



**UPSC
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DAILY CURRENT AFFAIRS

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SOURCES



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Geography

The La Niña and North India's pollution

Why in News?

The delayed La Niña and late monsoon retreat may worsen North India's air quality, especially in Delhi, raising concerns over winter pollution and stubble burning.

La Niña and Air Quality

- The delayed onset of La Niña and the late monsoon retreat have impacted air quality predictions for Delhi and North India.
- La Niña, usually linked to stronger winds that disperse pollutants, has not yet developed, raising concerns about high pollution levels in the early winter months.
- The earliest La Niña is expected to develop is between September and November 2024, meaning stagnant winds will likely exacerbate pollution in autumn and early winter.

Pollutant Dynamics in Delhi

- Extended periods of high humidity and calm winds due to the slower monsoon retreat are expected to trap pollutants near the surface.
- This will elevate PM2.5 and PM10 levels, worsening air quality.
- The post-monsoon anti-cyclonic circulation further reduces atmospheric mixing, contributing to higher pollution levels.

Impact of Stubble Burning

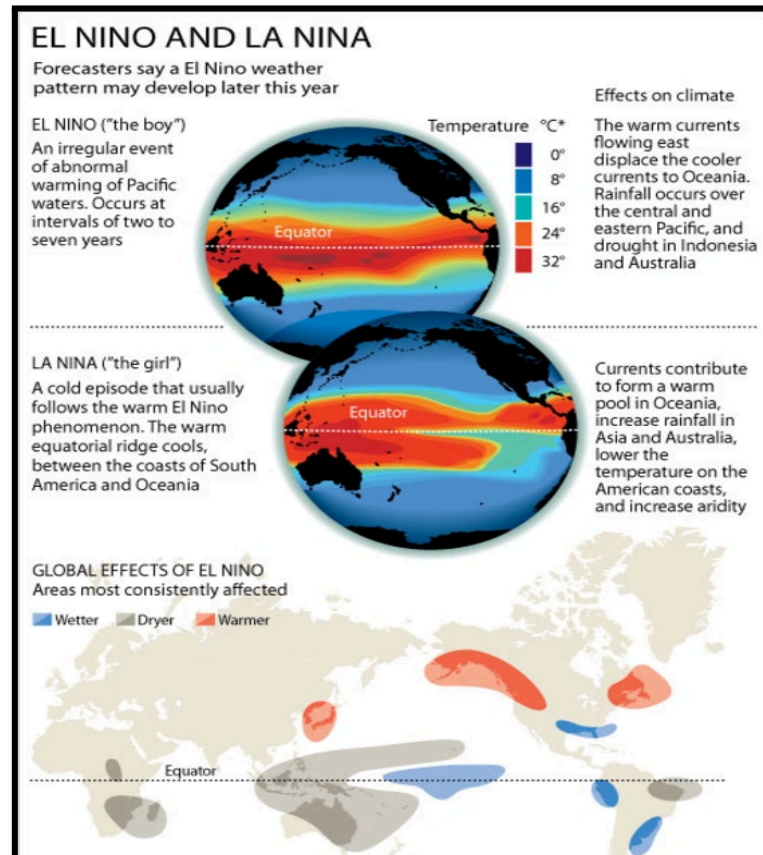
- With dominant north-westerly winds and weak La Niña conditions mean stubble burning will worsen Delhi's air quality.
- If La Niña strengthens in December, stronger winds may reduce pollutants, but severe winter could worsen air quality.

Link to Climate Change

- Extreme air pollution events are increasingly linked to climate change.
- Changes in atmospheric circulation patterns, wind behavior, and pollutant dispersion are influenced by global warming, complicating air quality management.

Policy Shifts

- The focus needs to shift from local emission-centric strategies to broader meteorological and climatological factors, especially in cities like Delhi.
- There is a need for a resource framework prioritizing health-centric measures,



integrating larger airshed management, and addressing both PM2.5 and PM10 pollution.

- Currently, there is an overemphasis on PM10, which has misallocated resources and priorities.

Conclusion

- La Niña affects North India's air quality, necessitating comprehensive strategies addressing meteorological factors and public health concerns.

Question: How does the delayed onset of La Niña impact North India's air quality, particularly in winter?

Source: [The Indian Express](#)



Economy

For the first time in 42 months, core sectors' output tanked in August

Why in News?

In August 2024, India's core sector output witnessed a 1.8% year-on-year contraction, marking the first decline in 42 months, with six of eight core infrastructure sectors showing reduced production.

Key Statistics on Core Sector Output

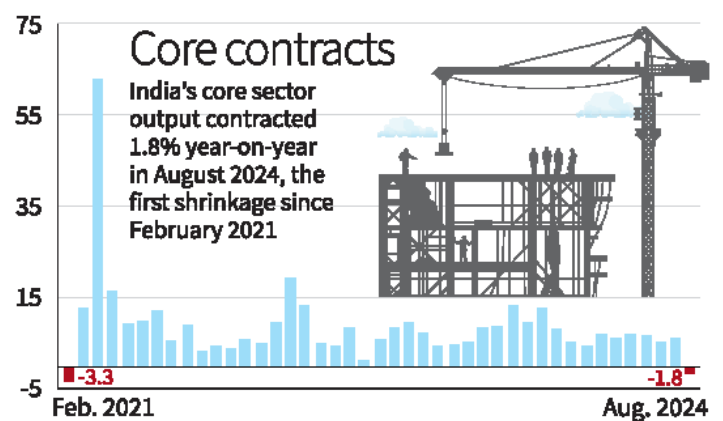
- **Decline in Core Sector Growth**
 - The Index of Core Industries (ICI) fell to 155.8 in August 2024, a 4.2% decline from July. This was the third consecutive month of sequential decline.
- **Sectors in Contraction**
Out of eight core sectors, six experienced a contraction:
 - Coal output declined by 8.1%.
 - Electricity generation dropped by 5%, reaching a five-month low.
 - Cement production fell 3%, the worst in nine months.
 - Refinery products declined 1%, the second drop in three months.
- **Sectors with Positive Growth**
 - Fertilizer output grew by 3.2%.
 - Steel production saw a modest increase of 4.5%, the slowest in 26 months.

