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Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

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Daily News Analysis

Page 01 : GS 2 : Indian Polity/ Prelims

Assam has introduced the Assam Prohibition of Polygamy Bill, 2025, aiming to criminalise polygamy and establish stringent penalties for those entering into multiple marriages while the first marriage remains legally valid. The Bill is positioned as a social reform measure intended to protect women's rights and ensure uniformity in marriage practices, while also raising important debates around personal laws, constitutional protections, and federal sensitivities.

Daily News Analysis

Assam proposes jail term, heavy fines for polygamy

Bill, tabled in Assembly, seeks to 'protect women, streamline society'; it covers residents entering such marriages outside State, but doesn't apply to Scheduled Tribes and Sixth Schedule areas

Rahul Karmakar
GUWAHATI

An anti-polygamy Bill tabled by Assam Chief Minister Himanta Biswa Sarma in the State Assembly on Tuesday prescribes imprisonment and heavy fines for people entering into, or hiding, a second marriage while the first continues to be valid.

The Assam Prohibition of Polygamy Bill, 2025, makes polygamy a criminal offence, punishable with up to seven years in jail and a fine, and up to 10 years in jail if a person enters into a marriage while concealing an existing one. The punishment will be doubled for repeat offenders, it says. Barring the Sixth Schedule areas, the draft law will be applicable across the State and will not cover members of the Scheduled Tribes under Article 342 of the Constitution. Customary laws of some tribes in Assam allow multiple marriages.

According to the Statement of Objects and Reasons, the Bill seeks to "prohibit and eliminate practices of polygamy", protect women from hardship and "streamline the society".

Other offenders

It brings village heads, qazis (Muslim clerics who solemnise marriages), parents, and legal guardians of people indulging in polygamy under its scope. Anyone who "wilfully hides, neglects or unreasonably delays" information to the police about such marriages may be punished as the main offenders and jailed for up to two years and fined up to ₹1 lakh.

The fine may extend to ₹1.5 lakh for any priest or qazi who solemnises a marriage contrary to the provisions of the law knowingly and willingly.

A provision covers any resident of Assam who willingly and knowingly enters into a polygamous marriage outside the State, as well as people who live outside Assam but own immovable property in the State or receive State-funded benefits, subsidies, or welfare support.

The Bill seeks to make people convicted under the law ineligible for government-funded or aided jobs and benefits under any government scheme, and bar them from contesting any election.

The draft law also provides a mechanism for compensation to women affected by polygamous marriages.

Polygamous marriages contracted before it comes into force will not be affected, as long as they follow existing personal or customary laws and have valid proof. It also gives police officers the power to intervene before a prohibited marriage takes place.

Banning polygamy

Assam Chief Minister **Himanta Biswa Sarma** on Tuesday tabled the Assam Prohibition of Polygamy Bill, 2025 in the State Assembly. It prescribes imprisonment and heavy fines for people entering into or hiding a second marriage while the first continues to be valid

Here is a timeline of the new Bill:

- **August 21:** Assam government seeks public opinion by August 30, through email or by post, on a law to end polygamy in the State
- **November 9:** The Assam Cabinet approves a new legislation to outlaw polygamy
- **November 25:** The Assam Prohibition of Polygamy Bill, 2025, is tabled in the 126-member Assembly

Key Provisions and Features

1. Criminalisation of Polygamy

- Polygamy made a criminal offence, punishable with:
  - Up to 7 years imprisonment + fine.
  - 10 years imprisonment if the first marriage is concealed.
  - Double punishment for repeat offenders.

2. Applicability and Exemptions

- Applicable across Assam except Sixth Schedule areas.
- Scheduled Tribes (under Article 342) are exempt due to recognition of customary laws.
- Also covers:
    - Assam residents entering polygamous marriages outside the State.
    - Non-residents who own property in Assam or receive State welfare benefits.

3. Accountability of Facilitators

- Village heads, qazis, priests, and legal guardians who knowingly facilitate such marriages can be punished.
- Penalties include:
    - Up to 2 years jail and fines up to ₹1 lakh.
    - Priests/Qazis may face fines up to ₹1.5 lakh.

4. Administrative and Civil Consequences

- Convicts become ineligible for government jobs, welfare schemes, and elections.
- Police empowered to intervene pre-emptively to stop a prohibited marriage.
- Mechanism for compensation to affected women.

5. Protection for Existing Marriages

- Marriages conducted before the enforcement of the Act are protected if valid under existing personal/customary laws.

Constitutional and Social Dimensions

1. Women's Rights & Social Justice

- Government argues that the Bill protects women from exploitation, emotional distress, and economic vulnerability.
- Aligns with judicial emphasis on gender equality under Articles 14, 15, and 21.

2. Personal Laws vs. Social Reform

- Raises questions about:
    - Uniform Civil Code-like reform at the State level.
    - Encroachment into areas covered traditionally by personal laws—a sensitive domain in India's plural society.

- Exemption for STs reflects constitutional recognition of customary practices in tribal areas.

3. Federal & Legislative Competence

- Marriage and divorce fall under the Concurrent List, enabling State legislation.
- However, laws affecting religious practices may invite judicial scrutiny on grounds of reasonableness and equality.

4. Preventive Policing and Due Process

- Provision empowering police to intervene pre-marriage may raise concerns about:
  - Administrative overreach,
  - Potential misuse,
  - Impact on personal autonomy.

5. Political and Societal Implications

- Seen by some as a move toward societal "streamlining"; by others as targeting specific communities.
- Could influence debates around UCC-like reforms in other States.

Conclusion

The Assam Prohibition of Polygamy Bill, 2025 marks a significant State-level initiative toward marital reform and women's protection. While it strengthens legal deterrence against polygamy and expands accountability to facilitators, it also raises complex constitutional questions about personal laws, exemptions for tribal communities, and potential enforcement challenges. Whether the Bill becomes a model for other States or faces judicial hurdles will shape the broader discourse on social reform and legal uniformity in India.

