While this increase is often linked to conservation models such as Project Tiger, I share an example from Vidarbha, in eastern Maharashtra, to illustrate how this plays out in the real world. Forests here, as in much of central India, are becoming increasingly fragmented due to development projects, including the construction of roads.<sup>4</sup> As the space available to tigers shrinks,

they spill out of protected areas into adjoining villages (see Fig. 1). As Nitin Desai of the Wildlife Protection Society of India explains: *"If there were 60 tigers in these regions then, there will be a 100 today in the same area. Where will they go? How will we manage a growing population of tigers in the same area? We don't have any plan."*<sup>4</sup> What effect does this have? Between 2010 and July 2018, about 330 people died in Maharashtra due to attacks by wildlife, mostly by tigers and leopards. Most of these incidents were reported around tiger reserves and sanctuaries in Vidarbha.<sup>4</sup> For example, in May 2018, three-year-old Vihan Kodwate and his father, Beersingh Kodwate, Gond Adivasis from Nagpur district, Maharashtra, were attacked by a tiger while travelling through a forested area near Pench Tiger Reserve. They were on their way to collect *tendu* leaves, which are dried and used for making *beedis*—a major source of summer livelihood in the forests of central India. Both father and son suffered serious injuries and were hospitalised for a week.<sup>4</sup> Sixty-five-year-old Babanrao Yeole, a member of the nomadic



**Fig. 1.** Tiger numbers in the Vidarbha region of Maharashtra have increased, but their habitats have shrunk. These animals spill out of protected areas into adjoining villages.

Credits: Davidvraju, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Tiger\\_chasing\\_a\\_wild\\_Pig.jpg](https://commons.wikimedia.org/wiki/File:Tiger_chasing_a_wild_Pig.jpg). License: [CC BY-SA 4.0 International Deed](https://creativecommons.org/licenses/by-sa/4.0/).

pastoralist Gowli (Nanda-Gawali) community that breeds the indigenous Gaolao cow, shares: *"But never ever in the past did we have such a tragedy, we had this practice of leaving a couple of male calves for the tigers..."*<sup>4</sup> Members of his community left their cattle to graze in the forest for nearly six months each year, from summer until after Diwali. The cattle were brought back to the village in winter, when fodder and water became available locally. *"There was a symbiotic relationship between us and the forests,"* Yeole says. *"It got broken when... [it] was declared a tiger reserve... We feel the forest and wildlife are no more part of our ecology."*<sup>4</sup> This discussion can be used to invite students to compare: **Success measured by counting tigers | Success measured by health of the forest for tigers and Adivasis.**

I also shared that India's Forest Rights Act (2006) protects the rights of forest-dependent communities, mandating that people cannot be evicted from forests unless there is evidence to show that their presence definitively harms wildlife and coexistence between people and tigers is impossible.<sup>5</sup> Yet, in 2008–2009, when Madhya Pradesh's Panna Tiger Reserve lost all its tigers, 12 villages were relocated to make space for tiger recovery. Among those displaced were the Raj Gond Adivasi families of Talgaon village, whose testimonies suggest their eviction bypassed legal protocols.<sup>5</sup> For example:

- Villagers say they were pressured to leave. As Deelan Kuandhar, now a daily wage labourer, shared: *"They [the forest department] harassed us every day. On some days, they would bring old tiger skins and threaten us that they will file a fake case against us for poaching tigers. I was even imprisoned once for a few days because they said I killed a sambar deer. One day, they brought elephants to destroy our homes. What else could we do after that?"*<sup>5</sup>
- Under Project Tiger, families being relocated should either receive money (10 lakh rupees per family) to arrange their own move or be properly resettled by the government. As Babulal Kuandhar, a resident of the village, shared: *"Some accepted the offer... in the beginning and left for*

*towns and cities. But without land, what use is the money for our survival outside the jungle? So, some of us refused."*<sup>5</sup> The 37 families who resisted relocation later moved to a hamlet called Sarathpura, about 16 kilometres away. They say they received only 8 lakh rupees per family.<sup>5</sup>

This relocation had serious impacts on Adivasi livelihoods that were closely tied to the forest ecosystem. For example, In Talgaon, Babulal's family grew *urad* (black gram) and maize on five acres of land and supplemented their income by harvesting seasonal forest produce. As Babulal's mother, Shobha, shares, *"We had everything in the forest before—tendu, mahua, chironji. In summer, we collected and sold them. But now the forest guards do not allow us to enter the forest, even to collect firewood."*<sup>5</sup> Cut off from access to the forest, Babulal is dependent on erratic daily wage labor at nearby farms or at construction sites in a nearby *tehsil*, earning just 200–250 rupees a day when work is available.<sup>5</sup> This discussion can be used to invite students to think about: **The rules for evicting a village from a forest | What a community loses when their link to the forest is broken.**