Impact on Broader Industrial Output

- **Industrial Production Index (IIP):** The core sector makes up 40% of the IIP; weaker factory output anticipated for August 2024 despite July's 4.8% growth.
- **Contributing Factors:** High growth in August 2023 skews performance; late monsoon withdrawal hampers output in cement and steel sectors, says Bank of Baroda.

Challenges for Core Sectors

- **Monsoon's Impact:** The delayed monsoon withdrawal is expected to continue affecting output in September 2024, especially in construction-related sectors.
- **Base Effect:** The strong growth in 2023 has created a high comparison base, influencing the performance metrics for 2024.



Outlook and Predictions

- **Marginal Industrial Growth:** Experts estimate mild industrial output growth for August, with predictions of around 0.5%-1%. This is a significant decline compared to earlier months.
- **Future Sector Performance:** Weak performance in core sectors like cement and steel signals ongoing sluggishness in construction and industrial activity for the year.

Conclusion:

- India's core sector output contracted for the first time in three years, impacted by weak coal, electricity, and construction sectors, creating uncertainty in future industrial output.

Question: Discuss the reasons behind the recent decline in India's core sector output and its potential impact on overall industrial growth.

Source: [The Hindu](#)



India's Current Account Deficit in Q1 FY25 Widens to \$9.7 Billion

Why in News?

On September 30, 2024, RBI reported India's current account deficit widened to \$9.7 billion in Q1 FY25, compared to \$8.9 billion last year.

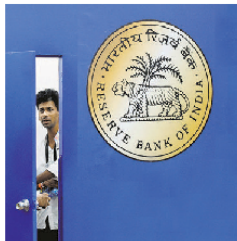
Widening Current Account Deficit (CAD)

- India's CAD widened marginally in Q1 FY25, primarily due to an increase in the merchandise trade deficit, which rose to \$65.1 billion from \$56.7 billion in Q1 FY24.
- The revised surplus for Q4 FY24 was brought down to \$4.6 billion from the earlier figure of \$5.7 billion due to an upward adjustment in customs data on merchandise imports.

Merchandise Trade and Services

- The larger trade deficit was a significant contributor to the widening of CAD.
- However, net services receipts increased to \$39.7 billion in Q1 FY25 from \$35.1 billion in Q1 FY24, driven by growth in exports of computer services, business services, travel services, and transportation.

Merchandise trade deficit widened to \$65.1 bn in Q1 FY25 from \$56.7 bn on a rise in oil, gold and other imports



- Net inflows via foreign portfolio investments moderated to \$0.9 billion from \$15.7 billion
- Net inflows under ECB amounted to \$1.8 billion in Q1 FY25 against \$5.6 billion in Q1 last year
- NRI deposits recorded net inflows of \$4 billion, higher than \$2.2 billion in Q1 last year

Private Transfer Receipts (Remittances):

Private transfer receipts, including remittances by Indian workers abroad, rose to \$29.5 billion in Q1 FY25, up from \$27.1 billion a year earlier.

Primary Income Account: Payments under the primary income account, largely reflecting investment income outflows, increased to \$10.7 billion in Q1 FY25 from \$10.2 billion in Q1 FY24.

Financial Account and Investments:

- FDI inflows rose to \$6.3 billion in Q1 FY25, up from \$4.7 billion in the same period last year.
- Foreign portfolio investment (FPI) inflows moderated sharply to \$0.9 billion from \$15.7 billion in Q1 FY24, while external commercial borrowings (ECBs)

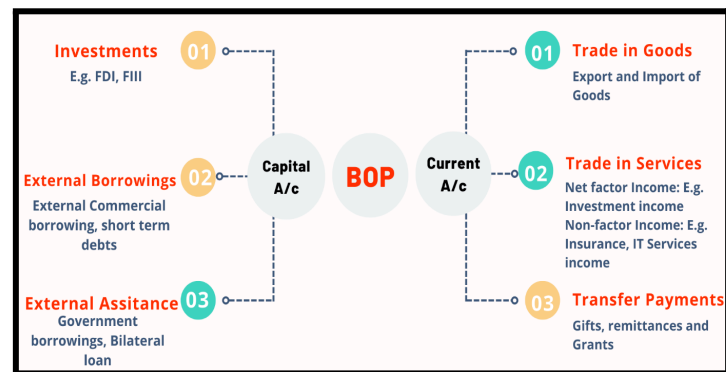
also declined to \$1.8 billion from \$5.6 billion.

- Non-resident deposits (NRI deposits) saw an increase in net inflows, rising to \$4.0 billion from \$2.2 billion in Q1 FY24.

Forex Reserves: India's foreign exchange reserves saw an accretion of \$5.2 billion on a balance of payments (BoP) basis in Q1 FY25, significantly lower than the \$24.4 billion accretion in the same period last year.

Expert Commentary:

- Chief Economist at Bank of Baroda, remarked that India's balance of payments remained stable in Q1 FY25, with a comfortable CAD of 1.1% of GDP.
- The widening trade deficit, particularly due to higher oil, gold, and non-oil imports. While FDI inflows improved, FPI flows declined. He projected the CAD to remain around 1.5% for FY25 if these trends persist.



Conclusion

India's current account deficit widened in Q1 FY25 due to a larger trade deficit, despite strong services exports and remittances.

Question: What are the key factors contributing to the widening of India's current account deficit in Q1 FY25, and what are the prospects for future quarters?

Source: [The Hindu](#)



Export ban on Non-Basmati White Rice lifted: why, what is the likely impact

Why in News?

India lifted the export ban on Non-Basmati White Rice, setting a minimum price of \$490 per tonne to boost trade after last year's production dip.

Context of the Ban

- The previous export ban was instituted due to a slight decline in rice production and concerns over an erratic monsoon season.
- With higher paddy sowing this kharif season and expected bumper output, the government decided to lift the ban.