UPSC Prelims Practice Question

Ques: **Which constitutional provision allows Scheduled Tribes in Assam to be exempt from the Bill?**

A. Article 14

B. Article 342

C. Article 370

D. Article 21

Ans : b)

UPSC Mains Practice Question

Ques: Evaluate the potential socio-political impact of the Assam Anti-Polygamy Bill on Assam's society. **(150 Words)**

Page 01 : GS 3 : Environment / Prelims

Air pollution in India is no longer a seasonal concern limited to winter months; it has emerged as a year-round public health crisis. A recent study by the Centre for Research on Energy and Clean Air reveals that 60% of Indian districts experience particulate matter (PM2.5) concentrations exceeding the National Ambient Air Quality Standard (NAAQS) throughout the year. This underscores the urgent need for comprehensive, continuous air-quality management and policy interventions.

Toxic air is a year-round blight in 60% of Indian districts: study

Jacob Koshy
NEW DELHI

People in 60% of India's districts are exposed to polluted air all through the year, not just in winter, according to an analysis by a research body published on Tuesday. This means that 447 of 749 districts recorded concentrations of particulate matter (PM2.5) – toxic chemical and organic particles – that exceed the annual safe values prescribed by the National Ambient Air Quality Standard (NAAQS).

Not a single district in the country reported concentrations within the World Health Organisation (WHO) guideline of 5 µg/m³ (microgram per cubic metre), which is about eight times more stringent than India's standards (40 µg/m³), according to the Centre for Research on Energy and Clean Air analysis. The study underlines the fact that exposure to significant air pollution is not restricted to winter alone as is commonly believed.

Left breathless: Delhi and Assam with 11 districts each accounted for nearly half of the top 50 most polluted districts. FILE PHOTO

The maximum number of polluted districts are concentrated in a few States. Delhi (11 districts) and Assam (11 districts) alone accounted for nearly half of the top 50 most polluted districts, followed by Bihar (7) and Haryana (7). Other States with significant numbers include Uttar Pradesh (4), Tripura (3), Rajasthan (2), West Bengal (2).

Cleaner States

On the other hand, the majority of districts in Andhra Pradesh, Telangana, Kerala, Sikkim, Goa, Karnataka, and Tamil Nadu have population-exposure numbers within the NAAQS-prescribed limits. "These patterns highlight the continued dominance of northern and eastern States in India's PM2.5 pollution hotspots, while southern and coastal regions remain relatively cleaner," the authors Manojkumar N. and Monish Raj say in their analysis, which is not a peer-reviewed paper. Population-exposure numbers can differ from ambient concentration numbers.

The winter months of December, January, and February are still the most polluted. About 82% (616 of 749 districts) of districts recorded values breaching the national standard during this season.

Key Findings

1. Nationwide Exposure

- 447 of 749 districts have PM2.5 levels above India's NAAQS annual safe limits.
- No district met the WHO guideline of 5 µg/m^3, which is significantly stricter than India's standard of 40 µg/m^3.
- Indicates persistent, chronic exposure to toxic air across large parts of India.

Daily News Analysis

2. Regional Hotspots

- Delhi and Assam lead with 11 highly polluted districts each.
- Other notable States: Bihar (7), Haryana (7), Uttar Pradesh (4), Tripura (3), Rajasthan (2), West Bengal (2).
- Pollution is concentrated mostly in northern and eastern India, while southern and coastal States (Andhra Pradesh, Telangana, Kerala, Sikkim, Goa, Karnataka, Tamil Nadu) remain comparatively cleaner.

3. Seasonal Trends

- Winter months (Dec–Feb) remain the most polluted, with 82% of districts breaching the NAAQS standard.
- However, the study highlights that significant pollution persists outside winter, challenging the perception that air pollution is only a seasonal problem.

4. Public Health Implications

- Continuous exposure to PM2.5 is linked to respiratory diseases, cardiovascular conditions, cognitive impairments, and premature deaths.
- Highlights the need for long-term health monitoring and sustained mitigation measures beyond temporary seasonal interventions.

Policy and Governance Implications

- Strengthen regulatory frameworks: Enforcement of stricter emission standards for vehicles, industries, and biomass burning.
- Year-round monitoring and action: Air quality management should be continuous, not only during winter.
- Public awareness and participation: Educating citizens about indoor and outdoor air quality measures.
- Regional focus: Northern and eastern States require targeted interventions, including urban planning and industrial regulation.

Conclusion

The study underscores that air pollution in India is a persistent, widespread, and life-threatening problem, concentrated in northern and eastern States but affecting millions nationwide. With 60% of districts exceeding safe PM2.5 limits year-round, policymakers must adopt long-term, region-specific, and systemic strategies to curb

emissions and protect public health. This situation also reinforces the urgency of aligning national air quality targets with global standards like WHO guidelines to safeguard citizens' well-being.

UPSC Prelims Practice Question

Ques : **Which of the following correctly compares India's NAAQS and WHO PM2.5 annual standards?**

A. India: 5 µg/m³; WHO: 40 µg/m³

B. India: 40 µg/m³; WHO: 5 µg/m³

C. India: 20 µg/m³; WHO: 10 µg/m³

D. India: 25 µg/m³; WHO: 15 µg/m³

Ans: b)

UPSC Mains Practice Question

Ques : How does chronic exposure to PM2.5 impact public health in India? Suggest long-term strategies to tackle year-round air pollution at both national and local levels. **(250 words)**

Daily News Analysis

Page : 07 : GS 3 : Science and Tech / Prelims

Assam, the heart of India's tea economy and home to over 12 lakh workers, is facing an unprecedented crisis. Once supported by predictable climatic rhythms, tea cultivation in the Brahmaputra valley today confronts rising temperatures, irregular rainfall, declining soil moisture, and emerging pests. Compounding this ecological stress is a long-term stagnation in tea prices, undermining the economic viability of tea estates and threatening livelihoods in a State where tea is both a cultural identity and an economic backbone.

