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IPS LAXMAN PRATAP
RANK - 597
FORMER ASST. COMMANDANT IN BSF
CITY COLLEGE KOLKATA

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IRS SARLA JAKHER
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CITY COLLEGE KOLKATA



IRS TANMAY
AIR 346
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DAILY CURRENT AFFAIRS-

1. Maternal Genes Determine Shell Coiling in Snails
2. SUVIKALP: Mine Repurposing Tool
3. EC: Electors Deleted from Draft Rolls Can Reapply Through Form 6
4. Supreme Court and Due Process in Death Penalty Cases
5. Sri Lanka's Nationwide Blackout: Rooftop Solar and Grid Stability
6. Mayon Volcano

1.Maternal Genes Determine Shell Coiling in Snails

Source: The Hindu

Why in News?

- A study published in the journal Current Biology on October 16 identified how variations in the myosin gene determine whether Japanese Euhadra snails develop left-handed or right-handed shells.
- Researchers from the UK and Japan found that shell coiling depends on the genetic variants inherited by the mother.

Key Scientific Findings

- Snail shell coiling, known as handedness or chirality, can be either:
    - Dextral (D): Right-handed shell coiling.
    - Sinistral (S): Left-handed shell coiling.
- Researchers identified two variants of the myosin gene:
    - S variant: Associated with left-handedness.
    - D variant: Associated with right-handedness.
- The study found that the mother's genotype determines the offspring's shell orientation, irrespective of the offspring's own genotype. This is known as the maternal effect.
- If the mother carries at least one S variant (SS or SD), her offspring develop left-handed shells.
- Right-handed offspring develop only when the mother has the DD genotype.
- Researchers identified this pattern in a mixed population of Euhadra quaesita snails discovered in northern Japan in 2023.
- The myosin protein interacts with actin to form an actomyosin complex, which helps in cell movement, cell division and generation of mechanical force.

Significance of the Study

- The findings explain how molecular-level asymmetry can influence the development of physical structures in an organism.
- Differences in myosin proteins may influence the movement of actin filaments, potentially affecting the orientation of cell division and the development of left-right asymmetry.
- Snails provide an important model for understanding the genetic and molecular mechanisms responsible for biological chirality.

Important Biological Terms

- Chirality: A property in which an object or organism has a form that is distinguishable from its mirror image, such as left- and right-handed structures.
- Maternal Effect: A phenomenon in which an offspring's phenotype is determined by the mother's genotype rather than solely by the offspring's own genotype.
- Hermaphrodite: An organism possessing both male and female reproductive organs. Snails exchange sperm during mating.
- Meteoroid: Not applicable here; the key molecular proteins discussed are myosin and actin.

2.SUVIKALP: Mine Repurposing Tool

Soirce: PIB

Why in News?

- The Ministry of Coal has introduced SUVIKALP, a digital tool developed by the Coal Controller Organisation (CCO) to transform closed and abandoned mines into productive assets.

Key Highlights

- SUVIKALP is a digital decision-support platform that provides a scientific, transparent and standardised framework for identifying suitable post-mining land-use opportunities.
- It uses the Multi-Criteria Decision-Making (MCDM) methodology, specifically the TOPSIS technique, to objectively evaluate and rank different mine-repurposing options.
- It integrates two important frameworks:

- RECLAIM (Community Engagement and Development Framework): Ensures that redevelopment plans incorporate local priorities, employment generation and livelihood opportunities.
- PRISM (Post-Mining Repurposing Implementation Strategic Model): Guides project implementation through project vision, investment planning and monitoring.

Significance and Future Roadmap

- The platform integrates geo-mining characteristics, environmental conditions, infrastructure, financial factors and socio-economic considerations for comprehensive site assessment.
- It addresses fragmented assessments and inadequate integration of community priorities in conventional mine-repurposing decisions.
- Future phases will focus on:
  - Wider adoption across closed and abandoned coal and lignite mines.
  - Converting recommendations into feasibility studies.
  - Mobilising investments for redevelopment projects.
- Its long-term vision is to develop a scalable national knowledge and decision-support ecosystem for sustainable post-mining land-use planning.