Current Agricultural Status

- **Increased Sowing:** As of September 20, 2024, paddy sowing has increased by 2.2% compared to last year, covering 413.50 lakh hectares.
- **Record Production Estimates:** India's total rice production for 2023-24 is projected to reach 137.82 million tonnes, a 1.5% increase from last year, primarily driven by enhanced kharif season yields.
- **Price Dynamics:** Wholesale rice prices have decreased, recorded at Rs 3,324.99 per quintal, down from Rs 3,597.09 a week prior.

Impact on Stakeholders

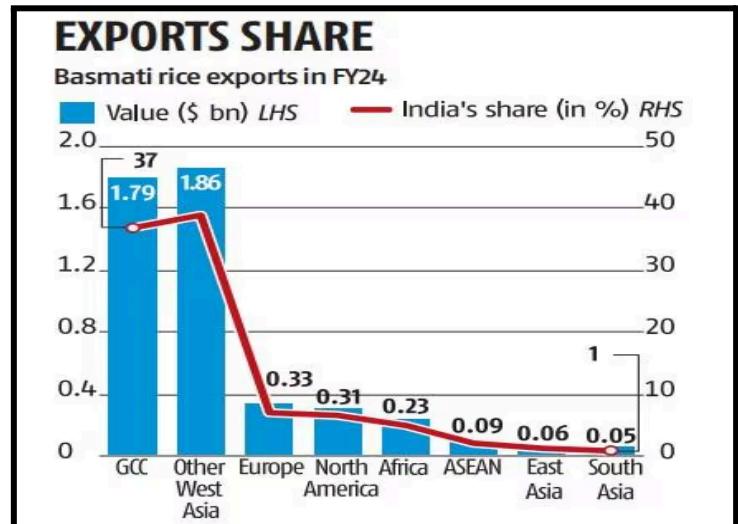
- **Exporters and Traders:** The lifting of the ban will benefit traders previously burdened by a 20% export duty. It will also positively affect farmers producing premium non-Basmati varieties like Sona Masoori.
- **Domestic Consumers:** Retail prices of rice, which have been elevated, may increase further due to the changes in export policy.

Exports During the Ban

- The government allowed exports to meet food security needs of other nations, with shipments occurring through the National Cooperative Export Limited (NCEL) to various countries, including UAE and Bhutan.

India's Position in the Global Rice Market

- India is the second-largest rice producer and the largest exporter, accounting for 33% of global rice exports in 2023, despite a drop from 40% in 2022 before the ban.



- Major competitors include Thailand and Vietnam, whose combined exports closely match India's.

Breakdown of Rice Exports:

- Rice exports are divided into basmati and non-basmati categories.
- Non-Basmati White Rice accounts for significant exports, with the government's lifting of the ban expected to enhance these numbers.

Conclusion

- Lifting the export ban on Non-Basmati White Rice aims to boost trade and support farmers, but may raise retail prices, requiring careful monitoring of market impacts.

Question: What are the potential implications of lifting the export ban on Non-Basmati White Rice for India's agricultural economy and rice pricing?

Source: [The Indian Express](https://www.thehindu.com/news-international/india-lifts-export-ban-on-non-basmati-white-rice/article67891234.html)



Science & Technology

Steady but slow: On the VIPER mission, lessons for India

Why in News?

India's growing space program faces resource constraints, limiting its ability to match global exploration developments.

NASA Cancels VIPER Mission

- NASA cancelled the VIPER mission in July 2024 due to delays and rising costs, disappointing scientists who aimed to explore lunar water-ice.

Global Lunar Competition:

- VIPER's cancellation raises concerns about China's lunar advancements, opening commercial and geopolitical opportunities, impacting the U.S.-led Artemis Accords involving India.

ISRO's Limitations

- ISRO gained acclaim for Chandrayaan-3's success but struggles to execute multiple flagship missions, limiting responsiveness and emerging space opportunities with its "one major mission at a time" model.

Chandrayaan-4 and Missed Opportunities

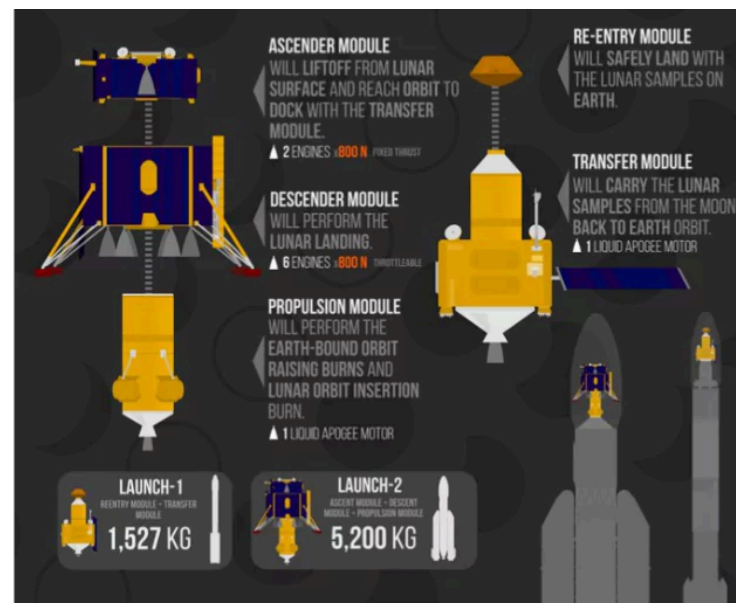
- Chandrayaan-4 that marks the second phase of India's lunar programme.
- ISRO could have pursued the Lunar Polar Explorer Mission with Japan's space agency, which aims to perform tasks similar to the cancelled VIPER mission, such as mapping water-ice deposits.

Challenges Facing India's Space Programme

- **Resource Constraints:** ISRO, despite increased funding, lacks resources for simultaneous large-scale missions, unlike NASA and China's CNSA.
- **Global Lunar Leadership:** As a signatory of the Artemis Accords, India risks falling behind in the renewed lunar race for resources like water-ice.
- **Strategic Importance of Lunar Exploration:** The cancellation of NASA's VIPER mission underscores the importance of lunar exploration in geopolitical and commercial arenas. ISRO's slower pace and limited resources could hinder its ability to lead in this critical area.