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Daily News Analysis

For Assam tea, erratic climate and stagnant prices present a crisis

Tea thrives within narrow environmental parameters that were once abundant across the Brahmaputra valley; that is no longer true; rising mean and maximum temperatures, shifts in rainfall seasonality, and the declining soil moisture now challenge the very foundation of tea cultivation in the region

Anurag Priyadarshi

By November, as the festival lights of Diwali fade and winter approaches, Guwahati usually enjoys cooler evenings, lower humidity, and a calm that signals the close of the tea-harvesting season. But in recent years, this rhythm has grown uncertain. Persistent heat, delayed rainfall, and muggy air now linger well past October, blurring the boundaries of Assam's once-distinct seasons.

For tea growers, these shifts from the traditional climatic cycle aren't just uncomfortable: they're existential.

The tea plant was introduced to Assam in the 19th century and has since become both a global commodity and the economic lifeline for over 12 lakh workers, many of them women. Yet its fragile harmony with the local environment is being tested.

Extended dry spells, abrupt downpours, rising night-time temperatures, and new pest patterns are making tea yields increasingly unpredictable. Farmers speak of blackened leaves, wilting bushes, and erratic flush cycles that defy long-trusted weather cues.

"We have not seen such weather-induced stress in 30 years," Tea Board advisor N.K. Bezbaruah said recently, underscoring how climate change is steadily eroding the ecological and economic stability of the State's tea heartland.

Despite such hardships, tea prices have barely kept pace with inflation. Auction prices in India have reportedly grown by only 4.8% annually in the last three decades, versus 10% for staples like wheat and rice. In real terms, returns to tea growers remain stagnant, squeezed between climate shocks and rising costs of wages, agrochemicals, energy, logistics, and irrigation. Tea prices have turned volatile and, despite short-lived corrections, the long-term trend shows no gainful improvement.

For Assam's planters, this is a cruel paradox: the weather grows harsher but the market offers no reward for resilience. Many estates now face shrinking margins and ageing bushes, unable to reinvest in climate-resilient varieties. The very regions that power India's $10 billion tea economy now confront a future where climate unpredictability threatens both livelihoods and the legacy of one of the world's most popular beverages.

Growing tea

Tea thrives within narrow environmental parameters: an annual temperature range of about 13° to 28° C, with optimal growth occurring when mean temperatures remain close to 23-25° C. Rainfall requirements are equally stringent, averaging 1,500-2,500 mm per year, distributed evenly to keep soils consistently moist but well-drained. Tea also prefers slightly acidic soils (pH 4.5-5.5) that are deep, friable, and rich in organic matter – conditions once abundant across the Brahmaputra valley.

Climate change is altering these thresholds. Rising mean and maximum temperatures, shifts in rainfall seasonality, and declining soil moisture now challenge the very foundation of tea cultivation in the region.

One study by the Tea Research Association and the Ethical Tea Partnership modelled the future of Assam's tea under future climate scenarios described by the UN Intergovernmental Panel on Climate Change (IPCC). Specifically, the projections for Assam's tea regions were developed using Global Circulation Models under the IPCC's RCP 2.6 and RCP 4.5 scenarios.

The researchers combined 50 years of historical climate data, including rainfall, temperature, and bioclimatic variables, with future climate grids generated by the WorldClim database at a resolution of 1 km. Using the MaxEnt species distribution model, they mapped the current suitability of tea-growing regions and predicted shifts by 2050.

They found that both minimum and maximum temperatures are set to climb across all regions, stressing plants and reducing nutrient absorption. Precipitation was projected to decline in winter and pre-monsoon months – critical for plant growth – while increasing erratically during the monsoon. Currently, South Bank, Upper Assam, and Cachar enjoy "very good" suitability for tea, but by 2050 these areas could lose much of their advantage, forcing tea cultivation to shift towards higher altitudes like Karbi Anglong and Dima Hasao. Flavour and aroma – the hallmarks of premium Assam teas – depend on precise climatic rhythms. Erratic weather will thus disrupt this delicate balance as well, threatening global competitiveness.

The study also found that the average minimum temperature in Assam had risen by 1° C in the last 90 years and that the region also lost around 200 mm of rainfall a year in this time.

Perhaps a more serious problem is the increased incidence of new pests and diseases attacking tea bushes. Extreme heat above 35° C hampers tea plants' ability to absorb nutrients, stunting leaf growth and making the tea bushes vulnerable to pests. Unlike the paddy farmers of Punjab, the tea growers of Assam receive little government aid when drought or heat strikes.

Adapting to a warmer future

Tea growers, researchers, and corporations have been encouraging climate-resilient practices, such as seed-grown varieties with deep taproots alongside high-yield clones to strengthen resilience to drought. Soil conservation measures such as mulching, cover crops, and organic amendments can help retain moisture while agroforestry through shade trees and companion crops can moderate heat stress and reduce pest pressure.

Innovations in water management, including micro-irrigation, rainwater harvesting, and drainage that mitigate drought and flooding are equally important.

Multistakeholder programmes such as 'trustea', the India Sustainable Tea Code, are already contributing to a climate resilient supply chain by verifying 1.4 lakh small growers and reaching 6.5 lakh workers through sustainable practices, efficient water use, and integrated pest management, thus building climate resilience at scale.

Economic diversification into fruits and spices, organic teas, fisheries and livestock, tourism, and direct-to-consumer trade can further cushion the industry against climate risks. The industry also needs policy support that treats tea on par with other crops, sustained investment in research, and capacity building to secure the future.

The tea tribes that form the backbone of Assam's plantation workforce, also represent a powerful political constituency. With State elections due in early 2026, their concerns over rising costs, stagnant wages, and climate-driven hardship are likely to feature prominently, turning the State's tea gardens into a crucial arena of both livelihood and electoral debate.