(b) **Cheetah Reintroduction Project:** Cheetahs are charismatic animals, and the arrival of the African species (*Acinonyx jubatus*) in Kuno National Park in Madhya Pradesh has been widely covered in the news (see Fig. 2). This is a developing story and can keep students engaged for months. I find that choosing a focus like the cheetah allows us, as teachers, to return to a theme repeatedly, building deeper engagement over time. I started by sharing how, more than two decades ago, around 1,600 families (predominantly from Sahariya Adivasi, Dalit, and OBC communities) were displaced from 24 villages in Kuno to accommodate lions from Gujarat's Gir forest.<sup>6</sup> Told their sacrifice served an 'important conservation cause,' they hastily abandoned ancestral homes, primary schools, hand pumps, wells, and land they had tilled for generations. Even cattle were abandoned, since they would be a burden to feed without the grazing resources of the forest. Displacement



**Fig. 2.** African cheetahs are being introduced in Kuno National Park, Madhya Pradesh. The forest-dwelling communities that lived here were displaced in 1999 to create a second home for lions from the Gir forest in Gujarat. Credits: PMO India, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Cheetah\\_In\\_India\\_2.jpg](https://commons.wikimedia.org/wiki/File:Cheetah_In_India_2.jpg). License: [CC BY-SA 4.0 International Deed](#).

also meant loss of access to the forest resources that sustained their livelihoods. As Kedar Adivasi, a 23-year-old teacher, expressed, *"All this kept us fed and clothed."*<sup>6</sup> Without these resources, many families found that farming alone could not sustain them. Some now migrate seasonally to nearby cities for construction labour and other work.<sup>6</sup> The lions did not come to Kuno. But 23 years later, the cheetahs arrived. At this point, I asked two students to come to the board and make a list: **Benefits of bringing Cheetahs to India | Sacrifices made and by whom.**

Most students' first responses focused on conservation needs: *"Forests should be left to animals only,"* and, *"yes, what to do, sometimes people have to sacrifice..."* I played a video of the displaced families speaking about the sacrifices they had made.<sup>7</sup> This changed the tone of the discussion. Students began asking about the land and livelihood options available to these communities. I contrasted their struggle with the money spent on transporting cheetahs from Africa on chartered planes. I also pointed out that for the chance to see one of these

animals, visitors to the park pay around 3,000 rupees for a single safari ride. This, I shared, was roughly the amount that a displaced forest-dweller earned from 10 days of daily wage work at a construction site in the area. Essentially, thousands were displaced for a 20-animal experiment accessible only to those who have sufficient money to view them.<sup>8</sup> Other teachers present in the session picked up on this theme. One of them asked the class to compare a zoo with a free-ranging jungle: *"Which one is about conservation and which one is for human viewing pleasure?"* she asked the children. Another teacher asked how many endangered animals they could name. This discussion led students to read documents such as the Wildlife Action Plan 2017–2031 and the Cheetah Annual Report.<sup>9, 10</sup> Based on their research, students compared: **Funding allocated to the relocation of nonnative species | Funding allocated to the conservation of threatened native species.**

(c) **Protection of the Great Indian Bustard's Habitat:** Once common across the grasslands of India and Pakistan, the Great Indian Bustard

(*Ardeotis nigriceps*) is now one of the world's rarest birds, with only 120–150 remaining in the wild. These birds are scattered across five states in small, isolated groups. For example, only 8–10 survive near the borders of Karnataka, Maharashtra, and Telangana, while just four females have been recorded in Gujarat. The largest population is found in the grasslands of western Rajasthan's Jaisalmer district, split between Pokaran and the Desert National Park (see Fig. 3).<sup>11</sup> Importantly, this bird is listed in India's Wildlife Action Plan as a *"highly threatened... priority species."*<sup>9</sup> To illustrate the threats facing this priority species, I share a story from Jaisalmer detailing how the grasslands vital for its survival are being rapidly used for large-scale solar and wind energy projects.<sup>11</sup> The associated infrastructure—specifically a massive web of high-tension power lines—has proven deadly. A 2018 Wildlife Institute of India study estimates that powerline collisions kill around 84,000 birds annually within a 4,200 sq. km area around the Desert National Park. This includes the heavy-bodied bustards, which frequently collide with these overhead high-tension wires. Radheshyam Bishnoi, a wildlife photographer and naturalist based in Pokaran *tehsil*, shares: *"If the electric shock on encountering the wires don't kill it, the fall usually does."*<sup>11</sup> Sumer Singh Bhati, a local environmentalist, shares: *"In my own lifetime I have seen these birds in flocks in the sky. Now I see the single bird, occasionally and rarely in flight."*<sup>11</sup>