Important Terms

- MCDM: A decision-making approach used to evaluate alternatives based on multiple criteria.
- TOPSIS: Technique for Order Preference by Similarity to Ideal Solution; ranks alternatives based on their closeness to an ideal solution and distance from the worst solution.

3.EC: Electors Deleted from Draft Rolls Can Reapply Through Form 6

Source: IE

Why in News?

- The Election Commission of India (ECI) clarified that voters whose names were deleted from draft electoral rolls during the Special Intensive Revision (SIR) can apply again through Form 6 for inclusion in the final electoral roll.
- The clarification aims to prevent genuine voters from losing their voting rights due to confusion over a declaration in Form 6.

- The EC clarified that such applicants will not face prosecution under Section 31 of the Representation of the People Act, 1950, merely for submitting Form 6 in these circumstances, provided they are not already enrolled elsewhere.

Key Highlights

- The clarification addresses concerns that Form 6 contains a declaration relating to first-time enrolment.
- Some previously registered electors feared that submitting the form could amount to a false declaration and attract legal action.
- The EC stated that Form 6 can be used by previously enrolled electors whose names were omitted during SIR.
- The directive has been communicated to Chief Electoral Officers (CEOs) of all States and Union Territories.
- The clarification follows observations by the Delhi High Court and the Supreme Court regarding protection of genuine electors from prosecution in such circumstances.

Special Intensive Revision (SIR)

- SIR is a comprehensive exercise conducted by the Election Commission of India to verify and update electoral rolls.
- It involves house-to-house enumeration and verification of existing voter entries.
- Its major objectives include:
    - Inclusion of eligible voters.
    - Removal of duplicate and ineligible entries.
    - Correction of errors in electoral records.
    - Verification of voter details to improve the accuracy of electoral rolls.

Form 6: Application for Inclusion in Electoral Roll

- Form 6 is prescribed under the Registration of Electors Rules, 1960.
- It is used by eligible Indian citizens for inclusion of their names in the electoral roll.
- It can be submitted by:
    - First-time eligible voters.
    - Previously enrolled electors whose names have been omitted from the electoral roll.
- The application is submitted to the Electoral Registration Officer (ERO).

Section 31 of the Representation of the People Act, 1950

- It deals with making false declarations in connection with the preparation, revision or correction of electoral rolls.
- A person making a false declaration in writing, which they know or believe to be false, or do not believe to be true, may face:
    - Imprisonment up to one year.
    - Fine.
    - Both imprisonment and fine.
- The EC's clarification ensures that genuine applicants are not treated as making false declarations merely because they were previously enrolled.

Important Authorities Involved

- Election Commission of India (Article 324):

- Constitutional body responsible for the superintendence, direction and control of elections to Parliament, State Legislatures, and the offices of President and Vice-President.
- Conducts and supervises electoral roll preparation and revision.

- Electoral Registration Officer (ERO):

- Statutory authority responsible for preparing and maintaining electoral rolls for a constituency.
- Handles applications for inclusion, correction and deletion of entries.

- Chief Electoral Officer (CEO):

- Supervises election-related activities at the State or Union Territory level.
- Coordinates implementation of ECI instructions.

Significance

- Protects the voting rights of eligible citizens.
- Prevents genuine voters from being discouraged by fear of prosecution.
- Improves transparency and uniformity in electoral roll revision.
- Reduces the possibility of wrongful exclusion from the electoral process.
- Strengthens public confidence in the electoral system.

