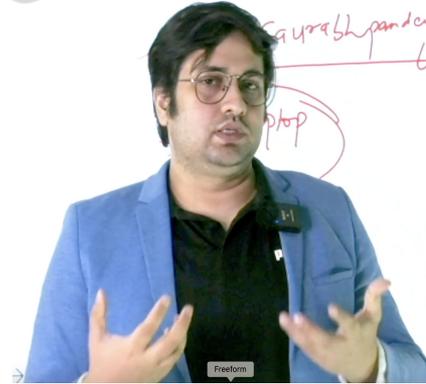


# Topics - MINDS MAPS included (Daily current affairs 6th & 5th January 2025)

- Target UPSC CSE Prelims 2025
- Avian Influenza Outbreak in Maharashtra
- Introduction to Digital Personal Data Protection Rules
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- Mega Dam project by china
- The Cultural Significance of Meroë and Menchal:
- Introduction to Squirrel Monkeys
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By saurabh Pandey



THE HINDU

## Topics - 2

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- Dayr Atiyah
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- Understanding the Rupee's Decline: Factors Behind the 85 Mark Against the Dollar
- Mains



By saurabh Pandey



THE HINDU

## Target Mains -2025/26 -

Q What impact construction of mega dam has on cultural landscape of the region ??”

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**Q3. Polavaram projects has recently been in news on account of threat posed to the tribe in neighbouring state. The given project is along which among the following River.**

**(The Hindu)**

**A) Krishna River**

**B) Kaveri River**

**C) Godavari River**

**D)Mahanadi River**

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**Schedule CRASH COURSE ON UPSC CSE Prelims 2025**  
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Monday	6 <sup>th</sup> January 2025	Indian Geography through Mapping of INDIA (Mountain)
Wednesday	8 <sup>th</sup> January 2025	Indian GEOGRAPHY through mapping (Passes, Rivers)
Friday	10 <sup>th</sup> January 2025	Agriculture for GS
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**EVERYTHING  
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# Quarantine animals with symptoms of avian flu, Centre tells States after deaths of tiger, leopard

**A.M. Jigeesh**

NEW DELHI

With Maharashtra reporting India's first case of avian influenza among animals, the Union Animal Husbandry Ministry sent a circular to all States on Sunday, urging them to quarantine infected or symptomatic tigers and other feline species to prevent transmission to humans and other animals.

Three tigers and one leopard died of the H5N1 virus, better known as bird flu, at an animal rescue centre in Nagpur in the last week of December.

Avian influenza is crossing the species barrier, Union Animal Husbandry Commissioner Abhijit Mitra told *The Hindu* on Sunday. Citing cases in the U.S.



**Infection alert:** Avian influenza has been found in cattle and goats, as well as in wild species, particularly tigers. A.M. FARUQUI

and Vietnam, he said that avian influenza has been found in cattle and goats, as well as in wild species, particularly tigers.

"In Maharashtra, the case was reported from a rescue centre and after post-mortem, the samples were sent to the Indian Council of Agricultural Re-

search's National Institute of High Security Animal Diseases at Bhopal. There, the samples tested positive for avian influenza," Dr. Mitra said, noting that this is the first time that bird flu has been reported among animals in India. "They are precious animals. We have isolated them and are

treating them. The National Joint Outbreak Response Team has reached there and is implementing the steps to be taken in such a scenario," he said, adding that the Ministry will issue detailed guidelines on the matter within a week.

The Ministry is also examining the reasons for the infection.

"The animals are in a rescue centre. Maybe the chicken served to them could be the reason for the disease. We are examining it and have alerted the Ministry of Environment, Forest and Climate Change too," Dr. Mitra said, adding that there is no need to panic at present. "The human beings who came in touch with the animals during the treatment and the post-mortem are also

being screened," he said.

## Biosecurity protocols

In its circular, the Ministry directed that any affected establishment will have to be temporarily shut to the public and initiate enhanced biosecurity protocols. It also directed States to strengthen biosecurity and carry out thorough disinfection in the entire area where deaths have been reported.

It added that the deaths of the tigers and a leopard that have tested positive for Highly Pathogenic Avian Influenza (HAI) raise significant concerns about the rapid spread of the virus. "The situation demands urgent attention to mitigate risks to both animal and human health" the circular said.

# Topic → Avian Influenza Outbreak in Maharashtra

## Key Developments



 **First Case in India:** Maharashtra reported the first case of avian influenza in animals, affecting tigers and a leopard.

 **Deaths Reported:** Three tigers and one leopard succumbed to the H5N1 virus at a Nagpur animal rescue center in late December.

 **Ministry Response:** The Union Animal Husbandry Ministry issued a circular for states to quarantine infected or symptomatic felines to curb transmission.

 **Testing and Findings:** The National Institute of High Security Animal Diseases confirmed avian influenza in samples from the deceased animals.

 **Biosecurity Measures:** Enhanced biosecurity protocols were mandated, including temporary closures and thorough disinfection of affected areas.

 **Investigation Underway:** The Ministry is probing potential infection sources, such as contaminated chicken fed to the animals.

 **Human Safety Measures:** Individuals in contact with infected animals are being screened; public panic is unwarranted.

**Summary:** Maharashtra has reported India's first avian influenza case in animals, leading to urgent biosecurity measures and investigations into the infection source.

# Personal data protection rules: Centre promises adequate time for compliance

**The Hindu Bureau**

NEW DELHI

The draft Digital Personal Data Protection Rules seek to protect citizens' rights in accordance with the Digital Personal Data Protection Act, 2023, while achieving the "right balance between regulation and innovation", said a note issued by the Union government on Sunday. Adequate time will be given to all stakeholders, from small enterprises to large corporates, for the smooth transition to achieve compliance, it added.

As provided, the Data Protection Board itself will function as a digital office and will be "born digital", with a digital platform and app to enable citizens to approach it digitally and have their complaints adjudicated without their physical presence.

People can share their feedback on the draft rules through the MyGov portal at the link <https://innovateindia.mygov.in/dpdp-rules-2025> till February 18. An official said there would be a structured interaction for feedback. "In addition,



The Data Protection Board itself will be 'born digital', with a digital platform and app for easy access. GETTY IMAGES

structured interaction for feedback with identified stakeholders, such as civil society, industry and government organisations, would also be organised to gather feedback. All feedback/comments will be taken into consideration while finalising the rules," the official from the Information and Broadcasting Ministry said. The final rules as notified will be placed before Parliament.

Stating that adequate time will be given to all entities to adapt their systems to meet the requirements, the official said processing of digital data on the basis of consent given before the new law came into force

was permitted. Such processing could continue while citizens were given notice of it so that they could exercise their rights under the law.

"While clear obligations have been cast on 'data fiduciaries' to protect personal data in accordance with the law, prescriptions have been kept to a minimum and compliance burden has been kept low by enabling compliance through digital means. While the entities will prepare themselves for compliance with the law during the period given for adapting their systems, widespread awareness initiatives will be undertaken to edu-

cate the citizens about their rights on their personal data," the official said.

Under the rules, digital platforms will have to inform and take the consent of people in a language of their choice – either in English or in any of the 22 Indian languages listed in the Constitution. They will have to notify their users of the online links using which they may exercise their rights for withdrawing their consent, obtaining information regarding processing of their data, updating and erasing their data, grievance redress, nomination, and making a complaint to the Data Protection Board.

The Act and the draft rules do not mandate that all personal data has to be stored within India. However, they provide that transfer of personal data outside India may be restricted for certain classes. The draft rules envisage a committee that may recommend restriction on such transfer by a significant data fiduciary with respect to specified personal data, the government said.



## **Topic → Introduction to Digital Personal Data Protection Rules**

In an age where our personal data is more valuable than gold, the draft Digital Personal Data Protection Rules are stepping in to safeguard our rights. Issued by the Union government, these rules aim to create a framework that not only protects citizens but also encourages innovation. Let's dive into what these rules entail and how they will impact us all.

### **What are the Digital Personal Data Protection Rules?**

The Digital Personal Data Protection Rules are a set of guidelines designed to protect the personal data of citizens in accordance with the Digital Personal Data Protection Act, 2023. They aim to ensure that individuals have control over their data while also fostering an environment conducive to technological advancement.

### **Purpose of the Draft Rules**

The primary purpose of these draft rules is twofold: to protect citizens' rights and to strike a balance between regulation and innovation. This means that while there are rules in place to protect us, they won't stifle the growth of new technologies and businesses.

## **Protecting Citizens' Rights**

At the heart of these rules is the commitment to protect citizens' rights. This includes ensuring that individuals have the ability to control their personal data, understand how it's being used, and have avenues for redress if their rights are violated.

## **Balancing Regulation and Innovation**

The government recognizes that too much regulation can hinder innovation. Therefore, these rules are crafted to provide a framework that allows businesses to thrive while still protecting the rights of individuals. It's like walking a tightrope—finding that perfect balance is crucial.

## **Transition Period for Stakeholders**

One of the most significant aspects of the draft rules is the provision for a transition period. This allows all stakeholders, from small businesses to large corporations, ample time to adapt to the new regulations.

## **Who are the Stakeholders?**

Stakeholders include everyone from tech startups to established corporations, as well as civil society organizations and government entities. Each group has a role to play in ensuring that the transition is smooth and effective.

## **Importance of Smooth Transition**

A smooth transition is vital for compliance. It ensures that businesses can adjust their systems and processes without facing undue pressure, which ultimately benefits consumers as well.

## **The Role of the Data Protection Board**

The Data Protection Board will serve as a digital office, designed to handle complaints and issues related to data protection. This board will be “born digital,” meaning it will operate entirely online.

### **Digital Office Concept**

Imagine being able to file a complaint or seek assistance without ever having to leave your home. That’s the beauty of a digital office! It makes the process more accessible and efficient for everyone involved.

### **: How Citizens Can Engage**

Citizens will have the opportunity to engage with the Data Protection Board through a dedicated app and platform, making it easier than ever to voice **concerns and seek resolutions.**

### **Feedback Mechanism**

The government is keen on gathering feedback on the draft rules, and they’ve set up mechanisms to do just that.

