KERALA STATE CIVIL SERVICE ACADEMY

Established under Centre for Continuing Education Kerala (CCEK)

WEEKLY CURRENT AFFAIRS

MAGAZINE

April 04 to April 10, 2026

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Monthly Current Affairs Magazine

PERIODIC LABOUR FORCE SURVEY (PLFS) REPORT

The Ministry of Statistics and Programme Implementation (MoSPI) released the Periodic Labour Force Survey (PLFS) Annual Report for 2025.

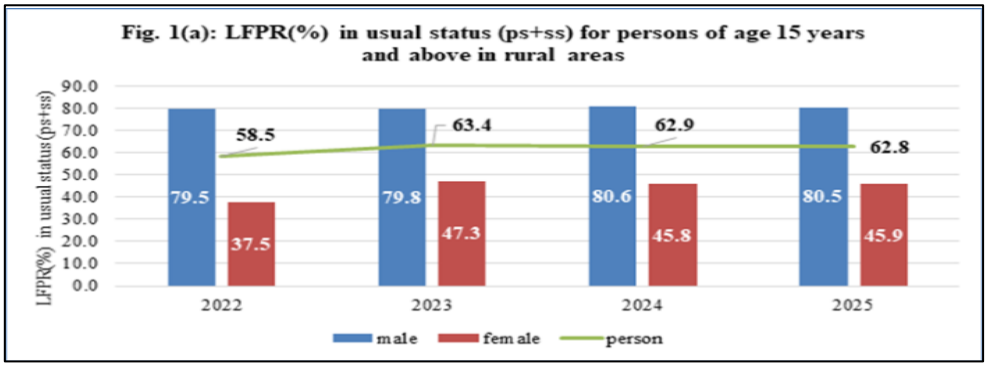
About Periodic Labour Force Survey (PLFS) Annual Report, 2025**:**

What it is?

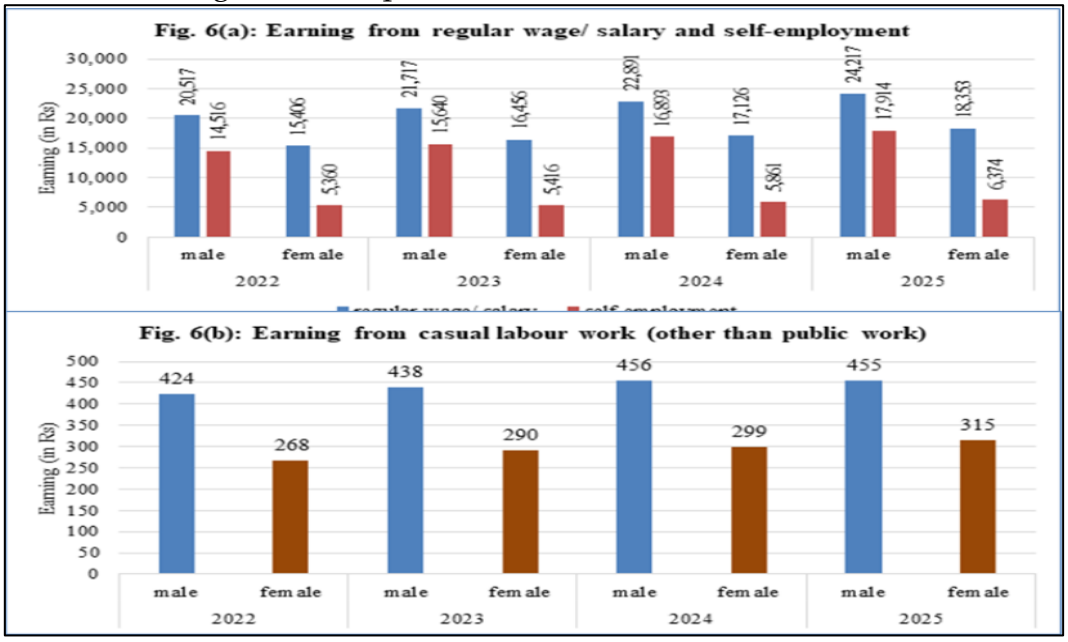
- The PLFS was launched by the National Statistical Office (NSO) in 2017 to estimate key employment and unemployment indicators. It provides data in two formats: **Usual Status (ps+ss)**, which maps activity over the preceding 365 days, and **Current Weekly Status (CWS)**, which maps the preceding 7 days.

Key Summary of the PLFS Annual Report **2025:**

- **Stable Participation:** The Labour Force Participation Rate (LFPR) for ages 15+ remained stable at **59.3**%, with male participation at 79.1% and female at 40.0%.



- **Steady Employment:** The Worker Population Ratio (WPR) stood at **57.4**%. Notably, rural female WPR held steady at 44.9%, sustaining gains made since 2022.
- Declining Unemployment**:** The overall Unemployment Rate (UR) was **3.1**%. Youth unemployment (ages 15-29) saw a drop to **9.9**% from 10.3% in the previous year.
- **Shift to Regular Wage:** There is a positive shift in employment quality, with regular wage/salaried employees increasing to **23.6**%, while self-employment declined to 56.2%.
- **Sectoral Recomposition:** Agriculture's share of employment decreased from 44.8% to **43.0**%, while manufacturing saw an improvement to **12.1**%.



- **Education & Unemployment:** The unemployment rate among educated persons (secondary and above) reduced to **6.5%**, reflecting better absorption of the skilled workforce.
- **Gender Wage Growth:** Nominal wages for women grew across all sectors, with the highest growth of **8.8%** observed in the self-employed category.
- **Education Attainment:** At the all-India level, the average number of years in formal education for those aged 15+ reached **10.0 years**.

Challenges Associated:

- **Gendered Reasons for Inactivity:** A massive disparity exists in why individuals stay out of the labor force.

Example: While 69.8% of males cite continued studies, 44.4% of females cite child care/home-making, highlighting persistent socio-economic barriers for women.

- **Working Hour Disparity:** There is a significant gap in the duration of economic work between genders.

Example: Urban self-employed males work **17.5 hours more per week** than females, suggesting women bear a disproportionate burden of unpaid domestic work.

- **High NEET Rates:** A large portion of the youth remains outside the productive ecosystem.

Example: Approximately **25.0%** of persons aged 15-29 are Not in Employment, Education, or Training (NEET), posing a risk of a wasted demographic dividend.

- Low Vocational Training**:** The reach of formal skill development remains minimal.

Example: Only **4.2%** of the 15-59 age group reported receiving formal vocational or technical training, indicating a massive skill gap in the workforce.

- **Comparability Issues:** The change in survey methodology makes historical trend analysis difficult.

Example: Because the 2025 report uses a revamped sampling design and a calendar-year cycle, results are **not strictly comparable** with reports prior to December 2024.

Way Ahead:

- **Bridging the Gender Gap:** Implement policies that reduce the home-making burden on women, such as expanded affordable childcare and flexible work models.
- **Scaling Vocational Training:** Revitalize the Skill India Mission to increase the 4.2% vocational training rate to at least 20% to meet manufacturing demands.
- **Targeting Urban Youth:** Address the higher urban youth unemployment rate (13.6%) by incentivizing start-ups and service-sector hubs in Tier-2 and Tier-3 cities.
- **Formalization of Jobs:** Continue the shift from self-employment to regular salaried jobs by providing social security benefits to a wider array of workers.
- **Utilizing the** NEET Population**:** Create targeted bridge courses and apprenticeships specifically for the 25% of youth currently not in education or employment.

The PLFS 2025 report paints a picture of a resilient Indian labor market that is successfully transitioning toward manufacturing and regular salaried employment. While declining unemployment and rising female wages are positive indicators, the high percentage of youth in the NEET category and the low levels of vocational training remain critical hurdles. Addressing these structural gaps will be essential for India to fully capitalize on its demographic transition by 2028 and beyond.

EXERCISE DWEEP SHAKTI

The Indian Armed Forces successfully concluded Dweep Shakti, a high-intensity tri-service exercise.

- The drill demonstrated seamless synergy between the Army, Navy, and Air Force in securing India's strategic island territories and maritime frontiers.

About Exercise Dweep Shakti:
What It Is?

- Dweep Shakti is a large-scale **Tri-Service joint military exercise** designed to test and validate India's integrated combat capabilities in coastal and island environments. It focuses on the rapid deployment of forces to protect remote island territories from maritime threats.

Host:

- The exercise was conducted under the aegis of the **Andaman and Nicobar Command (ANC)**—India's only theater command—utilizing the strategic geography of the Andaman and Nicobar archipelago.