Important Prelims Facts

Provision / Term	Details
Article 324	Powers and functions of ECI
Article 325	One general electoral roll; prohibits exclusion on grounds of religion, race, caste or sex
Article 326	Elections to Lok Sabha and State Legislative Assemblies based on adult suffrage
Article 327	Parliament's power to make laws relating to elections
Article 328	State Legislature's power to make laws relating to elections, subject to parliamentary legislation
Article 329	Bar to interference by courts in electoral matters, subject to constitutional provisions
Form 6	Application for inclusion in electoral roll
Form 7	Application for objection to inclusion or deletion of an existing entry
Form 8	Application for shifting, correction or replacement of EPIC
Section 31, RPA 1950	Penalty for making false declarations

Conclusion

The EC's clarification reinforces the principle of universal adult suffrage by protecting eligible voters from wrongful exclusion during electoral roll revision. Accurate electoral rolls must be ensured without creating unnecessary barriers for genuine citizens seeking inclusion.

4.Supreme Court and Due Process in Death Penalty Cases

Source: The Hindu

Why in News?

- The Supreme Court's evolving jurisprudence on capital punishment highlights the importance of procedural safeguards, individualised sentencing and the possibility of reformation.
- The issue was discussed in the context of the Day Against the Death Penalty, observed on 10 October.

Evolution of Death Penalty Jurisprudence

- Bachan Singh v. State of Punjab (1980):
    - Established the rarest of rare doctrine.
    - Life imprisonment was made the rule and the death penalty an exception.
    - Death sentences can be imposed only for special reasons.
    - Emphasised individualised sentencing and consideration of the accused's circumstances and possibility of reformation.
- Machhi Singh v. State of Punjab (1983):
    - Further elaborated the rarest of rare doctrine, placing greater emphasis on the nature and gravity of the crime.
- Ravji v. State of Rajasthan (1995):
    - Shifted the sentencing focus towards the crime rather than adequately considering the circumstances of the accused.
- Santosh Kumar Bariyar v. State of Maharashtra (2009):
    - Reaffirmed the principles laid down in Bachan Singh.
    - Emphasised the possibility of reformation as an important consideration in death penalty cases.

Procedural Safeguards and Recent Developments

- Section 354(3) of CrPC: Provided that life imprisonment is the standard punishment and death sentences require special reasons. It is now reflected in Section 393(3) of the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023.
- 262nd Law Commission Report (2015): Emphasised reformation as an important objective in death penalty sentencing.
- Manoj v. State of Madhya Pradesh (2022):
    - Mandated collection of relevant information before sentencing.
    - Required mental health evaluations, conduct reports during custody and probation officer reports.
    - Aims to ensure meaningful consideration of mitigating circumstances.
- Vasanta Sampat Dupare v. Union of India (2025):
    - Held that a sentencing hearing complying with the Manoj guidelines flows from Articles 14 and 21.

- A death sentence imposed without such safeguards is unconstitutional.

- Waris v. State of Madhya Pradesh (2026):
  - The Supreme Court commuted a death sentence.
  - Held that the gravity of the crime alone cannot rule out the possibility of reformation.

Recent Trends & Procedural Shifts (2024-2026)

Current data shows a "Trial Court Paradox"—while trial courts frequently award death, the Supreme Court has become extremely reluctant to confirm them.

Feature	Current Status (2026)
Confirmation Rate	The Supreme Court confirmed zero death sentences between 2023 and 2025, preferring commutation or acquittal.
Method of Execution	Hanging remains the legally prescribed method of execution. In August 2026, the Supreme Court rejected a plea to replace it with lethal injection, while leaving scope for reconsideration based on future scientific evidence.
Alternative Sentencing	The use of Life Imprisonment without Remission has increased as an intermediate punishment between the death penalty and ordinary life imprisonment.
Legal Aid	In Aman Singh v. State of Bihar (2026), the Supreme Court directed Legal Services Committees to provide a dedicated legal team comprising one Senior Advocate and two Advocates for all death reference cases before High Courts.

