



Weekly Current Affairs



To The Point

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Climate Crisis Fuels Intensifying Marine Heatwaves Across the Globe

Context: In January 2025, a devastating marine heatwave (MHW) in Western Australia led to the mass death of over 30,000 fish. This alarming event highlights the increasing frequency and severity of oceanic heat anomalies, driven primarily by climate change.



What Are Marine Heatwaves?

Marine heatwaves are prolonged periods of abnormally high sea surface temperatures, significantly impacting marine ecosystems and weather patterns worldwide.

Key Characteristics of Marine Heatwaves:

- Defined as ocean temperatures rising 3-4°C above the average for at least five days.
- Can persist for weeks, months, or even years.
- Climate change is the primary driver, with oceans absorbing 90% of excess heat from global warming.
- These events have become more intense, frequent, and long-lasting over recent decades.

Global Presence of Marine Heatwaves:

Marine heatwaves have been reported in major oceanic regions, including:

- North Pacific & North Atlantic
- Mediterranean & Caribbean Sea
- Indian Ocean & Western Australian waters

Wider Environmental Consequences:

- Extreme weather events:** MHWs contribute to the formation of tropical storms, hurricanes, and cyclones.
- Disruptions in the water cycle:** Increased flooding, droughts, and wildfires are linked to shifts caused by marine heatwaves.

Rising Trends in the Indian Ocean:

The Indian Ocean, once considered less vulnerable, is now experiencing marine heatwaves annually.

Key Trends (1982-2018):

- Western Indian Ocean:** A 1.5-fold increase in marine heatwave events per decade.
- Bay of Bengal:** A 0.5-fold rise per decade.

These trends directly impact the Indian monsoon, fisheries, and biodiversity.

How Marine Heatwaves Impact India and the World:

1. Disrupting Monsoon Patterns:

- Western Indian Ocean & Bay of Bengal heatwaves alter atmospheric circulation, affecting monsoon rainfall.
- Central India experiences reduced rainfall, while southern India sees intensified downpours.

2. Economic Losses for Coastal Communities:



- **Fisheries & Aquaculture:** Reduced **productivity** of key species like **lobster, snow crab, and scallops** impacts fisheries.
- **Tourism Industry:** Marine biodiversity loss affects **coastal tourism and livelihoods**.

3. Threat to Marine Biodiversity:

- **Mass mortality of marine species**, forcing migration and **disrupting food chains**.
- **Kelp forests and coral reefs**, essential ecosystems, face **irreversible damage**.
- **Coral bleaching** weakens reefs, **reducing reproductive abilities** and making them **more susceptible to disease**.
- **Compounded threats:** Ocean acidification, overfishing, and pollution **exacerbate** MHW damage.

Strategies to Combat Marine Heatwaves:

1. Mitigating Ocean Warming:

- **Reduce greenhouse gas emissions** by cutting reliance on **fossil fuels** and adhering to **Paris Agreement** goals.
- **Invest in renewable energy** to slow the pace of oceanic warming.

2. Strengthening Marine Ecosystem Protection:

- Implement **marine protected areas (MPAs)** to safeguard vulnerable species.
- Enforce **sustainable fishing regulations** and **catch management policies** to prevent economic losses.

3. Enhancing Research & Monitoring:

- **Expand global research networks** like the **Marine Heatwave International Group**.
- **Build advanced monitoring systems** to predict and mitigate the impacts of future MHWs.

4. Promoting Nature-Based Solutions:

- Apply the **IUCN Global Standard for Nature-based Solutions** to restore damaged marine ecosystems.

Way Forward:

To combat the growing threat of **marine heatwaves**, **governments, scientists, and stakeholders** must work together to:

- **Develop long-term conservation policies** to protect oceans.
- **Raise awareness among policymakers, businesses, and coastal communities**.
- **Enforce stricter environmental regulations** to minimize damage to marine biodiversity.

The **climate crisis is accelerating**, and with it, **marine heatwaves** are becoming a **new normal**. **Immediate action** is crucial to **preserve marine ecosystems, sustain coastal economies, and safeguard global climate stability**.



Role of the Governor in Granting Assent to Bills

Context: The **Supreme Court of India** recently raised concerns regarding the **Tamil Nadu Governor's delay** in approving several **Bills**, some of which have been pending for over **three years**. This has sparked debates over the **Governor's constitutional role** and the implications of such delays on the **legislative process**.



Governor's Role in the Legislative Process:

As the **constitutional head** of a state, the **Governor** plays a vital role in the **law-making process**, particularly in giving **assent** to **Bills** passed by the **State Legislature**. However, the **discretionary powers** exercised by Governors in either withholding or delaying assent have often led to **legal debates** and **political controversies**.