(Anurag Priyadarshi is non-executive director, Rainforest Alliance, and former director, sustainability, at Tata Consumer Products. apriyadarshi2708@outlook.com)

The tea tribes that are the backbone of the plantation workforce represent a powerful constituency. With elections due, their concerns are likely to feature prominently, turning the tea gardens into a crucial arena of livelihood and electoral debate

A group of workers harvest a flush of tea leaves in Jorhat, Assam. GETTY IMAGES

THE GIST

Tea is an economic lifeline for over 12 lakh workers. But its fragile harmony with the local environment threatens their livelihoods. Unpredictable weather has left farmers with blackened leaves, wilting bushes, and erratic flush cycles that defy long-trusted weather cues.

Tea prices are barely keeping pace with inflation. Prices have grown by only 4.8% over three decades. In real terms, returns remain stagnant, and the long-term trend shows no gainful improvement. For planters, this is a cruel paradox: the weather grows harsher, but the market offers no reward for resilience

Researchers used 50 years of climate data with future grids and found that by 2050, present locations would be unsuitable, forcing cultivation to shift towards higher altitudes. Flavour and aroma depend on precise climatic rhythms. Erratic weather threatens competitiveness

Key Analysis

1. Climate Change and the Shifting Ecology of Tea

Tea thrives within strict environmental thresholds—mean temperatures around 23–25°C, well-distributed rainfall of 1,500–2,500 mm, and moist acidic soils. These conditions are rapidly deteriorating:

a) Rising Temperatures

- Minimum temperatures in Assam have already risen by 1°C over 90 years.
- Maximum temperatures frequently cross 35°C, harming nutrient absorption and stunting growth.
- Higher night-time temperatures disturb flush cycles and reduce leaf quality.

b) Erratic Rainfall

- Decline of ~200 mm annual rainfall over decades.
- Reduction in winter and pre-monsoon showers—critical for early growth.
- Abrupt monsoon downpours increase soil erosion and waterlogging.

c) Soil and Moisture Stress

- Prolonged dry spells reduce soil moisture.
- Declining organic matter affects root health and plant resilience.

d) New Pests and Diseases

- Heat-stressed bushes attract more pests.
- Pest patterns no longer follow traditional seasons.
- Unlike farmers of Punjab, tea growers receive minimal government compensation during climate disasters.

2. Scientific Projections: What 2050 Could Look Like

A joint study by the Tea Research Association and the Ethical Tea Partnership used IPCC's RCP 2.6 and RCP 4.5 scenarios, 50 years of climate data, and MaxEnt modelling. Key projections:

- All tea-growing regions will experience rising minimum and maximum temperatures.
- Precipitation will decline during winter and pre-monsoon months.
- Current high-suitability areas—South Bank, Upper Assam, and Cachar—may lose much of their climate advantage by 2050.
- Tea cultivation may shift to higher altitudes such as Karbi Anglong and Dima Hasao.
- Signature Assam flavor and aroma, which depend on stable climate rhythms, are at risk.

3. Economic Stress: Stagnant Prices and Rising Costs

Despite worsening climate conditions, tea prices have remained stagnant:

a) Poor Price Growth

- Auction prices rose only 4.8% annually over the last 30 years.
- In contrast, staples like wheat and rice rose at 10% annually.
- This means real incomes for tea growers are declining.

b) Rising Input Costs

- Wages
- Agrochemicals
- Irrigation (now necessary for dry spells)
- Energy & logistics
- Replanting costs for ageing bushes

Many estates are now unable to invest in climate-resilient varieties or soil restoration, trapping them in a cycle of low productivity and low profitability.

c) Social Dimensions

- Over 12 lakh workers, many from tea tribes, depend on the sector.
- Stagnant wages and rising living costs fuel discontent.
- With Assam elections in 2026, the tea sector is becoming a significant political issue.

4. Adaptation and Resilience Pathways

Despite challenges, several climate-resilient strategies are emerging:

a) Agronomic Solutions

- Adoption of seed-grown varieties with deep taproots.
- High-yielding, climate-resilient clones.
- Mulching, cover crops, organic amendments for moisture retention.
- Agroforestry with shade trees to buffer heat and reduce pests.

b) Water Management

- Micro-irrigation
- Rainwater harvesting
- Flood-resilient drainage systems

c) Supply Chain and Certification Initiatives

"trustea" and the India Sustainable Tea Code are:

- Verifying 1.4 lakh small growers
- Improving water use
- Enhancing worker welfare
- Expanding integrated pest management

d) Economic Diversification

Planters are shifting toward:

- Organic teas
- Fruits, spices
- Fisheries, livestock
- Tourism and homestays
- Direct-to-consumer tea brands

e) Policy Needs

- Bringing tea cultivation on par with other agricultural crops for subsidies.
- State-backed insurance for heat, pests, and drought.
- Greater investment in research for climate-resilient cultivars.

- Support for small tea growers who lack capital buffers.

Conclusion

Assam's tea industry stands at a critical crossroads. Climate change is steadily eroding the ecological foundation of tea cultivation, while economic stagnation restricts the ability of growers and estates to adapt. Without timely interventions—both ecological and economic—the world-famous Assam tea industry may confront declining yields, diminishing quality, and severe livelihood insecurity. A coordinated response involving government, research institutions, industry, and growers is essential to safeguard the future of India's $10 billion tea economy and the millions who depend on it.

UPSC Prelims Practice Question

Ques: Tea cultivation thrives best under which of the following environmental conditions?

1. Mean annual temperature of 23–25°C

2. Annual rainfall of 1,500–2,500 mm, well-distributed

3. Highly alkaline soils (pH above 7.5)

4. Consistently moist but well-drained soils

Select the correct answer:

(a) 1, 2 and 4 only

(b) 1, 3 and 4 only

(c) 2 and 3 only

(d) 1 and 2 only

Ans: a)

UPSC Mains Practice Question

Ques : Despite being a major global tea producer, India's tea sector faces stagnant prices and rising costs. Discuss the structural and climatic challenges underlying this stagnation. Suggest policy measures to address them. **(250 words)**

Daily News Analysis

Page 06 : Prelims

Hayli Gubbi, a shield volcano in the Afar region of Ethiopia and part of the Erta Ale volcanic range, erupted on 23 November after remaining dormant for nearly 12,000 years. The eruption surprised scientists due to the volcano's remote location and limited monitoring. Its behaviour offers important insights into rift-zone volcanism and continental plate tectonics.