Organizations Involved: Indian Army, Indian Navy and Indian Air Force.
Aim: The primary objective is to refine **integrated tactics and procedures** for rapid response, ensuring the three services can operate as a single cohesive unit during amphibious assaults and maritime dominance operations.
Key Features:

- **Amphibious Assaults:** Execution of complex sea-to-land maneuvers where troops were moved from naval ships to shore via landing crafts.
- **Maritime Dominance:** Coordinated patrols and drills to establish control over sea lines of communication and deter adversarial naval presence.
- **Beach Landing Drills:** Heavy equipment, including tanks and armored vehicles, were landed on simulated hostile shores to test logistical speed.
- **Next-Gen Tech Integration:** Extensive use of **swarming drones** and electronic warfare suites for reconnaissance and precision strikes.
- **Multi-Domain Interoperability:** Testing of unified communication protocols to ensure real-time data sharing between aircraft, ships, and ground troops.

Significance:

- Sends a strong signal of India's readiness to defend its unsinkable aircraft carriers (the island territories) in the face of rising regional maritime competition.
- Bolsters the defense of India's vast coastline and Exclusive Economic Zone(EEZ) by perfecting rapid-response mechanisms.

GLOBAL ACTION PLAN FOR THE STEPPE EAGLE:

The Global Action Plan (GAP) for the Steppe Eagle (2026–2035) was officially adopted during CMS COP15, which concluded, in Campo Grande, Brazil.

About Global Action Plan for the Steppe Eagle:
What It Is?

- The Steppe Eagle Global Action Plan is a science-based international conservation framework designed to provide a coordinated strategy for the survival of the **Endangered** steppe eagle (*Aquila nipalensis*).
- It serves as a roadmap for range states to mitigate anthropogenic threats and stabilize the species' population.

Aim: The central vision is to **halt and reverse the decline** of the steppe eagle by delivering innovative, science-based conservation actions and community engagement across its entire migratory range.

Key Features (6 Strategic Goals)

The plan is built around **49 specific actions** categorized under six primary goals:

1. **Energy Infrastructure:** Reducing mortality caused by electrocution and collisions with powerlines and wind farms.
2. **Take and Trade:** Significantly reducing both legal and illegal killing, trapping, and trade (including online markets).
3. **Poisoning Prevention:** Understanding and mitigating the impact of unintentional poisoning from pesticides, NSAIDs (like Diclofenac), and heavy metals.
4. **Habitat Restoration:** Attaining and maintaining high-quality habitats and stable prey populations across the breeding and wintering grounds.
5. **Knowledge Gap Closure:** Increasing international research collaboration to better understand movement patterns and spatial hotspots.
6. **Effective Implementation:** Ensuring all range states endorse the plan through outreach, stakeholder engagement, and community involvement.

About Steppe Eagle:
What It Is?

- The Steppe Eagle is a large, migratory bird of prey belonging to the family **Accipitridae**. It is a quintessential raptor of the open plains and is known for its impressive transcontinental migrations, often traveling thousands of kilometers between its breeding and wintering grounds.

IUCN Status: Endangered

Habitat:

- **Global:** It breeds in the vast, open **steppes**, semi-deserts, and montane grasslands of the Palearctic region, stretching from **Romania and Russia**through **Kazakhstan to Mongolia and China**.
- **India:** It is frequently spotted in open habitats such as **grasslands, semi-arid regions, agricultural fields**, and even garbage dumps in states like Rajasthan, Gujarat, and Haryana.
    - The Thar Desert has emerged as a critical lifeline for these raptors, with the **Jorbeer Conservation Reserve** and **Desert National Park** now included in the Global Action Plan (2026–2035).

Characters:

- **Plumage:** Adults are dark brown with a pale golden nape; juveniles show a broad white band under the wings.
- **Size:** Large, heavy eagle with a wingspan of **7–2.1 m** and a long gape extending beyond the eye.
- **Feeding:** Hunts small mammals but also scavenges at carcasses and landfills.
- **Migration:** A soaring migrant that uses thermal currents; an important species of the Central Asian Flyway **(CAF)**.

BAB EL-MANDAB STRAIT

The Bab el-Mandab Strait, known as the Gate of Tears, faces renewed threats of closure as Yemen-based Houthi rebels escalate ballistic missile attacks amid the widening Middle East conflict.

About Bab el-Mandab Strait:
What It Is?

- The Bab el-Mandab is a strategic maritime chokepoint and one of the world's most vital shipping lanes. It serves as the southern gateway to the Red Sea, acting as the primary link between the Indian Ocean and the Mediterranean Sea (via the Suez Canal).

Location:

- **Geography:** Situated between the **Horn of Africa** (Djibouti and Eritrea) to the southwest and the **Arabian Peninsula** (Yemen) to the northeast.
- **Connectivity:** It connects the **Red Sea** to the **Gulf of Aden** and the **Arabian Sea**.
- **Key Point:** The strait is split into two channels by **Perim Island**; the western channel is the primary lane for large commercial vessels.

Origin of the Name:

- In Arabic, *Bab el-Mandab* translates to **Gate of Tears.** Legend attributes the name to the many people who drowned there during an ancient earthquake that separated Asia and Africa, or to the extreme danger posed by its narrow, treacherous navigation channels.

Key Features:

- **Width:** At its narrowest point, the strait is only about **29 kilometers (18 miles)**wide, making it highly vulnerable to land-based missile attacks and naval blockades.
- **Volume:** It accounts for approximately **10% to 12% of global seaborne oil**and natural gas shipments.
- **Capacity:** Over **30 million tonnes of LNG** and millions of barrels of oil pass through it annually.
- **Alternative Route:** If blocked, ships must divert around the **Cape of Good Hope** (South Africa), adding roughly **4,000 to 6,000 nautical miles** and **14 to 20 days** to the journey.

Significance:

- It is a critical conduit for Persian Gulf oil and gas heading to Europe and North America via the Suez Canal and the **SUMED pipeline**.
- A massive volume of container traffic carrying consumer goods, electronics, and food between Asia and Europe relies on this passage.

SUPERIOR KEROSENE OIL

The Ministry of Petroleum and Natural Gas has issued a gazette notification allowing the distribution of Superior Kerosene Oil (SKO) under the Public Distribution System (PDS) across 21 States and UTs, including Delhi and Gujarat.

About Superior Kerosene Oil (SKO):
What it is?

- Superior Kerosene Oil (SKO) is a highly refined middle distillate fraction of crude oil. It is a specific grade of kerosene that has undergone extra processing to remove impurities (like sulphur and aromatics), ensuring it meets stringent quality standards for domestic and industrial use.

- In India, it is primarily distributed through the **Public Distribution System (PDS)** to provide energy security to low-income households.

Aim: The primary aim of providing SKO is to ensure a **reliable and affordable fuel source** for cooking and lighting in rural and semi-urban areas.

Key Characteristics of SKO:

- **High Smoke Point:** It is refined to have a high smoke point (minimum 18-22 mm), which ensures that it burns with a steady, smokeless flame.
- **Low Sulphur Content:** SKO contains very low levels of sulphur, reducing the emission of harmful oxides (SOx) during combustion, making it safer for indoor use.
- **Flash Point:** It has a specific flash point (typically above **35°C** to **40°C**) to ensure safety during storage and transport, preventing accidental ignition.
- **Coloration:** In India, PDS-destined SKO is often dyed **blue** to distinguish it from non-subsidized kerosene and to prevent its illegal diversion for adulterating automotive fuels like diesel.

Applications:

- **Domestic Cooking:** Used in wick stoves and pressure stoves as a primary or backup cooking fuel.
- **Lighting:** Widely used in hurricane lanterns and simple lamps in areas with unreliable power grids.
- **Industrial Use:** Used as a solvent in paints, a degreaser in mechanical workshops, and a base for some pesticide formulations.
- **Aviation:** When further refined and treated with additives, a similar fraction serves as **Aviation Turbine Fuel (ATF)**.

How it differs from Regular Kerosene?

While both are derived from the same petroleum fraction, the Superior tag denotes significant differences:

Feature	Superior Kerosene Oil (SKO)	Regular/Low-Grade Kerosene
Refining Level	Highly refined with fewer impurities.	Less refined; contains more aromatics.
Burning Quality	Clean-burning; produces minimal soot/smoke.	Produces more smoke and a distinct odor.
Sulphur Content	Strictly controlled (very low).	Higher sulphur content, leading to more indoor pollution.
Primary Use	Household cooking and lighting.	Often used for heating or as an industrial furnace fuel.
Safety	Higher flash point for domestic handling.	May have more volatile components.