Outlook and Way Forward

- **Need for Increased Funding:** India's space program needs greater resources and infrastructure to avoid bottlenecks and compete in global exploration.
- **Leveraging International Partnerships:** Collaborating with international partners like Japan on the Lunar Polar Explorer Mission could enhance India's lunar exploration capabilities.



Conclusion:

- ISRO's success highlights capabilities, but resource limits hinder multiple missions; increased funding is essential for lunar leadership.

Question: What are the resource constraints limiting ISRO's ability to compete in the global space race, and how can these be addressed?

Source: [The Hindu](https://www.thehindu.com)



Having Private Participation in India's Nuclear Energy

Why in News?

In July 2024, India announced plans to expand nuclear energy, inviting private sector participation in Bharat Small Reactors and Bharat Small Modular Reactors to achieve 2030 decarbonization goals.

Government's Nuclear Energy Expansion Plans

In the 2024-25 Union Budget, India proposed private partnerships to develop **Bharat Small Reactor**, **Bharat Small Modular Reactor** and new nuclear technologies, aiming for 500 GW of non-fossil energy by 2030 aligned with the country's COP26 commitments.

Legal Framework: Atomic Energy Act, 1962 (AEA):

- AEA amended in 1987, grants the central government sole control over the production, development, and disposal of atomic energy, restricting private sector involvement.
- The Supreme Court upheld these restrictions in the case of Sandeep T.S. vs Union of India & Ors. (September 2024), noting the importance of strict safeguards in the exploitation of nuclear power.

Pending Legal Challenges: The Civil Liability for Nuclear Damage Act, 2010 (CLNDA), designed to provide compensation for victims of nuclear accidents, is currently facing a constitutional challenge in the Supreme Court.

Challenges to Private Participation

- **Strict Regulatory Controls:**
 - The Atomic Energy Regulatory Board (AERB), established under the Atomic Energy (Radiation Protection) Rules, 2004, supervises the use of radioactive technology.

- The Nuclear Safety Regulatory Authority Bill 2011, intended to strengthen regulatory oversight, was never enacted.

- **Liability Concerns:** High liability standards under India's 2010 Nuclear Damage Act complicate investments due to no-fault liability and constitutional litigation.
- **Public-Private Partnerships (PPP):** It could involve NPCIL retaining 51% ownership while inviting private capital for nuclear development.

Outlook and Way Forward

- **Legislative Reforms:** The NITI Aayog report urges a clear regulatory framework and liability structure to attract private investment in Small Modular Reactors.
- **Financial and Technical Investments:** The Union Budget aims to attract \$26 billion in private investment for nuclear energy, needing regulatory reforms to address legal uncertainties.

Conclusion:

- Private sector participation is vital for India's energy goals, requiring legislative reforms to address restrictions and legal challenges in the nuclear energy sector.

Question: What legal and regulatory changes are needed to facilitate private sector participation in India's nuclear energy sector?

Source: [The Hindu](https://www.thehindu.com)



Knowledge Nugget of the Day: Mini Moon 2024 PT5

Why in News?

Earth has recently welcomed a temporary mini-moon named 2024 PT5, captured by its gravitational pull. This celestial body will orbit Earth briefly, and its study offers insights into near-Earth objects.

Definition of Mini-Moons: Mini-moons are asteroids that become temporarily captured by Earth's gravity, usually small and difficult to detect.

Discovery of 2024 PT5: It was discovered on August 7, 2024 by scientists using the NASA-funded Asteroid Terrestrial-impact Last Alert System (ATLAS) and will orbit Earth from September 29 to November 25.

Characteristics: 2024 PT5 is about 10 meters (33 feet) in diameter and cannot be seen with the naked eye; specialized telescopes are required for observation.

Origin: This mini-moon is believed to have escaped from the Arjuna asteroid belt, which contains space rocks with similar orbits to Earth, located approximately 150 million kilometers from the Sun.

Unusual Behavior: Although classified as a mini-moon, some researchers argue that it may not complete a full orbit around Earth. Instead, it will revolve in a horseshoe pattern for about 55 days before escaping Earth's gravity.

Scientific Significance: Observations of 2024 PT5 will enhance our understanding of asteroids that pass near Earth. Many asteroids contain valuable resources, including minerals and water, which could be used for future space missions.

Beyond the Nugget: Interesting Facts about the Moon

- Two-Faced Nature:** The Moon rotates on its axis at the same rate it orbits Earth, resulting in only one side being visible from Earth, known as the near side.
- Moon's Shrinking:** As it cools, the Moon's diameter has decreased by over 50 meters in the last several hundred million years.
- Moonwalkers:** Twelve astronauts have walked on the lunar surface from 1969 to 1972, collecting 382 kilograms of lunar rocks and soil for study.
- Lunar Resources:** The Moon may contain critical resources such as hydrogen and

Mini-Moons & Their Significance

Mini-moons are small celestial bodies temporarily captured by Earth's gravity, unlike the permanent Moon that has been orbiting Earth for 4 billion years.

Only four mini-moons have been identified to date. Their orbits are temporary due to gravitational forces from both Earth and the Sun.

Studying mini-moons helps scientists understand the dynamics of near-Earth objects and Earth's gravitational influence on small celestial bodies.

water ice, which could support future space missions.

- Polar Regions:** The Moon's polar areas experience perpetual darkness and extreme temperatures, presenting challenges for equipment operation.

Conclusion

- The temporary mini-moon 2024 PT5 provides a unique opportunity for scientists to study near-Earth objects and expand our knowledge of asteroids.
- Its observation may lead to significant insights into the potential resources of asteroids for future space exploration.

Question: How might the study of mini-moons like 2024 PT5 contribute to our understanding of asteroids and their potential resources?

Source: [The Indian Express](#)



Annular Solar Eclipse on October 2: What is it?

Why in News?

