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**VISION IAS**  
INSPIRING INNOVATION

# THE PLANET VISION

Navigating the  
Legal Maze: Policies Shaping  
Human-Wildlife Conflict  
**11**

Wildlife on the Move:  
How Eco-Friendly  
Infrastructure  
Can Help Animals  
Cross the Road  
**22**

**Clash of Worlds:  
Unveiling the  
Trajectory of  
Human-wildlife  
Conflict**

A staggering 8,873 wild animal  
attacks happened between  
2022-23 in India







# From the Editor's Desk

Dear readers,

Welcome to this edition of '**The Planet Vision**'. In this edition, we embark on a journey to explore the frontiers of human-wildlife coexistence. As habitats shrink and human populations expand, encounters between humans and wildlife become increasingly inevitable.

From the villages of Kerela to the residential suburbs of Mumbai, clashes between human populations and wildlife have significantly enhanced. This has led to detrimental consequences for both parties involved. It is common knowledge that the issue of human-wildlife conflict is a complex one. Hence, it becomes imperative that we understand these complexities and explore how the conflict intersects with all aspects of human existence.


In this edition, we will dive into the different dimensions, discussing how human-wildlife conflict is linked to climate change and policy-making, as well as the ethical fibre of our society. You'll not only find stories about how humans and animals sometimes clash, but also how we can find ways to live together peacefully.

As the guardians of this planet, it is our responsibility to strike a delicate balance between our needs and the preservation of biodiversity. We must never lose sight of the fact that every living thing has intrinsic worth. Our best hope for a future free of **human-wildlife conflict** is to identify and address the underlying causes of this conflict while simultaneously developing and implementing long-term solutions.

**Happy Learning.**

**Team VisionIAS**

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We welcome and encourage your feedback, suggestions, and queries. Your input is invaluable to us as we strive to enhance our content and better serve our readers. Please feel free to reach out to us via email at: [theplanet@visionias.in](mailto:theplanet@visionias.in). 



# INDEX



## 5 Cover Stories

- 5 Clash of Worlds: Unveiling the Trajectory of Human-wildlife Conflict
- 11 Navigating the Legal Maze: Policies Shaping Human-Wildlife Conflict
- 16 Nature's Out of Balance: Climate Change and the Rise of Human-Wildlife Conflict
- 19 The Ethical Tightrope: Human and Animal Rights in Conflict
- 22 Wildlife on the Move: How Eco-Friendly Infrastructure Can Help Animals Cross the Road

## 25 Briefings

- 25 India
- 28 Global

## 31 Environment and You

- 31 Ecotourism: A Solution or Just Another Tourist Pitfall?

## 38 Protect and Preserve

- 38 Bishnoi community: A Legacy of Protection
- 39 Project Elephant: Safeguarding India's Majestic Giants
- 39 Project Vanya Jeevan

## 42 Developments

- 42 Mysteries Unveiled: The Enigmatic Snow Leopard
- 44 IMD at 150: Pioneering Meteorological Excellence
- 46 COP14: Convention on the Conservation of Migratory Species of Wild Animals
- 48 Science to the Service of Society: Bridging the Gap between Discovery and Impact

## 51 Green Tech

- 51 5 Technologies for Coexistence: Harnessing Tech to Bridge the Human-Wildlife Gap

## 32 Snapshot

- 14 Majestic Elephants
- 36 The Green Menace: Understanding Congress Grass in India
- 40 Allen's rule

## 34 Global: Quick Hits

## 30 Comic Strip

## 54 Crossword

## 55 Quiz Zone





# Clash of Worlds: Unveiling the Trajectory of Human-wildlife Conflict

The expansion of human territories and the entry of wild animals into local communities depict the transforming nature of human-wildlife conflict in modern times.



A field ravaged by elephants and humans fighting to protect the crops shows a glimpse into the rising human-wildlife conflict

In a quiet, nighttime scene, the camera pans across a field ravaged by elephants. The rustling of leaves and the sound of breaking branches create an atmosphere of unseen destruction. This scene from *The Elephant Whisperers*, an Academy Award-nominated documentary short, offers a distressing glimpse into the rising encounter between man and wildlife in modern times.

Government data documented a staggering 8,873 wild animal attacks between 2022 and 23 in India alone. This number depicts the grim side of human-wildlife interaction, which negatively influences both humans and wildlife. But what exactly is human-wildlife conflict?

The International Union for Conservation of Nature (IUCN) describes human-wildlife conflict as conflicts that emerge when the presence or behaviour of wildlife poses a real or perceived, direct and

“ Government data documented a staggering 8,873 wild animal attacks happened between 2022-23 in India alone ”

recurring threat to human interests or needs. These threats then lead to disagreement and negativity arising between groups.

The story of these conflicts can be observed regularly in the headlines of newspapers. It can be seen in instances of wildlife animals such as tigers, elephants, boars and nilgai rampaging the agriculture farms and residential areas of Maharashtra, MP, Karnataka, Himachal Pradesh.

The situation is so grim in some areas of India that recently, the Kerala government declared the man-animal conflict a state-specific disaster. The decision followed rising deaths, injuries, and agricultural and property losses from seemingly uncontrollable wildlife invasions into human habitations. These frequent incidents raise a critical question: Why are we witnessing such an increase in human-wildlife conflict?





Human-wildlife conflict is a complex web of negotiations and contestations that unfold between humans and wildlife. Let's look at the major reasons behind this menace.

### When human and Wildlife Needs Collide

An International Union for Conservation of Nature (IUCN) report suggests that the conflict stems from the overlapping needs of space and resources between man and wildlife. Humans are expanding their territories due to the growing demand for food and territory. From expanding agricultural and urban settlements to the development of new infrastructure, humans are steadily encroaching upon wildlife habitats. The shrinking wildlife ranges are thus bringing wildlife closer to human settlements, which triggers a vicious cycle of conflict.

For instance, around 30,000 hectares of forest land in Kerala is being used to cultivate alien plants like acacia and eucalyptus. As a result, animals are losing their natural habitat and food sources. In this tussle of space and resources, climate change also amplifies conflict as it changes the temperature and rainfall patterns. This negatively impact the availability of food and water for animals in the forest.

These environmental shifts, in combination with human encroachment into forested areas, compel wild animals to search for food and shelter in human habitats.

### Beyond Protected Areas, No Escape

Protected Areas (PA) are at the core of conservation efforts in India. Currently, India has a total of 1022 protected areas. However, most of these areas are closely intersects with highways and roads, which increases the interaction between humans and wild animals. While these areas provide safe shelter for wildlife, they don't necessarily foster harmony between

humans and wildlife.



Wild bison strays in Pune's residential areas causing panic among residents

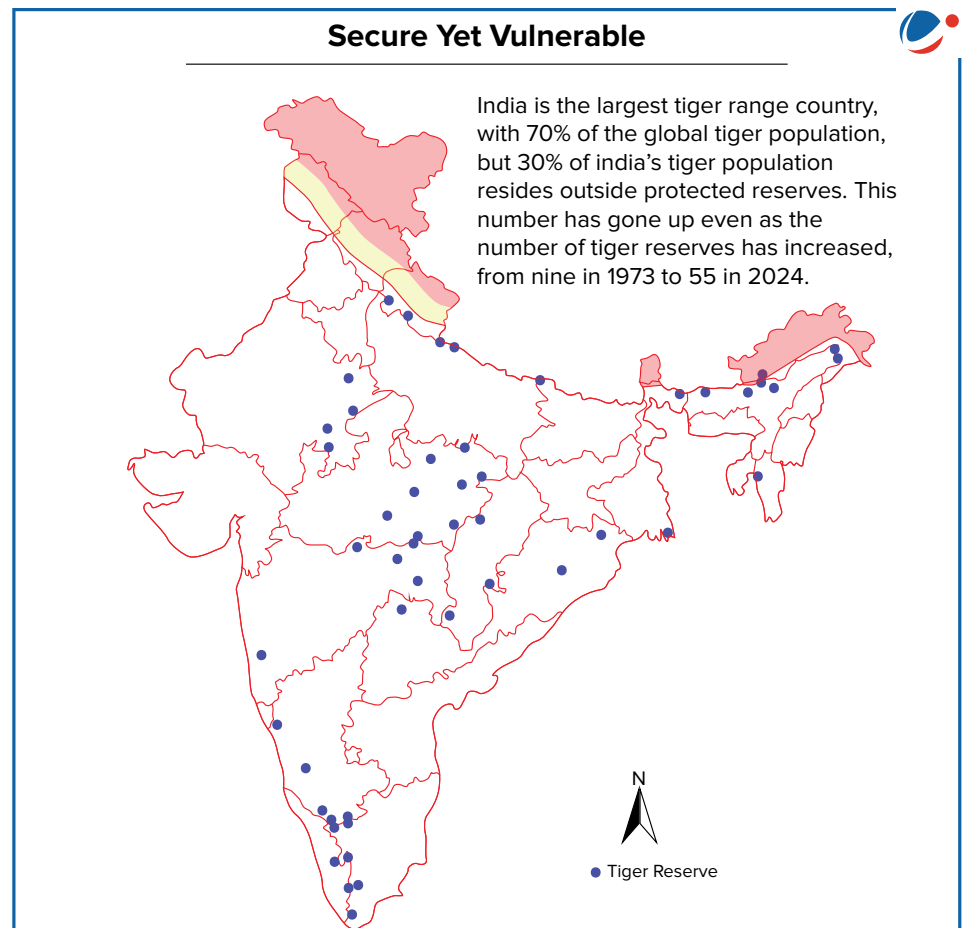
Wide-ranging species like tigers and lions have natural migration patterns beyond the designated areas. An adult tiger needs a large territory and a steady supply of prey to thrive. Such a territory may range anywhere between 60 square kilometres and 100 square kilometres. This renders the current extent of India's protected

areas insufficient to support their growing populations.

For instance, some experts say that the Sunderban tiger population may have reached its carrying capacity because of successful conservation efforts. This could have led to many animals moving to new areas and entering villages in search of prey (like livestock) or territory, creating panic among the villagers. These incidents highlight the challenges of protected areas for wide-ranging animals, showcasing the unintended consequences of successful conservation efforts.


### Human-induced Behavioural Change

Conflict, both in nature and frequency, is also greatly influenced by human-wildlife interactions. Tourists feeding wild animals during wildlife safaris or daily life leads to unexpected



There are not enough tiger reserves in India to keep up with the country's expanding tiger population.





The shrinking  
wildlife ranges  
bring wildlife to  
closer proximity to  
human settlements  
which triggers a  
vicious cycle of  
conflict



consequences. Processed food, which is frequently abandoned by tourists or carelessly thrown by residents into neighbouring forested regions, interferes with animals' scavenging instincts and discourages them from looking for food.

This dependence has made animals more aggressive towards humans, with monkeys and dogs becoming more assertive when food isn't provided. In Delhi, citizens feed black kites, believing it brings good luck. Such practices accompanied by city's inadequate waste management system subsidizes the diets of wild animals, bringing them closer to human settlements for easy meals.

The Wildlife Institute of India reports that maintaining a balance in the interactions between human actions and wildlife behaviour is crucial due to the multifaceted impacts of human-wildlife conflict on both humans and wildlife.

## Conflict's Many Faces

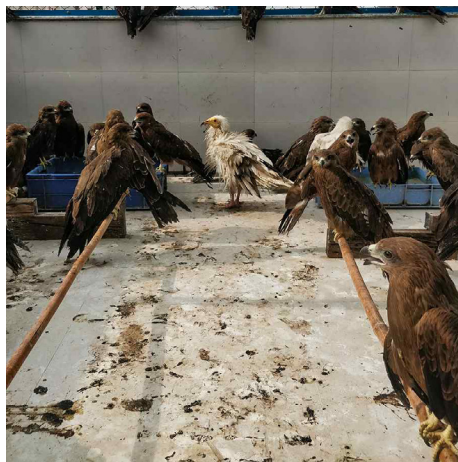
### *Ruined Reaps, Rising Toll*

Crop raids in Asia result in over 600 human deaths and 450 elephant deaths annually, with over 80% of such incidents occurring in India and Sri Lanka. These incidents not only threaten human life but also cost farmers millions of dollars in lost crops and significantly reduce farm productivity.

Research in Himachal Pradesh shows that farms can lose 16 to 24% of their output due to constant raids by wild animals. This highlights the heavy economic burden humans bear from increasing human-wildlife conflicts. Moreover, Smallholder and subsistence farmers often bear the brunt of these costs in such situations. It can be a persistent driver of local food insecurity in poor communities. In addition to the economic costs, human-wildlife conflict has serious consequences for welfare, safety, food security, health, education, and other development goals.

## **Paws and Pandemics**

Further complicating the issue is the close proximity between humans and wildlife which raises concerns about the transmission of diseases between species. 816 zoonotic diseases are lurking amongst animals, waiting for an opportunity to spill over to humans. Some of the deathly examples of



Citizens feeding Black Kites

zoonotic diseases are Ebola and Nipah which took millions of human lives. Studies highlight Zoonotic diseases emerging from wildlife reservoirs pose formidable challenges to public health and ecosystem stability.

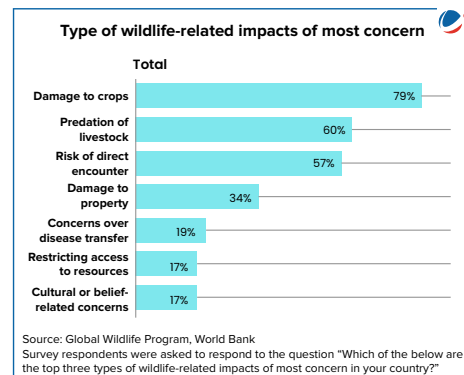
### **Growing antipathy towards wildlife**

Threatening encounters with wildlife have become a primary source of

“  
Research in Himachal Pradesh shows that farms can lose 16 to 24% of their output due to constant raids by wild animals  
”

rising tensions in human settlements near forested areas. Sensationalized media coverage also plays a role in escalating these anxieties. Villagers and farmers are in constant fear for their lives and the well-being of their livestock. This fear throws a damper on conservation efforts, with

locals resorting to retaliatory killings of predators. In a recent skirmish

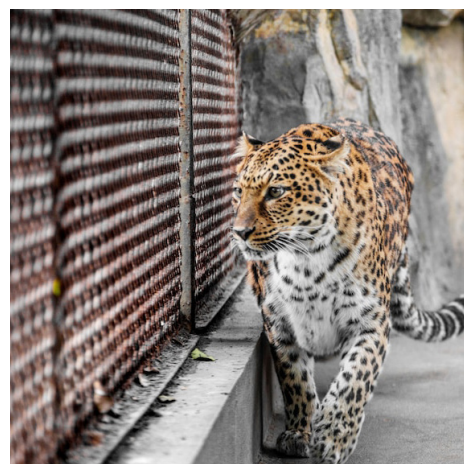


in Wayanad, when a wild elephant trampled a man to death, locals demanded the capture and killing of elephant. Such demands overlook safer alternatives, such as relocation into natural habitats, a solution that promotes human safety while protecting wildlife.