Constitutional Provisions Related to the Governor's Assent:

Article 200: The Governor's Options for Assenting Bills

When a **Bill** is presented to the **Governor** after being passed by the **State Legislature**, the Governor has **four possible courses of action**:

1. **Grant Assent** – The Governor **approves** the Bill, making it a **law**.
2. **Withhold Assent** – The Governor **rejects** the Bill, preventing it from becoming law.
3. **Return the Bill for Reconsideration** – The Governor may **send the Bill back** to the **Legislature** with **suggestions**. However, if the Legislature **passes the Bill again without modifications**, the Governor **must** grant assent.
4. **Reserve the Bill for Presidential Assent** – If a Bill **contradicts the Constitution**, affects **High Court powers**, or is **inconsistent with central laws**, the Governor may **send it to the President** for a final decision.

Article 201: The President's Role in Reserved Bills

If a **Bill** is **reserved** for the **President's approval**, the **President** has two choices:

1. **Give Assent** – The Bill is **approved** and becomes **law**.
2. **Withhold Assent or Send for Reconsideration** – The President can **return** the Bill to the **State Legislature** for **modifications**. However, even if the **Legislature re-passes** the Bill, the **President is not bound** to approve it.

Controversies and Recent Concerns:

1. Delays in Assenting to Bills:

- The **Constitution** states that the **Governor should act "as soon as possible"**, but does not specify a **time limit** for decision-making.
- **Prolonged delays** can lead to a **constitutional crisis**, obstructing governance and **weakening democracy**.
- The use of a '**pocket veto**', where a **Governor neither assents nor returns the Bill**, has raised **serious legal and political concerns**.

2. Political Disputes and Federalism Concerns:



- Some **state governments** have accused Governors of acting **under the influence of the Central Government**, undermining the **spirit of federalism**.
- States like **West Bengal, Maharashtra, and Punjab** have witnessed **major conflicts** over the **Governor's refusal** to sign crucial Bills.

Supreme Court's Stand on the Governor's Role:

Key Judicial Interpretations:

1. **Shamsher Singh v. State of Punjab (1974)** – The **Governor must act** on the aid and advice of the **Council of Ministers**, except in specific cases.
2. **Nabam Rebia v. Deputy Speaker (2016)** – The **Governor cannot act arbitrarily** or in a **partisan manner** against the **elected government**.
3. **Rameshwar Prasad Case (2006)** – The **Governor's discretion** must be **fair, reasonable, and aligned with constitutional principles**.

Discretionary Powers of the Governor:

- The **Governor's authority to withhold assent** or **return a Bill** is **not absolute**.
- The **Sarkaria Commission (1987)** recommended that the **Governor should reserve Bills for Presidential Assent only in exceptional cases**.
- It also suggested that the **President should decide on such Bills within six months** and provide **reasons** if assent is withheld.

Proposed Reforms and the Way Forward:

1. Implementing Time-Bound Decision-Making:

- The **Supreme Court** has indicated that **Governors should not indefinitely delay assent**.
- The **Governor must promptly communicate** with the **State Legislature** and provide reasons for rejecting or reserving Bills.

2. Clarifying the Scope of Discretionary Powers:

- A **clear constitutional framework** or **judicial guidelines** should define the **Governor's limitations** in the **assent process**.
- Establishing **fixed timelines** for **decision-making** can help ensure **transparency and accountability**.

3. Strengthening Accountability Mechanisms:

- The **Governor's actions** should be subject to **judicial or parliamentary review** to prevent **political misuse**.
- Enhanced **judicial oversight** can ensure **Governors act fairly**, without **partisan influence**.

Conclusion:

The **role of Governors in assenting to Bills** has increasingly come under **legal and political scrutiny**. While the **Governor holds a crucial constitutional position**, the **indefinite delay** in approving **Bills** can **obstruct governance and weaken federalism**. There is an urgent need for **greater transparency, judicial oversight, and time-bound decision-making** to ensure that the **Governor's role** remains aligned with **democratic principles**.

States Demand a Larger Share in Central Taxes

Context: The state of **Odisha** has joined the growing demand for an increase in the **States' share** of the **divisible tax pool**, urging the **Finance Commission** to raise it from the current **41% to 50%**. Several states argue that they require **greater financial autonomy** to meet their developmental and governance needs effectively.



Understanding Tax Devolution:

Tax devolution refers to the process by which **tax revenues** collected by the **Central Government** are distributed among the **State Governments**.

Key Aspects of Tax Devolution:

- The **Central Government** collects various **taxes** such as **Income Tax, GST, Excise Duties, etc.**, and a **portion** of this revenue is shared with the **states** based on the **Finance Commission's recommendations**.
- The **primary objective** is to **strengthen fiscal federalism**, allowing **states greater financial autonomy** to address their unique developmental needs.
- The **allocation formula** takes into account factors such as **population, geographical area, forest cover, per capita income, and tax mobilization efforts**.
- Besides **tax devolution**, the **Centre** also provides **additional grants** to states for certain **jointly funded schemes**.