The challenge is not only in the sky. On the ground, large tracts of grasslands and sacred groves—areas where even cutting a branch was traditionally forbidden—have been taken over by wind and solar farms. As a result, local pastoralists can no longer move freely across these lands to graze their livestock. Instead, they are forced to navigate around fences, windmills and other energy infrastructure.<sup>11</sup> Dhaneer, a 25-year-old who visits this protected area to collect grass for her four cows and five goats, says: *"If I leave in the morning, I get home only by evening. I get a shock from the wires sometimes..."*<sup>11</sup> In April 2021, the Supreme Court ordered that power lines in critical bustard habitats be moved underground wherever



**Fig. 3.** The largest population of Great Indian Bustards survive in the grasslands of western Rajasthan. The habitat of these highly threatened birds is used and protected by local communities.

Credits: SVKMBFLY, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Ardeotis\\_nigriceps,\\_Desert\\_National\\_Park,\\_Rajasthan,\\_India\\_1.jpg](https://commons.wikimedia.org/wiki/File:Ardeotis_nigriceps,_Desert_National_Park,_Rajasthan,_India_1.jpg). License: [CC BY-SA 4.0 International Deed](https://creativecommons.org/licenses/by-sa/4.0/).

possible. Until that happened, it mandated that bird diverters (reflective markers that help birds see the power lines) be placed on existing power lines. According to the order, 104 kilometers of power lines in Rajasthan would be put underground and 1,238 kilometers of lines would receive diverters. Yet, two years later, much of this work is pending. Scientists stress that proper execution of this order could have prevented many deaths.<sup>11</sup> As Radheshyam observes, losing the bird also hurts local agriculture: *"Godawan doesn't harm anyone. In fact, it eats small snakes, scorpions, small lizards and is beneficial for farmers."*<sup>11</sup> In class, we teach the science of climate change and the need for renewable technologies. But stories like this invite students to critically examine the real-world impact of our technology choices, prompting discussion on:

## Benefits of green energy for our cities | Costs for grasslands, birds, and local herders.

### Parting thoughts

In Chapter 12 ('How Nature Works in Harmony') of the Grade VIII science textbook (NCERT, Reprint 2026–2027), students read that: "... *biotic components and abiotic components of an ecosystem depend on each other and support various life processes. Humans also benefit from ecosystems. For example, forests provide fresh air, fertile soil, food, fibres, timber, and medicines... Ecosystems also offer aesthetic and recreational value. These support our well-being and shows how closely nature and humans are connected... An ecosystem stays in balance when interactions among organisms and their environment keep populations and resources stable. This balance is dynamic, not fixed, and can be disrupted by natural or human-made changes... Problems like deforestation, overuse of natural resources, the spread of invasive species, unsustainable land use, and pollution are damaging forests, rivers, scrublands, wetlands, grasslands, and coastal areas. How can we stop damaging forests, rivers, and wetlands? Think about what actions you and your community can take to protect these important places.*"<sup>12</sup> This chapter outlines the many threats to diverse ecosystems in the country and asks how we can protect them. In the classroom, we can approach this question in two ways: by focusing strictly on scientific processes, or by acknowledging that conservation involves competing needs and uneven outcomes for both the natural environment and human lives (see **Box 1**). When classrooms prioritize the transfer of textbook learning, they often sideline the social and ethical questions that must accompany scientific knowledge. Teaching science without its social context leaves students ill-equipped to navigate the complex realities of the real world. A greater risk is of nurturing a generation of young people who think more about personal achievement than about the well-being of others.