Daily News Analysis

QUESTION CORNER

Why did Hayli Gubbi erupt now?

Vasudevan Mukunth

A: Hayli Gubbi is a shield volcano in Afar, Ethiopia, and a member of the Erta Ale Range. It's located at the edge of the East African Rift where the African and Arabian plates are slowly pulling apart. A shield volcano is a broad, gently sloping volcano that consists of many thin, fluid lava flows. Its eruptions are typically less explosive so the lava spreads out wide like a warrior's shield — and so the name.

Geological studies have shown that Hayli Gubbi is built mainly from dark basaltic lavas but also contains more silica-rich rocks like trachytes and rhyolites. These lighter magmas can trap more dissolved gases, so when they rise, they're more likely to erupt explosively and throw ash high into the atmosphere. That's what happened on November 23.

But why did it erupt now after at least 12,000 years of quiet? While it's early days, scientists believe the answer lies deep under the rift. As the tectonic plates move apart, hot mantle rock rises and partially melts, feeding magma into shallow chambers beneath the volcano. Over millennia, this magma can slowly build up and pressurise the rocks above it.

At some point, faulting or cracking of the crust will open a path to the surface, allowing the pressurised, gas-rich magma to rise quickly and the dissolved gases to expand into bubbles.

This photo released by the Afar Government Communication Bureau shows ash billowing from the long-dormant Hayli Gubbi volcano in Ethiopia. AP

Because the volcano is remote and poorly monitored, scientists are still analysing satellite images and ash samples, so their explanations are provisional and may change as new data becomes available.

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

Why Did the Volcano Erupt Now? – Scientific Explanation

1. Tectonic Setting: East African Rift

- Hayli Gubbi sits on the boundary where the African and Arabian plates are slowly diverging.
- As plates pull apart, the crust thins and allows hot mantle material to rise toward the surface.

- This rising mantle undergoes partial melting, producing magma that feeds volcanic systems.

2. Long-Term Magma Buildup

- For millennia, magma accumulated gradually in shallow magma chambers beneath the volcano.
- Continuous but slow mantle upwelling caused:
    - Pressure build-up,
    - Heating of surrounding rocks,
    - Chemical evolution of magma (from basaltic to more silica-rich magmas).

3. Presence of Silica-Rich Magma (Trachytes & Rhyolites)

- Geological studies show Hayli Gubbi contains basalt, but also trachytic and rhyolitic magma, which are more viscous and trap more gases.
- When such gas-rich magma rises, pressure drops rapidly → dissolved gases expand → explosive eruption.
- This explains the ash-rich plume on November 23.

4. Crustal Faulting Trigger

- The immediate trigger was likely faulting or cracking along the rift due to ongoing plate movement.
- These fractures opened a pathway for pressurised magma to ascend suddenly to the surface.
- Such fractures are common in rift zones but unpredictable in timing.

5. Limited Monitoring

- The volcano is in a remote, poorly instrumented area.
- Scientists rely mainly on:
    - Satellite imagery,
    - Thermal signatures,
    - Ash sample studies.

- Therefore, interpretations are preliminary and may evolve as newer data arrives.

Conclusion

The eruption of Hayli Gubbi after millennia of dormancy is most likely the outcome of long-term tectonic divergence, gradual magma accumulation, and sudden crustal faulting that allowed gas-rich magma to escape explosively. Its location in the East African Rift — one of the world's most active continental rifts — makes episodic volcanism expected, though difficult to predict. Ongoing research and satellite monitoring will refine understanding of this rare but scientifically valuable event.

UPSC Prelims Practice Question

Ques: Consider the following statements about Shield Volcanoes:

1. They are formed by low-viscosity basaltic lava that spreads over long distances.

2. They are typically associated with explosive eruptions due to high silica content.

2. They generally occur in regions of plate divergence or hot spots.

Which of the statements given above is/are correct?

(a) 1 and 3 only

(b) 2 and 3 only

(c) 1 and 2 only

(d) 1, 2 and 3

Ans : a)

UPSC Mains Practice Question

Ques : Evaluate the role of satellite-based monitoring tools in studying volcanic eruptions in inaccessible regions like Hayli Gubbi. What are the limitations of such technologies? **(250 words)**

Daily News Analysis

Page 09 : GS 2 : International Relations

Over the past two decades (2000–2023), China has emerged as the world's largest bilateral lender, extending over $2 trillion in loans and grants to more than 80% of global countries and territories. New data released by AidData highlights the shifting nature of China's overseas financing — from developmental aid for poorer nations to commercial, profit-driven lending for high-income economies. The report also underscores how China's lending has reshaped global economic dependencies and geopolitical alignments.

Daily News Analysis

Over 80% nations got loans from China in the last two decades

Chinese banks have lent about $200 billion to U.S. projects and initiatives, which makes the U.S. the biggest beneficiary

DATA POINT

The Hindu Data Team

China lent more than $2 trillion in loans and grants to over 80% of countries and regions in the world between 2000 and 2023. The U.S. was the biggest beneficiary, according to data released by AidData, a research institute at the College of William and Mary in Williamsburg, Virginia.

Over the years, Chinese state-owned entities have lent about $200 billion for nearly 2,500 projects and initiatives – more than 9% of the total amount lent by China – to American companies. Over 95% of this amount was lent by Chinese state-owned banks, enterprises, and the central bank, while the rest was lent by non-state players.

Map 1 shows the amounts lent by China to various countries between 2000 and 2023. Across the world, during that period, 179 out of 217 countries and territories received at least one loan from a Chinese state-owned creditor. China was the world's largest creditor and debt collector in 2023, lending $140 billion to various countries.