Constitutional Provisions Governing Centre-State Financial Relations:

Several provisions in the **Indian Constitution** define the financial relationship between the **Union and the States**:

- **Articles 202 to 206:** Outline the financial administration of states, covering **budget, expenditure, borrowing, and taxation powers**.
- **Articles 268 to 272:** Detail the **distribution of revenues** between the **Union and States**.
- **Article 280:** Mandates the establishment of a **Finance Commission** every **five years** to recommend the **sharing of revenues**.
- **Article 282:** Allows the **Union Government** to provide **financial assistance** to states for **any public purpose**.

Current Tax Devolution to States:

Key Recommendations from Recent Finance Commissions:

- **14th Finance Commission (2015-2020):** Increased the **States' share** in the **divisible tax pool** from **32% to 42%**. It also introduced **revenue deficit grants** for states facing **financial shortfalls**.
- **15th Finance Commission (2021-2026):** **Reduced** the **States' share** to **41%** due to the creation of the **Union Territory of Jammu & Kashmir**.

Funding Ratios for State Schemes:

- **Northeastern and Hill States** receive **90% of the funding** from the **Centre**, while **States** contribute **10%**.



- Other **general category States** receive **60% funding** from the Centre, with the remaining **40%** covered by the State Governments.

Why Are States Demanding a Greater Share?

1. Need for More Financial Resources:

- **State Governments** argue that they handle **critical responsibilities**, such as **education, healthcare, policing, and infrastructure**, which require **greater financial support**.
- The **rising costs** of governance and **development projects** necessitate an increase in **financial allocations**.

2. Perceived Inequity Among States:

- **Economically advanced states** like Karnataka and Tamil Nadu argue that they **contribute more in taxes** than they receive from the Centre.
- **Concerns** have been raised that **better-performing states** are being **penalized** for their **strong economic performance**, while **less developed states** with **weaker governance** receive **larger financial aid**.

3. Issues with the Divisible Tax Pool:

- A **significant portion** of the Centre's revenue comes from **cesses and surcharges**, which are **not shared** with States.
- This means that while **officially States receive 41% of tax revenues**, the **actual share is much lower**, as **cesses and surcharges** constitute up to **28% of the Centre's revenue**.

Way Forward:

1. Review by the 16th Finance Commission:

- The **upcoming Finance Commission** must **assess the financial needs of States** and consider **raising their share** in the **divisible tax pool**.
- A fairer **resource-sharing mechanism** is essential to promote **balanced economic growth** across India.

2. Strengthening Disaster Relief Funding:

- States that are **prone to natural disasters** face **huge financial burdens**.
- A **separate disaster relief fund** could be established to provide **targeted financial assistance** to such states.

3. Enhancing Financial Management Capacity:

- **State Governments** should focus on **improving tax collection**, **reducing financial inefficiencies**, and **ensuring better utilization** of allocated funds.
- Strengthening **fiscal discipline** will help states **reduce their dependence on Central funding**.

Conclusion:

The demand for an **increase in States' share of Central taxes** reflects the growing need for **greater financial autonomy** at the state level. While the **Finance Commission** plays a crucial role in **determining revenue-sharing**, there is an urgent need for a **more equitable distribution framework** that ensures both **financial stability and economic development** across all Indian states.

Private Sector Participation in India's Nuclear Energy Sector

Context: The Union Government is exploring ways to involve private players in India's **nuclear power sector** to achieve the ambitious target of **100 GW nuclear power capacity by 2047**. This marks a significant shift from the traditional model, where **state-owned enterprises** have exclusively controlled nuclear power generation.



Current Status of India's Nuclear Power:

- India's **installed nuclear power capacity** stands at **8,180 MW**, spread across **24 reactors**.
- 10 new reactors** (totaling **8 GW**) are under construction in **Gujarat, Rajasthan, Tamil Nadu, Haryana, Karnataka, and Madhya Pradesh**.
- A **6×1208 MW nuclear plant** has been approved in **Andhra Pradesh** in collaboration with the **USA**.

Key Legislative Changes Proposed:

To allow **private sector participation**, the government is considering **amendments** to:

- Atomic Energy Act, 1962** – The backbone of India's **nuclear energy development and regulation**.
- Civil Liability for Nuclear Damage Act, 2010** – Ensures **compensation mechanisms** for nuclear incidents.

Objectives of Private Sector Collaboration:

The government plans to partner with **private companies** to:

- Develop **Bharat Small Reactors**.
- Invest in **R&D of Bharat Small Modular Reactors (SMRs)**.
- Advance **new nuclear technologies** for energy generation.

What is Nuclear Energy?

- Nuclear energy** is the energy released during **nuclear reactions**, either by **fission** (splitting of atomic nuclei) or **fusion** (merging of atomic nuclei).
- In **nuclear fission**, heavy elements like **uranium or plutonium** split, releasing massive amounts of energy, which is harnessed to generate **electricity** in **nuclear power plants**.