## **Structured Interactions with Stakeholders**

In addition to the MyGov portal, there will be structured interactions with identified stakeholders, including civil society and industry representatives. This collaborative approach ensures that all perspectives are considered.

## **Compliance and Adaptation**

Compliance with the new rules is essential, and the government is providing adequate time for entities to adapt their systems accordingly.

## **Processing of Digital Data**

Interestingly, the rules allow for the processing of digital data based on consent given before the new law came into effect. This means that businesses can continue their operations while citizens are informed about their rights.

## **Obligations of Data Fiduciaries**

Data fiduciaries, or those who handle personal data, will have clear obligations to protect that data. However, the government has kept compliance burdens low by enabling digital means for compliance.

## **Language and Communication**

Communication is key in ensuring that citizens understand their rights under these new rules.

:

### **Consent in Multiple Languages**

Digital platforms will be required to inform users and obtain consent in a language of their choice, whether it's English or one of the 22 Indian languages. This inclusivity is crucial for effective communication.

### **Data Storage and Transfer Regulations**

The draft rules also address how personal data is stored and transferred.

#### **Storage Requirements**

While the rules do not mandate that all personal data must be stored within India, they do provide guidelines for how data can be managed and protected.

## Restrictions on Data Transfer

There may be restrictions on transferring personal data outside of India for certain classes of data, ensuring that sensitive information remains protected.

### : **Conclusion**

The draft Digital Personal Data Protection Rules represent a significant step forward in protecting citizens' rights while fostering innovation. By providing a structured approach to data protection, the government is ensuring that individuals can navigate the digital landscape with confidence. As we move forward, it's essential for all stakeholders to engage in the feedback process and adapt to these new regulations.

# Moving away from coal a must: South African court upholds 'Cancel Coal' case

The court ruled the energy minister and the national energy regulator couldn't provide enough evidence to show that the ill effects of coal power on the environment and the health of the people, especially children, had been considered, suggesting they didn't comply with their constitutional obligations

Priyali Prakash

Civil society organisations claimed a landmark victory against fossil fuel power in South Africa on December 4 when the High Court in Pretoria turned down the national government's plan to add more coal-fired power stations to the country's power grid. According to the court, the government's plan was "inconsistent with the Constitution of the Republic of South Africa" and thus unlawful.

**The 'Cancel Coal' case**  
In its Integrated Resource Plan (IRP), the government of South Africa announced in October 2019 that it plans to add 1,500 MW of coal power to the country's national grid - 750 MW by 2023 and another 750 MW by 2027.

The Minister of Mineral Resources and Energy and the National Energy Regulator of South Africa in 2020 backed the announcement.

In 2021, youth-led civil organisations including the African Climate Alliance, the Yekani Environmental Justice Movement in Action, and the Groundwork Trust, represented by the Centre for Environmental Rights, brought the case against the government's plan. The group alleged that the plan would harm the environment and cause health issues, especially among children. The case soon acquired the popular monicker "Cancel Coal".

**South Africa's energy mix**  
Like most economically developing nations, South Africa is heavily dependent on coal for its energy needs.

According to estimates by the International Energy Agency, almost 71% of the country's total energy supply came from coal power in 2022.

According to an analysis of global emissions through high by Climate Watch, South Africa is the world's 16th largest emitter of greenhouse gases.

South Africa has ratified the Paris Agreement, which means it is legally bound to cut its greenhouse gas emissions and contribute to mitigating global warming.

According to the Nationally Determined Contributions South Africa submitted in 2021, the country plans to cut 350-420 million tonnes of carbon-dioxide-equivalent (MCO<sub>2</sub>e) of greenhouse gas emissions by 2030. It has also committed to reaching net-zero by 2050.

In July 2024, the country's President Cyril Ramaphosa signed the Climate Change Act into law, which includes a clause to reduce greenhouse gas



Cancel Coal protests in South Africa. GROUNDWORK

emissions.

#### Details of the judgement

Civil society organisations contended that the government's plan to add more coal power didn't consider the rights of children as granted by the Constitution of South Africa.

According to the Constitution, South African citizens have the right "to have the environment protected, for the benefit of present and future generations." This is to be ensured through measures that "prevent pollution and ecological degradation, promote conservation, secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

The court ruled that the Minister of Mineral Resources and Energy and the National Energy Regulator couldn't provide enough evidence to show that the ill effects of the coal power on the environment and the health of the people, especially children, had been considered, suggesting they didn't "comply with their constitutional obligations."

Speaking to *The Hindu*, Ritwick Dutta, environmental justice lawyer and associate at Doughty Street Chambers U.K., said the order is a significant development in the field of climate litigation.

"Although, at the core, the judgment still follows the basic principles of administrative law - duty to give reasons and non-application of mind to relevant consideration - what is however

South Africa is heavily dependent on coal for energy. Almost 71% of the country's total energy supply came from coal in 2022.

According to an analysis by Climate Watch, South Africa is the world's 16th largest emitter of greenhouse gases

significant is the fact that the court held that the minister, while according approval, did not take into account the interest of the future generations or the unborn generations.

He also highlighted the fact that "since the Court relied on Section 28 of the South African Constitution, which requires the state to protect the child against 'neglect and degradation' to hold that the governments/ministers decision was not in the 'best interest of the child'. The implication of this judgment as I see it is the requirement that a minister/government decision must not be based on the immediate short-term need but must consider a long-term holistic view," Mr. Dutta said.

A 2019 study published in the *International Journal of Environmental Research and Public Health* reviewed epidemiological literature to understand the impact of coal-fired power plant emissions on children's health. It concluded that they affect children negatively due to their "developing physiology, anatomy, metabolism, and health behaviours." The review also observed that children who lived near a

coal-fired plant exhibited more asthma and respiratory-related conditions.

#### Environmental justice

The case is also an example of environmental justice in the context of transitioning away from coal worldwide.

"Even in India, for the first time three ministries - Ministry of Power, Ministry of Environment, Forest and Climate Change and the Ministry of New and Renewable Energy - jointly filed an affidavit before the Supreme Court in the case of *M.K Ranjitsingh versus Union of India* that India will have to move from polluting coal to wind and solar not only to ensure cleaner air but also to meet its commitment under the Paris Agreement," Mr. Dutta said. "Coal will continue to meet the energy requirement in the short run, but it is now accepted that transition is a must if the world has to slow down climate change. The fact that courts globally are recognising this reality is ... only natural."

The lawyer also said that even though this case is limited to coal power, combating climate crisis goes beyond it. "Judicial decisions on climate change are a recognition of both the urgency to deal with climate crisis and the fact that civil society groups and citizens have an important role to play in tackling the crisis. It should not be forgotten that the South African judgement is an outcome of litigation undertaken by three civil society groups. It is therefore crucial that the state and the judiciary are more open and receptive towards divergent views on dealing with a crisis of an unparalleled nature," he added.

## THE GIST

In 2021, civil organisations represented by the Centre for Environmental Rights sued the government over plans to start more coal-fired plants

South Africa has ratified the Paris Agreement, which means it is legally bound to cut its emissions. It plans to cut 350-420 million tonnes by 2030. In 2024 President Ramaphosa also signed the Climate Change Act into law

A 2019 study concluded that children's physiology, anatomy, and metabolism were negatively affected by plant emissions. The review observed that children who lived near a coal-fired plant exhibited more asthma and respiratory-related conditions

# Topic → "Cancel Coal" Case in South Africa



## Background

Civil Society Victory 

Landmark court ruling against coal power

High Court deemed government plan unlawful

Constitutional Rights: Environmental protection for future generations

## Government Plans

Integrated Resource Plan (IRP) 

Proposal for adding 1,500 MW of coal power

750 MW by 2023

750 MW by 2027

Support from Minister of Mineral Resources and Energy

## Civil Society Involvement

Youth-led organizations ⚡

African Climate Alliance

Vukani Environmental Justice Movement

Groundwork Trust

Case against government for health and environmental impacts

saurabh pandey upsc

## Impact on Health

Studies show adverse effects on children

Increased asthma and respiratory issues

Importance of considering long-term health impacts

## Energy Mix in South Africa

Heavy reliance on coal (71% of energy supply in 2022) 

16th largest emitter of greenhouse gases globally

Commitment to the Paris Agreement 

## Judicial Implications

Decision highlights importance of considering future generations

Emphasizes a long-term view in governmental decisions

## Environmental Justice

Global context of transitioning from coal to renewable energy sources 

Recognizing the role of civil society in climate litigation

## BIG SHOT



This handout image received on December 26, 2024, from the State Control Centre of the Victoria Emergency Services shows a bushfire in the Grampians National Park in Australia's Victoria state. The country's southeast is sweltering in a heatwave that has raised the risk of bushfires. The nation's weather forecaster said temperatures would be up to 14 degrees C above average in some areas. AFP

## Topic → Grampians National Park Overview

### Location and Features



Location: Situated in Victoria, Australia.



Features: Known for its breathtaking mountain ranges, diverse wildlife, and rich Aboriginal cultural heritage.

Summary: Grampians National Park in Victoria, Australia, is celebrated for its natural beauty, diverse wildlife, and cultural significance, providing a variety of outdoor activities for visitor

## WHAT IS IT?

# Dinosaur highway: where dinos walked

### Vasudevan Mukunth

limestone quarry in Oxfordshire in the UK has come to be called a “dinosaur highway” for the number of footprints of the long-lost giants scientists have discovered there.

In 1997, workers at the Dewars Farm Quarry revealed more than two score dinosaur footprints, some of them extending for more than 180 metres. Further studies revealed the footprints were from the Jurassic period.

Recently, on January 4, a team of more than a hundred scientists from the University of Birmingham and the University of Oxford announced the discovery of more than 200 footprints in the same quarry. In June last year, a quarry worker had stumbled upon “unusual bumps,” as he called them, when he was digging for clay. After he reported them, the scientists got together and found that the footprints were from 166 million years ago — the Middle Jurassic period.