In a world of growing inequalities, education must extend beyond the petri dish of textbook

### Box 1. Curricular connections:

Planning classroom instruction around such explorations and discussions can help meet the following **curricular goal for middle-stage science: CG-5: [The student] understands the interface of Science, Technology, and Society.** Specifically, this lesson can help students develop the competency to:

- (C-5.1): "*Illustrate how Science and Technology can help to improve the quality of human life (health care, ... food security, mitigation of climate change, judicious consumption of resources...).*"
- (C-5.2): "*Share views on news and articles related to the impact that Science/Technology and society have on each other.*"<sup>13</sup>

information. We must reexamine what we teach and how we teach it, equipping students with the tools to question the application of science while also cultivating the ability to think and feel for others. One powerful way to bridge textbook knowledge with lived reality is by bringing rigorously researched journalistic stories, developed from public data, into the classroom. These narratives—often supported by photos and videos—breathe life into verified facts. Our experience shows that drawing students into such stories changes their perspectives. As one student reflected: "...*I realised how little I question what I see around me, and how important it is to change that.*" Another shared: "*I learned the importance of listening and being more aware of what is happening in my immediate surroundings.*"

Whether exploring species, habitats, or climate change, the science classroom offers multiple entry points to examine the socio-ecological impacts of conservation. These discussions help students trace how their everyday decisions impact people they may never meet, mapping the chain from conservation to displacement to who pays the price. Bringing these questions into the curriculum empowers teachers to nurture sensitive, empathetic students—young citizens who view science not merely as a collection of facts, but as a tool to contribute to a more just world.

## Key takeaways



- Middle-stage science textbooks introduce students to the importance of conserving forest ecosystems. But they do not adequately explore the impacts of conservation-related decisions on the lives and livelihoods of forest-dependent communities.
- Integrating journalistic stories about rural communities into classroom discussions on forests can help bridge the gap between textbook knowledge and real-world complexities. The most effective stories use public data, are rigorously researched, and present verified facts.
- Such stories reveal the competing needs and uneven consequences of decisions around ecosystem conservation. They can help students trace how conservation models and our everyday choices affect marginalised communities.

### Notes:

- (a) Credits for the image (Mahua season in Madhya Pradesh) used in the background of the article title: Nagarjun, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Mahua\\_collection.jpg](https://commons.wikimedia.org/wiki/File:Mahua_collection.jpg). License: [CC BY 2.0 Generic Deed](https://creativecommons.org/licenses/by/2.0/).
- (b) This article includes one classroom resource: **Critical Thinking Story: One Forest, Many Lives**.

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## DID YOU KNOW?

### MENSTRUAL HEALTH IS A CONSTITUTIONAL RIGHT

On January 30, 2026, the Supreme Court of India ruled: *"The right to life under Article 21 of the Constitution includes the right to menstrual health... The right to a healthy reproductive life embraces the right to access education and information about sexual health."*<sup>1</sup> In practical terms, schools are now mandated to provide gender-segregated toilets, access to sanitary products, and menstrual hygiene education to girls. The judgment goes further, recognizing that *"ignorance breeds insensitivity; knowledge breeds empathy."* It emphasizes the need to build awareness among boys, parents, and teachers: *"When menstruation is discussed openly in schools, it ceases to be a source of shame. It is recognized as what it is: a biological fact."*<sup>1,2</sup> The Court directed the NCERT and SCERTs to update curricula, particularly *"on menstruation, puberty, and other related health concerns... with a view to break stigma and taboo associated with menstrual health and hygiene."* This judgment raises many critical questions for us as teachers: How can our classrooms become safe spaces for open discussion on menstruation? What opportunities does the middle-stage science curriculum offer for discussing questions, fears, and misconceptions about adolescence and reproductive health? What capacities do we need to build in ourselves and our students to critically examine and address related social taboos?

Chapter 6 ('Adolescence: A Stage of Growth and Change') of the Grade VII science textbook (NCERT, Reprint 2026–27) introduces students to the physical, biological, and emotional changes during adolescence.<sup>3</sup> In our December 2025 issue, Anita Rawat shares how she adapted the ideas in this chapter to facilitate open discussions rooted in her students' contexts and life experiences.<sup>4</sup> She demonstrates how sensitive discussions on menstruation, when supported by student-friendly classroom resources, can go beyond building awareness about menstrual hygiene. They can also help build empathy among boys and encourage critical reflection on social taboos. Anita also draws our attention to what is critical for creating supportive classroom spaces for such discussions: teachers overcoming their own social conditioning and inhibitions. By approaching these discussions with care and confidence, we can help students live and learn with dignity and to their full capacity.

How are you bringing these conversations to life in your school? We invite you to share your experiences, strategies, and classroom stories with us.

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