Advantages of Private Sector Involvement:

- Faster Expansion of Capacity** : Private investment can **bridge financial gaps** and **speed up** nuclear power growth.
- Technological Innovations**: Collaboration with private companies will bring in **cutting-edge technology**, global expertise, and **efficient project execution**.
- Cost Efficiency**: Competitive **bidding** among private players can **reduce project costs** and **minimize delays**.
- Enhanced Energy Security**: Expanding **nuclear power** will help **reduce dependence on fossil fuels** and support India's **clean energy goals**.

Challenges in Private Sector Entry:

- Regulatory Hurdles**: Existing laws **need amendments** to permit **private participation**, requiring policy clarity.



2. **High Capital Investment:** Nuclear projects have long gestation periods and huge upfront costs, making them **less attractive** for private firms.
3. **Liability Concerns:** The Civil Liability for Nuclear Damage Act places **high financial liability** on nuclear plant operators, **discouraging private investment**.
4. **Safety & Security Issues:** Nuclear power requires **stringent safety measures**, necessitating **robust oversight** to ensure private firms adhere to safety norms.
5. **Public Resistance:** Concerns over radiation risks, nuclear waste disposal, and potential accidents may lead to **public opposition** against private sector entry.

Government Initiatives:

- Announced a **20,000 crore R&D mission** for developing **Small Modular Reactors (SMRs)**.
- Plans to deploy **at least five indigenously developed SMRs by 2033**.
- **NPCIL and NTPC** signed a **Joint Venture agreement** to develop **nuclear power facilities** in India.

Way Forward:

1. **Establishing a Clear Regulatory Framework:** A strong regulatory structure is needed to ensure safety, transparency, and national security.
2. **Promoting Public-Private Partnerships (PPPs):** The government should oversee nuclear projects, while private companies handle operations, investment, and technological advancements.
3. **Gradual Implementation with Pilot Projects:** Start with **small-scale pilot projects** to test private sector involvement, manage risks, and ensure **smooth scalability**.

Conclusion:

The entry of private players in India's nuclear sector could accelerate growth, bring innovation, and enhance energy security. However, regulatory clarity, financial support, and public trust are crucial to making this transition **successful and sustainable**.



India's Diagnostics Sector: Challenges, Growth & Reforms

Context: India's **diagnostics sector** is a cornerstone of the healthcare industry, enabling **early disease detection** and **treatment planning**. However, inadequate **regulation and oversight** have led to serious risks, as seen in the case of **Shankar Dhangre**, whose sister lost her life due to **incorrect diagnostic test results**.

**Significance of India's Diagnostics Sector:**

- **9% Contribution:** The diagnostics sector accounts for **9% of the healthcare industry**, playing a crucial role in **disease management**.
- **Rapid Growth:** Estimated to reach a **market value of ₹1,275 billion by 2028**.
- **Expanding Network:** India has around **300,000 diagnostic labs**, catering to a growing population.
- **Technological Advancements:** The sector is witnessing a transformation with **AI-driven diagnostics** and **digital health platforms**, improving **early disease detection**.

Key Challenges in India's Diagnostics Sector:**1. Weak Regulatory Oversight:**

- Only **12 states and UTs** have adopted the **Clinical Establishments Act**, leading to **inconsistent regulations**.
- No **mandatory accreditation**, allowing many labs to function without **quality control standards**.

2. Shortage of Skilled Personnel:

- **Lack of trained professionals**, including **pathologists, microbiologists, and lab technicians**, affecting **diagnostic accuracy**.

3. Urban-Rural Divide:

- Despite **70% of India's population living in rural areas**, only **24% of diagnostic revenues** come from rural regions.
- **Government labs** in rural areas face **poor infrastructure, lack of funding, and staff shortages**.

4. High Cost of Private Diagnostics:

- No **standardized pricing** leads to **huge disparities in test costs**.
- Private labs **charge exorbitant fees**, making diagnostics **inaccessible for low-income groups**.
- State initiatives like **Telangana's 'T-Diagnostics'** and **Kerala's 'Aardram Mission'** aim to provide affordable diagnostics but face **logistical challenges**.

5. Fraudulent Practices in the Sector:

- **Unqualified technicians** and **fake pathologists** compromise **patient safety**.
- Some labs use **"bought signatures"** from pathologists to **issue reports without review**.

Regulatory Framework:**1. Clinical Establishments (Registration and Regulation) Act, 2010:**

- Aims to **regulate diagnostic centers** and ensure **minimum service standards**.
- Adopted by **only 12 states and UTs**, with **poor enforcement**.



2. NABL Accreditation:

- **National Accreditation Board for Testing and Calibration Laboratories (NABL)** offers **voluntary accreditation**.
- While large diagnostic chains follow **NABL standards**, many **small labs** operate without accreditation.