The team found five trackways — or series of footprints — in all. They said



An artist's impression of sauropod dinosaurs on the Isle of Skye in this undated handout photo provided by the University of Edinburgh, December 2015. REUTERS

four were created by sauropods (long-necked herbivores) called cetiosaurus and one by a carnivore called megalosaurus. Analysis by the team suggested all the animals had been walking, not running, at the (possibly different) times the prints were made.

The megalosaurus footprint is particularly serendipitous because 2024 was the 100th year of its study. In 1824, a megalosaurus fossil became the first dinosaur fossil to be unearthed and examined in detail by the British theologian and geologist William Buckland.

#### **For feedback and suggestions**

for 'Science', please write to  
**science@thehindu.co.in**  
with the subject 'Daily page'

## Topic → Dinosaur Footprints Discovery in Oxfordshire

### Overview

 The limestone quarry in Oxfordshire, UK, is famously known as the "dinosaur highway" due to the discovery of numerous dinosaur footprints.

 In 1997, over 40 footprints were found, some extending over 180 meters, dating back to the Jurassic period.

 On January 4, a team of over 100 scientists from the University of Birmingham and the University of Oxford announced the discovery of more than 200 additional footprints in the same quarry.

 These footprints date back 166 million years to the Middle Jurassic period, discovered after a quarry worker noticed unusual bumps while digging for clay.

## Significance

The discovery enhances knowledge of dinosaur behavior and movement patterns.

The megalosaurus footprint discovery is timely, coinciding with the 100th anniversary of its detailed study.

## Conclusion

The limestone quarry in Oxfordshire continues to be a significant site for paleontological discoveries, providing valuable insights into the Jurassic period's dinosaur life

# Implications of China's mega-dam project

Do all riparian countries have major water infrastructure projects planned in the river basin of the Brahmaputra? What are China's and India's plans and how will they affect communities living alongside the river basin? How important are Tibet's river systems to the Himalayan bioregion?

## EXPLAINER

Mirza Zulfiqar Rahman

### The story so far:

The ambitious plan to build a mega-hydropower dam across the Brahmaputra at the Great Bend region of the Medog county in the Tibetan Autonomous Region (TAR) in China, has been in the drawing boards of Chinese hydrography for decades. The clearest signalling to this effect happened in 2020 when this project was included in China's 14th Five-Year Plan. Its approval was granted on December 25, 2024. India, Bhutan and Bangladesh will have serious downstream implications of this 60 GW hyper-dam built upstream by China.

### Where is this project?

The Brahmaputra is a transboundary Himalayan river basin spanning four riparian countries. China is the uppermost riparian nation with the river system originating in the TAR, where it is known as the Yarlung Zangbo (or Tsangpo). India and Bhutan are lower riparian nations in relation to China and middle riparian countries in relation to Bangladesh. It is from Bangladesh, which is the lowermost riparian nation, that the river drains into the Bay of Bengal. All riparian countries have major water infrastructure projects planned in the river basin, such as hydropower dams, embankments meant for river control, irrigation dams and barrages.

### Is the Brahmaputra river basin trapped within nation states?

Transboundary river systems are often likened by nation-states to 'taps', which they think can be closed or opened through hydraulic interventions such as dams within their respective nation-states. The Brahmaputra river system has been the site of planned and ongoing mega-dam projects by China, India and Bhutan, all contributing to an intense geopolitical power projection in the river basin. Mega-dams on rivers systems are seen as important sovereignty markers, symbols of nation-state control over natural features. Highly dramatised terms such as 'water wars' are part of the geopolitical vocabulary and upstream hydropower dams are viewed as 'water bombs' by lower riparian nations, as in the case of the Medog dam project. China sits pretty at the top of Asia's water tower, with complete control over Tibet's rivers and significant material, technological and discursive capabilities to deploy unilateral hydropower development.

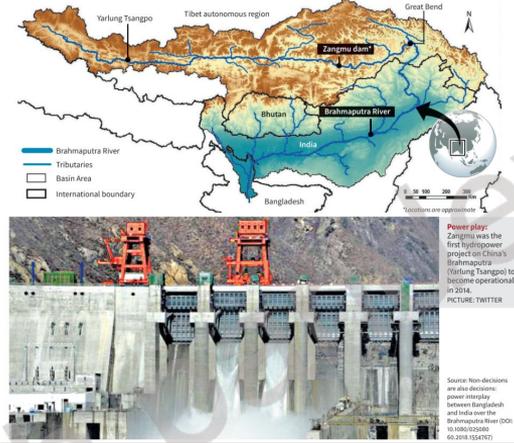
The Chinese hydrography has gone forward with mega-hydropower developments such as the Three Gorges Dam on the Yangtze river and the Zangmu Dam on the Yarlung Zangbo, commissioned in 2005, with its top political leadership firmly backing these interventions as state symbols.

### What are the risks for communities inhabiting the Brahmaputra river basin?

The communities living along the river system have adapted as the river has shaped and shifted over centuries. However, with interventions such as mega-hydropower dams by China, India and Bhutan, communities cannot use their traditional knowledge about the river system meaningfully, as the pace and occurrence of disasters have magnified. The upstream communities in Tibet as well as the downstream communities in India, Bhutan and

## Taming the 'rogue' river

The Brahmaputra is a transboundary Himalayan river basin spanning four riparian countries. This map shows its flow from the Tibetan Autonomous Region in China through Bhutan and India into Bangladesh.



Bangladesh have to live under the shadow of mega-hydropower dams with adverse consequences to their traditional lands and livelihoods. The perennial flow of the Brahmaputra in downstream areas in India and Bangladesh depends on the flow of the Yarlung Zangbo. The blocking of that perennial flow, in order to maintain headwaters to operate a mega-hydropower dam of the magnitude that China is planning at the Great Bend, will have catastrophic consequences on surface water levels, and to overall monsoon patterns and groundwater systems of the river basin. This will affect downstream agrarian communities and the sensitive ecology of the overall Himalayan bioregion/ecoregion.

### What explains the hydropower dam-building race in the Brahmaputra river basin?

There is a face-off between China and India on the Yarlung Zangbo Brahmaputra river course. China has announced the biggest hydropower project at the Great Bend while India has announced its largest dam project at Upper Stang. Bhutan has been planning and building several medium to small dams, which have raised concerns in downstream India and Bangladesh. None of the riparian countries of the Brahmaputra river basin have signed the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses of 2004, and hence first user rights on river systems are non-enforceable. China and India have an Expert Level Mechanism (ELM) since

2006, to discuss outstanding issues and share hydrological data, but do not have a comprehensive bilateral treaty to govern shared transboundary rivers. The outstanding land boundary dispute between China and India is weaved into the intense securitisation of the Brahmaputra river basin, which makes it an active site for strategic posturing by both countries.

### What next?

A recent academic book by some Australian researchers titled *Rivers of the Asian Highlands from Deep Time to the Climate Crisis*, puts forward important deep time (deep time means geological time, billions of years) perspectives to Himalayan river systems. The book juxtaposes a wider planetary thinking to emerge against the backdrop of narrow technocratic decision-making to build mega-dams within nation-states.

Tibet's river systems are important to the Earth's cryosphere, comprising permafrost and glaciers, and major climate systems directing climate and precipitation pathways such as the monsoon. Glacial Lake Outburst Floods (GLOFs) have increased in the Himalayas with climate change events, exemplified by the Chungtang Dam collapse in Sikkim during October 2023, which caused widespread devastation to life and property to downstream communities. The dams across the Himalayas aim at

their natural life cycles. This affects agro-pastoral communities, biodiversity, living biota in rivers and wetland systems. The Brahmaputra river basin will turn into an active risk-scenario if all these planned dams are built eventually. The accurate sensor history will help contextualise the site of the Medog dam being built by China. One of the greatest earthquakes of modern times, the 1950 Medog Earthquake, or the Assam-Tibet Earthquake, which transformed the riparian landscape, had its epicentre at Medog in Tibet. The earthquake had disastrous effects downstream in Assam and Bangladesh, with the landscape until now trapped in an unending cycle of annual catastrophic floods.

Philip Ball in his book titled *Water Kingdom: A Secret History of China* describes the Yarlung Zangbo being viewed in Chinese history as a 'river gone rogue' as it turns sharply from its west to east route at the Great Bend, to turn south to enter India, with other major rivers in China running from west to east. While China is going ahead with building mega-dams in Tibet to correct this geographical anomaly by disciplining a 'rogue river', India can assume an important riparian leadership role for regional river systems by not mirroring what China does. A dam for a dam will make the entire Himalayan riparian/climatic systems run dry and turn it into a disaster-scenario for its communities.

Mirza Zulfiqar Rahman is a Visiting Associate Fellow at the Institute of Chinese Studies, Delhi, India.

## THE GIST

The Brahmaputra is a transboundary Himalayan river basin spanning four riparian countries. China is the uppermost riparian nation with the river system originating in the TAR, where it is known as the Yarlung Zangbo.

There is a face-off between China and India on the Yarlung Zangbo-Brahmaputra river course. China has announced the biggest hydropower project at the Great Bend while India has announced its largest dam project at Upper Stang.

The dams across the Himalayas aim at territorialising river systems, breaking their natural life cycles. This affects agro-pastoral communities, biodiversity, living biota in rivers and wetland systems.

Power plays: Zangmu is the first hydropower project in China's Brahmaputra (Yarlung Zangbo) to become operational, in 2014.

PICTURE: TWITTER

Source: Non-decisions are also decisions: power struggle between Bangladesh and India over the Brahmaputra River (DOI: 10.1080/00263666.66.2018.1554787)

# Topic - Mega Dam project by china



The ambitious plan to construct a mega-hydropower dam across the Brahmaputra at the Great Bend region of Medog county in the Tibetan Autonomous Region (TAR) has long been the fervent dream of Chinese hydrocracy. Following its inclusion in China's 14th Five-Year Plan in 2020, the project has now been officially approved as of December 25, 2024. This monumental undertaking, boasting a staggering capacity of 60 GW, poses significant downstream implications for India, Bhutan, and Bangladesh.