Entities in Russia and Australia were the second and the third biggest beneficiaries in the last two decades, receiving $172 billion and $130 billion, respectively, in the period. Firms in the 27 member states of the European Union received $161 billion for 1,800 projects and activities.

Chart 2 shows the 20 countries that received the highest loan commitments between 2000 and 2023, along with the income bracket under which they fall. Of the countries shown in the chart, six are considered "high-income" countries, which together received more than 20% of the total amount lent by China in the period. About $943 billion was lent to high-income countries overall.

Beijing is moving away from its role as an aid provider to relatively poorer nations, as its focus has shifted towards commercial lending for developed countries. For instance, more than 75% of Chinese loan transactions with U.S. companies were "commercial" in nature, while only about 7% were for "developmental" intents, as per the data. China had lent about $320 million to the U.S. in 2000; this surged to about $19 billion in 2023, which hints at the "commercial" turn the investments took.

China's initial focus was on infrastructural development projects in economically disadvantaged nations. Chinese President Xi Jinping launched the Belt and Road Initiative (BRI) in 2013, which helped develop energy, infrastructure, and connectivity projects in Europe and Asia. The Aiddata report details how China has scaled back on its lending to such projects; where BRI once made up 75% of China's lending operations, it now makes up about 25%.

Chart 3 shows the share of high-income and low-income countries in China's portfolio. The report finds that in a typical year, China spent about $5.7 billion on what can be classified as aid for official development assistance. However, in 2023, China's global official development assistance commitments fell to $1.9 billion.

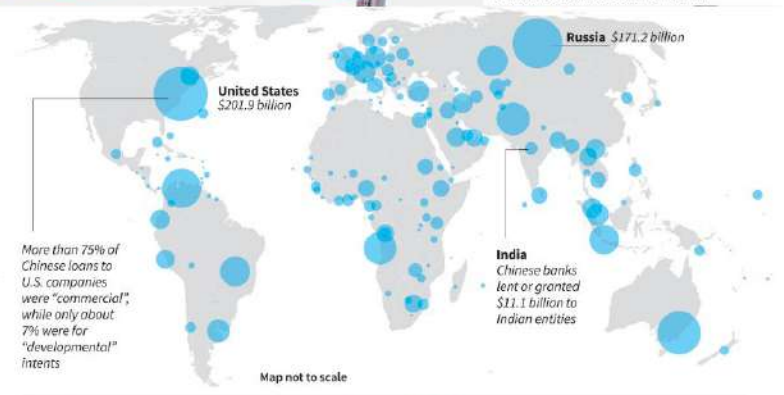
According to the report, China has an 80% success rate for getting overseas mergers and acquisitions approved. This is because of the relatively weak screening mechanisms for foreign capital inflow in most countries that China invested in. The report also alleges that China managed this by channelling funds through off-shore shell companies and international bank syndicates.

As of 2023, Indian entities have borrowed or were granted $11.1 billion from China, with a large amount of this dedicated to the energy sector and banking and financial services. Most of the funds were borrowed with a mix of commercial and developmental intent.

Lending hand

The data for the charts were sourced from a report titled 'Chasing China: Learning to Play by Beijing's Global Lending Rules' by AidData

Map 1: Amounts lent/granted to entities in various countries by China, between 2000 and 2023. Over 80% of countries/territories have received at least one loan from China



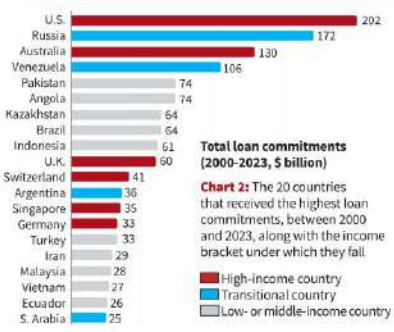
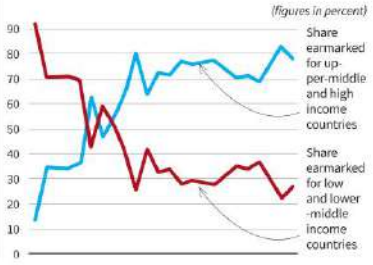


Chart 2: The 20 countries that received the highest loan commitments, between 2000 and 2023, along with the income bracket under which they fall

High-income country
Transitional country
Low- or middle-income country

Chart 3: The share of high-income and low-income countries in China's portfolio. Where Belt and Road Initiative once made up 75% of China's lending operations, it now makes up 25%



Key Findings

Daily News Analysis

1. Massive Global Footprint

- China lent to 179 out of 217 countries and territories.
- Total global lending: over $2 trillion.
- In 2023 alone, China lent $140 billion, making it the world's largest official creditor.

2. The U.S. is the Biggest Beneficiary

- $200 billion in loans and financing went to U.S. companies and initiatives.
- Over 95% of this came through Chinese state-owned banks and enterprises.
- More than 75% of U.S.-linked loan transactions were commercial, not developmental.
- China's lending to the U.S. jumped from $320 million (2000) to $19 billion (2023), indicating its shift toward profit-oriented investments.

3. Other Major Recipients

- Russia: $172 billion
- Australia: $130 billion
- European Union (27 members): $161 billion
- These high-income economies collectively accounted for over 20% of China's global lending.

4. Shift From Aid to Commercial Lending

- Early 2000s: China focused on infrastructure in low-income, developing countries.
- BRI (2013) accelerated this focus, especially in Asia, Africa, and Europe.
- Now: BRI accounts for only 25% of China's lending (down from 75%).
- China increasingly prefers commercial loans, equity investments, and mergers & acquisitions in developed markets.

5. Official Development Assistance (ODA) Declining

- Typical annual ODA: $5.7 billion
- In 2023, ODA fell to $1.9 billion — indicating reduced priority for developmental aid.

6. Approval Advantage for Chinese Firms

- China has an 80% success rate in overseas mergers and acquisitions.
- Reasons:
    - Weak screening mechanisms in many recipient countries,
    - Use of offshore shell firms and international banking syndicates to navigate regulations.