3. State-Specific Regulations:

- **Karnataka and Kerala** have separate **regulatory frameworks**, but **inconsistent enforcement** remains a challenge.
- **Tamil Nadu's Clinical Establishments (Regulation) Rules, 2018**, mandate **minimum space requirements** for labs.

Way Forward: Strengthening India's Diagnostics Sector:

1. Enhancing Regulations & Compliance:

- **Mandatory NABL accreditation** for all diagnostic centers.
- Uniform implementation of the **Clinical Establishments Act** across **all states**.
- Establish a **central regulatory body** for **consistent oversight**.

2. Expanding Workforce & Training:

- Increase **medical education seats** and **training programs** for **lab technicians, microbiologists, and pathologists**.
- **Mandate upskilling** and certification of lab technicians.
- **Set a cap** on the number of labs a **pathologist** can be associated with to curb **ghost pathologists**.

3. Eliminating Fraudulent Practices:

- **Digital tracking** of lab reports to **prevent misuse** of pathologists' credentials.
- **Strict penalties** for **fake pathologists and unauthorized technicians**.
- **Regular audits and surprise inspections** to ensure compliance.

4. Bridging the Urban-Rural Divide:

- **Increase government investment** in **rural diagnostic centers**.
- Expand **Public-Private Partnerships (PPPs)** to **improve accessibility** in remote areas.
- Extend **successful state-funded diagnostic models** like **T-Diagnostics & Aardram Mission** nationwide.

5. Standardizing Pricing & Quality Control:

- **Introduce price caps** for essential diagnostic tests.
- **Mandate Standard Operating Procedures (SOPs)** for **sample collection, testing, and reporting**.
- Enforce **internal and external quality control measures**.

Conclusion:

India's diagnostics sector is at a **critical juncture**, with **rapid growth** but **regulatory loopholes** that need urgent reform. Strengthening **regulations, increasing skilled workforce, improving accessibility, and curbing fraudulent practices** will ensure a **high-quality, affordable, and accessible diagnostic sector** that meets the needs of **all Indians**.

Delay in Grants Disbursal Under National Fellowship Scheme

Context: The Centre recently informed Parliament that **OBC scholars** under the **National Fellowship for OBC Students (NF-OBC)** have not received their grants since **June of the previous year**. Similarly, **Scheduled Caste (SC) scholars** under the **National Fellowship for Scheduled Caste Students (NFSC)** are facing **delays ranging from two to five months** in grant disbursal.



National Fellowship for Scheduled Caste (SC) Students (NFSC):

- **Launched in 2005-06**, this **Central Sector Scheme** aims to provide **higher education opportunities** to SC students for pursuing **M.Phil. and Ph.D. degrees** in **Sciences, Humanities, and Social Sciences**.
- **Funded by:** **Ministry of Social Justice & Empowerment** and implemented by the **National Scheduled Castes Finance & Development Corporation (NSFDC)**.
- **Eligibility:**
 - Must belong to the **SC category**.
 - Must have qualified **UGC-NET or Joint CSIR-UGC-NET**.
 - Enrolled in **regular, full-time M.Phil. or Ph.D. programs** at recognized institutions.
- **Number of Fellowships:**
 - **2,000 fellowships** per year.
 - **1,500** for **Humanities & Social Sciences**.
 - **500** for **Science streams**.

National Fellowship for Other Backward Classes (OBC) (NF-OBC):

- **Objective:** To enhance opportunities for **OBC students** to pursue **M.Phil. and Ph.D. degrees**.
- **Funded by:** **Ministry of Social Justice & Empowerment**, implemented by the **National Backward Classes Finance & Development Corporation (NBCFDC)**.
- **Eligibility:**
 - Must belong to the **OBC category**.
 - Must have qualified **UGC-NET or Joint CSIR-UGC-NET**.
 - Enrolled in **regular, full-time M.Phil. or Ph.D. programs** at recognized institutions.
- **Number of Fellowships:** **1,000 fellowships** per year.

National Fellowship Scheme for Scheduled Tribes (ST) (NF-ST):

- A **Central Sector Scheme** under the **Ministry of Tribal Affairs**, designed to provide **financial assistance** to **meritorious Scheduled Tribe (ST) students** for pursuing **M.Phil. or Ph.D.**
- **Eligibility:**
 - Must be an **ST student** admitted to a recognized institution.
 - **Total family income should not exceed ₹6 lakh per annum**.
 - The fellowship **continues until course completion**, subject to satisfactory performance.
- **Number of Fellowships:** **750** per year.



- Unused fellowships are carried forward to the next academic year.
- No state/university-wise limit on slots.
- Priority Beneficiaries:
 - Persons with Disabilities (PWD) – 3% of total slots.
 - Particularly Vulnerable Tribal Groups (PVTG) – 50 slots.
 - Below Poverty Line (BPL) students – 50 slots.
 - Female scholars – 30% reservation.