With fear and anxiety becoming pervasive in communities, peaceful coexistence becomes even more difficult. This also depicts the multiple dimensions related to human-wildlife conflict highlighting the need for dynamic mitigation strategies and regulations for this rising conflict.

## **From Respect to Regulations**

With the rising instances of human-wildlife conflicts, policies and acts in India have also undergone significant changes. India's National Wildlife



Leopard sightings are becoming common in several of India's residential areas



Action Plan (NWAP) 2017-31 proposes strategies to mitigate conflicts, such as incorporating traditional wisdom, conducting nationwide surveys on wildlife-human conflict, and providing training for forest department staff.

In addition, Union Minister for Environment, Forest and Climate Change Shri Bhupender Yadav, released 14 comprehensive Human-wildlife conflict mitigation guidelines, marking a significant milestone in 2023. These guidelines focus on prevention, like creating water and food sources within forests and empowering local communities (Gram Panchayats) to manage wildlife. It also proposes adoption of a “One Health” approach that recognizes the interconnectedness of human, animal, and environmental health. This holistic approach, developed with diverse stakeholders, ensures the guidelines remain relevant and adaptable.

The Ministry has also issued an advisory to all states for managing human-animal conflict. In accordance with the Wild Life (Protection) Act, 1972, it proposes empowering gram panchayats to deal with troublesome wild animals.

It also suggests that the Pradhan Mantri Fasal Bima Yojna provide additional coverage for crop compensation in the event that crops are damaged by wild animals. Further,



National Wildlife Action Plan (NWAP)  
Source: People's Archive of Rural India

the need to enhance forest-based fodder and water sources, implement early warning systems, and erect barriers is also emphasised.

With the help of the Centrally Sponsored Schemes “Development of Wildlife Habitats,” “Project Tiger,” and “Project Elephant,” the government of India also pays the state and union territory governments to oversee wildlife and their habitats.

To keep wild animals out of crop fields, these programmes fund projects that build or install physical barriers like barbed wire fences, electric fences powered by solar panels, bio-fences made of cacti and boundary walls.

At the global level, human-wildlife conflict makes appearance, in the updated ‘Kunming-Montreal Global Biodiversity Framework (KMGBF)’ of the Convention on Biological Diversity

“  
**Shri Bhupender Yadav  
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milestone in 2023**  
”

(CBD). Target 4 of the new framework states the need to effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence. However, given the potential impact of conflict on livelihoods and the hinderance of conservation initiatives, we need to devise more creative solutions.

### Future Pathway towards man-wildlife harmony

Some such solutions have emerged across the globe, few customised for particular species, while others with more universal uses. Strobe lights, for example, are employed to deter nighttime animals by emitting random flashes of light, resembling a farmer using a torch.

In Maharashtra and West Bengal villages, villagers have successfully prevented tiger attacks by leveraging their understanding of big cat behaviour. Tigers are known for their stealthy hunting tactics, which has led forest workers to take creative measures to protect themselves from surprise attacks.

Villagers wear masks with images similar to human faces printed on them at the back of their heads to



Use of fences to prevent wild animals from invading agricultural field.

prevent the chance of a tiger attack. This depicts the significance of innovative and local-level initiatives to reduce human-wildlife conflict.

In Himachal Pradesh, there is an insurance scheme that offsets economic losses from livestock depredation. It provides financial



Villagers wearing marks on the back of their heads to prevent tigers from attacking them

incentives to adopt anti-predatory herding methods, along with a conservation education programme, has successfully enhanced attitudes towards predators and halted their persecution. These initiatives have achieved success in easing tensions





Insurance scheme that offsets economic losses from livestock depredation and provides financial incentives to adopt anti-predatory herding methods



between herders and snow leopards and reducing the human-wildlife conflict in that area.

Wildlife corridors at the local level have become another alternative to address the human-wildlife conflict among communities. Local communities are showcasing innovative solutions customised to their specific needs. For instance,

villagers in Kerela and Karnataka are planting indigenous trees to establish shaded pathways for elephants, safely leading them away from croplands. These initiatives driven by local communities often achieve the most success by safeguarding wildlife and fostering a sense of ownership.

In addition, forest authorities are actively using mapping with GPS tracking collars for pinpointing hotspots and efficiently allocating resources to prevent conflicts. The example highlights how conflict-mitigation programmes can be supported by scientific evidence and tailored to individual species and regions in order to reduce harm to both humans and animals.

By promoting comprehension, welcoming creative solutions, and implementing ethical practices, we



Plantation of Indigenous trees can provide a shaded pathway for elephants

can establish a world where humans and wildlife can coexist on this planet without compromising livelihoods or conservation endeavours. Keep in mind that patience and respect are essential for reaching this common goal.



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**“Achieving a harmonious relationship between man and wildlife requires a multifaceted approach that integrates technology, policy reforms, community engagement, and innovation. By embracing these solutions and working together towards a common goal, we can create a future where both man and wildlife thrive in balance with nature.”**

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# Navigating the Legal Maze: Policies Shaping Human-Wildlife Conflict



Whether deliberate or unintended, laws and policies affect the dynamics between animals and humans.

Imagine a pride of lions stalking a herd of Chital near a village. The hunt is successful, but the lions then turn their attention to a nearby cattle enclosure. Lions versus livestock – a classic Human-Wildlife conflict (HWC). But this isn't just about nature. Laws protecting lions and policies on land use can inflame tensions or offer solutions.

While habitat loss and climate change are undeniable drivers of HWC, the legal and policy frameworks governing human-wildlife interaction also play a significant role. In some cases, well-intentioned policies can inadvertently create situations that exacerbate conflict. Let's discuss how specific legal and policy approaches can contribute to a rise in incidents of HWC.

## Genesis of Conflict: Land-use policies

HWC often finds its roots in human activities encroaching on wildlife habitats. Legal frameworks aimed at promoting economic development and infrastructure expansion frequently facilitate this encroachment through land-use policies and development projects. Forests are cleared for agriculture, roads dissect natural habitats, and urban sprawl penetrates into formerly wild spaces, fragmenting ecosystems and disrupting wildlife migration routes.

While these developments may be legally sanctioned and economically beneficial in the short term, they can have profound consequences for wildlife populations.

Fragmented habitats not only reduce available space for wildlife but also increase the likelihood of human-wildlife encounters as animals are forced to navigate through human-dominated landscapes in search of food, water, and shelter.

Traditionally, communities coexisted with wildlife by adapting their practices. Nomadic lifestyles, for instance, minimized competition for resources. However, policies promoting settled agriculture often disrupt these age-old patterns. Imagine a community that previously coexisted with migratory elephants by planting crops outside their path. A shift to a fixed agricultural system can inadvertently place farms right in the elephant's way, leading to crop raiding and retaliatory killings.

Protected areas are often hailed as bastions of conservation, safeguarding biodiversity and providing refuge for endangered species. However, the establishment of protected areas can also contribute to HWC, particularly in regions where local communities depend on natural resources for their livelihoods.

“Well-intentioned policies can inadvertently create situations that exacerbate conflict”



## Paradox of Protection: Wildlife Conservation and Conflict

Land designation for protected areas can also be a double-edged sword. While these sanctuaries are crucial for wildlife conservation, they often create “islands of wilderness” within a sea of human activity. Wildlife populations, restricted to these protected zones, can become concentrated, exceeding the carrying capacity of the land. This forces animals to venture outside in search of food and water, bringing them into conflict with human settlements bordering the protected areas.



Protected areas are vital for conservation but may lead to Human - Wildlife conflict due to resource restrictions, potentially exacerbating illegal activities.



Legal frameworks governing protected areas can restrict access to traditional hunting grounds, grazing lands, and water sources. This may exacerbate tensions between conservation authorities and local communities. Displacement from these areas can lead to resentment towards wildlife and fuel illegal activities such as poaching and habitat destruction as communities seek alternative means of livelihood. An example of this is Critical Tiger Habitat (CTH) identified under the Wild Life Protection Act of 1972. An order by the National Tiger Conservation Authority (NTCA) restricted the forest rights of Scheduled Tribes and other forest-dwelling communities in CTHs. Further, people in these areas are also required to relocate voluntarily. Such restrictions have the potential to create resentment among forest-dwelling communities.



Integrated land-use planning to address wildlife habitat fragmentation and provisioning of flexible protected areas can help minimize HWC.



Hunting regulations, too, play a complex role. Blanket bans on hunting, while aimed at protecting endangered species, can have unintended consequences. Unchecked by natural means, predator populations can rise dramatically. This can lead to increased predation on livestock, threatening livelihoods and inciting retaliation from communities facing economic hardship.



Blanket hunting bans protect endangered species but can lead to retaliation in impoverished communities.

## Policy-making and Bureaucratic inertia

Sometimes, policies that are intended to combat HWC can actually make the problem worse. Top-down policies, imposed without considering local needs and perspectives further exacerbate resentment among local communities. In cases where communities bear the brunt of HWC without a say in its management, they are less likely to cooperate and more likely to resort to retaliatory killings of ‘problem’ animals.

Compensation schemes aimed at reimbursing individuals for losses incurred due to wildlife depredation are a common tool used to mitigate HWC. However, bureaucratic inefficiencies can undermine the effectiveness of these schemes. Delays in processing compensation claims, arbitrary eligibility criteria, and inadequate funding allocations often leave affected individuals feeling frustrated and marginalized.

So, what can be done? The answer lies in a multi-pronged approach that acknowledges the limitations of existing policy and legal frameworks.

## Land-use planning

Wildlife corridors should be integrated into development plans and infrastructure development to address habitat fragmentation. For instance, ‘Animal Bridges and Passes’ constructed on the recently inaugurated Delhi-Mumbai Expressway. This, however, requires collaboration between conservationists, policymakers, and local communities.

## Flexible protected areas

Buffer zones with controlled human activities can act as transitions between protected areas and human settlements, allowing wildlife movement while minimizing conflict. For example, a predator management policy in Kenya drawn up at the request of the Kenya Wildlife Service recommended a zoning system. Such systems are designed to manage interaction with large carnivores outside protected areas, while seeking to reduce the negative consequences on people and their livelihoods. The proposal divides the district into three zones - predator conservation, predator management and predator control







'Animal' Bridge on Delhi-Mumbai Expressway [Representative image]

- each of which would apply mitigation tactics reflecting a level of tolerance appropriate for that zone.

### Sustainable agricultural practices

Agricultural practices should prioritize wildlife-friendly land management strategies that minimize conflict and promote coexistence. Implementing non-harmful barriers such as fencing, scare devices, and crop protection measures can deter wildlife from entering agricultural fields. Similarly, Integrated Pest Management (IPM) techniques which promote natural predators and enhance biodiversity on farms, not only improves agricultural productivity but also creates healthier ecosystems that support wildlife populations.

### Community engagement and Economic incentives

Active participation of local communities in wildlife management is essential. This can involve training programs on deterrents and coexistence strategies, as well as ensuring swift and fair compensation for livestock depredation. Developing alternative livelihoods for communities can further lessen dependence on resources that directly compete with wildlife. Investing in ecotourism ventures, creating markets for sustainably sourced wildlife products, and promoting wildlife-friendly agriculture can provide economic opportunities while fostering conservation.

Whether they are directly or indirectly related to the human-wildlife interface, the absence of appropriate laws and policies or the implementation of improper laws and policies can have a negative impact on human health and livelihoods, as well as the conservation of wildlife and their environment.

Lawmakers and policy-makers have the power to influence development and land-use planning procedures, as well as to enable locals to take action for conservation. In order to avoid and lessen HWC, they should create the necessary laws and regulations pertaining to hunting, tourism, human settlement, and other related activities to prevent and mitigate HWC.

**The institutional influence of laws and policies not just lend legitimacy, authority, and coercive force, but can also help shape and redefine the attitude, belief and, behavior of people and society towards wildlife. By fostering a sense of shared responsibility for the well-being of both wildlife and human communities, they can pave way for a peaceful and productive future where humans and wildlife can coexist.**





# Majestic Elephants

The national heritage animal of India, the majestic 'Asian elephant,' is under threat as human-animal conflicts intensify. The loss of their traditional foraging areas has brought wild elephants closer to people's homes, which has led to these conflicts.

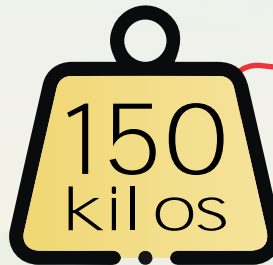


## Female leaders!

Asian elephants are extremely social. They live in groups of 6-7 related females with their kids, that are led by the oldest female, the matriarch.

## Do you know?

Interestingly! The world's largest animal, Elephant, communicate in a variety of ways - including sounds like trumpet calls, body language, touch and scent, seismic signals.



The amount of plant material that an Asian elephant can eat in a single day.

## Amazingly! Their tusks are actually teeth

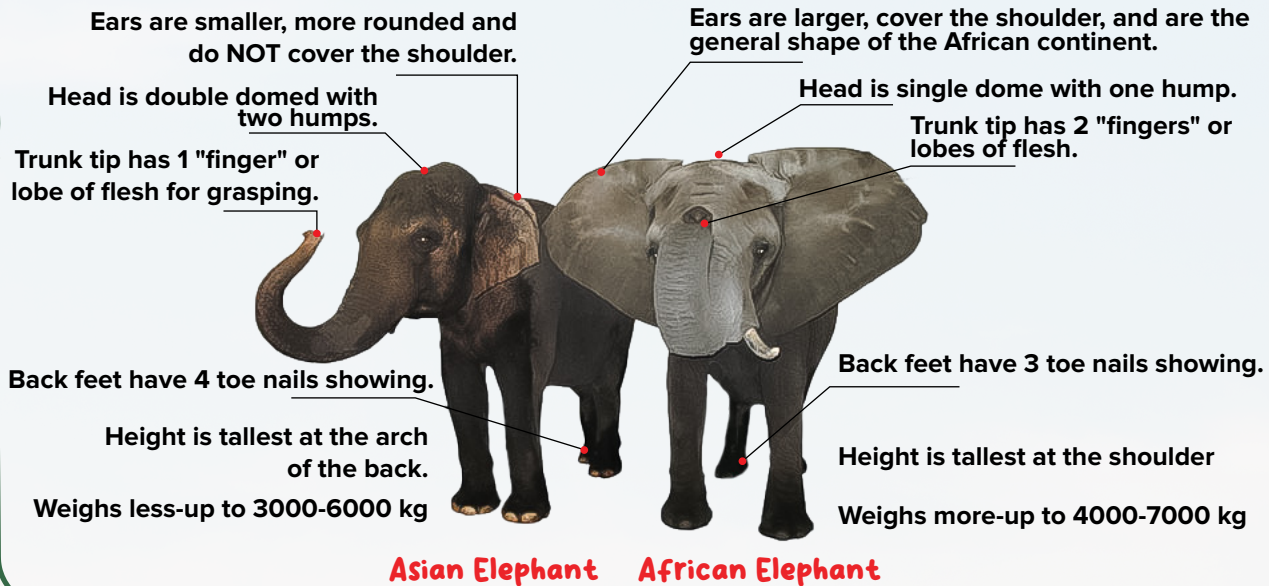
The tusks of elephants are more than simply an ornament. These are larger incisor teeth that appear when they are just 2 years old and continue to develop for their entire life span.