An annular solar eclipse will occur on October 2, 2024, visible in South America, while a partial eclipse will be seen elsewhere.

What is a Solar Eclipse?

- A solar eclipse occurs when the Moon moves directly between the Earth and the Sun, blocking the Sun's light either fully or partially. This alignment casts a significant shadow on parts of the Earth.

Types of Solar Eclipses:

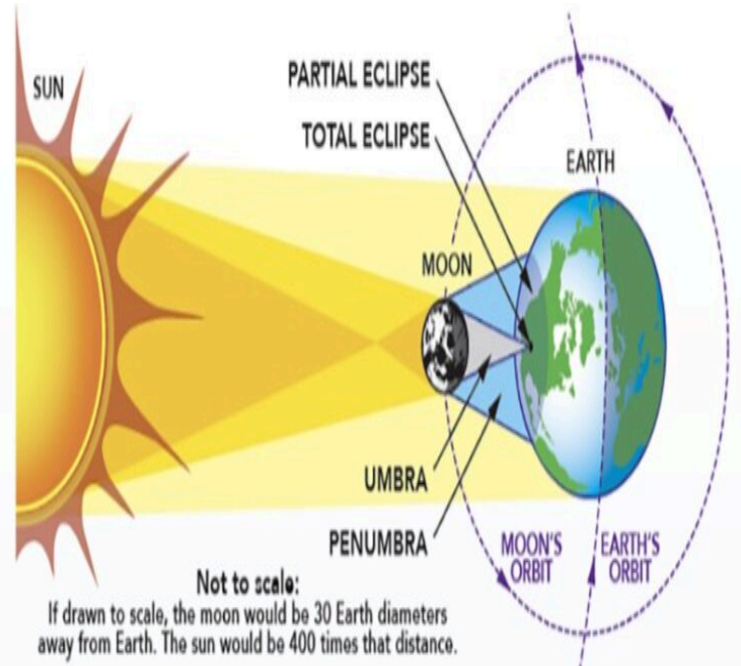
1. **Total Solar Eclipse:** Happens when the Moon completely covers the Sun. Observers in the path of totality experience darkness, allowing them to see the Sun's corona.
2. **Annular Solar Eclipse:** Occurs when the Moon is at or near its farthest point from Earth, covering the Sun's center and leaving a ring-like appearance known as the "ring of fire."
3. **Partial Solar Eclipse:** Takes place when the Moon only partially blocks the Sun, creating a crescent shape. This is the most common type of solar eclipse.
4. **Hybrid Solar Eclipse:** The rarest type, occurring when the eclipse transitions between annular and total phases. Some areas experience a total eclipse while others see it as annular.

Frequency of Solar Eclipses

- Solar eclipses can only happen during a new moon, which occurs approximately every 29.5 days. However, they typically happen 2 to 5 times a year.

Why Don't Solar Eclipses Occur Every Month?

- The Moon's orbit is tilted by about five degrees relative to Earth's orbit around the Sun.
- This tilt means that the Moon's shadow often misses the Earth during most new moons.
- Eclipses only occur when the new moon aligns with specific points (nodes) in its orbit that intersect with the Earth's orbital plane.



Conclusion

- The annular solar eclipse on October 2 offers a fascinating opportunity for viewers in certain parts of South America, showcasing the intricate movements of celestial bodies.
- Understanding the types of solar eclipses enhances our appreciation of these astronomical events and their rarity.

Question: What distinguishes an annular solar eclipse from other types of solar eclipses, and why is its occurrence rare?

Source: [The Indian Express](#)



SOLAR ECLIPSE

Things to know about this astronomical event

TYPES OF SOLAR ECLIPSE



TOTAL

The Moon completely blocks off the Sun's rays and casts a shadow over the Earth



ANNULAR

The Moon covers the Sun fully but due to its relatively small size the outer ring of the Sun is completely visible from Earth. This is also known as the Ring of Fire



PARTIAL

The Moon covers a part of the Sun and casts only the outer part of its shadow, the penumbra, on Earth

HYBRID: A rare form of solar eclipse which changes from an annular to a total solar eclipse, and vice versa, along its path. During a Hybrid Solar Eclipse you could see any of the three forms of eclipses, depending on exactly where you stand

WHAT IS A SOLAR ECLIPSE?

During a Solar eclipse the Sun, Moon and Earth are in a straight line and the Moon comes between the Sun and Earth. This blocks the rays of the Sun from reaching the Earth causing a solar eclipse

FACT

A solar eclipse usually occurs around two weeks prior or after a lunar eclipse



Environment and Ecology

Indian elephants lost genetic vigour as they moved north to south, 5 distinct populations exist: Study

Why in News?

A study in *Current Biology* reveals Indian elephants lost genetic diversity migrating from north to south, identifying five distinct populations and offering insights for conservation.

Migration and Genetic Diversity

- Indian elephants migrated from north to south over millennia, with each southward movement leading to a progressive loss in genetic diversity.
- The study identified five genetically distinct elephant populations:
 - One along the Himalayan foothills (northwest to northeast India),
 - One in central India,
 - Three in southern India.

Genetic Divergence Over Time

- The northern population diverged from the rest over 70,000 years ago, while the central Indian population separated around 50,000 years ago.
- The three southern populations diverged only around 20,000 years ago.

Southern Populations

- Located south of the **Shencottah Gap (Tamil Nadu-Kerala)**, has the lowest genetic diversity, making it highly vulnerable to extinction risks.
- This small, isolated population consists of fewer than 150 elephants.
- Previously, the **Palghat Gap** was considered the primary barrier to elephant dispersal in southern India.
- However, this study identified the **Shencottah Gap** as a significant additional barrier, resulting in three distinct populations in the south.

Risk of Inbreeding Depression

- Reduced genetic diversity in southern populations is attributed to the "serial founder effect," where fewer individuals migrate to form new populations.
- This increases the risk of inbreeding, leading to a higher likelihood of harmful genetic variants.