Concerns Over Delays in Grant Disbursal:

- Financial hardships for scholars relying on fellowship funds for research and living expenses.
- Disruptions in academic progress, especially for students from marginalized backgrounds.
- Lack of transparency in fund allocation and disbursal.
- Need for urgent intervention by the government to streamline grant releases.

Way Forward:

- Timely Disbursal Mechanism: Ensure automatic fund release at fixed intervals.
- Transparent Tracking System: Implement a real-time tracking portal for scholars to monitor their payments.
- Better Coordination: Strengthen coordination between UGC, NSFDC, and NBCFDC for smoother grant processing.
- Increased Funding: Expand the fellowship budget to accommodate rising research demands.
- Accountability Measures: Establish a grievance redressal system for scholars facing delays.

Conclusion:

The National Fellowship Schemes play a crucial role in promoting higher education among marginalized communities. However, delays in grant disbursal create significant financial and academic burdens. The government must take urgent steps to ensure timely, transparent, and efficient fund disbursement to support scholars in their academic pursuits.

Karnataka Becomes Second State to Allow Dignified Death for the Terminally Ill

Context: In a landmark decision, the Karnataka Health Department has implemented the Supreme Court's ruling allowing terminally ill patients the right to die with dignity. Karnataka is now the second state after Kerala to adopt this directive, reaffirming the right to a dignified death under the Indian Constitution.

Understanding Euthanasia:

Euthanasia refers to the intentional act of ending a person's life to relieve them from extreme pain caused by an incurable disease or disorder. It can be **active** (deliberate intervention) or **passive** (withdrawal of life support).



Supreme Court's Stand on Passive Euthanasia:

1. Legal Recognition (2018 & 2023 Rulings):

- **2018:** The Supreme Court legalized **passive euthanasia**, recognizing it as a fundamental right under **Article 21 (Right to Life and Dignity)**.
- **2023:** The ruling **simplified** the procedure for **withdrawing life support**, ensuring a **structured, ethical** approach.

2. Conditions for Passive Euthanasia:

- ✓ **Applicable to patients** with **no hope of recovery**.
- ✓ Allowed for individuals in a **persistent vegetative state** or suffering from an **incurable, prolonged condition**.

3. Advance Medical Directive (AMD) or 'Living Will':

- ✓ Any **competent adult** can create an AMD, specifying their **medical treatment preferences** if they become unable to decide.
- ✓ The AMD allows **two nominated representatives** to make end-of-life decisions.

4. Approval Process for Withdrawing Life Support:

- ✓ **Medical Boards** in hospitals must oversee the decision:
 - **Primary Board** (Three senior doctors)
 - **Secondary Board** (Three senior doctors for review)
- ✓ **District Health Officer involvement** for ethical compliance.
- ✓ **Final approval** by a **Judicial Magistrate of the First Class (JMFC)** with a report to the **High Court Registrar**.

What is Passive Euthanasia?

Passive euthanasia means **withholding or withdrawing life-sustaining treatment (LST)**, allowing a terminally ill patient to die **naturally**.

Legal in India as per **Supreme Court rulings (2018 & 2023)** under strict **medical and legal safeguards**. The **Ministry of Health and Family Welfare (MoHFW)** has issued **draft guidelines** titled "**Guidelines for Withdrawal of Life Support in Terminally Ill Patients**."

Ethical Debate: Arguments For & Against Euthanasia:



1. Autonomy and the Right to Die:

- **Pro:** Every individual has the right to **choose how they live and die**. If a person **competently** chooses euthanasia, it should be **respected**.
- **Anti:** The right to life does **not** include the right to end it. Legalizing euthanasia **devalues human life** and sets a **dangerous precedent**.

2. Beneficence and Compassion:

- **Pro:** Doctors are ethically bound to **reduce suffering**. For patients in **unbearable pain**, euthanasia is an **act of compassion**.
- **Anti:** Instead of euthanasia, **palliative care** and **pain management** should be prioritized.

3. The Slippery Slope Argument:

- **Pro:** **Strict regulations** can prevent **misuse**.
- **Anti:** Once allowed, it may lead to **non-consensual euthanasia** or **pressure** on vulnerable groups like the **elderly and disabled**.

4. Sanctity of Life vs. Quality of Life:

- **Sanctity of Life:** Many religious beliefs argue that life is **sacred**, regardless of suffering.
- **Quality of Life:** When a patient's suffering is **irreversible**, euthanasia is a **humane alternative**.

Legal and Social Implications:

Global Perspectives:

Countries like **the Netherlands, Belgium, and Canada** allow **euthanasia under strict conditions**.

Legalization remains **controversial worldwide**, with concerns over **ethics, misuse, and medical practices**.

Potential Risks:

Abuse of euthanasia laws may lead to **non-consensual deaths**.