These tusks can be used as a powerful weapon in combat or to help with feeding by ripping bark from trees.





## Spot the difference



Not only this, they are of huge cultural significance

Belief	Role of Elephant
<b>Hinduism</b>	Representing loyalty, power, wisdom, and fertility
<b>Budhism</b>	Queen Maya's dream of White Elephant
<b>Jainism</b>	Symbol of Ajitanath, the Second Jain Tirthankara
<b>Islam</b>	The year of the elephant is called "am al-fil" in Arabic, it's around 570–571 CE. In that year the Prophet, Muhammad was born.

## Footprints of Elephant across India's history

You will be amazed to know that Elephant since ancient times has its own place in the history of India. Let's take a look at some historical depiction!

On walls of Bhimbetka Caves



On seals and as miniature toys in Indus Valley Civilization



In sculptures of Pallava period





# Nature's Out of Balance: Climate Change and the Rise of Human-Wildlife Conflict



Is the threat of climate change driving a wedge between animals and humans?

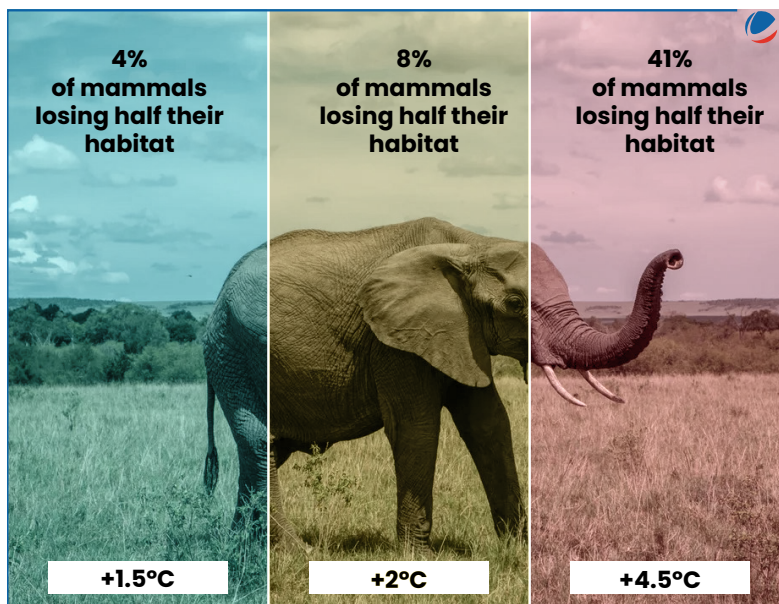
As the Earth's climate continues to undergo unprecedented changes, the repercussions are felt far and wide. Among this chaos, one result stands out but remains hidden in its complexities: human-wildlife conflict. It must be difficult to imagine how a global phenomenon like climate change can be the cause of this very specific issue. However, several studies have indicated a connection between rising human-wildlife conflict and climate change. In this article, we will try to uncover how climate change and human-wildlife conflict are connected.

## Habitat fragmentation and loss

India boasts a robust network of protected areas encompassing National Parks, Wildlife Sanctuaries, Tiger Reserves, and Conservation Reserves. However, climate change can intensify existing threats to these areas, such as habitat fragmentation. Extreme weather events like raging wildfires, intense floods, and prolonged droughts can degrade forest cover and create isolated pockets of habitat unsuitable for wildlife. According to the Intergovernmental Panel on Climate Change, 4% of animals are expected to lose more than half of their climatic habitat because of climate change.

Adverse changes in the habitat can push animals

outside their usual homes, leading to increased conflict with human settlements. For example, in Kaziranga National Park in Assam, floods in the Brahmaputra River are already held responsible for an increase in conflicts. Animals are forced to move to the highlands to seek safety, leading to an increased human-wildlife encounter.



The difference between 1.5°C & 4.5°C global warming means vastly different scenarios for our future





## Impact on Food Availability

Altered weather patterns can also affect food availability. For instance, warmer temperatures can lead to earlier springs, causing some plant species to flower and fruit earlier. This can disrupt the sync between the emergence of prey and predator hunting cycles. Prey animals might emerge earlier, leaving predators with less food available during their peak breeding season. Moreover, Climate change also changes ecosystems in ways that favor the spread of invasive species. Warmer temperatures or changes in rain patterns might create suitable habitats for invasive plants or animals that weren't present before. These invasive species while competing with native species for resources, can impact food availability for wildlife.

In these scenarios, animals are more likely to venture out to human settlements looking for food. In India, for instance, long-term climate change has decreased the availability of favored vegetation for blue sheep, also known as Bharal. As a result, these animals have shifted to lower elevations to graze on crops cultivated by humans. Their movement has also attracted snow leopards, leading to additional problems.

## Changes in animal behavior

Climate change can also disrupt the environmental cues that animals rely on to solve problems, leading to behavioral changes. It could interrupt biological cycles like hibernation and migration. For example, in Jammu and Kashmir, climate change has potentially led to an increase in snake encounters. Snakes' hibernation period turned shorter due to the excessive heat and the lack of rainfall, forcing them to come out of their burrows.

“ Climate change can disrupt the environmental cues that animals rely on to solve problems ”

## Increased dependence on forest resources

Animal conduct isn't the only thing that climate change is altering. Crop production is also being adversely affected by unpredictable weather patterns. Forest resources are becoming more and more important for farmers and forest communities in such situations. An increase in human-wildlife conflicts becomes an unintended outcome of the growing dependence on forests as a source of food and fuelwood.

Even though more evidence is needed to fully understand the effects of climate change, it is clear that it is changing the lives of animals and how they interact with humans. In



The early arrival of summer due to climate change has resulted in a spurt of snake sightings in Jammu and Kashmir.

light of this complexity, what steps should we take to find a solution?

## Addressing the complex interplay

Recently, the Convention on Biological Diversity also addressed the relationship between biological diversity and climate change. The convention recognized the importance of integrating biodiversity considerations into climate change mitigation and adaptation strategies, including managing human-wildlife conflict. Hence it is clear that plans to reduce conflicts between people and animals can be more successful if it takes climate change into account.

To begin with, Protected area management plans should consider the impact of climate change on wildlife behavior and habitat suitability. Governments can play a proactive role by planning for extreme weather events that bring humans and wildlife into closer contact. For example, Botswana has implemented a “dry day” fund, a novel approach that compensates herders and ranchers for livestock lost to wildlife during droughts. In exchange, these communities pledge to avoid retaliatory killings of wildlife, fostering a sense of shared responsibility.



Children playing with Bison



Further, additional research is needed to establish a strong connection between climate change and human-wildlife conflict. Such research could support allocating a portion of loss and damage payments to affected nations for local management and compensation of such conflicts. Payments made to traditional communities affected by climate-stressed animals could have immediate positive impacts on local livelihoods and biodiversity.

Last but not least, we need to take urgent action to combat climate change. Countries should come together and raise their ambition at all levels. Mitigation strategies like restoring natural habitats and reducing deforestation can help combat climate change and provide long-term, secure homes for precious wildlife. ■■

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**The silent war between humans and wildlife is escalating due to climate change, disrupting ecosystems and pushing animals into human territories. Understanding the link between climate change and conflicts is crucial for developing effective solutions.**

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# The Ethical Tightrope: Human and Animal Rights in Conflict



The discourse surrounding human rights and animal rights often intersects, prompting debates about where the boundaries lie

**A**ssume you are a police officer patrolling a village. You received a call about an emergency nearby, specifically a leopard attack on villagers. When you arrive, you notice a scuffle between the villagers and the leopard. Villagers are running around, trying to trap the leopard, while it is attacking villagers and destroying their property.

You called the Forest Department and other officials, but they will take about a half hour to arrive. You tried your best to drive the leopard away using loud music. While you were successful in getting the leopard away from the village, a young girl suddenly came in the way. You had the gun provided by the department. Will you use your gun in defence of the girl child? Whose rights matter more: the girl's or the leopard's?



**Animals should be considered morally defensible due to their capacity to feel sensations and emotions, including pain.**



In a just moral framework, what rights do you think non-human animals have? Because of their peripheral position in our moral framework, we sometimes accord these

creatures high moral status, while other times, we refuse to acknowledge their existence.

## The ethical dilemma: Animal ethics



A moral dilemma arises when you must choose between your farm and a wild animal

To answer these questions, let's delve into the philosophical field known as "animal ethics". It examines the inherent value of nonhuman creatures. What qualifies an animal for moral consideration is a question that has occupied ethicists for quite some time. In 1780, philosopher Jeremy Bentham initially put forward the idea that animals should be considered morally defensible due to their capacity to feel sensations and emotions, including pain. But in





the case of human-wildlife conflicts, the moral dilemma becomes more complex.

Several stakeholders have critical roles in addressing man-animal conflict and ensuring animal and human welfare. Collaboration among these stakeholders is critical for implementing comprehensive strategies that prioritize both animal welfare and public safety. So, first let's discuss the varied role they play.

### Identifying the stakeholders

Animal welfare organizations and activists are at the forefront, providing animals with shelter, food, and medical care, as well as assisting with rescue, rehabilitation, and rehoming. They also advocate for humane treatment and promote responsible behavior in case of conflict through educational programs.

Farmers are also important stakeholders, responsible for protecting their crops and their lives. At the ground level, they are also expected to participate in conservation efforts. Further, local governments are responsible for controlling conflict and providing healthcare facilities in case of injuries to humans or animals, thereby protecting public health.

At the governmental level, policies and legislation are developed to address animal control issues, with standard operating procedures developed to manage conflict systematically.

Now that we've understood the roles of different stakeholders, we need to take a closer look at different viewpoints.

### Perspective on Animal Rights

Different perspectives provide insight into our relationship with animals and how to navigate ethical dilemmas involving both human and animal needs. An end to the exploitation of animals in industries like food production, research, and transportation is advocated for by the inherent rights of animals perspective. It is asserted that animals possess intrinsic value independent of human

needs.

On the other hand, according to utilitarianism, human interests take precedence over animal welfare. This means that actions that hurt animals in the short term can be justified in the long run if they benefit humans or other animals.

According to the relational perspective, our responsibilities towards animals can differ according to the depth of our emotional attachments to them. Since our relationships with pets and wild animals are distinct, our duties to the former may vary from those to the latter. Our moral responsibilities to the natural environment are illuminated by each of these viewpoints. They add to the ongoing discussion of how to ethically handle man-animal conflict.

### India's Approach to Animal Rights

The Indian stance on animal rights is based on a set of principles that have been adapted to the country's specific cultural and legal environment. According to Article 51-A of the Indian Constitution, it is the fundamental duty of every citizen to treat all forms of life with kindness and compassion. Article 48-A states that the government must protect the environment and its inhabitants from harm.

India is also dedicated to protecting animal rights and welfare through its legislative frameworks and judicial pronouncements. In 2014, the Supreme Court made history by ruling that animals also have the right to life under Article 21, establishing that all living beings have inherent value and the ability to live with respect and dignity.



According to Article 51-A of the Indian Constitution, it is the fundamental duty of every citizen to treat all forms of life with kindness and compassion



Moreover, to protect wild animals legally, India has passed extensive laws. Animals are protected from needless suffering by the Prevention of Cruelty to Animals Act of





1960 and by the Wildlife (Protection) Act of 1972. The killing, trapping, or hurting of wild birds and animals is prohibited under these regulations to varying degrees.

As the world's population continues to grow, human-wildlife conflicts are inevitable. However, these conflicts can be mitigated through long-term planning, integrated strategies, and effective management.

### **Coexistence as the future**

International collaboration, coordinated efforts, and adequate funding are necessary to tackle the issue

on the necessary scale. We also need to reevaluate the connection, and particularly the direct encounters, between humans and wildlife. This is necessary if we hope to live in harmony with them in the future and reduce the frequency of confrontations between the two. With impacted communities as full and equal partners, we must develop systemic, context-specific solutions to conflicts by first identifying and then addressing their fundamental causes.



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**Humans are widely regarded as having a moral obligation to care for animals because they rely on one another for survival and have coexisted for ages. Thus, a balanced framework is required to fulfil human requirements while also maintaining animal welfare.**

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# Wildlife on the Move: How Eco-Friendly Infrastructure Can Help Animals Cross the Road



*Source: MoEF Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife*

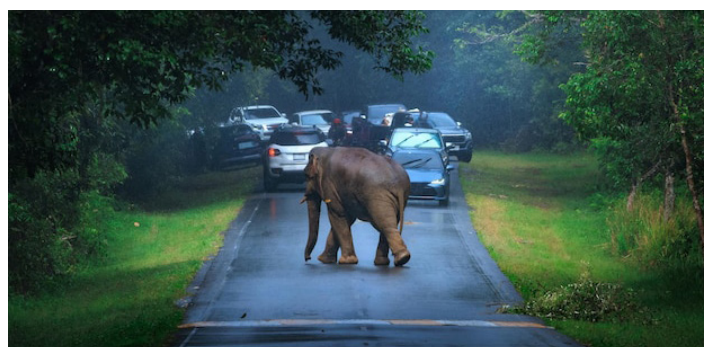
Heartbreaking photographs of wild animals killed or dying on Indian roadways and railway lines have become a common sight on social media. These photos depict the harsh reality of the country's rising infrastructure and its devastating effects on wildlife. Accidents that occur due to human-built linear infrastructure are a facet of human-wildlife conflict that is rarely discussed. When we talk about linear infrastructure, we are referring to projects that cover a considerable distance in a linear form. This includes trains, highways, canals, pipelines, electric power lines, and so on, all of which have a straight shape and have spread across large distances.



**In India, a staggering 72 of the 88 wildlife corridors consist of major roads or highways**



More than 30 lakhs kilometres of new railway lines and 250 lakhs kilometres of new roads will be constructed worldwide by 2050. However, the demise of wild animals such as leopards, tigers, and elephants on these roads



Road passing through an Elephant corridor

continues to raise questions about our efforts to conserve wildlife.

In India, a staggering 72 of the 88 wildlife corridors consist of major roads or highways. For example, NH 72 and 74 crosses Rajaji National Park, and NH 6 and 7 intersect at least 6 tiger corridors in the Vidarbha region of Maharashtra. The increasing predominance of linear developments outside of protected areas creates habitat barriers or gaps that are harmful to the long-





term preservation of ecosystems and species. So, let's understand the ecological consequence linked with linear infrastructure development.