7. India's Exposure to Chinese Lending

- India received/borrowed $11.1 billion from China since 2000.
- Sectors:
    - Energy,
    - Banking and financial services.
- Mix of both commercial and developmental lending.
- India remains cautious due to debt-dependency concerns and strategic rivalry.

Implications for Global Politics & Economy

A. Rising Financial Influence : China's lending has made it a central player in global financial systems, challenging Western-led institutions like IMF & World Bank.

B. Debt Sustainability Concerns : Countries with weak economies may struggle with repayment, raising fears of:

- Debt traps,
- Loss of strategic assets,
- Political leverage by China.

C. Strategic Competition with the West : The U.S. being the largest recipient indicates a complex economic interdependence despite geopolitical rivalry.

D. Changing Nature of Chinese Soft Power : A shift from poverty-focused aid to commercial investments reflects China's ambition to become a global economic powerhouse, not just an aid provider.

Conclusion

The AidData report reveals the unprecedented scale and reach of China's global lending, with more than 80% of countries receiving funds over two decades. While China earlier used development finance to build influence across the Global South, it now prioritises commercial, profit-driven investments in high-income economies, including the U.S. This strategic shift has major implications for global finance, geopolitical alignment, debt sustainability, and the evolving world order. For countries like India, understanding these trends is crucial to balancing economic needs with strategic autonomy.

UPSC Mains Practice Question

Ques: China has emerged as the world's largest bilateral creditor, with its lending now shifting from development aid to commercial financing. Analyse the geopolitical and economic implications of this shift for developing countries. **(150 Words)**

NITIN SIR CLASSES

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Daily News Analysis

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Daily News Analysis

What does the draft Seeds Bill entail?

Why has the seed industry been demanding a reform of the Seeds Act of 1966? What are the punishments prescribed for flouting provisions under the Bill? Why are farmers' groups worried about the new draft Bill? What will be the roles of the Central and State Seed Committees?

EXPLAINER

A. M. Jigeesh

The story so far:

The Union Agriculture Ministry released the draft Seeds Bill on November 12, and has invited public comments on it till December 11. The Seeds Bill, seen as a regulatory step to ensure quality of seeds sold and distributed to farmers, promotes "ease of doing business" and reduces compliance burden, while maintaining strong provisions to penalise serious violations, as per the government. The government has been open about its intention to amend the Seeds Act of 1966 and the Seeds (Control) Order of 1983.

What has been the history?

According to the Union Agriculture Ministry, in 2023-24, the country had an overall requirement of 462.31 lakh quintals of seeds for various crops with availability being 508.60 lakh quintals, which then led to a surplus of 46.29 lakh quintals of seeds.

The seed industry has been demanding that the 1966 Act should be amended to accommodate technological and scientific advancements in the sphere of seeds and to address the changes in trade and commerce over the last six decades. In their initial response, the Federation of Seed Industry of India Chairman Ajai Rana said the release of the draft is a timely and much-needed step toward modernising India's seed regulatory framework. However, the Samyukt Kisan Morcha, an umbrella body of farmers, said they will continue to oppose moves to bring amendments in the Bill that are "anti-farmer".

What are the new provisions?

The Bill provides a regulatory mechanism in the area of import, production and supply of quality seeds. The Bill does not restrict the right of the farmer to grow, sow, re-sow, save, use, exchange, share or sell his farm seeds, except when he sells such seed or planting material under a brand name. The Bill defines farmer, dealer, distributor and producer as separate entities that deal with the production, distribution, trade and use of seeds. It also provides for the establishment of 27-member Central and 15-member State seed committees. The Central seed committee can recommend the minimum limits of germination, genetic and physical purity, traits, seed health and additional standards of seeds to the Union Government. The State Seed Committee can advise the State Government on registration of seed producers, seed processing units, seed dealers, distributors and plant nurseries.

Under the Bill, it is mandatory that all seed processing units must be registered with the State governments based on the provisions in the proposed legislation. The Bill, however, adds that to promote ease of doing business, the Union government may establish a merit based and transparent Central Accreditation System for companies operating in multiple States.

The Bill suggests the creation of the office of Registrar to keep a National Register on seed varieties under the Central seed committee. The procedure for conducting field trials to assess the Value for Cultivation and Use of any kind or variety is also detailed in the draft Bill.

The Bill also has provisions for the establishment of Central and State seed testing laboratories, where analysis of seed of any kind or variety shall be carried out in the prescribed manner. The Bill also explains the role and powers of seed inspectors, an officer with powers under the provisions of the Bharatiya Nagarik Suraksha Sanhita to search or seize. The Bill details the punishment for trivial, minor and major offences for flouting provisions under the Bill. The punishment ranges from a fine of ₹50,000 to ₹30 lakh and up to three years of imprisonment.

New reforms: Women farmers sow maize seeds in a field, in Morigaon on November 10. PTI

What are changes from 2019 draft?

One of the major changes is in the section of offences and punishments. In the previous draft, the offences were covered under consumer protection laws and the penalty ranged between ₹25,000 and ₹5 lakh and an imprisonment up to one year. There are substantial changes with respect to this section in the new draft.

On farmers' rights, the new draft links the matter with the Protection of Plant Varieties and Farmers Rights Act. On quality norms, the standards have been tightened. The new Bill looks at the import of seeds in a more liberal way.

What are the concerns of farmers?

The All India Kisan Sabha, a constituent of the Samyukt Kisan Morcha, said the Bill is poised to increase cost of cultivation by allowing corporates to indulge in the predatory pricing of seeds. They doubt the Bill is part of a larger political project of the RSS-BJP to dispossess small farmers and surrender the country's seed sovereignty to a handful of multinational and domestic monopolies.

They demanded that the new draft must complement, not conflict with, the progressive legal safeguards already established under the Protection of Plant Varieties and Farmers Right Act of 2001, and India's international commitments under the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture. The Kisan Sabha pointed out that the draft Seeds Bill introduces a heavily centralised and corporatised regulatory system that risks weakening farmer-centered protection and diluting India's legal architecture for biodiversity conservation and farmers' rights.