QDENGA (TAK-003): INDIA'S FIRST DENGUE VACCINE – NEWS CONTEXT:

India's drug regulator (DCGI) has granted clearance to **Takeda's tetravalent dengue vaccine TAK-003 (brand name Qdenga)** for use in individuals aged **4 to 60 years**.

This marks a significant shift from reactive **vector control measures** (insecticide use, breeding site elimination) to a **preventive approach** against dengue—a disease endemic to India with a long-term rising trend.

Key Details & Important Facts:
Vaccine Name: Qdenga (TAK-003)
Developer: Takeda (Japan-based)
Type: Tetravalent live-attenuated vaccine (targets all 4 dengue serotypes: DENV-1 to DENV-4)
Platform: Developed on **DENV-2 backbone**

Regulatory Status in India: Cleared by **Subject Expert Committee (SEC)** under DCGI
Age Group: 4 to 60 years

Dosage Regimen: Two doses, 3 months apart
Key Advantage: No pre-vaccination screening required (unlike earlier vaccine – Sanofi's Dengvaxia).

Proven Efficacy: Strong protection against **severe dengue & hospitalization.**

Limitation: Lower efficacy against **DENV-3 and DENV-4** (especially in seronegative individuals)
Expected Cost in India: ₹3,000–6,000 per dose; full course ₹6,000–12,000 (private sector initially)
Indian Pipeline Candidate: DengiAll (Panacea Biotec + ICMR) – single-dose, based on **NIH's TV003 platform**; Phase III trials ongoing; expected availability ~2027

The core theme is the **cautious introduction of the first dengue vaccine in India** as a **disease-modifying** rather than **transmission-blocking** tool.

While Qdenga significantly reduces severe disease and hospitalization—key public health gains—its lower efficacy against emerging serotypes (especially **DENV-3**) and high cost necessitate continued reliance on **vector control** and development of **next-generation vaccines** like DengiAll.

IONS MARITIME EXERCISE

The Indian Navy hosted the IONS Maritime Exercise (IMEX) TTX 2026 at the Maritime Warfare Centre, Southern Naval Command, Kochi.

About IONS Maritime Exercise (IMEX) TTX 2026:
What it is?

- **IMEX TTX 2026** is a Table-Top Exercise (TTX) conducted under the framework of the Indian Ocean Naval Symposium (IONS).
- It is a **simulated multinational maritime security exercise** aimed at addressing **non-traditional maritime threats** in the Indian Ocean Region such as piracy, maritime terrorism, disaster response, illegal trafficking, and information-sharing challenges.

Aim: To strengthen interoperability, coordination, and decision-making among navies of IONS member states in handling maritime contingencies.
Key Features:

- Countries such as Bangladesh, France, Indonesia, Maldives, Mauritius, Sri Lanka, Singapore, Tanzania, and others participated, reflecting regional cooperation.
- Conducted in a sophisticated war-gaming environment, it allowed participants to tackle multi-scenario contingencies without live deployment constraints.
- Held under India's renewed IONS chairmanship, it showcases India's growing role as a **net security provider in the IOR**.

Significance:

- It advances India's maritime doctrine of **Security and Growth for All in the Region (SAGAR)** by promoting collective maritime security.
- The IOR is crucial for energy and trade flows; such exercises ensure safer Sea Lines of Communication (SLOCs) and regional stability.

ENERGY STATISTICS INDIA 2026 REPORT

The National Statistics Office (NSO) has released the 33rd edition of its annual publication, Energy Statistics India 2026, providing a comprehensive integrated dataset on India's energy reserves, production, and consumption.

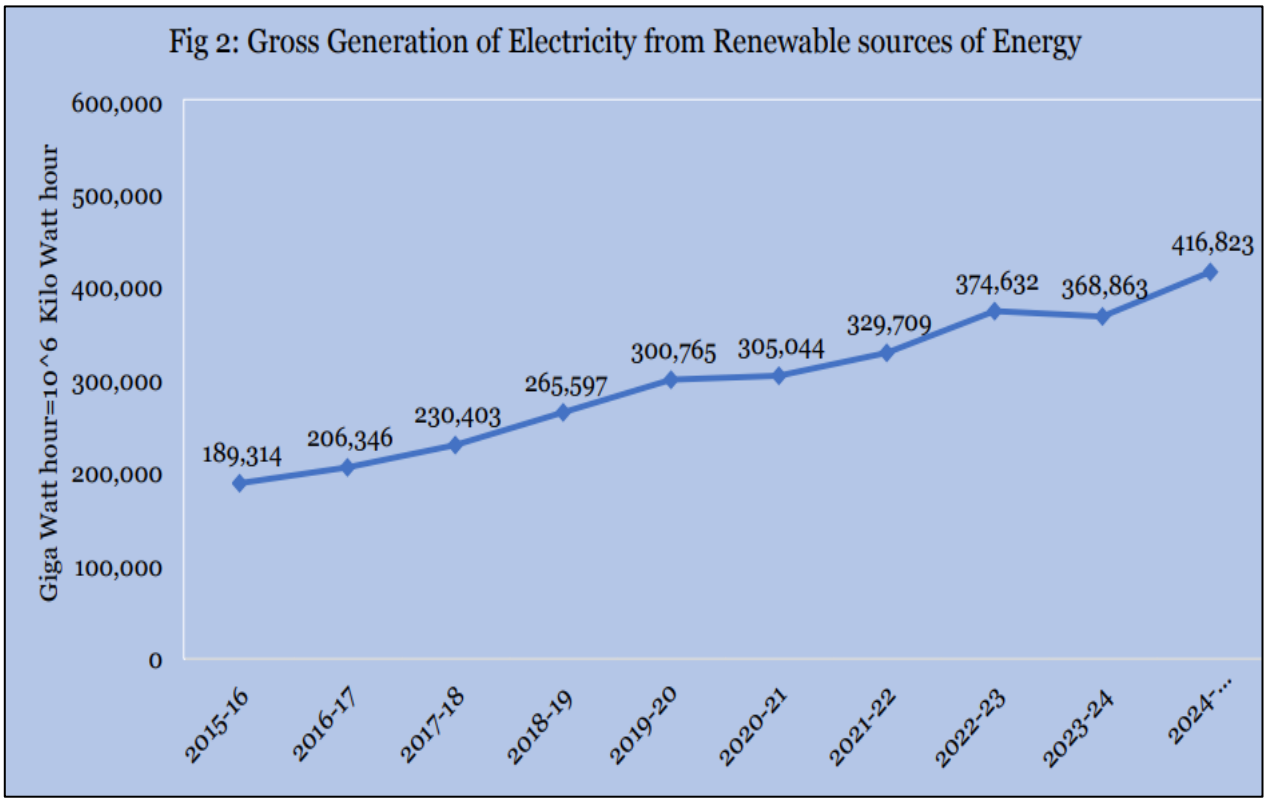
About Energy Statistics India 2026:

What it is?

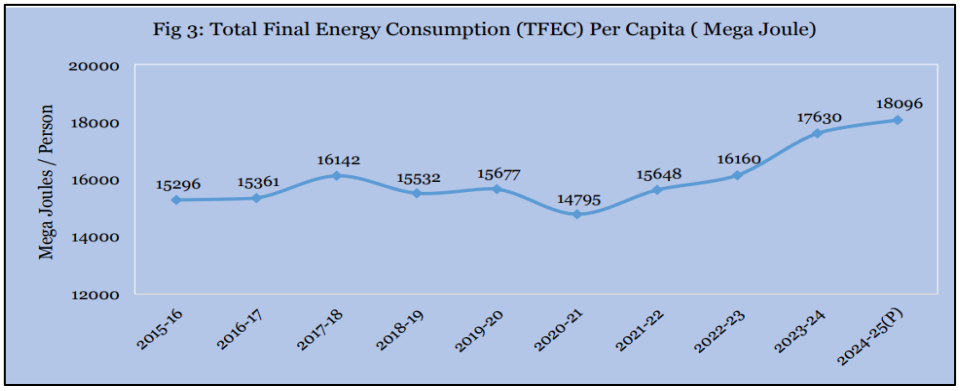
- **Energy Statistics India 2026** is the annual publication of the **National Statistics Office (NSO)**, under the Ministry of Statistics and Programme Implementation (MoSPI).
- It serves as a centralized repository of diverse information regarding the reserve, capacity, production, consumption, and trade of all energy commodities, including fossil fuels and renewables.