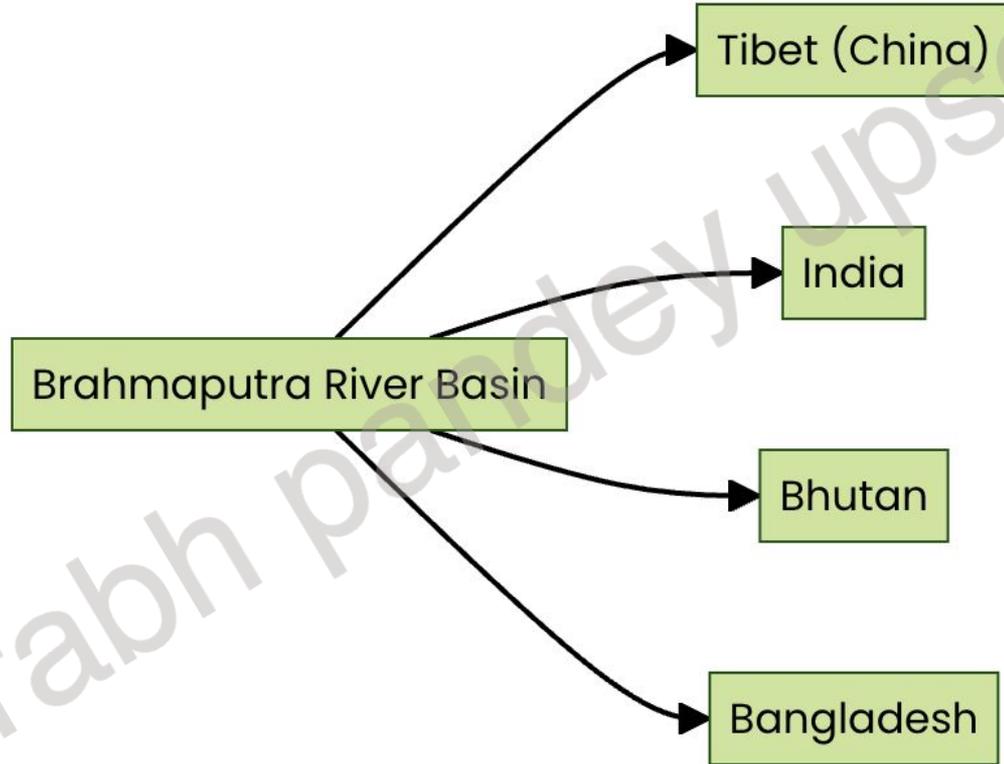
## **Strategic Location:**

The Brahmaputra is a transboundary river basin connecting four riparian nations: China, India, Bhutan, and Bangladesh.

Known as the Yarlung Zangbo in TAR, it originates in Tibet and flows downstream into the Bay of Bengal.

## **Ecosystem Impact:**

All riparian countries have planned substantial water infrastructure projects in the basin, including hydropower dams and irrigation barrages



## The Nationalistic Perspective:

The Brahmaputra river basin is often viewed by nation-states as a "tap" that can be turned on and off through the construction of dams. This perspective underscores the intense geopolitical dynamics at play, as China, India, and Bhutan engage in a race to dominate the river system.

### **Sovereignty and Control:**

Mega-dams are perceived as sovereignty markers, symbolizing national control over natural resources.

Terms like "water wars" have emerged in geopolitical discussions, with upstream dams viewed as "water bombs" by downstream nations.

### **China's Hydrocratic Ambitions:**

With the Three Gorges and Zangmu Dams already completed, China continues to assert its dominance over the region's hydropower potential

## Risks to Local Communities:

The communities inhabiting the Brahmaputra river basin have adapted to the river's natural cycles over centuries. However, the construction of mega-dams has disrupted their traditional knowledge and livelihoods.

### **Displacement and Disaster:**

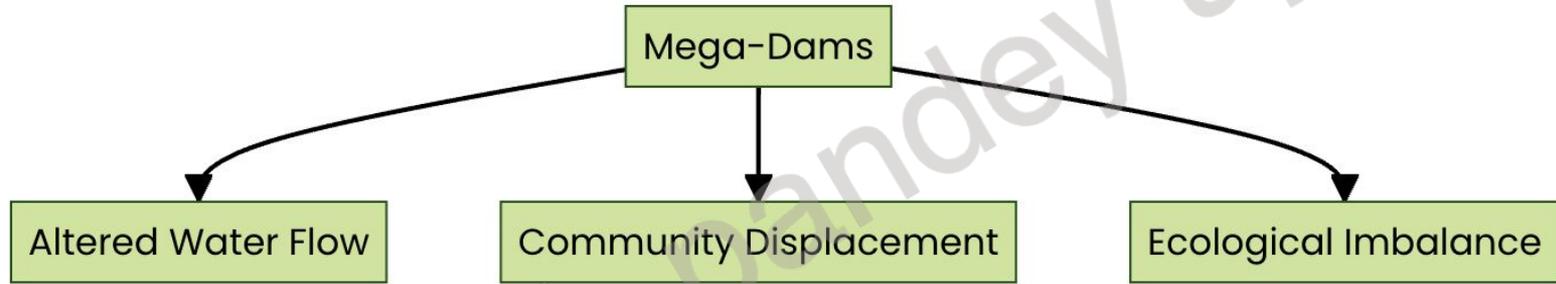
Upstream and downstream communities face increased risks as the natural flow of the Brahmaputra is altered.

The blocking of the river's perennial flow can lead to catastrophic consequences for surface water levels and monsoon patterns.

### **Ecological Concerns:**

The sensitive ecology of the Himalayan bioregion is at risk, with adverse effects on agrarian communities reliant on the river's natural flow for sustenance

Figure 2.1: Impact of Mega-Dams on Local Ecosystems



saurabh pandey upsc

## The Dam-Building Race:

The competition between China and India over the Yarlung Zangbo-Brahmaputra river system has escalated, with both nations planning significant hydropower projects.

### **Bilateral Tensions:**

The absence of a comprehensive bilateral treaty governing shared transboundary rivers complicates the situation.

The ongoing land boundary dispute further heightens tensions between the two nations.

### **Bhutan's Role:**

Bhutan's smaller dam projects have raised alarms in India and Bangladesh, contributing to the ongoing geopolitical complexities

## **Future Considerations:**

Recent academic discourse highlights the need for a more holistic approach to managing Himalayan river systems, advocating for a bioregional perspective.

### **Long-Term Vision:**

Understanding the geological time scale and climate implications can inform better decision-making.

This perspective can help mitigate the risks of mega-dam projects and their impact on local ecosystems.

### **Leadership in Riparian Affairs:**

India can take a leadership role by opting for sustainable practices rather than mirroring China's approach to dam-building.

A cooperative framework could foster regional stability and ecological integrity in the Himalayan region



The Shompen people, a vulnerable tribal group of the Nicobar Islands. FILE PHOTO

# Empower the guardians of the earth, do not rob them

A unilateral decision to establish three wildlife sanctuaries in southern Nicobar will deprive the indigenous peoples of their ancestral territories. For millennia, these historically isolated indigenes have relied on these islands as resource reservoirs for sustenance and protected them

**Ajay Saini**  
**Manish Chandi**

*The ₹72,000-crore mega infrastructure project on Great Nicobar will now also have an international cruise terminal and a shipbreaking yard, as proposed by the Union Shipping Ministry. In this article, dated April 22, 2024, Ajay Saini and Manish Chandi talk about the rights of the indigenous communities over the little islands of the Andaman and Nicobar archipelago and how they have been able to protect and preserve the area's ecological balance.*

In the southern expanse of the Andaman and Nicobar archipelago, off the shores of Little Nicobar, lie seven tiny islands. Classified as "uninhabited" in the government's records, these islets are nonetheless integral to the indigenous communities of the region. Two, officially called Meroë and Menchal, are known as Piruli and Pingayak, respectively, to the Fyain, the indigenous southern Nicobarese peoples, who hold traditional rights over these and other islets.

For millennia, these historically isolated indigenes have relied on these islands as resource reservoirs for sustenance and protected them. Menchal is revered, used, and protected under the spiritual realm called Pingayak (a spirit that is believed to reside on the island, prohibiting the overexploitation of resources or any undue harm to its ecosystem. Similarly, Meroë is believed to be the abode of a legendary islander community. Here, too, spiritual belief systems influence how the islanders use and protect natural resources.

Meroë and Menchal are managed by community elders as guardians and

specific individual caretakers. They ensure the protection of the island's resources and sustainability. In today's world, this phenomenon goes by the name of "conservation" and "sustainable use", among other terms and phrases.

## Conservation colonialism

In May 2022, in complete disregard of the indigenous land ownership and management systems, the Andaman and Nicobar (A&N) administration issued three public notices, announcing its intention to create three wildlife sanctuaries: a coral sanctuary at Meroë Island, a megapode sanctuary at Menchal Island, and a leatherback turtle sanctuary on Little Nicobar Island.

In mid-July, the A&N administration issued an order asserting that it did not receive any claims or objections from any individual regarding the land and marine areas within the three proposed sanctuaries; that no individual enjoys any rights within the boundaries of the proposed sanctuaries. And, that there will be "restriction on the people of neighbouring area to enter into these islands... in the national interest".

Approximately 1,200 southern Nicobarese inhabit Patai Takaru (Great Nicobar Island), and Patai I-bhi (Little Nicobar Island), holding traditional rights over both inhabited and ostensibly "uninhabited" islands. Yet, the A&N administration neither consulted nor informed the southern Nicobarese of its plans.

Despite verbal supplications and a letter in August 2022 from the Little & Great Nicobar Tribal Council that expressed the community's concerns to the A&N administration and the Ministry of Environment, Forest and Climate

Change, the A&N administration proceeded to issue official notifications in October 2022, designating the whole of Meroë (2.73 square kilometres, including the surrounding marine area) and Menchal (1.29 sq. km), along with a 13.75 sq. km area (including 6.67 sq. km. of water area within the baseline system) on Little Nicobar (40 sq. km), as wildlife sanctuaries.