THE GIST

- The seed industry has been demanding that the 1966 Act should be amended to accommodate technological and scientific advancements in the sphere of seeds and to address the changes in trade and commerce over the last six decades.
- The Bill also has provisions for the establishment of Central and State seed testing laboratories, where analysis of seed of any kind or variety shall be carried out in the prescribed manner.
- The All India Kisan Sabha, a constituent of the Samyukt Kisan Morcha, said the Bill is poised to increase cost of cultivation by allowing corporates to indulge in the predatory pricing of seeds.

GS. Paper 2 Indian Polity

UPSC Mains Practice Question : What does the Draft Seeds Bill entail? Why has the seed industry demanded reform of the 1966 Seeds Act? What punishments are prescribed for violations under the Bill? Why are farmers' groups concerned about it? Also discuss the roles of Central and State Seed Committees. **(250 words)**

Daily News Analysis

Context :

The Union Agriculture Ministry released the Draft Seeds Bill (2024) for public comments, seeking to overhaul India's seed regulatory architecture for the first time since the Seeds Act, 1966. The Bill aims to ensure the availability of quality, certified seeds, promote ease of doing business, and incorporate technological advancements in seed science. However, the proposed framework has ignited debates between the seed industry, which demands modernization, and farmers' groups, who fear corporatisation, higher costs, and erosion of farmers' rights.

Historical Background & Need for Reform

- India's seed requirement in 2023–24 was 462.31 lakh quintals, while availability stood at 508.60 lakh quintals, reflecting a surplus.
- Seed industry groups argue the 1966 Act does not reflect modern biotechnology, global trade changes, intellectual property concerns, or the need for uniform quality standards.
- The industry emphasises a futuristic regulatory environment, while farmers' unions view the reform as a potential threat to seed sovereignty.

Key Provisions of the Draft Seeds Bill

1. Regulatory Framework for Quality Seeds

- Mandatory regulation of import, production, processing, and sale of seeds.
- Restrictions: Farmers are free to grow, sow, save, use, exchange, or share seeds, but cannot sell branded seeds without registration.

2. Clear Definitions & Institutional Mechanisms

- Defines farmer, dealer, distributor, and producer separately.
- Establishes:
    - Central Seed Committee (27 members)
    - State Seed Committees (15 members)

3. Functions of Seed Committees

Central Seed Committee

- Recommends minimum germination, purity, trait standards, and seed health norms.
- Supervises national-level seed policy and regulations.

State Seed Committees

- Advises States on registration of producers, dealers, processing units, and nurseries.
- Coordinates inspections and quality control mechanisms.

4. Seed Registration & Accreditation

- Mandatory registration of all seed processing units with State governments.
- Provision for a Central Accreditation System to ease compliance for multi-State companies.

5. National Register of Seed Varieties

- Office of Registrar to maintain a National Register of seed varieties.
- Detailed procedure for field trials and Value for Cultivation and Use (VCU) testing.

6. Seed Testing and Enforcement

- Establishment of Central and State seed testing laboratories.
- Seed Inspectors empowered under the Bharatiya Nagarik Suraksha Sanhita to search, seize, and take samples.

Punishments Under the Bill

A graded system of penalties:

Category of Offence	**Penalty**
Minor/Trivial violations	Fine starting ₹50,000
Major offences	Up to ₹30 lakh + imprisonment up to 3 years

Difference from 2019 Draft: Earlier penalty range: ₹25,000 – ₹5 lakh and 1-year imprisonment. The new Bill sharpens punitive provisions.

What Has Changed from the 2019 Draft?

- Stricter quality norms and broader coverage.
- Offences and penalties significantly enhanced.
- Stronger linkage with PPV&FRA, 2001 for farmers' rights.
- Liberal import rules and greater centralisation of seed governance.

Why Is the Seed Industry Supporting the Reforms?

- Reflects modern biotechnology and hybrid seed technologies.
- Harmonises with global seed trade practices.
- Reduces compliance burdens and creates a transparent accreditation system.
- Helps India's seed market (one of the largest globally) align with international benchmarks.

Why Are Farmers' Groups Worried?

Daily News Analysis

1. Fear of Corporatisation

- Farmers' unions argue the Bill opens the door for corporate control over seed supply.
- Possibility of predatory pricing of seeds.

2. Threat to Seed Sovereignty

- Concerns of losing control over local varieties and traditional seed systems.
- Centralisation may weaken community-based seed conservation.

3. Conflict with Farmers' Rights

- Need to ensure consistency with:
    - PPV&FRA Act, 2001
    - CBD (Convention on Biological Diversity)
    - International Treaty on Plant Genetic Resources

4. High Compliance Burden

- Mandatory registration and testing could raise cost of seeds, impacting small and marginal farmers.

5. Over-centralisation

- The Central Seed Committee's dominance may reduce State autonomy and farmer participation.

Roles of Central and State Seed Committees

Central Seed Committee

- Frame national seed standards, traits, and health requirements.
- Maintain National Register.
- Oversee national-level accreditation, testing labs, and certification norms.

State Seed Committees

- Registration of seed dealers, producers, nurseries, and processing units.
- Enforcement of quality control at ground level.
- Recommend regional standards based on local agro-climatic needs.

Conclusion

The Draft Seeds Bill represents a major attempt to upgrade India's seed ecosystem, aligning it with modern agricultural technologies and global practices. While it promises better seed quality, traceability, and regulatory efficiency, the increasing corporatisation, stringent penalties, and centralised governance raise legitimate concerns among farmers. For the Bill to be successful, it must strike a balance between innovation and inclusivity, ensuring that improved seed standards do not compromise farmers' rights, affordability, local biodiversity, or India's seed

sovereignty. A consultative, farmer-centric approach will be critical for achieving this delicate balance in India's agrarian landscape.