Key Highlights of the Report:

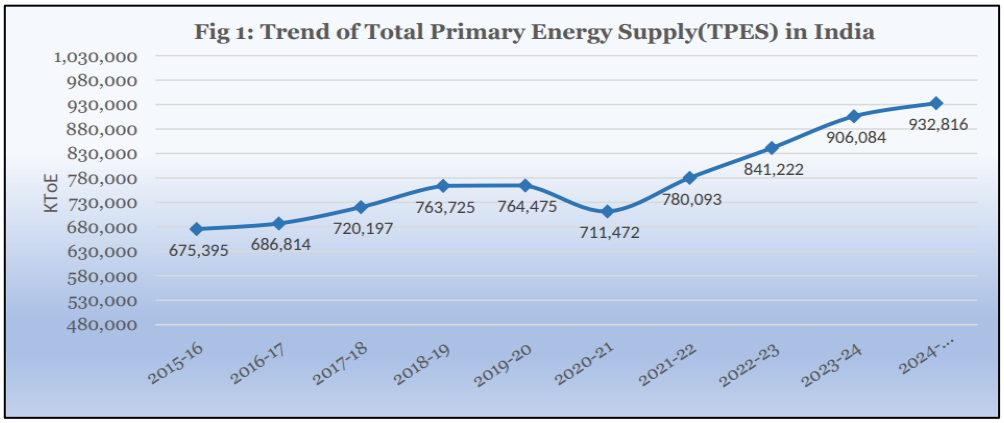
- **Primary Energy Supply:** The Total Primary Energy Supply (TPES) stood at **9,32,816 KTOE** in FY 2024-25, marking a growth of **2.95**% over the previous year.
- **Renewable Energy Potential:** India's total RE potential reached **47,04,043 MW** as of March 2025, with **Solar Energy** holding the highest share at approximately **71**%.



- **State-wise Concentration:** Over **70**% of RE potential is concentrated in six states: Rajasthan, Maharashtra, Gujarat, Andhra Pradesh, Karnataka, and Madhya Pradesh.
- **Capacity & Generation:** Installed RE capacity grew at a **CAGR of 10.93**%(2016–2025), while gross electricity generation from renewables reached **4,16,823 GWh** in FY 2024-25.
- **Consumption Trends:** Per-capita energy consumption rose from **15,296 MJ** in 2015-16 to **18,096 MJ** in 2024-25.



- **Efficiency Gains:** Transmission and Distribution (T&D) losses were reduced from **22**% in FY 2015-16 to **17**% in FY 2024-25.
- **Fossil Fuel Dominance:** Coal remains the primary energy source, with its supply increasing to **5,52,315 KTOE** in FY 2024-25.
- **Financial Growth:** Credit flow to the energy sector increased over **sixfold**, rising from ₹1,688 crore in 2021 to **₹10,325 crore** in 2025.



Analysis:

Positive Aspects:

- **Renewable Energy Momentum:** The staggering growth of solar potential (from 7.48 lakh MW to 33.43 lakh MW in one year) underscores a successful shift toward green energy targets.
- **Improved Efficiency:** A 5% reduction in T&D losses indicates better grid management and reduced wastage during electricity utilization.
- **Financial Robustness:** The sixfold increase in credit flow suggests high investor confidence and aggressive infrastructure financing in the energy sector.
- **Enhanced Data Transparency:** Incorporating previously missing data, such as international marine bunkers and e-Auction coal consumption, allows for more accurate policy-making.

Challenges Yet to Tackle:

- **Heavy Coal Dependency:** Coal remains the dominant source, with supply growing to 5,52,315 KTOE, making the transition to net-zero challenging.
- **Geographical Imbalance:** Over 70% of RE potential is limited to just six states, potentially leading to regional energy security disparities.
- **Rising Energy Demand:** The 30.41% surge in Total Final Consumption (TFC) since 2015-16 puts immense pressure on existing supply chains.
- **Persistent Grid Losses:** Despite improvements, a 17% T&D loss is still significant compared to global efficiency standards.
- **Rising Imports/Trade Reliance:** Consistent growth in Crude Oil and Natural Gas supply indicates a continued high reliance on imports for these commodities.

Way Ahead:

- **Decentralize RE Potential:** Focus on harnessing renewable resources in states beyond the top six to ensure balanced national energy growth.
- **Further T&D Reforms:** Implement advanced smart-grid technologies to bring the 17% distribution losses down to single digits.
- **Diversify Energy Mix:** Accelerate the transition from coal (the dominant source) to natural gas and hydrogen to meet climate commitments.
- **Leverage ASI Data:** Use the newly integrated Annual Survey of Industries(ASI) data to create targeted energy-efficiency programs for high-consumption industrial sub-sectors.
- **Sustain Credit Momentum:** Continue facilitating high credit flows (currently ₹10,325 crore) specifically toward emerging green technologies and storage solutions.

Energy Statistics India 2026 paints a picture of an economy successfully scaling its renewable capacity and financial investment while battling a persistent reliance on coal.
While efficiency gains and solar potential are impressive, the concentration of resources and rising overall demand remain critical hurdles. Ultimately, the report provides the essential data roadmap required to navigate India's complex transition toward a sustainable energy future.

SIJIMALI BAUXITE MINE

Recent violent clashes between tribal villagers and police in Odisha's Rayagada district have left dozens injured following protests against the construction of an approach road for the Sijimali bauxite mine.

About The Sijimali Bauxite Mine:

What it is?

- Sijimali is a massive high-grade bauxite reserve that was handed over to **Vedanta Limited** in 2023 through a government auction. The project is currently in its early development stages, having recently received conditional Stage-1 forest clearance from the Central government.

Located in: The mine covers an area of **1,500 hectares** and is spread across the **Rayagada and Kalahandi** districts of Odisha. It is situated within the Eastern Ghats hill ranges, a region characterized by a series of hills interspersed with fertile valleys.

Key Features:

- **Massive Reserves:** It holds an estimated **311 million tonnes** of high-grade bauxite ore.
- **Industrial Utility:** The bauxite from Sijimali is intended for refining into alumina, which is the primary raw material for producing aluminium.
- **Controversial Approvals:** While the administration claims unanimous approval from eight Gram Sabhas, local villagers allege these meetings were fraudulent and their signatures forged.

About Bauxite Mines in Odisha:

What it is?

Odisha is the undisputed leader in India's bauxite sector, serving as the backbone of the country's aluminium industry. The state's mineral wealth extends beyond bauxite to include significant deposits of iron ore, coal, and nickel.

Resource Data:

- National Share: Odisha accounts for 41% of India's total bauxite resources.
- Production Leader: As of 2021-22, the state contributed approximately 73% of India's total bauxite production.
- Overall Mineral Wealth: The state holds nearly 17% of India's total mineral reserves.

Key Bauxite Mines in Odisha:

- **Panchpatmali:** Operated by NALCO, it is one of the largest bauxite mines in the world.
- **Gandhamardan:** Located in Bargarh and Balangir districts, known for its ecological and medicinal significance.
- **Sijimali:** The newly auctioned site currently at the center of tribal-police clashes.
- **Niyamgiri:** A site of historical protest where 12 Gram Sabhas famously rejected Vedanta's mining bid in 2013 to protect the sacred hills.

Tribes Involved: The mining regions are predominantly inhabited by indigenous tribal communities whose livelihoods depend on the forest ecosystem.

- **Kondhs:** The broader tribal group inhabiting the Rayagada and Kalahandi regions.

- **Dongria Kondhs:** A **Particularly Vulnerable Tribal Group (PVTG)** who famously led the resistance at Niyamgiri, worshipping the forest's Niyam Raja as their supreme deity.

PM MUDRA YOJANA (PMMY)

Prime Minister of India marked the 11th anniversary of the PM Mudra Yojana (PMMY), highlighting its role in redefining credit access and fostering entrepreneurship among the youth and women.

About 11 Years of PM Mudra Yojana (PMMY):

What it is?

- The Pradhan Mantri MUDRA (Micro Units Development & Refinance Agency) Yojana is a flagship scheme designed to provide collateral-free loans to non-corporate, non-farm small/micro-enterprises.
- It operates through a refinancing model, where MUDRA provides support to banks, NBFCs, and MFIs to lend to grassroots entrepreneurs.

Launched in: 2015.