## Masking an ecological disaster

The selection of Meroë and Menchal Islands as conservation reserves for coral reefs and Megapode birds is arbitrary. Menchal does not have more than a pair or two of the endemic Megapode birds. Similarly, questions arise regarding the actual diversity and abundance of corals on Meroë Island.

Notably, the announcement of wildlife sanctuaries coincided with growing scrutiny and criticism from experts over the denotification of the Galathea Bay Wildlife Sanctuary for a ₹72,000-crore mega project on Great Nicobar, a UNESCO Biosphere Reserve.

Establishing exclusionary conservation areas in a region, which is already a paradise for biodiversity, stems from the fact that the champions of the mega project are aware of the extensive environmental and social damage that the project will entail. It will devastate about eight to 10 lakh evergreen forest trees, smother and gouge out scores of coral reefs found along Galathea Bay, destroy the nesting site for the globally endangered Leatherback sea turtle species, devastate hundreds of nesting mounds of Nicobar Megapodes, and kill as many as 100 crocodiles.

Furthermore, it will prevent the indigenous Great Nicobar islanders from

returning to their pre-tsunami homeland where they husbanded pigs and chicken, cultivated coconut and betel nut trees, and lived simple and gregarious lives. Most importantly, it will uproot three or more settlements of the Shompen (a "Particularly Vulnerable Tribal Group") and permanently destroy their foraging and hunting grounds.

The unilateral decision to establish wildlife sanctuaries disregards the islands' profound significance to the indigenous population.

Their ancestral lands are unjustly perceived as "no-man's-land" to appease conservationists, investors, public opinion, and more.

## Support earth's guardians

Globally, governments blatantly violate indigenous people's rights by evicting them from their ancestral lands, often under the guise of development, national interest, conservation projects, among others. Approximately 476 million indigenous peoples, constitute about 6% of the global population. Indigenous territories cover roughly 22% of the planet's land surface and harbour 80% of its biodiversity.

Indigenous peoples are the original guardians of our earth. The world must learn from their wisdom. Reason and justice dictate that in southern Nicobar, we should support and empower the islanders to continue to steward their ancestral territories, rather than robbing them of their lands, resources, lifeways, and worldviews.

*Ajay Saini teaches at the Indian Institute of Technology Delhi. Manish Chandi is an independent researcher with over two decades of research experience in the Andaman and Nicobar Islands*

## Topic → The Cultural Significance of Meroë and Menchal:

The islands of Meroë and Menchal are not just geographical locations; they are the very essence of life for the Payuh people of the southern Nicobarese community. For centuries, these minuscule landmasses have served as vital reservoirs of sustenance and cultural identity.

**Historical Context:** These islands, classified as "uninhabited" by government records, are sacred to the indigenous Payuh. They embody a rich tapestry of traditions, stories, and spiritual beliefs.

**Resource Reservoirs:** Meroë and Menchal are essential for fishing, gathering medicinal plants, and other resources, deeply intertwined with the community's daily lives

## Spiritual Beliefs and Resource Management:

At the heart of the Payuh people's relationship with Meroë and Menchal lies a profound connection to the spiritual realm. This connection governs how they utilize and protect these islands.

**Pingaeyak and Ecological Balance:** Menchal is revered as the abode of Pingaeyak, a spirit that embodies the protection of natural resources. This belief system instills a sense of responsibility among the community members to safeguard the ecosystem.

**Sustainable Practices:** Traditional knowledge dictates sustainable harvesting, ensuring the islands' resources are not overexploited. This ancient wisdom is crucial for maintaining ecological balance

## Challenges from Modern Development:

Despite the rich cultural heritage and sustainable practices of the Payuh people, modern development poses significant threats to the islands and their way of life.

**Infrastructure Projects:** Large-scale development initiatives are encroaching upon the pristine environments of Meroë and Menchal, jeopardizing their ecological integrity.

**Loss of Traditional Rights:** The government's push for development often sidelines indigenous rights, threatening the very existence of these communities

## Roll call



A zookeeper poses with Squirrel monkeys during a photocall for the annual stocktake at ZSL London Zoo in central London. AFP

## Topic → Introduction to Squirrel Monkeys

Squirrel monkeys are small, vibrant primates that inhabit the tropical forests of Central and South America. With their distinctive yellow and black fur, these lively creatures are not only adorable but also exhibit remarkable intelligence and social behavior.

### Physical Characteristics:

Size: Typically weigh around 1.5 to 2.5 kg.

Coloration: Bright yellow underparts with a contrasting black or dark brown back.

### Social Structure:

Live in troops ranging from 10 to 30 individuals.

Complex social interactions characterized by grooming and vocalizations.

squirrel monkey, (genus *Saimiri*), most [abundant primate](#) of riverside forests in the Guianas and the [Amazon River](#) basin, distinguished by a circle of black hairless skin around the nose and mouth set against an expressive white face.

## *Down with the regime*



**Colossal wreck:** A statue of former Syrian President Hafez Assad seen destroyed on the top of a mount in Dayr Atiyah, Syria, on Sunday. AP

## Topic → Dayr Atiyah

 Location: Dayr Atiyah is situated in Syria.

 Type: It is classified as a town.

 Geographical Context: Dayr Atiyah is part of the larger region of Syria, which has a complex socio-political landscape.

 Cultural Significance: The town may have historical and cultural relevance within the context of Syrian heritage.

 Current Situation: The area has been affected by the ongoing conflict in Syria, impacting its development and stability.

Summary: Dayr Atiyah is a town in Syria, influenced by the ongoing conflict and its historical significance.

# Study traces the route of Ebola virus to the skin surface

## The Hindu Bureau

While transmission of Ebola virus through contact with bodily fluids from an infected person is well known, more recent Ebola outbreaks have demonstrated that the infectious virus is also found on the skin's surface of those who have succumbed to infection or at late times during

infection. In a new study, researchers in the U.S. have traced a cellular route the virus uses to traverse the inner and outer layers of skin and emerge onto the skin's surface. The study identifies new cell types within the skin that are targeted by the virus during infection and shows that human skin specimens actively support virus infec-

tion. The results published in *Science Advances* suggest that the skin's surface may be one route of person-to-person transmission.

The researchers developed a new approach to examine which cells within the skin are infected by Ebola virus. They created a human skin explant system using full-thickness skin

biopsies from healthy individuals, which contained both deeper (dermal), and surface (epidermal) layers of skin.

Previous clinical and animal studies had reported that cells within the skin become infected with the virus, but the specific cells targeted by the virus had not been identified. In the new study, the team

showed that the virus infected several different cell types in the skin explant, including macrophages, endothelial cells, fibroblasts, and keratinocytes. While some of these cell types are also found to be infected by the virus in other organs, keratinocytes, which are unique to the skin, had not been previously appreciated to sup-

port Ebola virus infection.

Interestingly, virus replication was more robust in the epidermal layer than in the dermal layers on a per gram basis. Additionally, the infectious virus was detected on the epidermal surface within three days, indicating that the virus rapidly spreads and moves through the explants to the skin's surface.

# Topic → Ebola Virus Transmission and Skin Infection



## Key Findings

-  Ebola Transmission: The virus is transmitted through contact with bodily fluids and can be present on the skin's surface of infected individuals.
-  Cellular Route: Research has mapped the virus's journey through the skin, showing its emergence on the surface.
-  New Cell Types Identified: Specific skin cells targeted by the virus include macrophages, endothelial cells, fibroblasts, and keratinocytes.

 **Human Skin Explant System:** A system using full-thickness skin biopsies was employed to study the virus's infection in skin cells.

 **Robust Virus Replication:** The virus replicates more robustly in the epidermal layer than in the dermal layers, indicating a preference for the skin's surface.

 **Rapid Spread:** The virus was detected on the epidermal surface within three days, indicating a quick spread to the skin's surface.

 **Implications for Transmission:** The study suggests the skin's surface could be a route for person-to-person transmission of the Ebola virus.

## Summary

A recent study highlights that the Ebola virus can infect various skin cell types and may rapidly spread to the skin's surface, suggesting a potential new route for transmission



## Hunt for life on Jupiter's moon hits an ice block

The icy crust on Jupiter's moon Europa is much thicker than scientists had thought, which could quash the hope of finding the ingredients for life in the salty oceans beneath its surface. Using measurements collected by NASA's Juno spacecraft, researchers estimated the ice is around 35 km thick, which could suggest the ocean doesn't have the heat or chemical reactions needed to spark life. The crust could thwart the efforts of NASA's Europa Clipper to investigate the moon for the ingredients for life.

## Topic → Europa's Icy Crust: Implications for Life Search

### Key Discoveries and Implications

-  Thicker Ice Crust: Europa's icy crust is now estimated to be approximately 35 km thick, significantly thicker than earlier estimates.
-  Impact on Life Search: This increased thickness could pose challenges in discovering life-sustaining elements in the salty oceans beneath.
-  NASA's Juno Spacecraft: The data on ice thickness was gathered by NASA's Juno spacecraft.
-  Heat and Chemical Reactions: A thicker crust implies that the ocean may not have sufficient heat or chemical reactions to support life.
-  Europa Clipper Mission: These findings may complicate the objectives of NASA's Europa Clipper mission, which seeks signs of life.
-  Salty Oceans: Europa's subsurface salty oceans remain a focal point in the quest for extraterrestrial life.
-  Scientific Implications: The new insights could shift the scientific community's strategies in studying Europa's potential for life.

Summary: The revelation of a thicker ice crust on Europa presents new challenges for the moon's potential to support life, affecting future exploration missions.



## Migratory bats ‘surf’ storm front winds to save energy

A species of migrating bat “surfs” the warm winds of incoming storm fronts to conserve energy, according to a study that used tags to track the tiny animals on their long journeys across central Europe. The findings offer new insights into how weather, physiology, and environmental factors shape bats’ seasonal migration patterns. Emerging evidence also shows shifts and reductions in migratory bat ranges.

## Topic → Bat Migration and Environmental Impact

 A species of migrating bat utilizes warm winds from storm fronts to conserve energy during migration.

 The study tracked these bats across central Europe using tagging technology.

 Findings provide new insights into the interplay of weather, physiology, and environmental factors in bat migration.