Conservation Implications

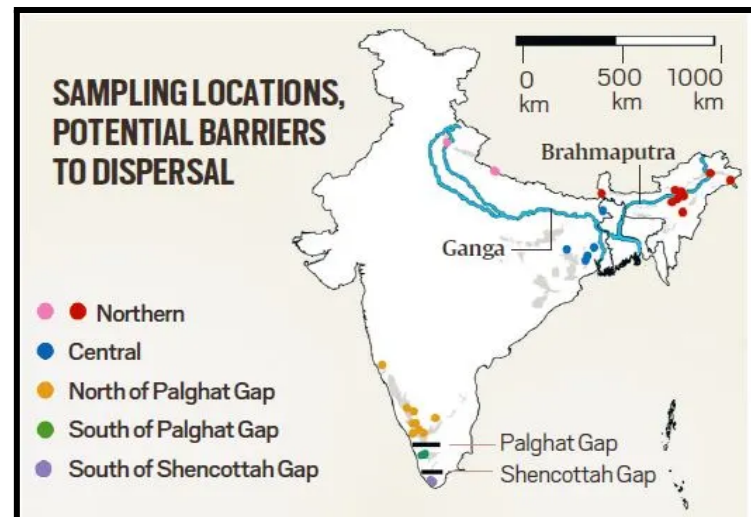
- The study emphasizes the need for region-specific conservation strategies

to protect these distinct populations.

- Habitat connectivity, particularly in the Western Ghats, has been disrupted by recent infrastructure development, further limiting gene flow between elephant populations.

Future Conservation Efforts

- The research team plans to develop a genetic toolkit using DNA from elephant faeces to monitor populations and track individual elephants more accurately in the wild.



Conclusion

- The study emphasizes the need for tailored conservation strategies to protect Indian elephants' genetic diversity, especially for the vulnerable southern population.

Question: How does the identification of genetically distinct populations of Indian elephants affect future conservation strategies?

Source: [The Indian Express](#)

Internal Security

AFSPA Extended in Manipur's Hill Districts Amidst Ongoing Ethnic Violence

Why in News?

On September 26, 2024, Manipur extended AFSPA for six months in hill districts due to ongoing ethnic violence between Kuki-Zo and Meitei communities.

Extension of AFSPA

- AFSPA allows armed forces to carry out arrests, searches, and use force in disturbed areas without legal repercussions, subject to sanction by the Central Government.

Ethnic Violence and Law and Order

- Since May 2023, Manipur has witnessed severe ethnic clashes between the Kuki-Zo people of the hills and the Meitei community in the valley.
- The violence has led to continuous law enforcement challenges, prompting the state to keep AFSPA in force.

Governor's Notification: Extremist activities require armed forces support for civil administration, exempting 19 police station areas in specific districts.

Legal Provisions of AFSPA:

- The Armed Forces (Special Powers) Act, 1958, grants sweeping powers to the Army and Central Armed Police Forces (CAPF) in "disturbed areas" to maintain order and conduct operations without facing legal consequences for their actions.
- Manipur has been under AFSPA since 1981, though it was first introduced in Naga-dominated areas in 1958. In 2004, it was partially lifted from the Imphal Municipality area.

Previous AFSPA Withdrawals:

- AFSPA was removed from certain parts of the state.
- In April 2022, it was withdrawn from 15 police stations in six districts, and in April 2023, four more police stations were exempted from the Act.

Challenges to Reviewing AFSPA's Scope

- The "disturbed area" status of the state remains in force as security agencies are preoccupied with handling the ongoing violence, making it premature to conduct a detailed ground assessment to review AFSPA's presence.

Conclusion

The extension of AFSPA in Manipur highlights the state's ongoing struggles with ethnic violence and security threats.

While essential for maintaining order, concerns over human rights remain, emphasizing the need for a long-term resolution to address governance challenges.

Question: How can the state balance the need for security with human rights concerns while addressing the root causes of ethnic violence in Manipur?

Source: [The Hindu](#)



Daily Quiz

Q1. Consider the following statements regarding the impact of La Niña on North India's air quality:

1. The delayed La Niña may lead to stagnant winds in North India, exacerbating air pollution levels during the winter months.
2. La Niña conditions typically promote better air quality by dispersing pollutants more effectively due to stronger winds.
3. The current predictions suggest that La Niña is unlikely to develop until December 2024, coinciding with the peak of winter pollution in North India.
4. The dynamics of air circulation influenced by climate change complicate air quality management in urban areas like Delhi.

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 3 and 4 only
- C. 1, 3, and 4 only
- D. 1, 2, 3, and 4

Q2. Consider the following statements regarding the recent contraction in India's core sector output in August 2024:

1. **Statement 1:** India's core sector output witnessed a year-on-year contraction of 1.8% in August 2024, marking the first decline in 42 months, with six of the eight core infrastructure sectors showing reduced production.
2. **Statement 2:** The core sectors' contraction included a significant decline in coal output by 8.1% and electricity generation by 5%, marking a five-month low.

Which of the following is correct?

- A. Both statements are correct, and Statement 2 explains Statement 1.
- B. Both statements are correct, but Statement 2 is independent of Statement 1.
- C. Statement 1 is correct, and Statement 2 is incorrect.

- D. Statement 2 is correct, and Statement 1 is incorrect.

Q3. Consider the following Assertion & Reason statement regarding the India's Current Account Deficit (CAD) in Q1 FY25:

1. **Assertion (A):** India's merchandise trade deficit widened to \$65.1 billion in Q1 FY25, contributing significantly to the overall current account deficit.
2. **Reason (R):** India experienced an increase in exports of computer services, business services, and travel services during the same period, leading to higher net services receipts.

Which of the following is correct?

- A. Both A and R are true, and R is the correct reason for A.
- B. Both A and R are true, but R is not the correct reason for A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Q4. Which of the following statements best describes the potential implications of lifting the export ban on Non-Basmati White Rice for India's agricultural economy and rice pricing?