Challenges in Implementation

- A study of 306 death sentences pronounced between 2018 and 2020 found that 36.1% were awarded on the same day as conviction, indicating inadequate opportunity for mitigation arguments.
- In 2025, trial courts recorded 95.18% non-compliance with the Manoj guidelines.
- In 2025, the Supreme Court acquitted accused persons in 10 out of 19 death penalty cases reviewed, citing seriously flawed investigations and prosecutions.
- These findings highlight gaps in investigation, sentencing procedures and implementation of constitutional safeguards.

5.Sri Lanka's Nationwide Blackout: Rooftop Solar and Grid Stability

Source: The Hindu

Why in News?

- Sri Lanka experienced a nationwide power grid collapse on 17 October, plunging the country into darkness for over five hours.
- The incident raised concerns about integrating rooftop solar power into electricity grids without compromising grid stability.

Key Highlights

- The grid operator directed rooftop solar operators to switch off their systems following the blackout.
- Rooftop solar accounts for approximately 48% of Sri Lanka's total installed renewable energy capacity, amounting to 2,499 MW.
- A preliminary report indicated the possible role of non-dispatchable generation sources in triggering the grid disturbance.
- Sri Lanka's power generation mix comprises:
    - Renewable energy: 51%.
    - Hydropower: 21%.
    - Oil-based power: 17%.
    - Coal: 11%.

Grid Stability Challenges

- Non-dispatchable sources, such as rooftop solar and wind energy, depend on weather conditions and cannot be easily controlled or ramped up and down by grid operators.
- Sudden fluctuations or loss of generation from intermittent sources can disturb the balance between electricity supply and demand.
- Large-scale rooftop solar integration can create challenges such as:
    - Intermittency in power generation.
    - Voltage fluctuations.
    - Reverse power flow in distribution networks.
- Grid upgrades, energy storage systems and improved power management are necessary to maintain grid stability.

Rooftop Solar in India (Status 2026)

As of **November 2024**, India's rooftop solar sector is witnessing an unprecedented acceleration, primarily driven by the **PM Surya Ghar: Muft Bijli Yojana**. The government has shifted from a mere "subsidy" model to a "mission" mode to solarize **1 crore (10 million) households**.

1. Current Progress & Targets

- **Capacity:** India's cumulative grid-connected rooftop solar capacity reached **32.59 GW** as of August 31, 2026.
- **Installation Pace:** The speed of adoption has surged; as of November 2026, India is installing **1 lakh rooftop systems every six days**, with the target to reduce this to every 4–5 days.
- **Residential Lead:** Under the flagship PM Surya Ghar scheme, over **55 lakh systems** have already been installed, benefiting approximately **65.6 lakh households**.

2. Scheme Mechanics: PM Surya Ghar

This scheme replaced the older Rooftop Solar Phase-II for the residential sector. Its core promise is **300 units of free electricity** per month.