 There is emerging evidence indicating shifts in migratory patterns and reductions in bat ranges.

 The research highlights the importance of understanding how climate and environmental changes affect wildlife.

 The study contributes to the broader knowledge of seasonal migration patterns in bats.

 The findings raise concerns about the impact of environmental changes on bat populations.

Summary: A study reveals that migrating bats use warm storm winds to save energy, highlighting the effects of weather and environmental changes on their migration patterns.

## Key Insights

**Energy Conservation:** Migrating bats leverage warm winds from storm fronts to conserve energy.

**Tracking Technology:** The study utilized advanced tagging technology to monitor bat movements across central Europe.

**Interplay of Factors:** The research provides insights into how weather, physiology, and environmental factors interact during bat migration.

**Shifts in Patterns:** Evidence suggests changes in migratory patterns and reductions in bat ranges.

**Climate Impact:** Highlights the critical need to understand the effects of climate and environmental changes on wildlife.

**Broader Knowledge:** Contributes to the understanding of seasonal migration patterns in bats.

**Environmental Concerns:** Raises concerns about the impact of environmental changes on bat populations.

# Lipase inhibitors cause mosquito sterility, study shows

**R. Prasad**

As per a study published recently, the development of *Plasmodium falciparum*, which causes malaria, can be severely impacted when the lipid transport by lipophorin (Lp) in *Anopheles gambiae* mosquitoes is targeted. The study found that exposing adult female mosquitoes to broad-spectrum lipase inhibitors prior to an infectious blood meal can induce mosquito sterility. Impairing the breakdown of the stored fat in the mosquitoes can be lethal for the embryos. When lipolysis is impaired, the embryos develop normally during early embryogenesis but fail to hatch due to severely impaired metabolism. This is because lipoproteins, particularly lipophorin and the yolk protein vitellogenin (Vg), which transports approximately 5% of lipids within oocytes, are essen-

tial for egg development. The results were published in the journal *PLOS Biology*.

The authors demonstrated that the maternal lipolytic machinery in the mosquitoes plays a key role in shaping the development and survival of progeny. Silencing triglyceride lipase or lipid storage droplet of the mosquitoes significantly disrupts the progeny's energy metabolism, which stops embryos from hatching and results in embryonic death. Treating adult females with orlistat, a broad-spectrum hydrolase inhibitor, mimics the effects of silencing triglyceride lipase, causing death of embryos. "These data provide a proof of principle that targeting lipolysis can aid mosquito control and increase our understanding of the importance of lipid metabolism during pregnancy and embryonic development,"



**Sterility:** Exposing mosquitoes to lipase inhibitors prior to an infectious blood meal can induce sterility. AP

the authors write.

To determine the role of triglyceride mobilisation in *An. gambiae* reproduction, the authors silenced the expression of triglyceride lipase. This resulted in a reduction in the number of eggs laid by the mosquitoes compared with controls. When triglyceride lipase is silenced, the glyceride levels in midguts

and fat bodies tend to increase, while there was a large drop in glyceride levels in ovaries by the end of 24 hours. As seen in oocytes, embryos from triglyceride lipase-depleted mosquitoes had low levels of glyceride. Due to depleted glyceride levels, only a handful of larvae emerged from eggs.

Even the metabolic pro-

files of the embryos from triglyceride lipase-depleted mosquitoes were strikingly different. While the controls showed a steady increase in major metabolites over time, the embryos of triglyceride lipase-depleted mosquitoes had significantly reduced levels of most of these metabolites.

"While changes in lipid and metabolite composition started early during embryogenesis, we observed limited differences in the transcriptional profile of the two groups at the two earlier time points. However, by 38 hours post oviposition, there were large differences in the triglyceride lipase-depleted group characterised by hundreds of up- and down-regulated genes," the authors write. "This reveals that maternal triglycerides are essential for driving key metabolic processes during embryogenesis,

such that when these lipids are limiting, embryos cannot complete development."

Since mosquitoes absorb insecticides and sterilising compounds through their legs when they land on bed nets coated with these ingredients, as in the case of pyriproxyfen nets, the authors tested the delivery of lipase inhibitors by allowing mosquitoes to rest on a surface coated with lipase inhibitor orlistat before blood feeding. As tested in the lab, the number of larvae emerging from eggs was drastically reduced in a dose-dependent manner in field settings.

"The data reveal that the development of *Anopheles*-specific lipase inhibitors may represent a promising tool for field interventions aimed at reducing the size of field mosquito populations," they write.

# Topic → Targeting Lipid Transport in Malaria Mosquitoes



## Key Findings

 **Targeting Lipid Transport:** Focus on lipid transport by lipophorin (Lp) in *Anopheles gambiae* mosquitoes to affect *Plasmodium falciparum* development.

 **Inducing Sterility:** Use of broad-spectrum lipase inhibitors on adult female mosquitoes before an infectious blood meal to induce sterility.

 **Embryonic Development:** Impaired lipolysis allows normal early embryonic development but prevents hatching due to metabolic issues, causing embryonic death.

 **Role of Lipoproteins:** Lipoproteins, especially lipophorin and vitellogenin (Vg), are essential for lipid transport necessary for egg development.

 **Published Research:** Findings published in PLOS Biology, emphasizing the importance of maternal lipolytic machinery in mosquito progeny

**⚠️ Impact of Lipase Inhibitors:** Silencing triglyceride lipase or lipid storage droplets disrupts energy metabolism in progeny, leading to embryo death.

**🔬 Potential for Mosquito Control:** Suggests targeting lipolysis as a viable mosquito control strategy and enhances understanding of lipid metabolism during pregnancy and embryonic development.

## Summary

A recent study highlights that targeting lipid transport in malaria-carrying mosquitoes can induce sterility and prevent embryo hatching, offering potential new strategies for mosquito control

# Is India's forest cover growing enough?

What has the State of Forest Report, 2023 found? What do the findings signify? Which are the States that have increased forest cover, where has it declined? What does the report say on vulnerable areas such as the Western Ghats? Why is tree planting not a blanket fix?

**Priyali Prakash  
Vasudevan Mukunth**

## The story so far:

**T**he State of Forest Report (SFR), 2023 was released by Union Environment Minister Bhupendra Yadav at the Forest Research Institute, Dehradun, on December 21, 2024. The SFR is a biennial exercise that the Government of India undertakes to track tree and forest cover, carbon stock, forest fires, and other parameters related to the country's green cover.

## What did SFR, 2023 find?

According to SFR, 2023, 25.17% of India's area is under forest and tree cover. Of this, forests cover 21.76% of land and trees 3.41%. These figures represent marginal increases from 21.71% and 2.91%, respectively, as reported in SFR, 2021. In absolute terms, the increase is 1,445 sq. km. The National Forest Policy, 1988, which governs green cover in India, requires 33% of the country's geographical area to be under tree or forest cover. Chhattisgarh, Uttar Pradesh, and Odisha led the list of States that increased forest and tree cover while Madhya Pradesh, Karnataka, Ladakh (Union Territory), and Nagaland were the top four where forest and tree cover has dropped.

## What is green cover?

Forest cover in India means an area of a hectare or more "with a tree canopy of more than or



**Green canopies:** The Folding Hills and the Shola ecosystem are considered the heart of the Nilgiris biosphere reserve. SATHYAMOORTHY M.

Not all ecosystems are suited for trees, and damaging them by planting trees could be counterproductive

equal to 10%, irrespective of ownership and legal status," per the report. Likewise, tree cover refers to all tree patches that exist outside of forest area and which occupy "less than one hectare in extent, including all the scattered trees found in the rural and urban settings, and [are] not captured under the forest cover assessment exercise."

The SFR uses a mix of satellite data and details from the National Forest Inventory, plus ground-truthing to verify the information. Forest cover estimates come from satellite data and growing and carbon stock estimates from the Inventory. The 2023 report uses satellite data from October to December 2021 and NFI data from 2017 to 2022.

## How have sensitive areas fared?

In 2014, the Union government first notified the Western Ghats Eco-Sensitive Area (WGESA) along the country's west coast under the Environment Protection Act, 1986 for special protection. According to SFR, 2023, the Western Ghats Area has lost 58.22 sq. km of forest cover in the last decade. While the cover of "very dense" forests increased, those of "moderately dense" and "open" forests fell. "Very dense" forests have a canopy density of at least 70%, "moderately dense" forests of 40-70%, and "open" forests of 10-40%.

The Nilgiris forests are part of the WGESA and a UNESCO biosphere. Between 2013 and 2023, they lost 123.44 sq. km of forest cover. Nilgiris district reported a fourfold increase in the number of forest fires from 2022-23 to 2023-2024.

Mangroves – tropical trees in the intertidal zones of coastal areas – are withdrawing as well. The report has estimated 0.15% of India's total geographical area as under mangrove cover following an overall decrease of 7.43 sq. km from 2021 alone. Andhra Pradesh and Maharashtra increased their State-wise share but Gujarat's Kutch area reported a significant decrease. These trees stabilise coastlines, mitigate erosion, encourage biodiversity, shield coastal communities from sea-level rise, and temper the fury of cyclones.

The northeast occupies less than 8% of India's total land area but more than 21% of its tree and forest cover. Per SFR 2023, tree and forest cover in the region shrunk by 327.3 sq. km. There have been reports in the press that at least part of the decline is due to conversion of forests for agricultural use.

## What is the SFR's applicability?

While the definitions are straightforward, what they include or exclude has prompted concerns.

For example, as trees became popular as a 'solution' for climate mitigation because of their ability to sequester carbon, many lawmakers as well as researchers began to tout tree-planting as a blanket fix.

In due course, two important problems emerged with this idea. First, not all ecosystems are suited for trees, and damaging them by planting trees could have repercussions that negate the original purpose of the exercise.

Second, only native and mature species in the right environments can sequester carbon efficiently. Young trees or those unsuitable for their environs either wouldn't help as much or not at all. One direct analogue in the SFRs is that the definition of forests includes "orchards, bamboo, and palm". Divya Gupta, assistant professor of environmental studies and sustainable communities at the State University of New York, thus called the report's marquee finding a "celebratory statistic". "By including plantations, orchards, palms, and non-native ecosystems, it erases the distinction between natural forests and monocultures," she added. "This aggregation misrepresents forest health, obscures deforestation and degradation, and offers a distorted view of what we should truly prioritise."