Could shift focus **away from healthcare improvements**.

Conclusion: A Step Towards a Humane Healthcare System

The implementation of **passive euthanasia in Karnataka** marks a **progressive shift** in India's **end-of-life care policies**. It upholds **personal dignity, autonomy, and compassionate decision-making**. However, **strict legal oversight** and **medical ethics** are essential to **prevent misuse** and **protect human rights**.

As India navigates this complex issue, a **balanced approach** is needed—ensuring that **patients' rights, ethical concerns, and legal safeguards** work together for a **just and humane medical system**.

UIDAI Introduces New Rules for Aadhaar Authentication

Context: The Ministry of Electronics and Information Technology (MeitY) has introduced the Aadhaar Authentication for Good Governance (Social Welfare, Innovation, Knowledge) Amendment Rules, 2025 under the Aadhaar Act, 2016 to enhance digital service accessibility.

Key Highlights of the 2025 Amendment:

1. Expanded Scope of Aadhaar Authentication:

- **Government and Non-Government Entities** can now utilize Aadhaar authentication for services that serve the **public interest**.
- New sectors included: **E-commerce, Travel, Tourism, Hospitality, and Healthcare**, enabling seamless service access beyond government initiatives.

2. Enhancing Service Delivery & Ease of Living:

- Aadhaar authentication will **simplify service access**, eliminating bureaucratic delays.
- Ensures **trusted digital transactions** between **service providers and users**.

3. Streamlined Approval Process:

- Entities seeking Aadhaar authentication must submit applications via a **dedicated government portal**.
- The **Unique Identification Authority of India (UIDAI)** will **review applications** and provide recommendations.

Significance of the Amendments:

- **Encourages Innovation** by facilitating digital transformation.
- Enhances **knowledge-sharing and access to essential services**.
- Strengthens **government-private sector collaboration** for efficient service delivery.
- Ensures **regulatory oversight**, maintaining **privacy and security** standards.

Understanding Aadhaar:

- **Aadhaar** is a **12-digit unique identification number** issued by **UIDAI** (established under the **Aadhaar Act, 2016**) to residents of India.
- It is based on **biometric and demographic data**, ensuring **accuracy and preventing duplication**.
- **Aadhaar is NOT proof of Indian citizenship**.

Legal Framework of Aadhaar:

1. **Section 7 of the Aadhaar Act, 2016:** Aadhaar may be required for **benefits, subsidies, and services** funded by the **Consolidated Fund of India or State Governments**.
2. **Supreme Court Ruling (2018):** Declared Aadhaar **constitutional** but **not mandatory** for private services like **bank accounts, mobile numbers, and school admissions**.
3. **Aadhaar Metadata & Privacy Regulations:**
 - UIDAI cannot store authentication data beyond **six months**.





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- The **Right to Privacy judgment (2017) (Puttaswamy Case)** reaffirmed that **Aadhaar data must be secured and protected from misuse.**

The **2025 Amendments** mark a significant step towards **digital transformation, service efficiency, and privacy protection**, ensuring a **seamless and secure Aadhaar authentication process.**



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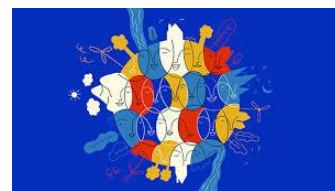
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Mental Well-Being: A Key Driver of Economic Growth

Context: The **Economic Survey 2024-25** underscores the vital link between **mental health** and **India's economic future**, emphasizing its role in **workplace productivity**, **economic growth**, and **overall national well-being**. The report highlights how **mental well-being** influences **efficiency**, **lifestyle choices**, and the **country's progress**.



Understanding Mental Well-Being: The survey defines **mental well-being** as a **multidimensional** concept, encompassing:

- **Emotional Health** – Managing stress and emotions effectively.
- **Social Health** – Building supportive relationships and communities.
- **Cognitive Health** – Enhancing focus, decision-making, and problem-solving abilities.
- **Physical Health** – Maintaining overall fitness through a balanced lifestyle.

Rising Mental Health Challenges Among Youth:

The survey highlights an **alarming rise in mental health issues** among India's youth due to:

- **Excessive Internet & Social Media Use** – Contributes to **anxiety**, **sleep disorders**, and **attention deficits**.
- **Weak Family Engagement** – Lack of **social support** negatively impacts emotional stability.
- **Toxic Work Environments & Long Hours** – Leads to **burnout**, **stress**, and **declining productivity**.
- **Unhealthy Lifestyles** – Consumption of **ultra-processed foods** and **physical inactivity** worsens both **mental** and **physical health**.

Mental Health & Economic Growth:

- **Hostile workplaces** and **long desk hours** negatively impact **mental well-being**, slowing down **economic progress**.
- According to the **World Health Organization (WHO)**, **mental health disorders** could cost India a **staggering \$1.03 trillion** between **2012** and **2030**.
- India's **demographic dividend** depends on **skilled**, **educated**, **physically fit**, and **mentally strong youth**.