### Loss of natural habitat

“Fragmentation can isolate populations and also lead to inbreeding and diminished genetic variety.”

Trees, bushes, and grasses, which can be important habitats for animals, are either destroyed or severely damaged during road and railway construction. This reduces the size of their homes, making it more difficult for them to locate food and mates. The landscape's ability to support animals also diminishes if linear development through a closed forest. Fragmentation can isolate populations and also lead to inbreeding and diminished genetic variety.



### Injury and Mortality

Collisions with cars and trains are the biggest cause of animal fatalities. Power lines create lethal electrocution zones, particularly for birds with huge wingspans and large beasts looking for new territory. Moreover, noise from heavy traffic affects wildlife that rely on auditory signaling for defense and reproduction. Artificial lights, such as headlight glares, impact the navigational ability of birds and Amphibians.

### Restriction of movement of wildlife

While it is true that roads facilitate the migration of certain species across different landscapes. But they can also limit, hinder, or even eliminate their ability to travel altogether. The natural movement of wild animals is impacted due to roads and railways. This also increases human-wildlife encounters.

### How engineering can solve this problem?

Although the term “green infrastructure” is relatively new,

the ideas of it are based on the traditional philosophy of development without harming nature. It can be pictured as an approach to land development, growth management, and built infrastructure planning that takes conservation ideals and activities into account. Such planning should align with traditional “design and develop with nature” principles. Over the years, some architectural marvels have been developed across the world for safer co-existence between humans and wildlife. Let's take a look!

### Eco Bridge

Eco Bridges are natural habitat linkages that connect two larger areas of comparable animal habitat. They allow animals to flow across the linear infrastructure, which may assist in mitigating the chances of isolated populations. Wild animals can walk freely as these bridges are less confined, quieter, and provide natural lighting, temperature, and rainfall conditions.

### Canopy Bridge



Eco-bridge for free movement of animals

A canopy bridge is made from rope, pole or wooden ladder suspended above the road or railways, either from vertical poles or trees. It is designed for tree-dwelling animals.

### Underpasses

This kind of construction keeps the road or railway grade stable or raises it so animals below may pass. The underpass can be connected to seasonal drainage. When guiding roadways or rail lines over a valley, an underpass bridge is particularly helpful near the valley floor.

### Fences

The most effective usage of fences is in combination with strategically placed wildlife crossing facilities. They serve to divert animals off roadways and trains. It has been shown that crossing structures are much improved by fencing. Mammals of all sizes, as well as amphibians and reptiles, need special fencing of natural trees and stones to make way for animals.

### Future pathway for shared space





Creating a future where infrastructure and wildlife can peacefully coexist calls for a comprehensive strategy with innovative strategies. For instance, promoting collaboration among engineers, conservationists, and policymakers is crucial for designing structures that can mitigate the impact of linear infrastructure on wildlife.

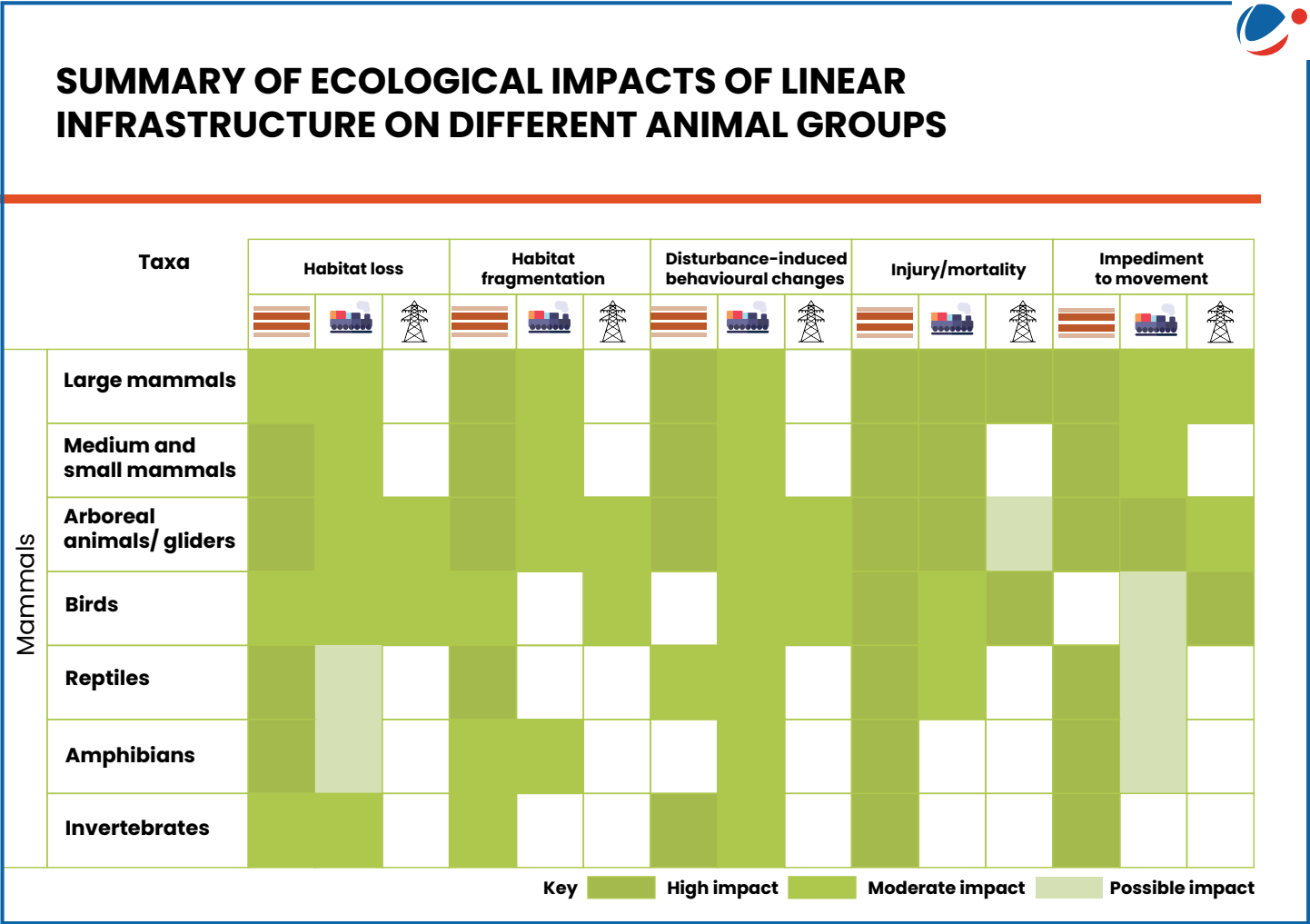
This allows engineers to consider wildlife passages when designing infrastructure, while conservationists can contribute their expertise on animal behaviour and habitat needs.

Policymakers can also make a positive impact by implementing legislation that encourages eco-friendly construction and ensures the enforcement of environmental regulations. By combining these elements, a harmonious coexistence between transportation networks and wildlife corridors can be achieved in the future.



Underpass for wild animals  
Source: MoEFCC report

From roads and railways to pipelines and power lines, the expansive footprint of linear infrastructure presents significant challenges to the natural world. Incorporating wildlife-friendly design features and strategic planning and route optimization, present viable avenues to minimize the ecological footprint of linear infrastructure projects.



## India

### Swachh Survekshan Awards 2023 Conferred: Surat Joins Indore in the League of "Cleanest City"

India's President, Smt. Droupadi Murmu, presented the Swachh Survekshan awards 2023 at Bharat Mandapam in New Delhi. The awards celebrated the achievements of cities and entities in maintaining cleanliness and promoting sustainable waste management practices. The ceremony recognized 24 National, 20 Zonal, and 54 State-level achievements across categories such as Clean Cities, Cleanest Cantonment, SafaiMitra Suraksha, Ganga Towns, and Best Performing State.



Indore and Surat become the Cleanest city in India

Source: PIB

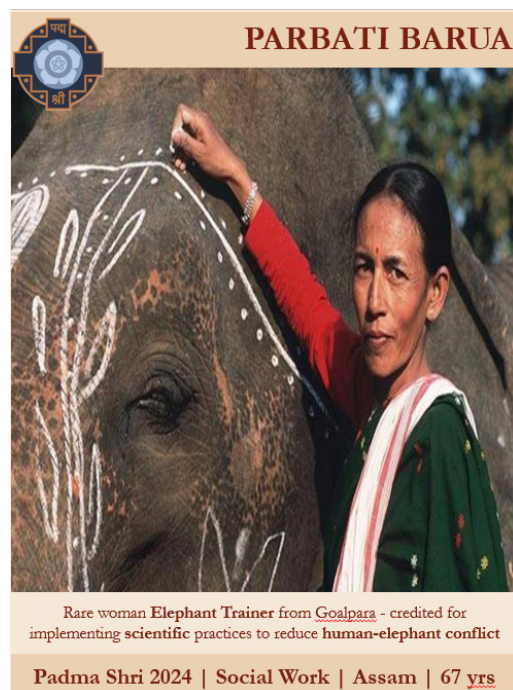
Surat, known for its progressive waste management practices, was a joint winner with Indore, which had previously held the top spot for six consecutive years. Sasvad, Patan, and Lonavala secured the top three spots for cities with a population of less than 1 lakh. Varanasi and Prayagraj won the top two awards for Cleanest Ganga Towns, while Madhya Pradesh and Chhattisgarh won the Best Performing State awards. The Swachh Survekshan awards ceremony emphasized the commitment of cities

and citizens to achieving garbage-free cities and sustainable waste management practices.

### 1st woman elephant mahout among Padma Shri awardees

Parbati Baruah, India's first female elephant mahout, has been honoured with the Padma Shri Award for Social Welfare (Animal Welfare) in the Padma Awards 2024. Known as Hastir Kanya, she has dedicated her life to wildlife and elephant conservation. Her efforts extend beyond individual elephant care. She has actively improved living conditions and assisted in the treatment and nursing of newly tamed elephants.

Her efforts have also been recognized globally. She earned the United Nations Environment Program (UNEP) award, "Global 500 – Roll of Honour," in 1989. She is also known for her work in educating others about elephants through writings and performances. Her story gained international attention when the BBC produced a documentary titled "Queen of Elephants," based on her life.



Source: Padma Awards Website



## First-ever IUCN Assessment of the Himalayan Wolf published

The Himalayan Wolf has been classified as ‘Vulnerable’ on the IUCN Red List, marking its first assessment. The population is estimated at 2,275-3,792 mature individuals, with 227-378 in India. The species is a unique predator endemic to the Himalayas and is adapted to high altitudes with genetic traits to cope with low oxygen conditions. Interestingly, the Himalayan wolf does not show a preference for livestock, reducing human-wildlife conflict.



Distribution of Himalayan Wolf across the globe

However, the assessment highlights a continuing decline in habitat area, extent, and quality. Major threats to the species include human-wildlife conflict, hybridization with dogs, and illegal hunting for trade. Given the situation, conservation efforts must focus on securing healthy wild prey populations, improving livestock guarding methods, managing feral dog populations, and promoting transboundary conservation efforts.

## India and Denmark launch Green Fuels Alliance India (GFAI) initiative



India and Denmark launch Green Fuels Alliance India

Source: Maersk

India and Denmark have launched the Green Fuels Alliance India (GFAI) initiative as part of the Green Strategic Partnership (GSP) signed in 2020. The initiative aims to promote sustainable energy growth in India, advance joint goals towards carbon neutrality, and accelerate net-zero emissions by 2070.

Inspired by the India-Denmark Energy Partnership and joint R&D efforts on green fuels, the GFAI seeks to establish an ecosystem that encourages collaboration among businesses, government entities, research institutions, and financial stakeholders. It will play a crucial role in fostering innovation and partnerships between Danish industries and Indian counterparts.

## Humboldt's Enigma: Importance of Mountain Biodiversity

In the field of natural science, the concept of biodiversity and its geographic distribution has long intrigued explorers and naturalists. Alexander von Humboldt, a 19th-century naturalist, meticulously documented plant distribution and noted that features transform with elevation, revealing Humboldt's Enigma. Humboldt's Enigma challenges the presumption that biodiversity diminishes with distance from the tropics, particularly in mountain regions. It suggests that mountains act as both cradles and museums of biodiversity, creating new habitats and stable climates allowing species to persist.



Humboldt's Enigma and its significance for India

The Shola Sky Islands in the Western Ghats and the northern Andes are examples of these biodiverse mountain regions. Factors like the earth's history, geography, climate, and geological heterogeneity drive mountain biodiversity. In India, the Eastern Himalayas, farther from the equator, are even richer in biodiversity than the tropical areas. Climatic dissimilarity and species dispersal contribute to this diversity.

## Vulture restaurant set up in Jharkhand to conserve Endangered species

A 'vulture restaurant' has been established in Jharkhand's Koderma district to protect the declining vulture population. Their numbers have been on decline primarily due to the widespread use of drugs in livestock. The restaurant, located in Koderma's Gumo area, will serve as a feeding site for scavenger birds and offer carcasses of livestock from goshalas and municipalities.

However, the protocol mandates that the carcasses must be free from harmful elements like diclofenac.

Conservation efforts have shown signs of recovery in Koderma. Also, plans are underway to establish a vulture interpretation and rescue center and geo-tagging birds for monitoring. Vultures are accorded the highest protection under the Wildlife Protection Act. ■■

# WE NEED THE VULTURES BACK

## Imagine if the Vultures disappeared?

Nine species of vultures are found in India, most of them threatened. They are the most effective scavengers, and play a vital role in keeping the environment healthy and stopping the spread of diseases from carcass by feeding on it quickly and efficiently. No other scavenger can replace this service. With very low populations of vultures, free-ranging dog populations have also increased. Dogs are carriers of rabies and other diseases which can affect humans and animals.

## How can we help vultures?

- Stop the use of drugs toxic to vultures.
- Prevent poisoning of animals and carcasses.
- Infrastructure, including for electricity, should be sensitively sited.
- Do not disturb their roosting and nesting sites.
- Gain knowledge about vulture species.

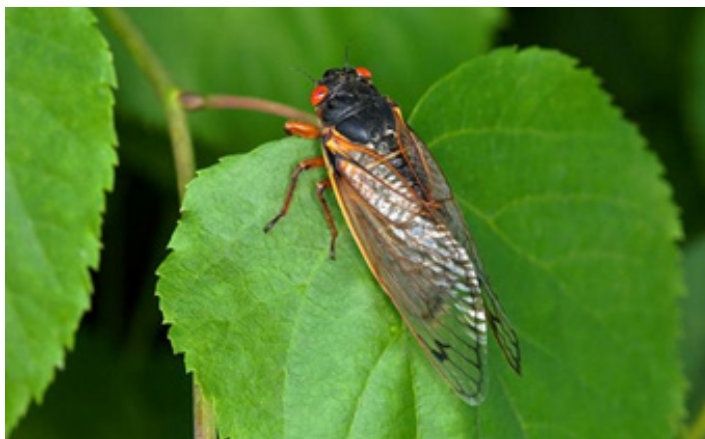




# Global

## Rare Double Cicada Emergence after 221 years

2024 is gearing up to be the year of the cicada, with two broods emerging simultaneously. The two broods - Brood XIII and Brood XIX, are on a 13-year cycle and 17-year cycle respectively. The entire process, from emergence to the end of their life cycle, will last about six weeks. This synchronization is a once-in-a-lifetime event, with each specific pair aligning only once every 221 years.