"The share of actual increase in forest cover appears to be very minimal ... compared to the 1,445 sq. km of forest and green cover increase claimed in the document," Sudeep Budhaditya Deb, deputy conservator of forests at the Office of the Additional Principal Chief Conservator of Forests (North Bengal), said.

## Is SFR related to climate action?

Exercises to understand how much carbon can be sequestered use the term carbon stock to denote all the carbon held in living and non-living biomass in an ecosystem. In a mature forest, for example, the carbon collects in the trees as they grow both aboveground and below, in the leaf litter surrounding the trees, in the deadwood, etc.

In 2022, India committed to increase its carbon stock by 2.53 billion tonnes "through additional forest and tree cover by 2030". The current stock of this variety is around 30.4 billion tonnes. According to SFR 2023, India increased its carbon stock by 81.5 million tonnes and the growing stock – the sum (by number or volume) of all the trees living/growing in forests – by 4.25% between 2021 and 2023.

But experts have said the report doesn't say anything about the quality of forests contributing to increases in forest cover nor provides data on the actual causes of forest degradation. "Key ecological indicators such as forest fragmentation and biodiversity health are missing, making it impossible to evaluate the true significance of the statistics reported," Ms. Gupta said. "Moreover, the report lacks mechanisms to track ecosystem losses caused by land-use changes and deforestation."

## Topic → Introduction to the State of Forest Report 2023



- The State of Forest Report (SFR) 2023 was unveiled by Union Environment Minister Bhupender Yadav on December 21, 2024, at the Forest Research Institute in Dehradun. This biennial report serves as a crucial barometer for tracking tree and forest cover, carbon stock, forest fires, and other significant parameters affecting India's verdant cloak.
- The findings reveal that 25.17% of India's geographical area is now under forest and tree cover, showcasing an upward trend from the previous report in 2021.
- This translates to a modest increase of 1,445 sq. km, with forests covering 21.76% and trees 3.41% of the land area.
- As per the National Forest Policy of 1988, the goal is to have 33% of the nation's land under tree or forest cover, highlighting the imperative for ongoing conservation efforts

# Findings of the SFR 2023

## Key Statistics

Forest and tree cover in India stands at 25.17%.

Forests occupy 21.76% of land, while tree cover accounts for 3.41%.

An increase of 1,445 sq. km from 2021 figures.

## Comparative Analysis

The previous SFR reported forest cover at 21.71% and tree cover at 2.91%.

The report indicates positive growth trends in states like Chhattisgarh, Uttar Pradesh, and Odisha, while Madhya Pradesh, Karnataka, and Nagaland have seen declines

## State-wise Analysis of Forest Cover Changes

Chhattisgarh: Notable for significant increases in both forest and tree cover.

Uttar Pradesh: Improved management practices have led to a rise in green cover.

Odisha: Recognized for effective afforestation initiatives.

Conversely:

Madhya Pradesh, Karnataka, and Nagaland have reported reductions, raising alarms regarding deforestation and land conversion for agricultural purposes.

### Implications

The SFR 2023 reveals a complex landscape where wins in some states are offset by losses in others, necessitating a nuanced approach to forest management and conservation.

# Challenges to Forest Health and Biodiversity

## Sensitive Areas at Risk

**Western Ghats:** Documented a loss of 58.22 sq. km of forest cover over the last decade, signaling concerns for biodiversity and ecosystem health.

**Nilgiris:** A UNESCO biosphere, faced a staggering 123.44 sq. km decrease, exacerbated by increased forest fires.

**Mangrove Degradation:** India's mangrove cover has reduced by 7.43 sq. km, impacting coastal ecosystems crucial for biodiversity and climate resilience

## Factors Contributing to Decline

Agricultural expansion and urbanization are major culprits, threatening fragile ecosystems and biodiversity.

The health of forests is crucial not only for carbon sequestration but for the myriad species that depend on these habitats.

# The Role of Forests in Climate Action

Forests play a pivotal role in mitigating climate change through carbon sequestration.

**Carbon Stock:** The SFR 2023 reports an increase of 81.5 million tonnes in carbon stock, supporting India's commitment to enhance its carbon sequestration efforts.

**Future Targets:** India aims to increase its carbon stock by 2.5-3 billion tonnes by 2030, emphasizing sustainable forest management practices

## Conclusion: The Path Forward

The State of Forest Report 2023 provides a mixed bag of insights, highlighting both progress and significant challenges. While certain states have made commendable strides in increasing forest cover, others are grappling with degradation and loss.

**Call to Action:** The findings urge policymakers and stakeholders to focus on sustainable practices, prioritize biodiversity, and enhance conservation efforts to secure the green cover for future generations.

# Why was the no-detention policy rolled back?



What led to the amendment of the Right to Education Act, 2009 Rules? What have schools been allowed to do? Is there something wrong with the appraisal system? What are some of the best ways to test a child's learning? Who should be made accountable?

**Priscilla Jebaraj**

## The story so far:

**T**he Union government amended the Rules of the Right to Education Act, 2009 in December 2024 to allow schools to detain students in Classes 5 and 8 if they are unable to meet the promotion criteria after a year-end examination. Students will be given a second chance re-examination after two months of extra teaching. This rollback of the RTE Act's vision of a no-detention policy was initially brought through an amendment of the law in 2019, following which 18 States and UTs have reinstated the option to detain students; the 2024 amendment now extends the option to Central government-run schools too.

## What was the rationale behind the original no-detention policy?

When the RTE Act was passed in 2009, it included Section 16, which stipulated that "No child admitted in a school shall be held back in any class or expelled from school till the completion of elementary education [Classes 1 to 8]". "The spirit of a no-detention policy was to ensure that children can learn without unnecessary pressure. Detention is demoralising to children. There was also an understanding

'No detention became no testing, and in many schools, no teaching. It was a slippery slope'

that a single final year-end examination is not the best way to assess learning and decide on their progress," said Vimala Ramachandran, a former professor at the National Institute of Educational Planning and Administration. "But it was implemented very shoddily. No detention became no testing, and in many schools, no teaching. It was a slippery slope."

She noted that government schools in many States simply stopped testing in any form until Class 5, automatically promoting children without bothering to find out if they had acquired grade-specific skills and knowledge. Monitoring systems focussed on inputs or maybe indicators, rarely on outcomes.

Efforts to introduce a Continuous and Comprehensive Evaluation (CCE) programme instead, in coordination with UNICEF, were largely stymied by a lack of resources and training, and teacher apathy. In many schools, NCERT's CCE forms were simply filled en masse by teachers without an assessment of individual children's skills. A number of boards abandoned the model of multiple formative and summative assessments, retreating to the familiarity of a final year-end examination.

## Why has it been rolled back?

Surveys conducted by both government and private entities in recent years have documented an alarming learning gap in India's schools.

The Annual Status of Education Report (ASER), a respected survey spearheaded by the NGO Pratham, found that only 42.8% of Class 5 students could read a Class 2-level text in 2022, a fall from 50.5% in 2018. Only 25.6% of them could do basic arithmetic problems in 2022, a slight drop from 27.9% in 2018.

Even more worryingly, ASER 2023 tested foundational skills in youth aged 14 to 18 years and found that a quarter of them still cannot read a Class 2 level text fluently in their regional language. More than half struggle with division (3-digit by 1-digit) problems, a skill taught in Class 3 and 4.

The Department of School Education's National Achievement Survey 2021 also showed clear declines as students moved up the school ladder. Out of a maximum 500, Class 3 students

scored an average of 323 in language and 306 in Mathematics. By Class 5, the scores dropped to 309 and 284 respectively, and to 302 and 255 by Class 8.

A government analysis of Classes 10 and 12 results across 59 State and national boards in 2023 showed that more than 65 lakh students had failed to clear their examinations, with a failure rate ranging from 12% in national boards to 18% in State boards.

"In the name of promoting all students in the younger classes, we are adversely affecting them in later life," said Joseph Emmanuel, who was academic director of the Central Board of Secondary Examination (CBSE) till a few months ago, when he took charge of the Council for the Indian School Certificate Examinations (CISCE). "There is a clear learning gap that was exacerbated by the COVID disruptions. This [rollback of the no-detention policy] is a good example of evidence-based decision making."

Dr. Ramachandran said the amendment represents a regression, and instead called for better mechanisms to assess children's learning and hold teachers accountable.

## What is the way forward?

"Timely remedial action is needed at every stage. There must be regular assessment done at the school level in every class, not at the board level. Who is the best judge of a child's learning? It is their own teachers. We must trust teachers and equip them," said Dr. Emmanuel.

He noted that the Rules require the class teacher to "provide specialised inputs after identifying the learning gaps at various stages of assessment" and stipulate that the school Head personally monitor the progress of the children who are held back. "More accountability is being brought in," he said.

Dr. Ramachandran said the focus of accountability must change. "Instead of detaining and punishing the child for not doing well, we need a way to hold the teacher responsible and accountable," she said. Too many teachers only focus on the children in the front rows of their classroom, often discriminating against those from lower socio-economic backgrounds who may struggle more and are more likely to be detained. "Rigorous teacher appraisal is needed to ensure inclusive teaching. There must be some consequences for the teacher, not just the student, as well as incentives to ensure this," she urged.



**New rules:** Students appear for exams at a school in Gurugram in 2024. PTI

## Topic → The Rollback of the No-Detention Policy in India

### Introduction

The education landscape in India has seen significant changes over the years, particularly with the Right to Education (RTE) Act of 2009. However, recent amendments have stirred up a debate that has left many questioning the future of education in the country. ‘

In December 2024, the Union government amended the RTE Act to allow schools to detain students in Classes 5 and 8 if they fail to meet promotion criteria. This article delves into the implications of this rollback and what it means for students, teachers, and the education system as a whole.