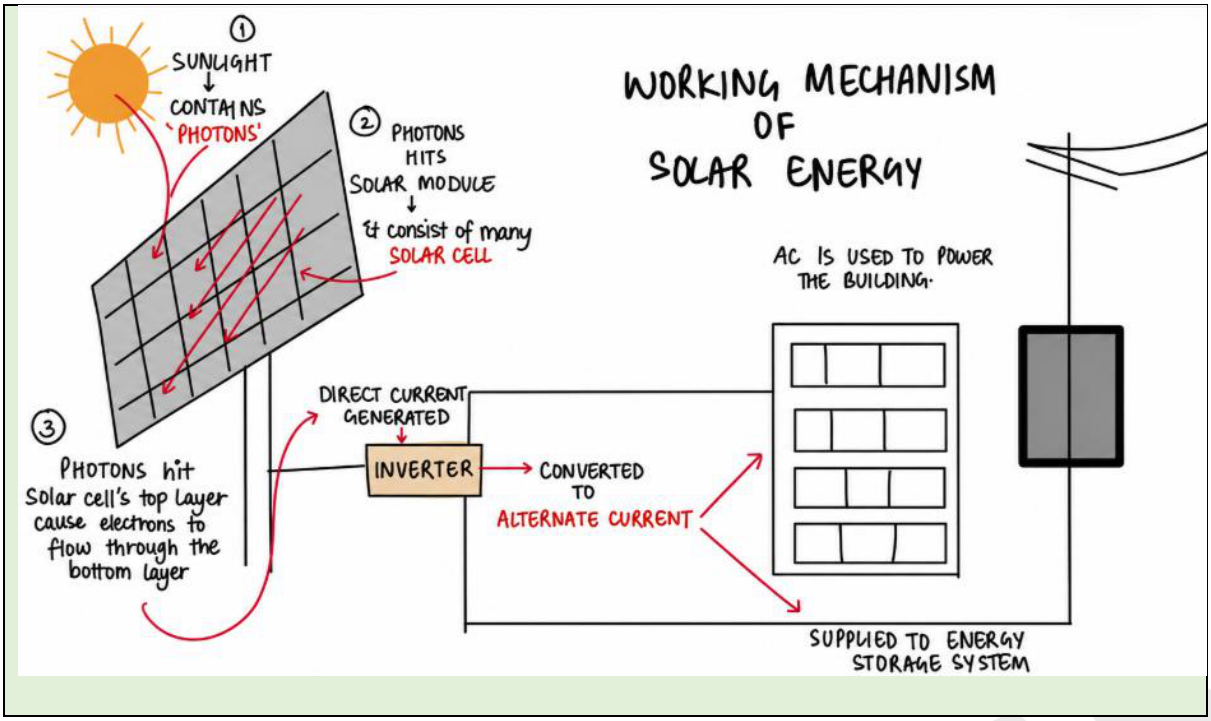
- **Subsidy Structure:**
  - **2 kW system:** ₹60,000 (60% of benchmark cost).
  - **3 kW system:** ₹78,000 (Maximum cap).
- **Financial Support:** Households can access **collateral-free, low-interest loans** (currently around 7%) for installations up to 3 kW.
- **Net Metering:** This is the technical backbone where the surplus power you generate during the day is "sold" back to the grid, offsetting your consumption at night.

Key Challenges & Innovations

- **Utility-Led Aggregation (ULA):** Since individual households often face technical hurdles, DISCOMs are now being incentivized to "aggregate" demand, taking a lead role in installation and maintenance.
- **Insurance Products:** The government is currently (Nov 2026) working with insurers to develop **customized solar insurance** to protect these small assets from weather damage and improve "bankability" for lenders.
- **State Leadership: Uttar Pradesh** has emerged as a frontrunner in 2026, solarizing over 9.4 lakh households, followed closely by Gujarat and Maharashtra.

Solarizing Government Buildings

A parallel target exists for the public sector. As of November 2026, **65% of the targeted government buildings** in India have been equipped with rooftop solar, saving the exchequer nearly ₹700 crore annually.



Relevance for India

- India's cumulative rooftop solar installations reached approximately 33.4 GW by September 2026.
- The government is promoting rooftop solar through PM Surya Ghar: Muft Bijli Yojana, which aims to cover 1 crore households.
- Sri Lanka's blackout highlights the importance of strengthening grid infrastructure and storage capacity alongside renewable energy expansion.