Billions of cicadas to emerge from underground in US in rare event last seen in 1803

The cicadas, known for their noisy mating ritual, spend most of their lives underground feeding on tree roots. They emerge to find a mate, triggered by increasing soil temperature in the spring. While the insects are harmless to humans, their mating noise can be deafening. Their high-pitched buzz can reach up to 100 decibels.

## First-ever report on the “State of the World’s Migratory Species”

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) released its inaugural ‘State of the World’s Migratory Species’ report. The report was unveiled during its 14th Conference of Parties in Uzbekistan. Among some concerning findings, the report revealed that one in five CMS-listed species is threatened with extinction. Also, around 44% of migratory species listed under CMS are experiencing decreasing populations. The extinction risk is growing for “State of the World’s both CMS-listed species and all migratory species. Globally, 399 migratory species that are



Source: UNEP

threatened or near threatened with extinction are not currently listed under CMS.

The main threats identified are include habitat loss, degradation, fragmentation, overexploitation, climate change, severe weather, pollution, invasive species, and diseases. The report recommends international cooperation to protect these vital species and their habitats.

## Kyrgyzstan announces snow leopard as a national symbol

Kyrgyz President Sadyr Zhaparov has declared the snow leopard as the country’s national symbol, highlighting its significance to the people and environment. According to the decree, the snow leopard represents natural wealth, cultural prosperity, and the stability of the mountain ecosystem. It is also revered as a symbol of greatness, nobility, courage, and resilience in Kyrgyz culture.



Snow leopard

Kyrgyzstan has been actively involved in global wildlife conservation efforts, with the Bishkek Declaration on Snow Leopard Protection adopted in 2013. This also led to the initiation of Global Snow Leopard and Ecosystem Protection Programme (GSLEP) with the ambitious goal “Secure 20 by 2020.”. The President’s directive signifies a commitment to safeguarding the snow leopard population, promoting responsible tourism, and attracting green investments.

## Global Environmental Facility (GEF) Council approves \$916 million for urgent environmental action

The 66th meeting of the Global Environmental Facility (GEF) Council recently took place in Washington, DC, from 5-9 February 2024. During the meeting, the Council allocated \$916 million for international action on biodiversity, climate change, nature renewal, and pollution control. This marks the eighth replenishment of the GEF Trust Fund, which cover its activities in the 2022-2026 period.

The funding will support 45 projects and programs, including four blended finance initiatives involving the private sector. The programs aim to directly benefit over 12 million people, including Indigenous Peoples and local communities. The work program includes \$530 million for Integrated Programs for the ocean, food systems, transportation infrastructure, wildlife conservation, and critical forest biomes. These programs are designed to break down silos and advance holistic action across sectors and borders.



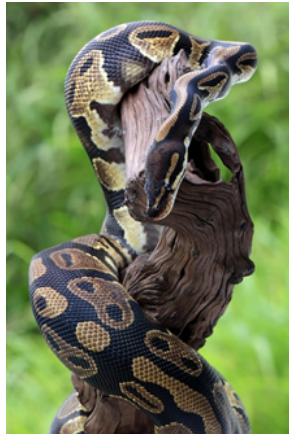


GEF council approve funds for climate action

Source: GEF website

## New giant anaconda species found in the Amazon

A new species of the green anaconda, pegged as the world's largest snake, was recently discovered in Ecuador. The snake species was found by the TV wildlife presenter, Professor Freek Vonk during a National Geographic expedition in the Amazon rainforest. The new species, *Eunectes Akiyama*, or the "northern green anaconda," is 6.1 meters long and weighs around 200 kilograms. It is distinct from its closest relatives, having split off nearly 10 million years ago.



The discovery underscores the importance of understanding and preserving biodiversity in the Amazon rainforest. Researchers have been studying anacondas as an indicator species, to assess the impact of oil spills in the Yasuni region of Ecuador. The oil extraction activities have raised concerns about environmental damage.

A member of the boa family, South America's green anaconda is the heaviest snake in the world.

## Researchers mapped largest deep-sea coral reef off the US Atlantic coast

Researchers have discovered the largest known deep coral reef off the Atlantic Coast, stretching approximately 500 kilometres from Florida to South Carolina. The discovery, made using advanced 3D mapping technology, expanded our understanding of deep-sea ecosystems. The reef, home to various marine life, has been a mystery since the 1960s.

Deep-sea reefs play a crucial role in marine ecosystems, providing habitat for diverse species. However, they face

threats from climate change, oil and gas drilling, and unsustainable fishing. This discovery underscores the need for continued exploration and conservation efforts



Coral reefs host a large variety of marine life underwater.

to protect these vital ecosystems. The true size of the reef remains unknown.

## Saudi Arabia to host COP-16 of United Nations Convention to Combat Desertification (UNCCD)

Saudi Arabia and the United Nations Convention to Combat Desertification (UNCCD) have agreed to host the 16th session of the Conference of the Parties (COP16) in Riyadh from 2-13 December 2024. This will mark the largest-ever meeting of UNCCD's 197 Parties and the first to be held in the Middle East. Additionally, 2024 also commemorates the 30th anniversary of the UNCCD, a key environmental treaty under the Rio Conventions.

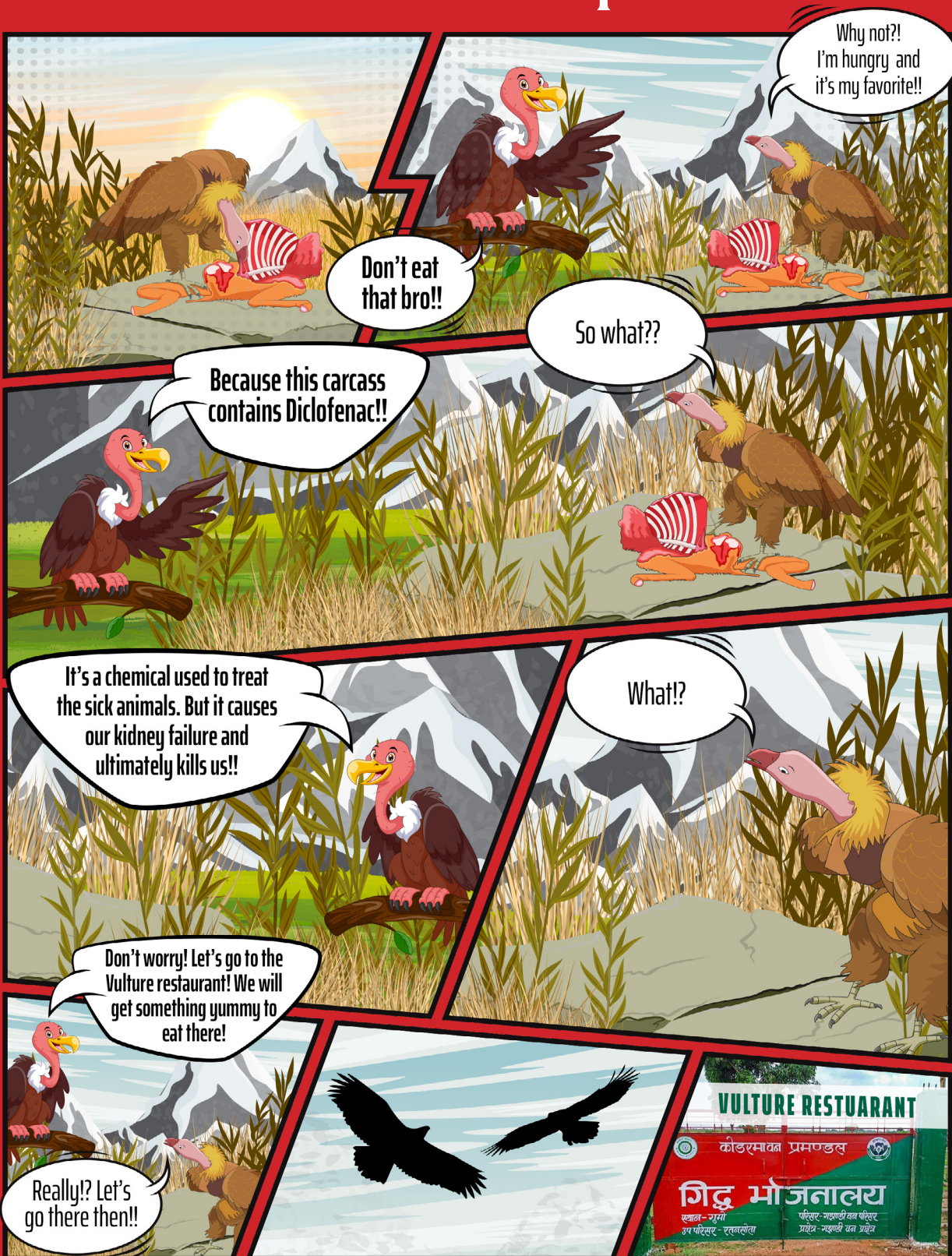
UNCCD Executive Secretary Ibrahim Thiaw emphasized the urgent need to address land degradation, which affects 40% of the world's land and half of humanity. He also called for collective action to tackle the global drought emergency. Droughts have increased by 29% since 2000 and are expected to affect a quarter of the world's population by 2050.



Kingdom of Saudi Arabia and the UNCCD signing agreement  
Source: United Nations Convention to Combat Desertification (UNCCD) website



# Comic Strip



While the Government of India has banned veterinary use of Diclofenac and similar other drugs, including ketoprofen and aceclofenac, their use is still rampant. Given the situation, Vulture restaurants have been popping up in India in a bid to conserve the fast-dwindling population of the species by providing diclofenac-free animal carcasses.



### Ecotourism: A Solution or Just Another Tourist Pitfall?

The answer to this question cannot be black and white as while ecotourism fosters conservation and empowers locals, it also carries risks like wildlife disruption and unsustainable practices.



Tourists feeding monkeys in Indian temples [Representative Image]

**D**o you also find the videos of tourists feeding monkeys or even cuddling tiger cubs cute and appealing? Even though these interactions seem harmless, they give a false impression of responsible ecotourism. But what exactly is ecotourism, and how does it differ from traditional tourism?

Ecotourism can be defined as responsible travel to natural areas that conserves the environment and improves the well-being of local communities. Unlike conventional tourism, which often prioritizes profit and mass consumption, ecotourism seeks to minimize negative impacts on the environment and promote sustainable practices. However, is ecotourism truly the answer, or does it present its own set of challenges and dilemmas?

“Ecotourism initiatives in India focus on wildlife conservation, community engagement, responsible tourism guidelines and promoting local economies.”

#### Ecotourism: A Win-Win for Communities and Nature

The Ministry of Tourism, under its Swadesh Darshan Scheme, had identified Eco Tourism as one of the identified thematic circuits. Under the scheme, projects have been sanctioned in several states, including Uttarakhand, Madhya Pradesh, Kerala and Mizoram. Ecotourism initiatives in India focus on wildlife conservation, community engagement, responsible tourism guidelines and promoting local economies. They also aim towards addressing challenges such as encroachment and wildlife poaching. These initiatives not only contribute to the preservation of India's natural

wonders but also provide economic opportunities for local communities. It also empowers local communities to take ownership of their natural resources and become an integral part of conservation efforts. However, ecotourism is not without its challenges.



## Unintended Consequences of Eco-Conscious Travel

The increasing popularity of ecotourism has led to concerns about its potential negative impacts on wildlife and the environment. Irresponsible tourist behaviour, such as feeding or disturbing wildlife, can disrupt natural



**Irresponsible tourist behaviour can disrupt natural ecosystems and endanger the safety of both animals and visitors**



ecosystems and endanger the safety of both animals and visitors. Let's take the example of langur monkeys, a common sight in many Indian temples and tourist destinations. Tourists often offer these monkeys food, like chips or biscuits, creating an unhealthy dependence. This disrupts the monkeys' natural feeding habits and can lead them to become aggressive towards tourists who don't offer handouts.

Another worrying trend is the rise of "selfie tourism" with wild animals. In India, this has been seen with tigers,

where some unethical operators lure these majestic creatures with food or sounds to create close encounters for tourists. This not only stresses the wild animal but also teaches them to associate humans with food, potentially leading to attacks in the future.

These incidents highlight the importance of responsible ecotourism that prioritizes wildlife well-being while balancing economic and conservation efforts.

### Balancing Act: Managing negative fallouts

For effective and efficient ecotourism, sustainability is very important. Implementing visitor limits ensures that natural sites remain intact for future generations. Using sustainable materials for construction and opting for renewable energy sources like solar, wind, or water power can reduce the ecological footprint of tourism activities. Placing tourist facilities at the periphery of protected areas minimizes environmental impact. In addition, governments need to regulate foreign investments and promote local entrepreneurship in lodging, guiding services, and other sectors to ensure that revenue stays within the local community. These steps can help in building a sustainable future for ecotourism in India.



# THE TOURIST HANDBOOK

## What to do and what not to do on your next trip in the wild!

Planning a trip to a wildlife sanctuary? Here's how you can make your eco-tourism experience not only memorable but also beneficial for the wildlife and local communities:



Remember, you're a guest in their home. Avoid disturbing and chasing animals. Observe from a safe distance and respect their natural behaviour



Experienced guides know the area best. Listen to their instructions to enhance your experience and stay safe.



Keep noise to a minimum to avoid startling animals. Enjoy the natural sounds of the environment.



For your safety and the wildlife, stay inside the vehicle unless instructed otherwise. This also applies to not standing in a moving vehicle.



Flash can startle animals and disrupt their behaviour so avoid taking photos and selfies with them. Use natural light and adjust your camera settings instead.



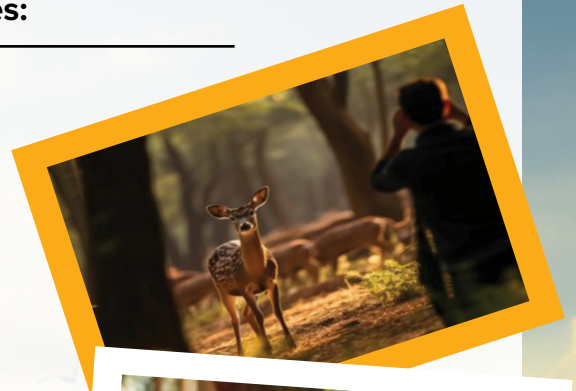
Feeding animals can alter their natural behaviour. So do not give them any food.