Aim:

- To Fund the Unfunded by bringing small enterprises into the formal financial system.
- To encourage entrepreneurship among the youth (Yuva Shakti) and women (Nari Shakti).
- To generate large-scale employment opportunities at the local level.

Key Features:

- **Three Loan Categories:** The loans are tailored to the stage of growth of the business:
  1. **Shishu:** Loans up to **₹50,000** (for start-ups/early stages).
  2. **Kishore:** Loans from **₹50,000 to ₹5 lakh** (for established businesses seeking expansion).
  3. **Tarun:** Loans from **₹5 lakh up to ₹10 lakh** (for diversification or larger scaling).
  4. **Tarun Plus**: covers loans above ₹10 lakh and up to ₹20 lakh.

NOTE: Exclusively for entrepreneurs who have successfully availed and repaid Tarun loans.

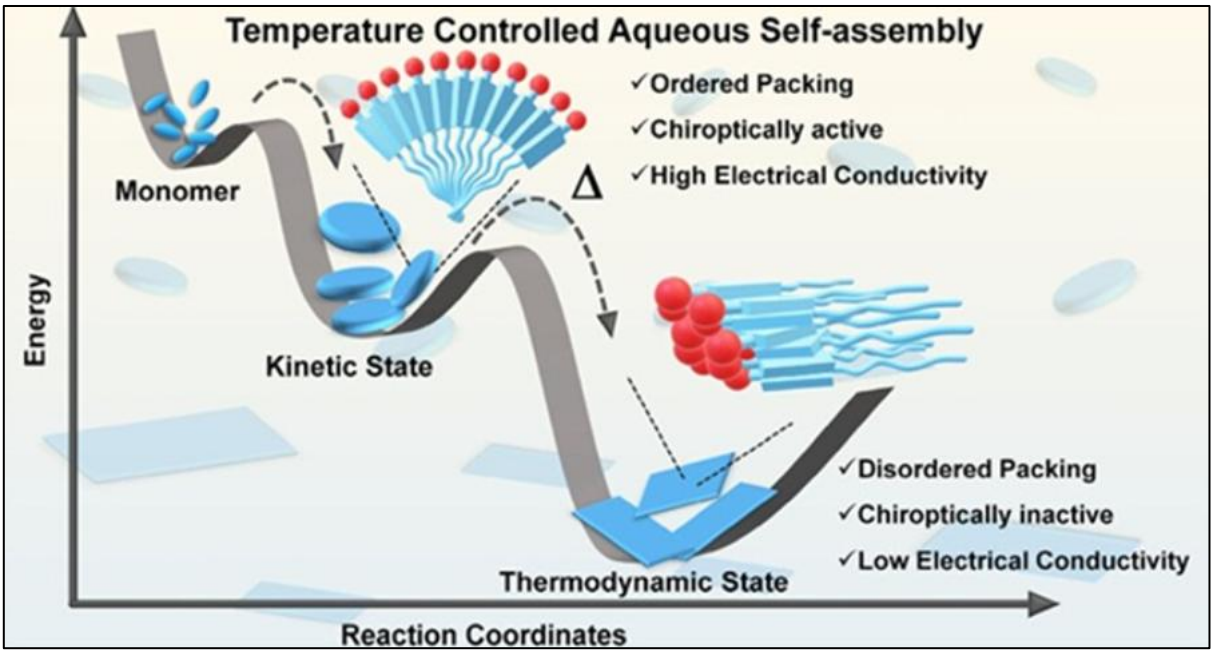
- **Collateral-Free:** No security or collateral is required from the borrower, lowering the barrier to entry for the poor.
- **MUDRA Card:** Borrowers receive a RuPay debit card for the loan amount, allowing for flexible withdrawals and management of working capital.
- **Processing Charges:** Generally, there are no processing fees for Shishu loans, making them highly accessible for micro-entrepreneurs.
- **Target Group:** Focuses specifically on small manufacturing units, service sector units, shopkeepers, fruit/vegetable vendors, and truck operators.

Significance:

- It has successfully bridged the credit gap for millions of citizens who were previously dependent on informal moneylenders and high-interest rates.
- A significant majority (historically around 68-70%) of the total loan accounts have been sanctioned to women entrepreneurs, fostering financial independence.
- Over 50% of the loans are typically disbursed to SC/ST and OBC categories, ensuring that the benefits of economic growth reach marginalized sections.

NAPHTHALENE DIIMIDE

Researchers from CeNS and JNCASR have discovered a way to switch the structural and electrical properties of organic nanomaterials using only temperature.



About Naphthalene Diimide (NDI):

What it is?

- Naphthalene diimide (NDI) is a specialized **amphiphilic molecule**, meaning it possesses both water-attracting and water-repelling parts. This unique chemical nature allows it to organize itself into complex architectures when placed in water.

Discovered: Centre for Nano and Soft Matter Sciences (CeNS) and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR).

How it Works?

- **Aqueous Assembly:** In water, NDI molecules naturally group together through noncovalent interactions.
- **Room Temperature (Nanodisks):** At standard room temperature, these molecules form tiny circular **nanodisks**. These disks are highly conductive and interact with polarized light.
- **Thermal Trigger (Heating):** When the environment is heated, the molecules undergo a structural reorganization.
- **State Switch (Nanosheets):** The disks transform into two-dimensional **nanosheets**, causing the material to lose its specific light-interacting properties.
- **Conductivity Change:** This physical shift causes the electrical conductivity to drop **nearly sevenfold**, effectively allowing temperature to act as an electrical dimmer switch.

What is Supramolecular Self-Assembly?

- Supramolecular self-assembly is a process where molecules spontaneously organize themselves into well-defined structures without human intervention.
- Instead of strong chemical bonds, they use weaker **noncovalent interactions** to come together.
- It is essentially nature's way of Lego-building at the molecular scale, where the final shape is determined by the molecule's environment, such as temperature or the solvent used.

Applications:

- **Future Electronic Devices:** Creating organic circuits where electrical behavior can be precisely tuned or switched.
- **Smart Sensors:** Developing sensors that change their optical or electrical signals in response to thermal changes.
- **Tunable Optoelectronics:** Systems that can switch between different optical states for advanced displays or photonics.
- **Bioelectronic Interfaces:** Creating materials that can adapt and respond within biological environments for medical monitoring.
- **Adaptive Materials:** Designing smart surfaces that can dynamically change their properties based on external conditions.

EMPEROR PENGUIN AND THE ANTARCTIC FUR SEAL

The International Union for Conservation of Nature (IUCN) has officially uplisted the Emperor penguin and the Antarctic fur seal to the Endangered category due to the devastating impacts of climate change.

About Emperor Penguin and Antarctic Fur Seal:

What it is?

- The Emperor penguin is the largest of all living penguin species and a sentinel species that serves as an indicator of the health of the Antarctic ecosystem. They are iconic for their survival in the harshest conditions on Earth and are currently facing a sharp decline due to human-induced greenhouse gas emissions.

Habitat:

- They are native to Antarctica and rely heavily on **fast ice**—sea ice that is fastened to the coastline or ocean floor.
- This ice serves as a critical habitat for raising their chicks and during their annual **moulting season**.

IUCN Status: Endangered

Key Characteristics:

- **Flightless Marine Birds:** They are highly specialized for life in the water but are not waterproof during their moulting phase.
- **Breeding Cycles:** They require stable ice platforms; early sea-ice break-up can lead to the collapse of breeding colonies and the death of chicks before they can swim.
- **Population Vulnerability:** Satellite imagery showed a loss of 10% of the population (over 20,000 adults) between 2009 and 2018 alone.
- **Climate Sensitivity:** They are uniquely vulnerable to the early spring break-up of ice caused by rising global temperatures.

About Antarctic Fur Seals:

What it is?

- The Antarctic fur seal is a marine mammal that is part of the eared seal family. Their survival is intrinsically linked to the Antarctic marine ecosystem, particularly the availability of **krill**, which is their primary food source.

Habitat:

- They inhabit the Antarctic and sub-Antarctic waters, with a major breeding stronghold at **South Georgia**.
- Rising ocean temperatures are pushing their habitat and food sources further south or to greater depths.

IUCN Status: Endangered

Key Characteristics:

- **Dietary Dependency:** They rely almost exclusively on krill; as warming oceans push krill deeper into colder water, the seals face severe food shortages.
- **Rapid Population Decline:** Their population plummeted from approximately 2.18 million in 1999 to just **944,000 in 2025**, a decline of over 50%.
- **Ageing Population:** High mortality rates among pups in their first year due to krill shortages have resulted in an ageing breeding population that cannot easily replenish itself.
- **Compounding Pressures:** Beyond climate change, they face increased competition for food from recovering baleen whale populations and predation by killer whales and leopard seals.