6.Mayon Volcano

Source: The Hindu

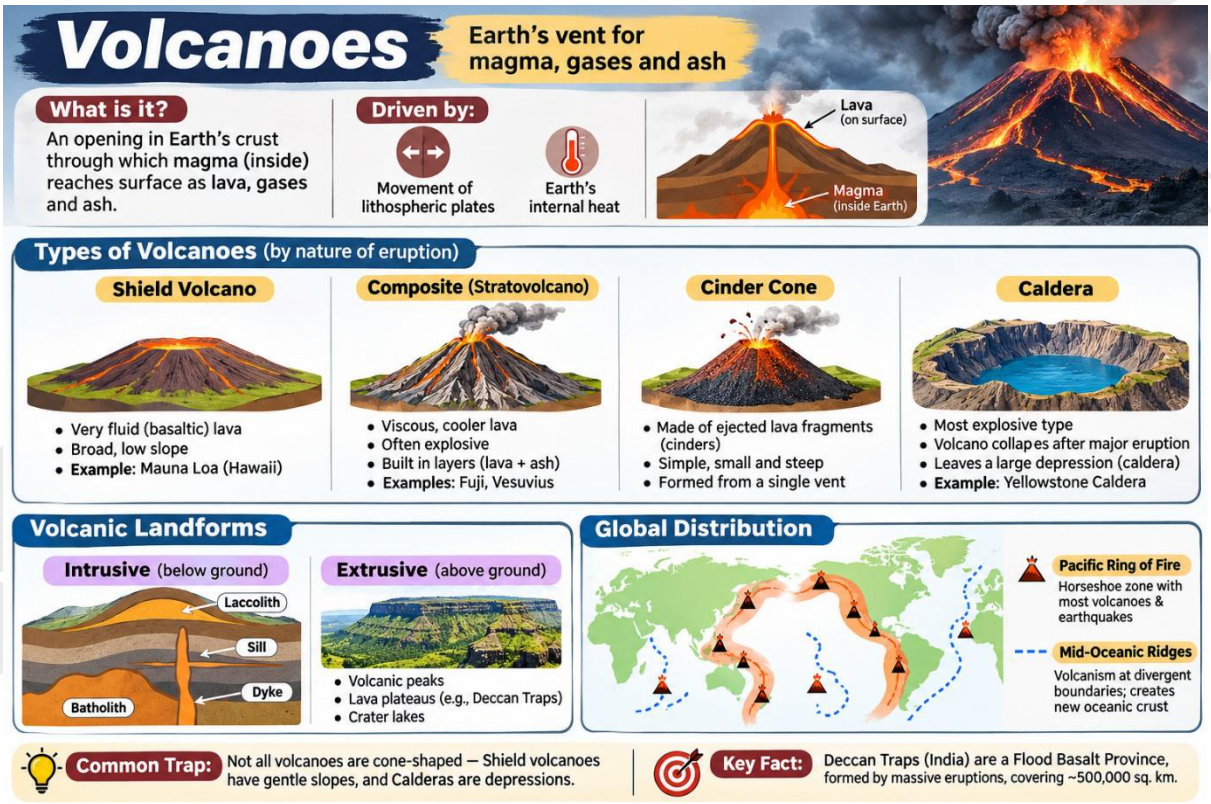
Why in News?

- Mayon Volcano, one of the most active volcanoes in the Philippines, recently produced a dark ash column rising thousands of metres into the sky during a moderately explosive eruption.

Key Highlights

- Mayon Volcano is an active volcano located in Albay province on Luzon Island, Philippines.
- It is a stratovolcano, formed by alternating layers of lava and ash.

- It is part of the Pacific Ring of Fire.
- It is situated on the eastern side of Luzon, near the Philippine Trench, a convergent plate boundary where the Philippine Sea Plate moves beneath the Philippine Mobile Belt.
- It rises to approximately 2,462 metres above the Albay Gulf.
- It is considered one of the world's most symmetrical volcanic cones.
- Its base has a circumference of approximately 130 km, with steep upper slopes and a summit crater about 250 metres wide.
- It is the centre of Mayon Volcano National Park and was designated a UNESCO Biosphere Reserve in 2016.
- Large abaca plantations are found on its lower slopes.



Eruptions and Historical Significance

- Historical records of its eruptions date back to 1616 CE.
- More than 30 eruptions have been recorded since 1616.
- Its eruptions include:

  - Strombolian eruptions.
  - Lava flows.
  - Pyroclastic flows.
  - Mudflows (lahars).
- The most destructive eruption occurred in 1814, killing more than 1,200 people and devastating several towns.
- An eruption in 1993 caused 79 deaths.
- Most eruptions originate from the central volcanic conduit, producing lava flows that can travel down the volcano's slopes.

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