Dispose of your waste responsibly and leave the natural environment as you found it.



Wildlife encounters are unpredictable. Respect the rules and guidelines for a chance at unforgettable experiences.



**Remember, every action counts in preserving our natural heritage. Embrace these practices to make a positive impact on your eco-tourism adventure.**





# Global: Quick Hits

## Greenland

According to a study that utilised satellite photos to monitor glacier retreat over the last 40 years, Greenland's ice sheet will lose 20% more ice than previously estimated owing to climate change.

## USA

California was bracing for two Pacific storms that were anticipated to soak most of the state in heavy rains and cause extensive floods.

PACIFIC OCEAN

## Panama

Severe drought in Panama caused a decline in water levels, forcing officials to reduce ship crossings in the Panama Canal by 36%. This resulted in an anticipated loss of \$500 million to \$700 million in 2024.

## Spain

Catalonia has declared a state of emergency due to the country's worst drought, which will impact over six million people in 200 towns and cities, including Barcelona.

## Peru

Several palm oil and cocoa enterprises operating in the Peruvian Amazon have deliberately contributed to the deforestation of at least 13,000 hectares (32,000 acres) in the Amazon Forest.

## Chile

Chile recorded its deadliest wildfire in 123 years that claimed 122 lives. According to World Meteorological Organization (WMO) scientists, the wildfire may be linked to climate change and El Nino.

SOUTH ATLANTIC OCEAN

SOUTHERN OCEAN

## Cameroon

Cameroon has joined the Nagoya Protocol on Access and Benefit Sharing to guarantee the advantages of binding genetic resources and traditional knowledge to access biodiversity in a fair manner.

## Ethiopia

In a historic decision, taken during the 37th African Union summit held in Ethiopia, the killing of donkeys for their skin was outlawed in the African continent.

## India

Kashmir's hangul, which is enlisted as a critically endangered indigenous species of deer, has reported one of the healthiest mating seasons, which will boost its population.

## Nigeria

Nigeria destroyed \$11.2 million worth of seized elephant tusks to protect its dwindling elephant population from rampant wildlife traffickers.

## Kenya

Kenya hosted 180 nations for the 6th UN Environment Assembly (UNEA-6) in Nairobi, delivering 15 resolutions to boost multilateral efforts to address climate change, nature loss, and pollution.



# Snapshot

## The Green Menace: Understanding Congress Grass in India

The Congress Grass arrived in India as an uninvited guest and decided to stay forever. At first glance, the plant may seem attractive and harmless because of its fluffy white flowers and soft, green leaves. But, it has emerged as a green menace as it has taken over millions of acres of land across the country.

Seeds are very light in weight and easily carried or transported by wind, water or through various human activities.



### How can you identify me?

- Interestingly, I can attain a height of 1 to 1.5 meter.
- My Stems and leaves are covered with fine hair and my flowers are white.
- My seeds are dispersed by wind, water, animals, and other means.
- I am popularly referred to as carrot weed.

### Who am I?

- My scientific name is *Parthenium hysterophorus* L.
- I'm an invasive plant species.
- Native to the area surrounding the Gulf of Mexico, Central America, southern North America, West Indies, and central South America.

Can you imagine how it covered such a long distance?



### How did I reach India?

- My seeds came to India along-with the grains imported from USA under the PL 480 scheme in 1950s and 60s.
- Within a short span I spread throughout India.
- Comparatively, I have highly impinged the states like Uttar Pradesh, Bihar, Haryana etc





### Why am I infamous?

- ✔ This is because I dominate over other vegetation in its vicinity because of the allelopathic effect of my leachates (released chemicals) which inhibit the germination of other plants.
- ✔ Also I have been blamed for inhibiting germination of other weed plants.
- ✔ Sadly, I have caused health problems in humans such as dermatitis, asthma and bronchitis.
- ✔ Things get worse as I have been responsible for adversely affecting agriculture. Significant amount of my grass in the diet can also kill cattle.

### Rescue Ops: How the Spread of Congress Grass can be tackled?

- ✔ Uproot it while wearing protective gloves and masks to prevent skin and breathing allergies.
- ✔ Chemical and biological control agents can be also used.



### Turning Problem into Opportunity

- ✔ Farmers have started using congress grass in bio-composting.
- ✔ They used to collect it from fields and other places before flowering period. Then, they make bio-fertilizer through different means of bio-composting.
- ✔ Bio-fertilizer made out of it good source of nitrogen, phosphorous, and potash.







People of Bishnoi Community taking care injured chinkara antelope [Representative image]

## Bishnoi community: A Legacy of Protection

**T**he Bishnoi community of western Rajasthan is a testament to the world as to how human beings can co-exist with nature in peace. The world is preaching the idea of Sustainable Development but it is communities like Bishnoi who are practising it in a true sense. Over the years, the community has immensely contributed to protect the flora and fauna in the region of their habitat.

The Community follows the path shown by their ancestors, for instance, a legend like Amrita Devi. It is believed that, in 1730, 363 Bishnoi men, women, and children died to prevent the Khejri tree from cutting. A local king sent his men to cut wood so that he could fuel cement lime kilns and build his palace. In opposition, people from the Bishnoi community hugged the trees and sacrificed their lives for their belief.

In the present scenario, they are contributing at both individual and at community capacity. Many farmers from the community purposefully reserved portions of their areas for animals like blue bulls and cattle. The community also works

### Who are Bishnois?

Bishnoi community was established in the 16th century by Guru Jambheshwar. The community follows the principles propagated by the Guru which includes principles like Jeev Daya Palani - 'be compassionate to all living beings' and Runkh Lila Nahi Ghave - 'do not cut green trees'. The community is playing key role in upholding environmental cause from centuries.





closely with the forest department. It gives information to the forest department about poachers and those “hunting for pleasure”. Additionally, they have played an active role in the setting up of rescue centres for injured animals. They have established the Bishnoi Tiger Force, which is an environmental campaign group and anti-poaching vigilante organisation. Because of their prominent role they are often called the protector of wildlife and environment.

## Project Elephant: Safeguarding India's Majestic Giants

Elephant, the National Heritage Animal of India, is one of the biggest animals on the planet Earth. Elephants are often referred to as “Ecosystem Engineers” because of their central role in shaping and maintaining the forest environment. It acts as a keystone, flagship, and umbrella species. However, due to several threats such as poaching for tusk and habitat fragmentation, the population of Elephants had started declining. To tackle this, the Project Elephant was launched in 1991-92. The Project Tiger division has now been merged with Project Elephant, and a new division called ‘Project Tiger and Elephant Division’ has been established inside the Ministry of Environment, Forest, and Climate Change.

Project Elephant is a Centrally Sponsored Scheme of the Ministry of Environment, Forest & Climate Change. It provided financial and technical support to the elephant range states of India for the protection of elephants, their habitats and corridors and address the issue of human-animal conflict. It promotes welfare of captive elephants.



Care of Elephant is taken by Mahout

Under it, Elephant Reserves are basic management unit for elephant conservation and management. A total of 33 Elephant Reserve have been notified in the country with the area of 80777 Sq.km approximately. Additionally, the Ministry has established an Elephant Cell at the Wildlife Institute of India (WII), Dehradun to provide technical inputs to the Ministry for strengthening the efforts towards conservation of elephants, both in the wild and in captivity. As a result, it has led to increase in population of elephants to 29964 in 2017 as compared to 27669-27719 in 2007.

## Project Vanya Jeevan

The Project Vanya Jeevan was launched in 2022 by the ICICI Foundation, established by ICICI Group. Project Vanya Jeevan was launched with the objective of conserving ecology, environment and supporting sustainable livelihood of the people living in the periphery of forests. It supports several forests and national parks across the country. It includes Sariska Tiger Reserve in Rajasthan, Tadoba-Andhari Tiger Reserve and Bhimashankar Forest in Maharashtra, to name a few.

Under this ambitious initiative of the foundation, the major intervention in these forests include animal safety and healthcare, making water available for flora and fauna, habitat restoration and conservation, afforestation and prevention of soil erosion. For this, it has constructed water holes, developed grassland, provided patrolling vehicle and rescue vans, etc.

With the help of the innovative techniques like Miyawaki method, pioneered by the late Japanese botanist Akira Miyawaki, it has created 50 Miyawaki forests in the states of Gujarat, Madhya Pradesh, Maharashtra and Punjab in the year 2023 itself.



Women doing plantation

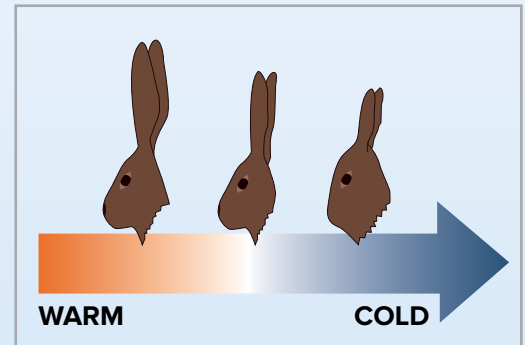


# Snapshot

## Allen's rule

Allen's rule is a biological rule posited by Joel Asaph Allen in 1877. It states that warm-blooded animals from colder climates usually have shorter body parts (nose, ears, tail, and legs) than the equivalent animals from warmer climates.

- Warm-blooded animals are defined as animals that can regulate and maintain constant



Let us understand it with an example



Fennec Fox



Arctic fox

- Arctic fox found in cold temperatures of around -15 degrees Celsius.
- It possesses short limbs when compared to fox species living in the warmer region.
- Fennec foxes found in the Saharan desert (very high temperature) have large ears and limbs.



### What explains the change in the size of the body parts?

- Larger body parts such as huge ears, limbs, etc are advantageous in warmer climate as they offer a larger surface area to volume ratio.
  - ▣ Therefore, they can emit more heat.
- Similarly, animals with shorter body parts allow them to retain more heat as a low surface area to volume ratio helps to conserve heat.

### Example

#### Arctic Fox

Body temperature –  $37^{\circ}\text{C}$   
Average outside temperature –  $0^{\circ}\text{C}$



The Arctic fox has small ears and a round head to reduce its 'surface area: volume' ratio and heat loss.

#### African bat-eared fox

Body temperature –  $37^{\circ}\text{C}$   
Average outside temperature –  $25^{\circ}\text{C}$



The African bat-eared fox has large ears and a more pointed nose to increase 'surface area: volume' ratio and heat loss.

#### European Fox

Body temperature –  $37^{\circ}\text{C}$   
Average outside temperature –  $12^{\circ}\text{C}$



The European fox is intermediate between the two, matching the temperature of its environment.

### What are the other adoptions by animals to counter extreme climate?

- It is important to remember that exposure of exterior surface area is only one of many mechanisms by which animals retain or dispose of the body heat.
- The other mechanisms of heat conservation are fat layers, feathers, fur, etc, and behavioral adaptations like hibernation.





# Mysteries Unveiled: The Enigmatic Snow Leopard



Snow Leopard: Ghost of mountains

**I**n Pakistan's icy Himalayan mountains, Leo (snow leopard cub) became an orphan at the tender age of seven weeks. Unlike most snow leopards, Leo was not accompanied by his mother throughout his first two years of life. Thankfully, a generous shepherd and his family came to the cub's rescue, and they cared for Leo, feeding him by hand and keeping him safe.

Shepherd's family, however, were unable to care for Leo because he got too big so fast. The Wildlife Conservation Society felt compelled to take action upon hearing about Leo's story. After the collaboration, Leo was settled in Bronx Zoo in New York City. Leo's story is a remarkable tale of courage, generosity, and the magic that can be unleashed when individuals band together to find a solution.



It is the first scientific exercise to estimate the snow leopard population.



### Status of Snow leopards in India

Recently, The Ministry of Environment, Forest, and Climate Change (MoEFCC) published a report on the status of

snow leopards in India. The report is the result of the Snow Leopard Population Assessment in India (SPAI) program, which took place between 2019 and 2023. It is the first scientific exercise to estimate the snow leopard population. This exercise is being coordinated at the national level by the Wildlife Institute of India (WII).

The report has highlighted that 70% of snow leopard habitat remains unprotected. This finding underscores the challenges inherent in conserving these elusive creatures. One major obstacle is the difficulty in accurately counting snow leopards. Much of their habitat, situated between altitudes of 10,500 to 17,000 feet, is virtually inaccessible to researchers. Unlike other iconic species such as tigers, zebras, and leopards, snow leopards evade detection by conventional means, including Artificial Intelligence software.

### Behaviour and ecology

Snow leopards are solitary animals, only seen with company during mating season or while raising young. Unlike other large cats, they cannot roar. They typically hunt at dawn and dusk and can kill prey up to three times their own weight. However, they are not aggressive towards humans, and there has never been a verified snow leopard attack on a person.



Despite their name, snow leopards are more closely related to tigers than leopards. Their long, insulating fur is well adapted to low



temperatures, and each snow leopard has a unique dark rosette pattern. Their large, furry paws also help to distribute body weight and prevent them from sinking into the snow essentially acting as natural snow shoes. Their hind legs give them the ability to leap six times the length of their body. At night, they curl their tails around their bodies like a cozy scarf to keep themselves warm.

### Importance and range

As apex predators, snow leopards serve as significant habitat indicators. This means that their presence indicates the presence of other members of their food chain, as well as diverse wildlife and flora that contribute to the habitat's sustainability. It enables us to quantify the impact of climate change in these frigid, fragile alpine habitats, where even minor temperature changes can affect certain species and have a cascading effect throughout the ecosystem.



Range of Snow leopards

For years, these majestic cats dominated the mountains. The mountains are plentiful with prey, such as blue sheep and Argali wild sheep. They dwell in the hilly areas of twelve Asian countries. The whole range is around 772,204 square miles, with 60% of the habitat being in China.

### The real threat

Snow leopard is listed as globally Vulnerable on the IUCN Red List and the species is listed (as *Uncia uncia*) on Appendix I of CITES (Convention on International Trade in Endangered Species of Fauna and Flora). In India, they are

listed under Schedule I & IV of the Wildlife (Protection) Act, 1972, giving them the highest protection status under the country's laws.

Even though they reside in some of the most difficult alpine environments on the planet, humans are the greatest threat to their survival. Poachers sell snow leopard hides and bones for thousands of dollars.

Herders frequently kill snow leopards that attack their sheep. Climate change is likely the most serious long-term threat to snow leopards. The animal's breeding pattern also makes it a particularly fragile species, with female snow leopards giving birth to only one or two cubs every two years.

### Path ahead for protection

The Indian government has launched several initiatives to safeguard snow leopards, including the Snow Leopard Project, the Snow Leopard Breeding Project at Padmaja Naidu Himalayan Zoo Park, and involvement in the Global



Snow Leopard and Ecosystem Protection Program. To improve conservation, states and Union Territories (UTs) can conduct population estimates every four years inside snow leopard areas. This aids in identifying issues, addressing threats, and developing more effective conservation programs. Furthermore, landscape-level management planning and coordination are essential for the effective implementation and management of conservation activities.