- A. The lifting of the export ban is expected to boost rice exports, support farmers, and lower domestic retail prices, leading to better consumer affordability.
- B. The export ban lifting is irrelevant to India's rice market as India's domestic consumption fully absorbs all non-basmati white rice, with no major export market impacts.
- C. With the lifting of the export ban, India's share of global rice exports will surpass its major competitors, eliminating the need for further agricultural reforms.
- D. The removal of the ban will help traders and farmers but may cause retail rice prices to rise, impacting consumers despite the anticipated increase in rice production.



Q5. Consider the following statements regarding the VIPER mission and India's space exploration challenges:

1. NASA's cancellation of the VIPER mission in 2024 raises concerns about China's advancements in lunar exploration, which may impact India's position in the global space race.
2. The VIPER mission aimed to map water-ice deposits on the Moon, a task similar to what ISRO's Chandrayaan-3 successfully achieved.
3. India, despite the success of Chandrayaan-3, faces resource constraints, limiting its ability to carry out multiple large-scale space missions simultaneously.
4. The Artemis Accords, signed by India, enhance the country's capacity to execute lunar exploration missions, including collaborations with international space agencies.

Which of the above statements is/are correct?

- A. 1 and 3 only
- B. 2 and 4 only
- C. 1, 3, and 4 only
- D. 1, 2, 3, and 4

Q6. Consider the following statements regarding private sector participation in India's nuclear energy sector:

1. **Statement 1:** The Atomic Energy Act (AEA) of 1962, amended in 1987, allows private sector participation in the development and production of atomic energy, particularly through public-private partnerships.
2. **Statement 2:** The Supreme Court upheld restrictions on private sector involvement in nuclear energy in 2024, emphasizing the need for stringent safeguards in the exploitation of nuclear power.

Which of the following is correct?

- A. Statement 1 is correct, and Statement 2 is incorrect.
- B. Statement 2 is correct, and Statement 1 is incorrect.

- C. Both statements are correct, and Statement 2 explains Statement 1.
- D. Both statements are incorrect.

Q7. Consider the following Assertion & Reason statement regarding the mini-moon 2024 PT5:

1. **Assertion (A):** The mini-moon 2024 PT5 was temporarily captured by Earth's gravity and will orbit Earth for a brief period.
2. **Reason (R):** The mini-moon 2024 PT5 was launched into orbit by a gravitational anomaly caused by a lunar eclipse, which frequently influences the trajectory of near-Earth objects.

Which of the following is correct?

- A. Both A and R are true, and R is the correct reason for A.
- B. Both A and R are true, but R is not the correct reason for A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Q8. Consider the following statements regarding the annular solar eclipse on October 2, 2024:

1. **Statement 1:** An annular solar eclipse occurs when the Moon is at its closest point to Earth, covering the Sun completely and leaving a "ring of fire" appearance.
2. **Statement 2:** The eclipse on October 2, 2024, will be visible as an annular eclipse in South America, while other regions will see a partial eclipse.

Which of the following is correct?

- A. Statement 1 is correct, and Statement 2 is incorrect.
- B. Statement 2 is correct, and Statement 1 is incorrect.
- C. Both statements are correct, and Statement 2 explains Statement 1.
- D. Both statements are incorrect.

Q9. Consider the following statements regarding the genetic diversity of Indian elephants:

1. Indian elephants migrating from north to south over millennia resulted in a



loss of genetic diversity, with southern populations being more vulnerable to extinction due to lower genetic vigour.

2. The study identified three genetically distinct populations in central India, which were previously unknown due to limited research on elephant migration patterns.
3. The Shencottah Gap has been identified as a major barrier to elephant dispersal in southern India, leading to the separation of populations, whereas the Palghat Gap was earlier believed to be the primary barrier.
4. The southern population, located south of the Shencottah Gap, has the lowest genetic diversity, making it highly susceptible to inbreeding depression.

Which of the above statements is/are correct?

- A. 1 and 3 only
- B. 2 and 4 only
- C. 1, 3, and 4 only
- D. 1, 2, 3, and 4

Q10. Consider the following Assertion & Reason statement regarding AFSPA's extension in Manipur:

1. **Assertion (A):** The Government of Manipur extended the Armed Forces (Special Powers) Act (AFSPA) for six months in hill districts due to ongoing ethnic violence between the Kuki-Zo and Meitei communities.
2. **Reason (R):** The extension of AFSPA was necessary to prevent the Indian Army from being held accountable for actions taken during civil unrest, as it operates under the jurisdiction of the United Nations.

Which of the following is correct?

- A. Both A and R are true, and R is the correct reason for A.
- B. Both A and R are true, but R is not the correct reason for A.
- C. A is true, but R is false.
- D. A is false, but R is true.



Solutions

1. Correct Answer is C

Explanation:

Statement 1: Correct : The delayed onset of La Niña is expected to lead to stagnant winds in North India, particularly during the winter months. This stagnation can trap air pollutants close to the surface, resulting in elevated levels of PM2.5 and PM10, which are harmful to health and contribute to poor air quality.

Statement 2: Incorrect : While La Niña is generally associated with stronger winds that can help disperse pollutants, the current delay in its development means that these benefits will not be realized in the immediate future. Thus, rather than improving air quality, the delayed La Niña could lead to worse conditions.

Statement 3: Correct : Predictions indicate that La Niña is unlikely to fully develop until December 2024. This timing aligns with the peak winter pollution period in North India, which is critical for understanding the air quality challenges during this season.

Statement 4: Correct : There is increasing recognition that climate change affects air circulation patterns, which in turn influence pollutant dispersion. This means that urban areas like Delhi need to consider broader climatological factors when formulating air quality management strategies, moving beyond localized emissions.

2. Correct Answer is A

Explanation:

Statement 1 is Correct as the data released in August 2024, where the core sector output declined by 1.8% after 42 months of consistent growth. This contraction was largely driven by the underperformance of key infrastructure sectors.

Statement 2 is also correct & correct explanation of Statement 1 that

provides more specific details about the sectors that contributed to this contraction, particularly highlighting the decline in coal and electricity output, which played a significant role in the overall downturn.