ELEPHANTA ISLAND

The Archaeological Survey of India (ASI) has unearthed a 1,500-year-old T-shaped stepped reservoir on Elephanta Island, highlighting advanced ancient water management.

About Elephanta Island:

What it is?

- Elephanta Island, locally known as **Gharapuri** (City of Caves), is a UNESCO World Heritage site located in the Mumbai Harbour.

- It is world-renowned for its majestic rock-cut cave temples, primarily dedicated to the Hindu god Shiva, which represent the pinnacle of Indian rock-cut art and sculpture.

Discovered/Named By:

- **Original Name:** Local inhabitants called it Gharapuri.
- **The Elephanta Name:** The name Elephanta was given by **Portuguese explorers** in the 16th century after they found a massive monolithic stone elephant near the island's landing area.

Kingdoms Associated:

- **Kalachuris of Mahishmati:** The 6th-century excavations (including the recent coins of King Krishnaraja) suggest the Kalachuris were the primary patrons of the main caves.
- **Konkan Mauryas:** Historical records suggest they ruled the region before the Kalachuris.
- **Chalukyas & Rashtrakutas:** Subsequent dynasties that maintained or contributed to the island's religious and strategic importance.
- **Portuguese & British:** Later colonial powers who used the island for military and administrative purposes.

Key Characteristics of Elephanta:

- **Main Cave (Cave 1):** A sprawling 60,000-square-foot rock-cut temple featuring a complex layout of halls, pillars, and shrines.
- **Sadashiva (Trimurti):** The most iconic sculpture on the island, a 20-foot high masterpiece depicting Shiva as the Creator, Preserver, and Destroyer.
- **Gangadhara & Ardhanarishvara:** Elaborate relief panels depicting the descent of the Ganges and the union of Shiva and Parvati as half-male and half-female.
- **Geological Composition:** The caves are carved out of solid **basalt rock**, typical of the Deccan Trap formations.
- **Dual Religious Influence:** While primarily Shaivite (Hindu), there are also smaller groups of Buddhist stupas on the island, indicating a syncretic religious history.

Recent Discovery (2025-2026 Excavation)

- **Stepped Reservoir:** A T-shaped massive structure (14.7m long) built with imported stone blocks from the mainland, used to combat the island's rocky runoff and store monsoon water.
- **Economic Hub Evidence:** A **dyeing vat** for textiles and large storage pots suggest the island was an industrial and commercial center, not just a religious site.
- **International Trade:** Over 3,000 sherds of **Mediterranean amphorae** and **West Asian torpedo jars** prove that the island had maritime links with Rome and Mesopotamia.
- **Numismatic Evidence:** The discovery of 60 coins, including silver and copper coins of **King Krishnaraja (Kalachuri dynasty)**, helps firmly date the island's peak activity to the 6th century CE.

NATIONAL QUANTUM MISSION

The Union Minister for Science & Technology, recently announced that the National Quantum Mission (NQM) has achieved a historic 1,000-km secure quantum communication milestone in less than two years.

About The National Quantum Mission (NQM):

What it is?

- The National Quantum Mission is a specialized initiative aimed at seeding, nurturing, and scaling up scientific and industrial R&D in Quantum Technology(QT).
- It seeks to make India a leading nation in the quantum domain, which is considered the next frontier of computing and communication.

Launched in: The mission was formally approved by the Union Cabinet in April 2023 and became operational in **October 2024**.

Aim:

- To develop intermediate-scale quantum computers with 50-1000 physical qubits in 8 years.
- To establish a pan-India **Quantum Communications** network spanning 2,000 km.
- To ensure national security by developing indigenous, hack-proof communication systems.

Key Features:

- **Thematic Hubs (T-Hubs):** The mission is structured around four specialized hubs established in top academic and R&D institutions:

    1. **Quantum Computing:** Developing hardware and software for high-speed computation.
    2. **Quantum Communication:** Focusing on Quantum Key Distribution (QKD) and secure networks.
    3. **Quantum Sensing & Metrology:** Creating highly sensitive sensors for navigation and healthcare.
    4. **Quantum Materials & Devices:** Developing the physical components needed to sustain quantum states.

- **Quantum Key Distribution (QKD):** Utilizing the principles of quantum mechanics (like entanglement and superposition) to create encryption keys that are physically impossible to intercept without detection.
- **Satellite-Based Communication:** The mission includes plans for ground-to-satellite and long-distance inter-city quantum communication.
- **Startup Support:** Expansion of funding to ventures like **QNu Labs**, with new financial instruments like **Optionally Convertible Debt (OCD)** to support startups without immediate equity dilution.
- **Indigenous Development:** A strong focus on Atmanirbhar Bharat, ensuring all critical components—from photon sensors to atomic clocks—are developed within India.

Significance:

- By achieving the 1,000-km QKD milestone, India can now secure critical infrastructure, and financial systems against the threat of future quantum hacking.
- The mission bridges the gap between lab research and market-ready products, fuelling a new deep-tech economy and attracting private investment through TDB and BIRAC.

MISSION MITRA

ISRO launched Mission MITRA in Leh, Ladakh, on April 2, 2026, to conduct India's first-of-its-kind team behavioral and physiological study in a high-altitude environment.

About Mission MITRA:

What It Is?

- Mission MITRA (Mapping of Interoperable Traits and Response Assessment) is an **Analog Space Mission** designed to simulate the isolation and environmental challenges of spaceflight on Earth.
- By utilizing the unique geography of Leh, which mimics certain stressors of space, ISRO aims to study how humans behave, communicate, and perform under extreme conditions.

Launched In: 2026.

Location: Leh, Union Territory of Ladakh (**Altitude:** ~3,500 meters).

Organizations Involved: ISRO (Indian Space Research Organisation)

Aim:

- To examine the coordination between the Gaganyatris (Crew) and the Ground Control Teams.
- To evaluate how hypoxia (low oxygen), cold temperatures, and isolation affect decision-making and psychological resilience.
- To refine protocols for long-duration human spaceflight missions.

Key Features:

- **Natural Analog Environment:** Leh provides a natural laboratory with low atmospheric pressure, extreme cold, and a desolate landscape similar to lunar or Martian surfaces.
- **Behavioral Mapping:** Detailed tracking of interoperable traits—how team members support one another and maintain morale during high-stress periods.
- **Physiological Monitoring:** Continuous health monitoring of the crew to study the effects of **hypoxia** (oxygen deprivation) on cognitive function.
- **Ground-Crew Link:** Real-time testing of communication lags and the effectiveness of ground support in helping the crew solve technical problems.
- **Simulated Missions:** The crew undergoes specific operational tasks while isolated in a habitat to simulate the closed-loop life support environment of a spacecraft.

Significance:

- The data generated on human factors will contribute directly to the safety and performance protocols of India's first manned space mission.
- This mission builds foundational knowledge for **long-duration missions**, such as the proposed Indian Space Station and future Moon landings.
- It marks a leap in India's indigenous research in aerospace medicine, reducing dependence on foreign analog data.

MOUNT SEMERU

The Mount Semeru, the tallest and one of the most active volcanoes in Indonesia, erupted multiple times, sending thick ash plumes up to 1,100 metres into the sky.

About Mount Semeru:

What It Is?

- Mount Semeru, also known as **Mahameru** (The Great Mountain), is an active **stratovolcano** (composite volcano). It is characterized by its steep profile and periodic, explosive eruptions. It is the highest peak on the island of Java and a sacred site in local culture.

Location:

- **Island:** East Java, Indonesia.
- **Geographic Coordinates:** It is part of the **Tengger Massif**, a volcanic complex that includes the famous Mount Bromo.
- **Tectonic Setting:** Located on the **Pacific Ring of Fire**, where the Indo-Australian Plate subducts beneath the Sunda plate (which is part of Eurasian Plate).

Origin and Formation:

Mount Semeru is a product of **subduction zone volcanism**.

- The denser Indo-Australian oceanic plate sinks into the mantle beneath the Sunda Shelf.
- As the plate descends, water and volatiles are released, lowering the melting point of the overlying mantle and creating magma.
- Over hundreds of thousands of years, successive layers of hardened lava, tephra, and volcanic ash have accumulated to form its massive 3,676-metre structure.