There are little changes we can make in our daily lives to help safeguard them. When we all work together to make these improvements, we can make a significant impact. For example, be a responsible tourist While visiting the Himalayas, don't buy snow leopard merchandise, etc. We can pledge these changes and protect our environment. ■■



# IMD at 150: Pioneering Meteorological Excellence



India Meteorological Department (IMD) [ Representative image]

From farmers planning their crops, disaster management authorities preparing for cyclones, India Meteorological Department's (IMD) forecasts are integral to decision-making across various sectors. It will not be an exaggeration to call IMD as a sentinel which is watching over the skies and seas to safeguard the nation against nature's whims. It is a pillar of national resilience, providing invaluable services that impact the lives of millions.

## What is the history of IMD?

IMD recently celebrated the 150th Year of its establishment and service to India. Let's delve into the realm of IMD, exploring its history, impact, and different facets associated with it.

During the decade of 1860's and early 1870's, India faced monstrous cyclones on its east coast along with severe drought and famine in different parts of the country. These events forced administrators towards thinking that there is need of a system to monitor atmospheric parameters and foreseeing their changes.

“On the occasion of the 150th anniversary, the National Framework of Climate Services (NFCS) was launched. It is premised on the concept of the Global Framework for Climate Services (GFCS) launched by the World Meteorological Organization (WMO).”

In this backdrop, IMD was established in 1875 as one of the first scientific departments of the Government of India. In its initial phases, HF Blanford used to see the work of IMD alone and thus, he has been referred to as the Imperial Meteorological Reporter.

At present, IMD is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology and allied subjects. It works under the Ministry of Earth Sciences.

## What does it do?

Its key mandate includes meteorological observations and to provide current and forecast meteorological information for optimum operation of weather-sensitive activities like agriculture, irrigation, shipping, aviation, offshore oil explorations, among others. Also, it warns against severe weather phenomenon like tropical cyclones, norwesters, dust storms, etc.

Over the years, IMD has immensely contributed in the development of the Nation through its different services. A significant improvement in forecast accuracy of severe weather events

by 40-50% has been witnessed during the last few years. This can be attributed to the establishment of the several Doppler Weather Radars (DWRs) across the country. It releases alerts on block-level weather forecasts and advisories for farmers, fisherfolk and livestock rearers.

Earlier, predicting monsoon was a big challenge for IMD. The study of monsoons made major strides during the time period of Gilbert Walker, who led the IMD in early 20th century. And, in the recent times with the help of new technique and models the accuracy rate of prediction has improved.

Along with India, it is helping other neighboring countries for instance its cyclone forecast services. The IMD's Pune Centre has been recognized as the Regional Climate Centre for South Asia.

### What lies ahead?

Having said this, the rise in the severity and frequency of extreme weather events are emerging as big challenge for IMD. There is an urgency to increase the accuracy of forecasting localized weather phenomenon in the backdrop of climate change. Continuous upgradation of the technological system is need of the hour for IMD.

The importance of IMD's role will further enhance in future. For this, it has to enhance its capability by investing in advanced technologies and infrastructure to improve the accuracy and availability of climate data, including satellite observations, ground-based measurements, and ocean monitoring. It needs to develop and implement robust early warning systems to effectively communicate and mitigate the impact of extreme weather events, especially in remote and vulnerable regions. It needs to leverage advanced predictive analytics and artificial intelligence tools to enhance the precision of climate predictions and identify patterns in complex climate systems.



**Years of Service to the Nation**

राष्ट्र सेवा के 150 वर्ष



# COP14: Convention on the Conservation of Migratory Species of Wild Animals



Convention on the Conservation of Migratory Species of Wild Animals (CMS) seeks to unite the states to safeguard the migratory birds

If someone was to tell you, that the lifetime journey of migratory species equals more than three trips to the moon and back, you might wonder if such a feat is possible. The Arctic Tern, a medium-sized bird, travels approximately 90,000 kilometers from pole to pole each year, migrating from Greenland in the North to the Weddell Sea in the



Species of wild animals of which the entire population or any geographically separate part of the population cyclically and predictably crosses one or more national jurisdictional boundaries are known as Migratory species.



South. They can live up to 30 years, which means, if we add up the distance they traverse in a lifetime, it is equal to three trips to the moon and back.

## What are migratory species?

Species of wild animals of which the entire population or any geographically separate part of the population cyclically and predictably crosses one or more national jurisdictional boundaries are known as Migratory species. Birds migrate from areas with limited or decreasing resources to areas with abundant or increasing resources. The two primary resources sought are food and nesting sites.



**COP 14**  
CONVENTION ON MIGRATORY SPECIES  
**SAMARKAND**  
UZBEKISTAN 12-17 FEBRUARY 2024

The Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS COP14) met recently to review the Convention's implementation. CMS, also known as the Bonn Convention, recognizes that states must protect migratory species



that live within or pass through their national jurisdictions, with the goal of conserving terrestrial, marine, and avian migratory species across their ranges.

### What is Conservation of Migratory Species of Wild Animals (CMS)?

It is an intergovernmental treaty established under the United Nations Environment Programme (UNEP). Serving as a global platform, the CMS aims to promote the conservation and sustainable use of migratory animals and their habitats worldwide. Introduced in 1979, the convention officially came into force in 1983. India has been a member since 1983, actively participating in the convention's initiatives and agreements.

The CMS Appendices categorize migratory species based on their conservation status and level of threat. Appendix I comprises species considered endangered, facing a very high risk of extinction in the wild in the near future. These species receive special attention and protection measures under the convention. On the other hand, Appendix II lists migratory species with an unfavourable conservation status, indicating the need for international agreements to address their conservation and management challenges



Eurasian Lynx

### What were the key outcomes of the meet

A comprehensive set of new measures has recently been adopted and the first-ever “State of the World’s Migratory Species” report was launched. Notably, 14 additional species, including the Eurasian Lynx, Pallas’s Cat, and the Sand Tiger Shark, have been added to the CMS Appendices. Furthermore, the launch of the Global Partnership on Ecological Connectivity (GPEC) marks a significant step towards ensuring the maintenance, enhancement, and restoration of ecological connectivity in critical areas for migratory species worldwide.

Specific strategies have been devised to address the conservation challenges faced by certain species. New Concerted Actions have been initiated for six species, such as the Chimpanzee, Straw-colored Fruit Bat, and the Blue Shark, to facilitate focused conservation efforts. Moreover, Single Species Action Plans (SSAPs) have been developed for aquatic species like the Atlantic Humpback Dolphin, the Hawksbill, etc. The Agreement on the Central Asian Flyway (CAF), encompassing 30 Range States of



Many important migratory species travel through India such as the Amur falcon, Great Indian bustard, etc.



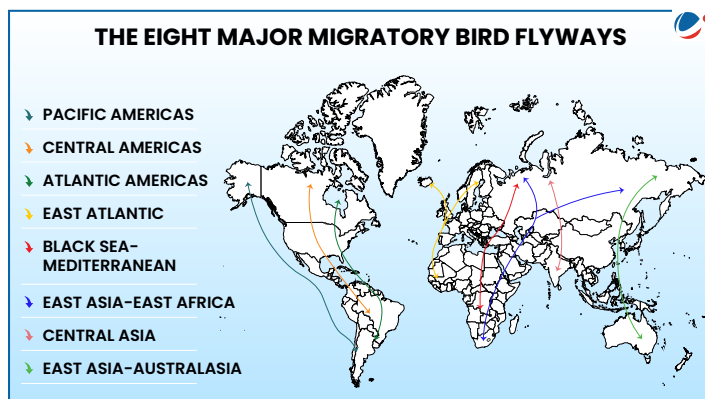
migratory birds, signifies a concerted effort to manage and protect key migration routes.

### What are the initiatives taken by India to protect migratory species?

Many important migratory species travel through India such as the Amur falcon, Great Indian bustard, etc. India is taking several steps for their protection. One significant effort is the implementation of the National Action Plan for the conservation of Migratory birds along the Central Asian Flyway, spanning from 2018 to 2023. The primary objective of this plan is to halt the decline in population and secure habitats for migratory bird species traversing the Central Asian Flyway.

Furthermore, India has participated in the Identification of Important Bird Areas (IBAs) programme, led by Birdlife International. This initiative seeks to identify and protect critical sites globally that are vital for the conservation of birds and associated biodiversity. Additionally, India has developed the National Marine Turtle Action Plan for the period 2021-2026. The objective of this plan is to conserve marine turtles and their habitats, recognizing their importance in maintaining a healthy marine ecosystem.

### What need to be done to protect migratory birds?



Migratory birds connect people, ecosystems, and nations. They are symbols of peace and of an interconnected planet. Efforts to protect migratory species and their habitats require a multifaceted approach that addresses various threats they face. Even on individual level, we can take several small measures such as turning off outside lights at night, keeping water in the balcony, etc. To make the life of migratory bird species easy.





# Science to the Service of Society: Bridging the Gap between Discovery and Impact



“Science and everyday life cannot and should not be separated” – Rosalind Franklin

Union Cabinet has recently approved the PRITHVI (PRITHvi Vigyan) initiative under the Union Ministry of Earth Sciences (MoES). PRITHVI is designed to comprehensively address all five facets of the Earth system, including the atmosphere, hydrosphere, geosphere, cryosphere, and biosphere, aiming to enhance understanding of Earth System Sciences.

This scheme will enable MoES to effectively deliver on its mission of translating science into service to society, particularly in areas such as weather forecasting, climate studies, oceanography, hydrology, and seismology.



Science in the Service of Society is basically a multifaceted concept that bridges the gap between scientific discovery and real-world impact.



In the 21st century, as society increasingly relies on knowledge-based endeavours, the generation of new knowledge is paramount. However, the true advancement lies in applying this knowledge for societal benefit. A concept that embraces this idea is “Science in the Service of Society.” It is a multifaceted concept that bridges the

gap between scientific discovery and real-world impact. Let's understand what this idea entails and why it is important for the betterment of our society.

## From research to Application: Transforming lives

At its foundational core lies ‘research translation’- the process of transforming abstract scientific findings into practical applications for social, economic, and environmental benefits. This can involve developing new technologies, creating evidence-based policies, or simply communicating complex scientific ideas to the public in a clear and accessible way.

A successful example of research translation is the Green Revolution of 1960s – 1970s in India. Advances in plant breeding, irrigation techniques, and fertilizers, coupled with the transfer of agricultural technologies from research institutions to farmers, led to substantial improvements in crop yields and food security. It not only transformed agricultural practices but also significantly contributed to increasing food production and alleviating hunger and poverty.

## From Lab to Market: Achieving results

Diving into more details, a key aspect of translating research into societal impact is the transfer of technology. It



involves getting scientific discoveries, inventions, and new ideas out to more people so they can be built upon, sold, and used to solve important problems. It also facilitates the exchange of knowledge and resources between academia and industry. This enables the transformation of ideas and discoveries made in the laboratory into products, services, and processes for society as a whole.

The development and widespread distribution of vaccines are excellent examples of this process. They have been instrumental in controlling and eradicating infectious diseases such as smallpox, polio, measles, and, more recently, COVID-19. Scientific research led to the discovery of vaccines, while technology transfer facilitated their production, distribution, and administration on a global scale, saving countless lives and reducing the burden of disease.

### Collaboration is the key!

Further, collaboration between academia, scientists, entrepreneurs, government, and civil society plays a pivotal role in driving the Science to Service of Society agenda forward. These stakeholders play complementary roles in supporting and advancing scientific research, technology development, and innovation.



India's Unified Payments Interface (UPI) ecosystem is a collaboration between the government, technology and financial service providers.

Government, entrepreneurs, and civil society can bring scientific innovations to market and scale them for widespread impact. It can foster synergies between science and society, ultimately creating a virtuous cycle that fuels further scientific exploration, while simultaneously addressing social and environmental challenges.

In the domain of digital technology, for instance, researchers are collaborating to develop digital technologies such as AI, Internet of Things (IoT), etc. Government, on the other hand, is promoting digital literacy and inclusion and providing a conducive environment for researchers. Tech companies are playing a key role in the commercialization of digital innovation and the adoption of digital technologies across sectors. Civil society, in this scenario is ensuring equitable access to digital resources and opportunities and protecting collective interests through advocacy and activism. A successful example of this is India's Unified

Payments Interface (UPI) ecosystem.

As scientists push the boundaries of knowledge, they also face several challenges in translating discoveries into real-world solutions. Let's briefly explore some of these hurdles.

### Short-Termism in Research Governance

Most policymakers look at research and innovation through the lens of management and control, ignoring how they are connected to the bigger picture of how society works. This perspective is reflected in how places, where knowledge is created, follow the rules of new public management, which stress efficiency and set goals. As a result, the future is seen in terms of its usefulness, society is limited to formal interactions, and a variety of values are pushed to the side.

An example of this perspective can be seen in the governance of research funding. In many cases, funding agencies implement strict guidelines and metrics to measure the success of research projects, often prioritizing short-term deliverables and tangible outcomes. While this approach may make administrative processes easier. But it can also limit the exploration of innovative ideas and interdisciplinary collaborations that could have significant long-term societal impact.

“Most policymakers look at research and innovation through the lens of management and control, ignoring how they are connected to the bigger picture of how society works.”

### Academic Isolation

Further, notable changes are occurring within academic settings, with a primary focus on research and innovation. One important problem is the conflict between how society sees science as a public good and how research institutions usually evaluate it based on narrow, metric-based criteria. This notion is further amplified by the nature of educational and research institutions as 'Gated Communities'.

This results in institutions operating as isolated bubbles cut off from broader societal concerns and priorities. This adversely affects the translation of scientific discoveries into practical solutions. Further, it creates barriers to access and inclusivity, overlooks the needs and experiences of diverse communities and causes institutional inertia towards adaptation.





Scientific advancements in recent times have also raised various ethical concerns. Issues like gene editing, AI, development of autonomous weapons systems, etc., all necessitate careful consideration of the ethical implications before widespread adoption. Robust ethical frameworks and responsible research practices are essential to safeguard society from potential misuse of scientific knowledge.

### Forging a Path for Change

To make science work for the betterment of society, it is essential to link excellence to societal relevance and responsibility. There is a need to expand the definition of relevance beyond economic measures and broaden the understanding of excellence beyond traditional research metrics. An example of this is the Unnat Bharat Abhiyan of the Government of India with the vision of transformational change in rural development processes by leveraging knowledge institutions such as IITs.



**To make science works for the betterment of society, it is essential to link excellence to societal relevance and responsibility**



In the context of socio-cultural diversity prevalent in India, it is essential to recognize and embrace the diversity within educational and research institutions. This entails conducting comprehensive comparative research and integrating diversity considerations into policymaking processes as well.