# Background of the Right to Education Act

## The Original No-Detention Policy

When the RTE Act was enacted in 2009, it included a no-detention policy aimed at ensuring that no child would be held back in any class until they completed their elementary education. The idea was to create a stress-free learning environment where children could thrive without the fear of failure.

## Purpose of the Policy

The rationale behind this policy was simple: learning should be a journey, not a race. As Vimala Ramachandran, a former professor at the National Institute of Educational Planning and Administration, pointed out, the spirit of the no-detention policy was to allow children to learn without unnecessary pressure.



## Implementation Challenges

However, the implementation of this policy was far from perfect. In many states, schools stopped testing altogether, leading to a situation where students were promoted without any assessment of their skills. This lack of accountability created a slippery slope, where "no detention" morphed into "no testing" and, in some cases, "no teaching."

## Recent Amendments to the RTE Act

### The 2024 Amendment Explained

Fast forward to December 2024, and the government decided to amend the RTE Act once again. This amendment allows schools to detain students in Classes 5 and 8 if they fail to meet the promotion criteria after a year-end examination. Students will have a second chance to take a re-examination after two months of extra teaching.

## **Impact on Central Government Schools**

This amendment extends the option to detain students to Central government-run schools, which previously followed the no-detention policy. This shift has raised eyebrows and sparked discussions about the future of education in India.

## **Reasons for the Rollback**

### **Learning Gaps in Indian Education**

The decision to roll back the no-detention policy was not made in a vacuum. Surveys conducted by various organizations have highlighted alarming learning gaps in Indian schools. The Annual Status of Education Report (ASER) revealed that only 42.8% of Class 5 students could read a Class 2-level text in 2022, a decline from 50.5% in 2018.

## **Findings from ASER Reports**

Even more concerning, ASER 2023 found that a quarter of youth aged 14 to 18 could not read a Class 2-level text fluently. This paints a grim picture of the educational landscape, where foundational skills are lacking.

## **National Achievement Survey Insights**

The National Achievement Survey 2021 also showed a decline in student performance as they progressed through school. For instance, Class 3 students scored an average of 323 in language, which dropped to 255 by Class 8. This downward trend raises questions about the effectiveness of the no-detention policy.

# **Perspectives on the Rollback**

## **Support for the Amendment**

Some educators and policymakers argue that the rollback is a necessary step to address the learning gaps exacerbated by the COVID-19 pandemic. Joseph Emmanuel, former academic director of the CBSE, emphasized that promoting all students without adequate assessment adversely affects their future.

## **Criticism of the Decision**

On the flip side, critics like Dr. Ramachandran argue that this amendment represents a regression. They advocate for better mechanisms to assess children's learning rather than punishing students for not meeting standards.

## **The Way Forward**

### **Need for Regular Assessments**

Moving forward, experts agree that timely remedial action is crucial. Regular assessments at the school level, rather than just board-level evaluations, are essential. After all, who knows a child's learning better than their own teachers?

## Teacher Accountability

Moreover, there needs to be a shift in accountability. Instead of solely focusing on detaining students, the emphasis should be on holding teachers responsible for their students' learning outcomes. Rigorous teacher appraisals and incentives for inclusive teaching can help bridge the learning gap.

## Conclusion

The rollback of the no-detention policy has sparked a significant debate about the future of education in India. While the intention behind the amendment is to address learning gaps, it raises questions about the effectiveness of punitive measures in education. As we move forward, a balanced approach that emphasizes regular assessments and teacher accountability may hold the key to improving educational outcomes for all students

## Why is rupee weakening against dollar?

What has caused the currency to depreciate? Why made the central bank to intervene?

Prasanth Perumal

**I**n the last week of December, 2024, the rupee breached the 83 mark against the U.S. dollar, touching an all-time low of 84.4. The currency depreciated about 2% in 2024, continuing its long-term trend of gradually but consistently losing value against the dollar.

### What causes a currency to depreciate?

The price of any currency in the foreign exchange market is determined by the demand for the currency (its supply). This is similar to how the price of any other product is determined in the marketplace. When the demand for a product rises while its supply remains constant, this causes the price of the product to rise in order to ration the available supply. On the other hand, when the demand for a product drops while its supply remains constant, this causes sellers to drop the price of the product in order to attract sufficient buyers.

The only difference between the goods market and the foreign market is that currencies are exchanged for other currencies rather than for goods in the foreign exchange market.

A currency depreciates against a foreign currency when the demand for it (in terms of the foreign currency) drops compared to its available supply in the market. When the currency's value depreciates, the value of the foreign currency

automatically appreciates on the other side. This is similar to how the reserves dropped to an other side. This is similar to how the \$160 billion as of the purchasing power of the last week of December depreciates or appreciates which the price of goods in the marketplace rise or fall, respectively.

There are various factors that determine the demand for and the supply of any currency in the foreign exchange market.

One of the most important determinants of the supply of currency in the market is the monetary policy of a country's central bank. A central bank adopting tighter monetary policy compared with other central banks will cause the supply of its currency in the market (for both goods trade and investment purposes) to rise relative to other currencies, causing the currency's value to drop. Central banks adopting relatively tighter monetary policy, on the other hand, are likely to see their currencies appreciate in value.

A critical factor that determines the demand for any currency, on the other hand, is the demand among foreigners for the goods and assets of the country. Since foreigners will first have to purchase the local currency before they can purchase a country's goods and assets, high demand for a country's goods and assets translates to high demand for its currency and which in turn leads to a rise in the value of the currency. A fall in demand for a country's goods or assets, on the other hand, will cause the value of its currency to fall.

### What is behind the rupee's fall?

The current bout of rupee depreciation is seen as driven primarily by the exit of foreign investors from India, which has put pressure on the rupee.

Global investors have been shuffling their investments across countries as central banks recalibrate their monetary policies to varying degrees. High inflation in the aftermath of the coronavirus pandemic led to monetary tightening by central banks which is now being reversed as inflation comes more under control. This has pushed investors to withdraw money from markets like India and invest in more advanced markets.

Meanwhile, the longer-term trend of the rupee's depreciation against the dollar is attributed to higher inflation in India than in the U.S. due to the Reserve Bank of India's looser monetary policy compared to the U.S. Federal Reserve. India's traditional demand for high-value imports such as crude oil and gold (which boosts demand for the dollar) and weaker exports to keep its economy going and its inability to boost exports (which can help boost demand for the rupee) have also contributed to the lackluster performance of the rupee. The RBI has been using its dollar reserves to prop up the value of the rupee by artificially increasing the supply of dollars in the foreign exchange market, and thus the dollar demand for rupees.

As a result, the value of India's foreign exchange reserves dropped to an eight-month low of \$160 billion as of the last week of December from over \$200 billion in September.

Analysts believe the rupee's depreciation would have been far worse if not for the RBI's intervention to support the rupee against the dollar.

The RBI's traditional stance has been to

Saurabh Bandey upsc



# Topic → Understanding the Rupee's Decline: Factors Behind the 85 Mark Against the Dollar

## Introduction

The Indian rupee has recently plummeted to an all-time low of 85.81 against the U.S. dollar, marking a significant point of concern for economists and investors alike. This depreciation, which represents a 3% decline in 2024 alone, is a reflection of various underlying economic factors. Understanding why the rupee is losing value is crucial for both businesses and consumers as they navigate this challenging economic landscape.

## What Causes Currency Depreciation?

In the realm of foreign exchange (forex), the valuation of a currency hinges on the intricate interplay of supply and demand. Here's how it works:

### **Supply and Demand Dynamics:**

When demand for a currency wanes while its supply remains constant, its value diminishes.

Conversely, a surge in demand with a static supply will bolster a currency's worth.

### **Central Bank Influence:**

Central banks wield significant power over their respective currencies. A looser monetary policy can lead to an increased supply of currency in the market, prompting a depreciation.

### **Global Comparisons:**

The forex market operates similarly to other marketplaces, where currency values fluctuate based on international comparisons and perceptions.

# Factors Behind the Rupee's Fall

Several factors have converged to precipitate the rupee's recent decline:

**Foreign Investor Exodus:** A substantial withdrawal of foreign investments has placed immense pressure on the rupee. As global investors shift their focus towards more stable markets, the demand for the rupee has diminished.

**Inflation Disparities:** India has been grappling with higher inflation rates compared to the U.S., primarily due to the Reserve Bank of India's relatively lax monetary policies. This disparity has further exacerbated the depreciation.

**High-Value Imports:** India's persistent demand for high-value imports, such as crude oil and gold, has strengthened the dollar's position while weakening the rupee.

**Central Bank Actions:** The RBI has intervened to stabilize the rupee by utilizing its dollar reserves. However, as these reserves dwindle, the effectiveness of such interventions is called into question.

## Central Bank Interventions and Their Effects

The Reserve Bank of India (RBI) has traditionally aimed to manage the rupee's value to prevent excessive volatility. Their strategies include:

**Market Interventions:** The RBI has actively engaged in the forex market to prop up the rupee, purchasing dollars to support the rupee's value.

**Monetary Policy Adjustments:** The RBI's approach to monetary policy can greatly impact the rupee's strength. A tighter policy could potentially enhance the rupee's value against the dollar.

**Foreign Exchange Reserves:** As of late December, India's foreign exchange reserves have dropped to \$640 billion, down from over \$700 billion. This reduction raises concerns about the RBI's ability to sustain its interventions.

## Future Outlook for the Rupee

Looking ahead, the trajectory of the rupee will be shaped by various factors:

**Economic Recovery:** As global markets stabilize, a recovery in foreign investments could bolster the rupee.

**Inflation Control:** If India manages to bring inflation under control, it may result in a stronger rupee.

**Investor Sentiment:** The perception of India's economic stability will play a crucial role in attracting foreign investments

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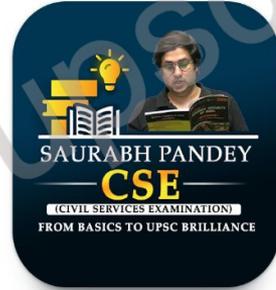
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**(The Hindu)**

**A) Krishna River**

**B) Kaveri River**

**C) Godavari River**

**D)Mahanadi River**

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