Key Features:

- **Summit:** The highest point is called **Mahameru**. The active crater, **Jonggring Seloko**, is located southeast of the summit.
- **Eruption Style:** It is known for its **Vulcanian and Strombolian** activity, frequently emitting small ash explosions every 15–30 minutes, interspersed with massive, deadly eruptions.
- **Lahar Risk:** Due to high rainfall in Indonesia, the accumulated ash on its slopes often mixes with water to create **lahars** (volcanic mudflows) that race down river channels.
- **Pyroclastic Flows:** The volcano often generates hot avalanche clouds which are fast-moving currents of hot gas and volcanic matter that can reach speeds of over 100 km/h.
- **Height:** Rising **3,676 metres** above sea level, it dominates the landscape of East Java.

Significance:

- Indonesia is home to nearly 130 active volcanoes; Semeru is among the most closely monitored due to its proximity to dense population centres.
- In Hindu-Buddhist tradition, Semeru is considered the Abode of the Gods and a replica of the mythical Mount Meru of India. It is a major pilgrimage and trekking destination.

PROTOTYPE FAST BREEDER REACTOR

Prime Minister of India congratulated scientists as India's first indigenous Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, Tamil Nadu, successfully attained criticality.

About India First Fast Breeder Reactor (FBR) Achieve Criticality:

What is Fast Breeder Reactor (FBR)?

- A Fast Breeder Reactor is an advanced nuclear reactor that **generates more fissile material (fuel) than it consumes** while producing electricity. It is fast because it uses high-energy (fast) neutrons to sustain the fission chain reaction, unlike conventional reactors that use slow neutrons.

What is Criticality?

- In nuclear physics, **criticality** is the state in which a nuclear fuel sustains a **self-supporting chain reaction**. It is the point at which the number of neutrons produced by fission is exactly equal to the number of neutrons lost (through leakage or absorption) plus those causing new fissions.

Developed By: The 500 MWe PFBR has been developed by Bharatiya Nabhikiya Vidyut Nigam Ltd (BHAVINI).

How It Works?

1. Fuel: It uses a Uranium-Plutonium Mixed Oxide (MOX) fuel.
2. The Breeding Process: The reactor core is surrounded by a blanket of fertile material (Uranium-238). When these U-238 atoms capture fast neutrons, they undergo transmutation to become Plutonium-239, which is a high-grade nuclear fuel.
3. Coolant: Instead of water, it uses Liquid Sodium as a coolant because sodium does not slow down neutrons, allowing the fast reaction necessary for breeding.
4. Heat Exchange: The heat generated by fission is transferred to the liquid sodium, which then heats water to produce steam to turn turbines.

Aim:

- To create a surplus of Plutonium fuel to power future fast reactors.
- To act as a bridge to the third stage of India's nuclear programme, where **Thorium-232** will be converted into **Uranium-233**.
- To provide a sustainable, long-term solution to India's energy needs by extracting significantly more energy from uranium than conventional reactors.

Key Features:

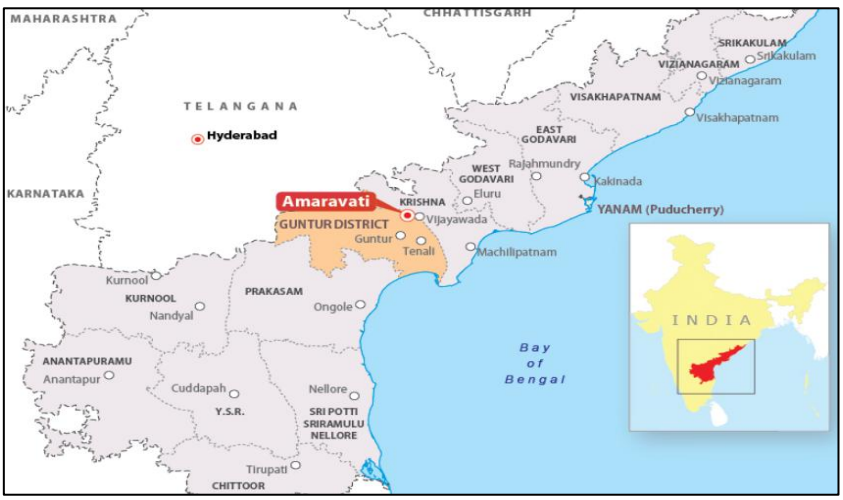
- **Indigenous Design:** Built almost entirely with Indian technology and materials.
- **MOX Fuel Technology:** Utilizes recycled fuel from the first stage (Pressurized Heavy Water Reactors).
- **Passive Safety:** Equipped with advanced safety systems that can automatically shut down the reactor during emergencies without human intervention.
- **High Efficiency:** Operates at higher temperatures than conventional reactors, leading to better thermal efficiency.

Significance:

- Attaining criticality is the final scientific green light before the reactor begins generating electricity for the grid.
- It proves that the reactor's core geometry, fuel arrangement, and engineering calculations are accurate and functional.
- For India, PFBR criticality signals the formal operational start of the Second Stage of its nuclear roadmap, moving the country closer to utilizing its vast thorium reserves.

ANDHRA PRADESH REORGANISATION (AMENDMENT) BILL, 2026

President of India has given her assent to the Andhra Pradesh Reorganisation (Amendment) Bill, 2026, officially declaring Amaravati as the sole and permanent capital of the state.



About Amaravati:

What It Is?

- Amaravati is a planned city situated on the banks of the **Krishna River**. It serves as the administrative, legislative, and judicial capital of Andhra Pradesh. The city is designed as a People's Capital, blending modern urban planning with deep-rooted historical and spiritual heritage.

Location:

- **District:** Guntur district, Andhra Pradesh.
- **Geographic Feature:** Located on the southern bank of the **Krishna River**, positioned between the major urban hubs of **Vijayawada** and **Guntur**.

Origin of the Modern City:

- **Post-Bifurcation:** Following the creation of Telangana in 2014, Andhra Pradesh required a new capital.
- **Foundation:** The foundation stone for the modern city was laid on **October 22, 2015**, at Uddandarayunipalem.
- **Naming:** It was named after the ancient capital of the Satavahana dynasty, symbolizing a rebirth of Telugu pride.

Historical Importance:

Amaravati holds a prestigious place in Indian history, spanning over 2,000 years:

- **Satavahana Dynasty:** It served as the capital of the Satavahanas (2nd Century BCE to 3rd Century CE), who were among the first great rulers of Central and Southern India.
- **Buddhist Learning Center:** The city was a world-renowned centre for Buddhism. The **Amaravati Stupa** (Mahachaitya) was one of the largest in India, famously adorned with intricate limestone carvings known as the **Amaravati School of Art.**
- **Ancient Global Trade:** Historical records and Roman coins found in the region indicate that Amaravati was a major hub for trade with the Roman Empire and Southeast Asia.
- **Religious Pluralism:** It is known as **Aramavati** (City of Gardens) and is home to the **Amareswara Temple**, one of the five sacred Pancharama Kshetrams dedicated to Lord Shiva, making it a City of Five Religions including Hinduism, Buddhism, and Jainism.
- **Xuanzang's Visit:** The famous Chinese traveller **Xuanzang** visited the region in 639 CE, writing extensively about the magnificent monasteries and the vibrant Buddhist culture of the area.

Significance:

- The 2026 Act provides legal finality to the capital issue, ensuring that all three branches of government—Executive, Legislature, and Judiciary—function from a single point.
- As a Greenfield capital, it is intended to become a hub for IT, pharmaceuticals, and blue-economy industries due to its proximity to the Krishna River.
- The restoration of Amaravati as the capital is seen as a revival of the historical glory of the Telugu people.

INDIAN SOFTSHELL TURTLES

Police in Greater Noida rescued 16 Indian Softshell turtles from a smuggler during a routine check.

- The turtles, native to the Ganga river system and protected under Schedule I of the Wildlife Protection Act, were being illegally transported.

About Indian Softshell Turtles:

What It Is?

- The Indian Softshell Turtle (*Nilssonia gangetica*), also known as the **Gangetic Softshell Turtle**, is a large freshwater reptile. Unlike most turtles that have a hard, bony scute, these belong to the family *Trionychidae*, characterized by a leathery shell that lacks a traditional keratinized cover.

IUCN Status and Legal Protection:

- IUCN Red List: Endangered.
- Wildlife Protection Act (1972): Schedule I (India's highest level of legal protection, equivalent to that of the Tiger).
- CITES: Appendix I.