Also, the concept of innovation needs to be expanded beyond traditional STEM fields to encompass contributions from the social sciences, humanities, and arts. We must acknowledge and leverage the diverse forms of knowledge available across various sectors of society, recognizing



Unnat Bharat Abhiyan serves as an example of 'Science in the Service of Society'

their value in driving innovation and societal development.

Government policies should prioritize grassroots initiatives and grassroots efforts to address science-society issues in diverse ways. This includes supporting researchers who actively engage in these practices and creating alternative spaces for dialogue and collaboration. The journey from scientific discovery to societal benefit is an ongoing process that requires openness to new ideas, collaboration, and public engagement. By embracing openness and fostering communication, we can bridge the gap between discovery and impact, harnessing the potential of science to create a brighter future for all. ■■



## 5 Technologies for Coexistence: Harnessing Tech to Bridge the Human-Wildlife Gap



The age-old problem of human-wildlife conflict may finally have a technological solution

As human-wildlife conflicts continue to grow in frequency and intensity, it has become important to find sustainable solutions that prioritize the safety of both humans and animals. Amidst these challenges, technology has emerged as a beacon of hope. Technology is changing how we perceive, track, and manage human-wildlife conflicts.

Let's explore how cutting-edge technology is not only bridging the gap between humans and wildlife but also fostering harmonious coexistence in an ever-changing world.

### 1. AI and Machine Learning

The Indian Railways introduced the AI-based 'Gajraj' system to prevent elephant deaths on railway tracks. It alerts station masters, loco pilots, and other stakeholders who take preventive measures to avoid imminent danger based on elephant intrusion detection.

AI-based tools and models hold significant promise in mitigating conflicts by providing insights to identify targeted intervention measures. AI algorithms can look at big sets of data about biological, environmental, and human factors to figure out where and when there will be a lot of conflict. They can do predictive analytics and find places where conflicts are likely to happen by looking at old data on how animals move, where they like to live, along with human activities in an area.



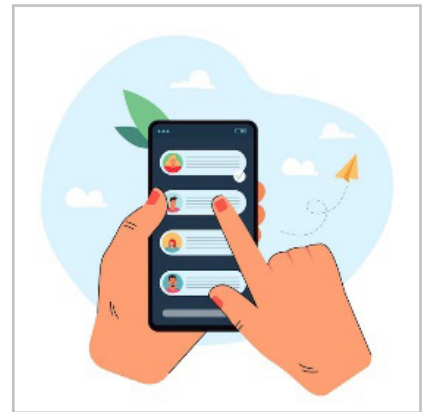


## 2. Early Warning System (EWS)

In Anaimalai in the Western Ghats, the Nature Conservation Foundation (NCF) began sending bilingual text messages (in English and Tamil) about elephant movement. The Forest Department, researchers, and community members provided this information, which was broadcast on local television channels. Since the EWS began functioning, human deaths have dropped by over 50% in the region.

EWS can prove to be one of the most promising technological interventions in HWC mitigation. These systems utilize a combination of sensors, cameras, thermal imaging, etc., to detect and identify wildlife activity in real time.

For example, acoustic monitoring devices can detect the vocalizations of predators such as lions or leopards, triggering alerts. Similarly, camera traps equipped with motion sensors can capture images of wildlife approaching agricultural fields. Timely alerts allow farmers to take preventive measures to protect their livestock.

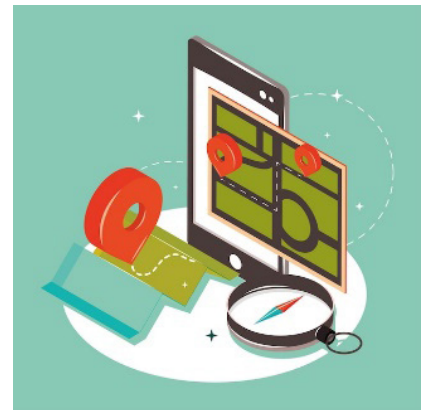


## 3. GPS Tracking and Collaring

MSTripES (Monitoring System for Tigers: Intensive Protection and Ecological Status), used for monitoring of Tigers in India, utilizes GPS, General Packet Radio Services (GPRS), and remote sensing to collect information from the field and creates a database using IT-based tools.

This information is invaluable for developing targeted conservation strategies and informed land-use planning decisions. For example, data collected from MSTripES is being utilized under different modules - Patrol module, Ecological module, and Conflict module.

GPS technology can improve the ability to monitor the movements and behaviour of wildlife in their natural habitats. By fitting animals with GPS collars or tags, researchers can track their movements with unprecedented accuracy, gaining insights into their ranging patterns, habitat use, and interactions with human activities.



## 4. Non-lethal Deterrents

Hanging solar-powered electric fences, an example of a non-lethal deterrent deployed by Assam's forest department, have proved to be an effective tool in addressing human-elephant conflict. Under this, steel wires are hung from a horizontal overhead wire connected to a solar system. Elephants receive a mild shock if they try to cross through hanging wires.

Automated lights and sound devices triggered by motion sensors can also be excellent deterrents that farmers can deploy. When applied to crops, scent repellents containing natural compounds also help stop herbivores from feeding, reducing crop damage and minimizing conflicts between farmers and wildlife.



## 5. Unmanned Aerial Vehicles (UAVs)

Wildlife Trust of India (WTI) provided a quadcopter to the forest department in Similipal Tiger Reserve (Odisha) to improve surveillance capabilities. It is also being used to monitor meadows, mining, and encroachment activities in and around Similipal. It has also greatly assisted in anti-poaching and anti-depredation drives.

UAVs, or drones, have emerged as a versatile tool for monitoring wildlife populations and detecting illegal activities such as poaching and habitat destruction. Equipped with high-resolution cameras and thermal imaging technology, drones can survey vast areas of land with speed and efficiency, providing valuable data for conservation efforts.



Drones can also be used to disperse or track the movements of problem animals in real time. For example, drones equipped with loudspeakers or pepper spray can be deployed to deter predators from approaching human settlements or livestock enclosures.

### **Endless possibilities!**

In addition to the technologies mentioned above, new use-cases have emerged around the world. As new and emerging technologies enter every aspect of our lives, we are devising strategies to deal with the conflict between humans and animals.

Augmented Reality (AR) and Virtual Reality (VR) hold immense potential in preventing conflicts. They can be used in simulations to (re)create realistic scenarios for Empathy training. Directly placing viewers in habitats of threatened species, can allow them to experience challenges faced by animals. AR/ VR, along with AI tools, can simulate the potential outcomes of different conservation and management strategies. This can make the decision-making more informed and effective.



Other applications of AR/ VR vis-à-vis HWC include the creation of virtual deterrents such as holographic fences, education and awareness of communities, and training and capacity building of forest officials, among others.

Integration of technology with conservation efforts presents a transformative approach to mitigate HWC. But technology is just one piece of the puzzle. Successful implementation of these interventions requires partnership and collaboration between the state, scientists, conservationists, and local communities. Further, innovative solutions need to be tailored to local needs and contingencies to make them effective.

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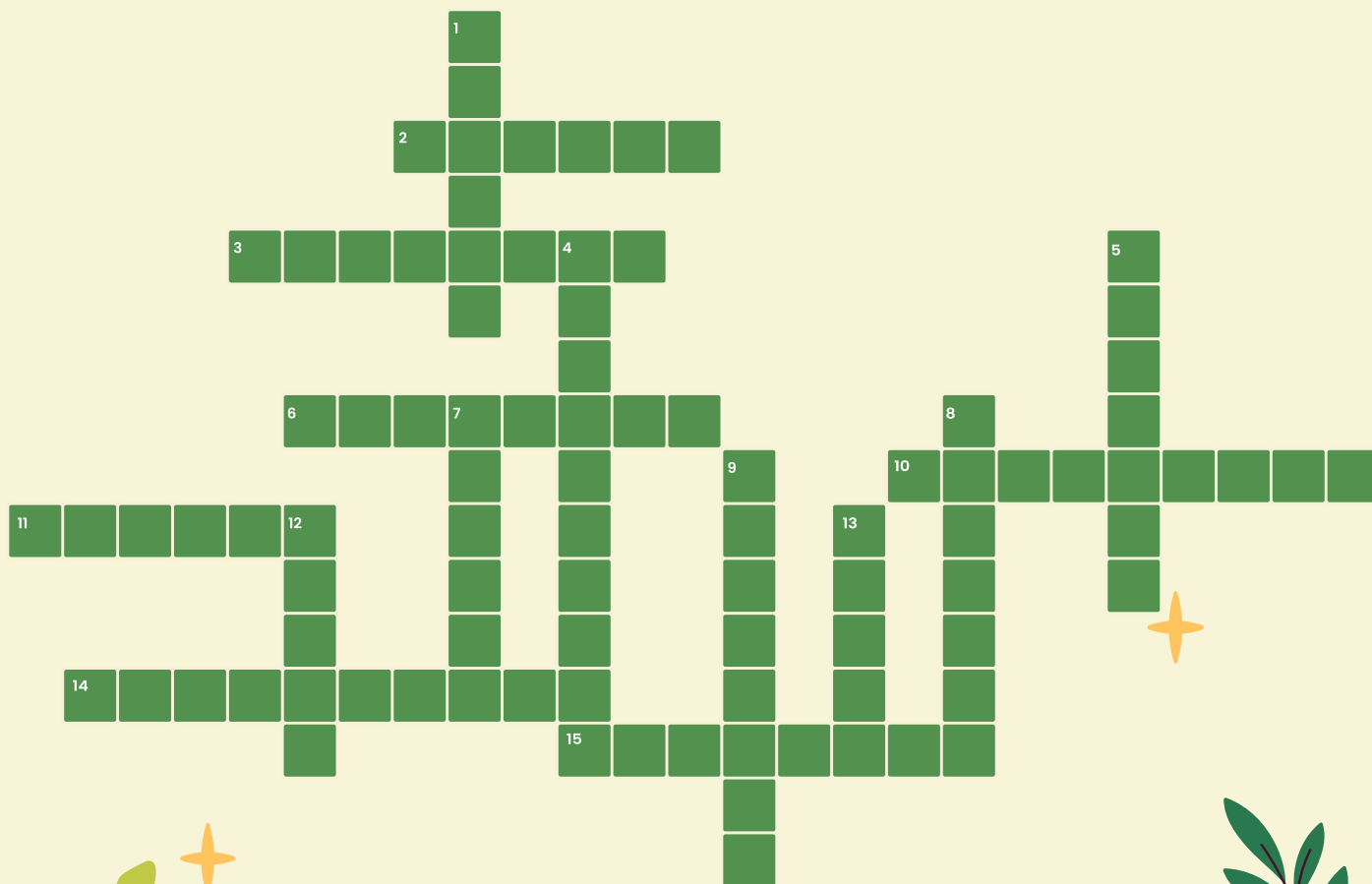
**By harnessing the potential of technology and fostering collaboration between stakeholders, path for a more sustainable future can be paved which will ensure peaceful coexistence of human and wildlife together.**

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# Crossword



## Across

2. City in India that topped Swachh Survekshan Awards 2023 for 6 consecutive years
3. A scavenger whose population is being impacted by Diclofenac
6. Ebola and Nipah are examples of this type of disease
10. World's largest island
11. Species that generally lives underground but emerges at regular intervals to find a mate
14. Tiger population in this region may have attained its carrying capacity
15. Innovative technique for afforestation

## Down

1. A critically endangered indigenous species of deer found in Kashmir
4. Responsible travel to natural areas that conserves the environment and improves the well-being of local communities
5. A Community in Rajasthan famous for conservation efforts
7. Protocol on Access and Benefit Sharing to guarantee the advantages of binding genetic resources
8. Government of India's scheme to address all five facets of the Earth system
9. The national heritage animal of India
12. Scientist who put forward a biological rule differentiating warm-blooded animals living in colder climates from those living in warmer climates.
13. A Country which hosted 6th UN Environment Assembly (UNEA-6)

Answers  
Across: 2. Indore, 3. Vultures, 6. Zoonotic, 10. Greenland, 11. Cicada, 14. Sunderbans, 15. Miyawaki  
Down: 1. Hangul, 4. Ecotourism, 5. Bishnoi, 7. Nagoya, 8. PRITHVI, 9. Elephant, 12. Allen, 13. Kenya

# Quiz Zone

1. **Kaziranga National Park is located in which of the following States?**
  - (a) Madhya Pradesh
  - (b) Assam
  - (c) West Bengal
  - (d) Uttar Pradesh
2. **The State of the World's Migratory Species has been released by**
  - (a) Convention on the Conservation of Migratory Species of Wild Animals (CMS)
  - (b) United Nations Environment Programme
  - (c) World Wide Fund for Nature
  - (d) Conservation International
3. **Recently, which country has declared snow leopard as its national symbol?**
  - (a) Myanmar
  - (b) Sri Lanka
  - (c) Indonesia
  - (d) Kyrgyzstan
4. **A new species of the green anaconda has been discovered in which of the following country?**
  - (a) Argentina
  - (b) Ecuador
  - (c) Brazil
  - (d) South Africa
5. **Which of the following cities topped in the Cleanest Ganga Towns category in the Swachh Survekshan Awards 2023?**
  - (a) Varanasi and Kanpur
  - (b) Kanpur and Haridwar
  - (c) Varanasi and Prayagraj
  - (d) Haridwar and Patna
6. **India and Denmark have recently launched which of the following initiative?**
  - (a) Green Fuels Alliance India (GFAI) initiative
  - (b) Lifestyle for the Environment- LiFE Movement
  - (c) Global Biofuels Alliance (GBA)
  - (d) International Solar Alliance
7. **Congress Grass is endemic to which of the following region?**
  - (a) Central Asia
  - (b) In the Himalayan region of South Asia
  - (c) Areas adjacent to the Gulf of Mexico, Central America etc.
  - (d) East Asia
8. **Larger body parts of animals such as huge ears, limbs, etc. are advantageous in warmer climate. Why it is so?**
  - (a) Helps in emitting more heat
  - (b) Helps in protecting animals from predator
  - (c) Helps to conserve heat
  - (d) None of the above
9. **Khejri trees are mainly found in which of the region?**
  - (a) North-East India
  - (b) Ganga Plains
  - (c) Arid region
  - (d) Himalayan region
10. **In India, MStrIPES is used for the monitoring of which of the following animals?**
  - (a) Dolphin
  - (b) Peacock
  - (c) Tiger
  - (d) Elephant

Answers  
1-B, 2-A, 3-D, 4-B, 5-C, 6-A, 7-C, 8-A, 9-C, 10-C



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'The Planet Vision' aims to educate and inspire individuals about the importance of individual actions for a sustainable future. It presents uplifting narratives, highlighting local conservation efforts and community initiatives.

We also provide regular updates on the latest environmental technology and groundbreaking projects, aiming to raise awareness of the environment, nature, and the planet. The goal is to encourage eco-friendly behaviours and promote sustainable practices.

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