3. Correct Answer is B

Explanation:

Assertion (A): True

India's merchandise trade deficit widened to \$65.1 billion in Q1 FY25, contributing significantly to the overall widening of the current account deficit. This increase was largely driven by a rise in imports, particularly oil, gold, and non-oil items, which overshadowed any improvements in exports. Thus, the widening trade deficit is a major contributor to the increased current account deficit.

Reason (R): True, but not the correct reason for A

Although India did experience an increase in net services receipts, driven by exports of computer services, business services, and travel services, this did not directly explain the widening merchandise trade deficit. Instead, the rise in services exports helped offset the impact of the trade deficit on the current account. Therefore, while R is true, it does not correctly explain the reason for A, as the widening trade deficit was unrelated to the increase in services receipts.

4. Correct Answer is D

Explanation:

- The lifting of the export ban on Non-Basmati White Rice is expected to benefit exporters and farmers, particularly those involved in the production of premium rice varieties.
- This policy change comes in light of increased sowing and projected record rice



production, driven by a good monsoon season.

- However, it may lead to a rise in domestic retail prices, creating challenges for consumers.
- While trade opportunities improve, the increase in export activities might strain the local market by reducing the supply available for domestic consumption, thus pushing prices higher.

5. Correct Answer is A

Explanation:

Statement 1: Correct : NASA's cancellation of the VIPER mission in July 2024 raised concerns about the competitive edge that China is gaining in lunar exploration. This creates opportunities for China to assert dominance in lunar resource exploration, potentially impacting India's strategic position in space exploration and related geopolitical spheres.

Statement 2: Incorrect : While the VIPER mission aimed to map lunar water-ice deposits, Chandrayaan-3 did not perform the same tasks. Chandrayaan-3's primary objective was a soft landing and surface exploration, not specific mapping of lunar ice deposits like the VIPER mission intended.

Statement 3: Correct : ISRO, despite the success of Chandrayaan-3, continues to face significant resource constraints, limiting its ability to carry out multiple major missions at once. This challenge restricts ISRO's flexibility in responding to new opportunities in space exploration, particularly in the global lunar race.

Statement 4: Incorrect : Although India is a signatory of the Artemis Accords, this agreement alone does not significantly enhance ISRO's capacity to conduct lunar exploration missions. The constraints faced by ISRO, particularly in terms of funding and infrastructure, still limit its ability to

match the scale of international collaborations.

6. Correct Answer is B

Explanation:

Statement 1 is incorrect because the Atomic Energy Act of 1962, even after the 1987 amendment, does not allow private sector participation in nuclear energy development. The Act grants the central government sole control over the production, development, and disposal of atomic energy. Private sector involvement remains restricted under this legislation.

Statement 2 is correct, as the Supreme Court in 2024 reaffirmed the restrictions on private sector involvement in nuclear energy through the Sandeep T.S. vs Union of India & Ors. case, emphasizing the importance of stringent regulatory safeguards in the management of nuclear power.

7. Correct Answer is C

Explanation:

Assertion (A): True

The mini-moon 2024 PT5 was indeed captured by Earth's gravitational pull. This temporary capture occurs when small asteroids, like mini-moons, get caught by Earth's gravity and orbit for a short duration before escaping back into space. 2024 PT5 was discovered on August 7, 2024, and will orbit Earth from September 29 to November 25, 2024, providing scientists a rare opportunity to study such objects.

Reason (R): False

The capture of mini-moons like 2024 PT5 is not caused by a lunar eclipse or any specific gravitational anomaly. Instead, mini-moons are captured by Earth's gravity through natural orbital mechanics when they come close enough to Earth. The reason mentioned in the statement (R) about a gravitational anomaly during a lunar eclipse is scientifically inaccurate. Therefore, while the assertion is correct, the reason is false.



8. Correct Answer is B

Explanation:

Statement 1 is Incorrect because an annular solar eclipse occurs when the Moon is at or near its farthest point from Earth, not its closest point. This means the Moon does not completely cover the Sun, leading to the characteristic "ring of fire" appearance as the Sun's outer edges remain visible.

Statement 2 is Correct and provides an accurate description of the October 2, 2024, solar eclipse. It correctly notes that the annular eclipse will be visible in South America, while regions outside this path will experience a partial eclipse. This detail highlights the geographical variation in the visibility of the eclipse and correctly informs us about the nature of the event occurring on that date.

9. Correct Answer is C

Explanation:

Statement 1: Correct : As Indian elephants migrated from north to south over thousands of years, they progressively lost genetic diversity. The southern populations, in particular, exhibit lower genetic diversity, making them more vulnerable to extinction due to reduced genetic vigour and increased susceptibility to environmental changes.

Statement 2: Incorrect : The study did not identify distinct populations in central India that were previously unknown. Instead, it confirmed one population in central India and identified three genetically distinct populations in southern India, which had been separated due to geographical barriers.

Statement 3: Correct : The Shencottah Gap was identified in the study as a significant barrier to elephant dispersal, leading to the division of the southern population into three distinct groups. Previously, the Palghat Gap was considered the main barrier, but this new research highlights the importance of the Shencottah Gap.

Statement 4: Correct : The southern elephant population, south of the Shencottah Gap, has the lowest genetic diversity, increasing the risk of inbreeding and making them more vulnerable to extinction. This is due to the "serial founder effect," where small populations with limited gene flow face higher risks of harmful genetic mutations.

10. Correct Answer is C

Explanation:

Assertion (A): True

The extension of AFSPA in Manipur's hill districts is a response to the ongoing ethnic violence that has escalated since May 2023 between the Kuki-Zo and Meitei communities. The law is intended to empower armed forces to restore order in areas classified as disturbed, where normal law enforcement has been severely challenged.

Reason (R): False

The assertion that the extension of AFSPA is necessary to prevent the Indian Army from being held accountable under the jurisdiction of the United Nations is incorrect. AFSPA provides immunity from legal prosecution to armed forces operating in disturbed areas, but it is a domestic law governed by the Indian legal framework, not international law. The UN does not have jurisdiction over India's internal security laws. Therefore, while the assertion about the extension of AFSPA is accurate, the reasoning provided is misleading.





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