Habitat and Distribution:

- **Primary Range:** Found predominantly in the **Ganges, Indus, and Mahanadi** riversystems.
- **Environment:** They prefer deep, turbid rivers, streams, large canals, lakes, and ponds with mud or sand bottoms where they can easily bury themselves.
- **Geographic Spread:** Distributed across India, Pakistan, Bangladesh, and Nepal.

Key Characteristics:

- **Soft Shell:** It has a flat, oval, and leathery carapace (upper shell) that is olive-green or dull green in color.
- **Distinct Head:** The head is large with a distinctive **snout-like proboscis** (pointed nose) that allows it to breathe while remaining submerged.
- **Size:** They are massive, with the carapace length reaching up to **94 cm**.
- **The 20-Claw Myth:** Poachers specifically target individuals with 20 claws (five on each limb), as they are falsely believed to bring good luck or have higher medicinal value in the black market.
- **Diet:** They are omnivorous scavengers, feeding on fish, mollusks, frogs, and occasionally rotting vegetation or carcasses.

Significance:

- As scavengers, they play a vital role in the river ecosystem by consuming organic waste and dead matter, helping to keep the Ganges and other rivers clean.
- Their presence indicates the health of the freshwater riverine systems.

PROJECT CHETAK

BRO's Project Chetak has celebrated its 47th Raising Day on 4 April 2026 at Bikaner, Rajasthan, marking over four decades of strategic infrastructure development in India's western border region.

About Project Chetak:

What it is?

- **Project Chetak** is one of the largest and strategically significant infrastructure projects under the Border Roads Organisation (BRO).
- It was **raised in 1980** to develop and maintain roads and defence-related infrastructure in the **western border region**, especially across Rajasthan, Punjab, and northern Gujarat.

Organisation Involved: Border Roads Organisation (BRO)

Aim:

- To strengthen border infrastructure and military logistics in western India.
- To ensure all-weather connectivity for defence forces and border communities.
- To support national security and regional economic development.

Key Features:

- **Extensive Road Network:** Maintains over 4,000 km of roads across the western sector.
- **Defensive Infrastructure:** Includes 214 km of Ditch Cum Bund (DCB) for border security and flood control.
- **Strategic Upgradation:** Feeder roads toward the International Border are being upgraded to National Highway double-lane standards.

Significance:

- **National Security:** Ensures rapid movement of troops, equipment, and supplies to border areas.

- **Regional Development:** Improves connectivity for remote border villages, boosting trade, mobility, and socio-economic integration.

INDIAN CRESTED PORCUPINE

Kashmir's red gold (Saffron) is under severe threat as the Indian crested porcupine has begun devouring saffron corms (underground bulbs) in the Pampore highlands.

About The Indian Crested Porcupine:

What It Is?

- The Indian crested porcupine (*Hystrix indica*) is a large, nocturnal rodent belonging to the Old World porcupine family. It is characterized by its coat of sharp quills, which serve as a highly effective defense mechanism against predators. In Kashmir, it has recently emerged as a significant agricultural pest, specifically targeting the roots and bulbs of high-value crops.

Habitat:

- **Geographic Range:** Found throughout Southern Asia and the Middle East, including India, Pakistan, and Iran.
- **Ecological Preference:** They are highly adaptable and live in various habitats, including rocky hillsides, scrublands, forests, and increasingly, **cultivated agricultural highlands** (like the *karewa* uplands of Pampore).
- **Nesting:** They are expert burrowers, creating extensive underground tunnel systems or using natural caves and rock crevices for shelter.

IUCN Status:

- **Least Concern (LC):** Globally, the species is widespread and not currently threatened with extinction.

Key Characteristics:

- **Defense Mechanism:** Its body is covered in multiple layers of quills; the longest quills are located on the neck and shoulder, forming a crest.
- **Nocturnal Behavior:** They are active primarily at night, making it difficult for farmers to monitor or deter them during their peak foraging hours.
- **Diet:** They are herbivorous, feeding on fruits, grains, and roots. Their powerful incisors allow them to dig deep and hollow out **corms and tubers**.
- **Size:** They are the largest rodents in India, weighing between **11 kg and 18 kg**.
- **Reproduction:** They have a high survival rate in areas where natural predators like **leopards** are declining.

SAFFRON

About Saffron:
What It Is?

- Saffron is the world's most expensive spice by weight, derived from the dried, vivid crimson stigmas (thread-like structures) of the **Crocus sativus** flower, commonly known as the saffron crocus. Each flower produces only three stigmas, which must be hand-harvested and dried to produce the spice used in cooking, medicine, and dyes.

Region and Cultivation:
Saffron requires a very specific climate—cool, dry summers and cold, snowy winters—to thrive.

- **Global Leaders: Iran** is the largest producer, accounting for roughly 90% of global supply. Other major producers include **Spain, Greece, and Afghanistan**.
- **Indian Context:** In India, saffron is primarily grown in the **Kashmir Valley**, specifically in the **Pampore highlands** (Pulwama district), often referred to as the Saffron Bowl of Kashmir.
- **Soil Type:** It grows best in **Karewa soil**—lacustrine (lake-derived) deposits consisting of silt, sand, and clay, which are unique to the Kashmir valley and provide excellent drainage.

Key Features:

- **The Corm:** Unlike many plants grown from seeds, saffron grows from **corms**, which are underground, bulb-like stems. These corms are perennial and are the target of pests like the Indian crested porcupine.
- **Labor Intensive:** It takes approximately **150,000 to 175,000 flowers** to produce just **one kilogram** of dry saffron. Because the flowers bloom for only a few weeks in autumn and must be picked at dawn, the labor costs are immense.
- **Chemical Profile:**
    - **Crocin:** Responsible for the intense orange-yellow color.
    - **Picrocrocin:** Gives saffron its distinct, slightly bitter taste.
    - **Safranal:** Provides the characteristic hay-like or metallic aroma.
- **GI Tag Status: Kashmir Saffron** has been granted a **Geographical Indication (GI) tag**, which protects its identity and prevents the sale of adulterated or cheaper Iranian saffron under the Kashmiri name.
- **Grade and Quality:** It is graded based on the length of the red part of the stigma. Mongra (Kashmiri) or Sargol (Iranian) represents the highest grade, consisting only of the deep red tips without the yellow style.

TAR BALLS MANAGEMENT RULES, 2026

The Ministry of Environment, Forest, and Climate Change has released the draft Tar Balls Management Rules, 2026, to protect India's coastline from oil spills.

About Tar Balls:

What They Are?

- Tar balls are small, dark, sticky, or hardened blobs of weathered crude oil found floating on the ocean surface or washed ashore on beaches. They are essentially the remnants of oil that has undergone physical and chemical changes due to environmental exposure.

Chemical Composition:

Tar balls are complex mixtures consisting of:

- **Hydrocarbons:** Primarily heavy, high-molecular-weight compounds like paraffins and aromatics.
- **Asphaltenes:** These provide the characteristic black color and sticky texture.
- **Impurities:** They often trap sand, shells, seaweed, and microplastics as they roll along the ocean floor or beach.
- **Sulfur and Metals:** Trace amounts of nickel and vanadium are often present, depending on the source of the crude oil.

How They Are Formed?

The formation of tar balls is a result of a process called **weathering**:

1. **Oil Release:** It begins with an oil spill from ships, offshore platforms, or natural oil seeps on the ocean floor.
2. **Evaporation & Dissolution:** Lighter components of the oil evaporate into the air or dissolve in water.
3. **Emulsification:** The remaining heavy oil mixes with seawater to form a thick, mousse-like emulsion.
4. **Fragmentation:** Wind and waves break this thick oil into smaller pieces.
5. **Solidification:** As the lighter fractions continue to leave, the residue hardens into sticky, dense spheres (tar balls) that are carried by currents to the shore.

Key Features:

- **Persistence:** They are highly resistant to environmental degradation and can remain in the marine environment for a long time.
- **Size Variability:** They can range from the size of a coin to that of a basketball.
- **Seasonal Presence:** In India, they are most prominent on the western coast (Gujarat to Goa) between **April and September** due to south-westerly winds and currents.
- **Sticky Texture:** When fresh, they are soft and tacky, but they can become hard and crusty over time as they incorporate sand and debris.

Implications:

- Seabirds, fish, and sea turtles often mistake tar balls for food. Ingestion can lead to internal poisoning, while external coating can impair a bird's ability to fly or swim.
- They can smother coral reefs and seagrass beds, disrupting local marine habitats.
- Accumulation on beaches reduces the aesthetic value of coastal destinations, impacting the tourism industry in states like Goa.

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