Recommendations for Improvement:

- Creating a **positive work culture** to support mental well-being.
- Implementing **family and school-based interventions** to promote **healthier lifestyles**.
- Encouraging **outdoor activities**, **social bonding**, and **family interactions** to **reduce internet addiction** and boost mental health.

India's Mental Health Landscape:

- **First Recognition** – The **Economic Survey 2023-24** marked the **first official acknowledgment** of **mental health's significance** in policy-making.
- **National Mental Health Survey (NMHS) 2015-16 Findings:** **10.6%** of Indian adults suffer from mental disorders.



- **Treatment gap ranges between 70%-92%**, highlighting inadequate access to mental healthcare.
- **Higher prevalence in urban metros (13.5%)** compared to rural areas (6.9%).
- **Shortage of Psychiatrists** – As per WHO, a minimum of **3 psychiatrists per 1 lakh population** is needed. India, however, has only **0.75 psychiatrists per 1 lakh people**.

Key Government Initiatives:

1. Mental Healthcare Act, 2017:

- **Decriminalized suicide attempts**, aligning with **WHO guidelines**.
- Introduced "**advanced directives**", allowing individuals to **choose their treatment course**.
- **Restricted Electro-Convulsive Therapy (ECT)**, banning its use on **minors**.
- Tackled **mental health stigma** in society.

2. Rights of Persons with Disabilities Act, 2017: Recognizes **mental illness as a disability**, ensuring better rights and entitlements.

3. Kiran Helpline: **Suicide prevention** initiative providing **immediate support and crisis intervention**.

4. District Mental Health Programme (DMHP): Operates in **767 districts**, offering **stress management, suicide prevention, and counseling services**.

5. National Tele Mental Health Programme (NTMHP): Launched in **2022**, ensuring **mental health services through 53 Tele MANAS Cells** across **36 states/UTs**.

6. Expansion of Mental Health Infrastructure: Strengthening **mental health education and services** in **medical colleges and hospitals**.

Conclusion:

Mental health is a **cornerstone of individual and national development**. For a **prosperous and productive India**, governments, businesses, and society must **prioritize mental healthcare, improve access to services, and eliminate stigma**. With progressive **policies and programs**, India is steadily bridging **mental health treatment gaps** and fostering a **healthier future**.

India's Debt Market: Challenges & The Road Ahead

Context: The Economic Survey 2024-25 highlights that India's debt market remains undercapitalized, preventing smaller players and high-risk borrowers from accessing funds. Addressing these challenges is essential for fostering economic growth and financial inclusivity.

Understanding the Debt Market: The debt market is where fixed-income securities are issued and traded. It includes instruments from government bodies, financial institutions, banks, and corporations.



- **Government Bonds (G-Secs):** Issued by the Central and State Governments to meet fiscal needs.
- **Corporate Bonds:** Issued by companies to fund operations and expansion projects.
- **Money Market Instruments:** Includes Treasury Bills, Certificates of Deposit (CDs), Commercial Papers (CPs), and Bills of Exchange—all with maturities under one year.

Challenges & Constraints in India's Debt Market:

1. Undercapitalization & Limited Access:

- India's corporate bond market is only 18% of GDP, far behind South Korea (80%) and China (36%).
- Smaller firms and risky borrowers struggle to raise capital.

2. Dominance of Private Placements:

- 99.1% of bonds are issued through private placements, limiting retail investor participation.

3. Declining Public Issuance:

- Public issuance of corporate bonds fell from 12% (2014) to just 2% (2024).
- In FY24, public bond issuance was only 19,000 crore, while private placements reached a massive 8.38 lakh crore.

4. Regulatory Barriers:

- Most bond market borrowing is restricted to firms with AAA, AA+, or AA credit ratings.
- Non-Banking Financial Companies (NBFCs) and smaller companies struggle to access funds.

5. Liquidity Challenges:

- High entry costs, lack of information transparency, and the absence of a secondary market make it difficult for investors and borrowers to participate.

6. Debt Recovery Issues:

- Inefficiencies in debt recovery frameworks, including the Insolvency and Bankruptcy Code (IBC) and Debt Recovery Tribunals (DRTs), weaken creditor confidence.
- Out-of-court restructuring models, like those in South Korea, could expedite recovery and reduce legal burdens.

Opportunities in India's Bond Market:

1. Infrastructure & Green Bonds:

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- The **National Infrastructure Pipeline (NIP)** aims to **mobilize \$1.4 trillion** for infrastructure development.
- **Green finance is booming**, with **\$10 billion worth of green bonds in 2024**, supporting **climate-friendly projects**.

2. Strengthening Foreign Portfolio Investment (FPI) Norms:

- **Enhancing the Voluntary Retention Route (VRR)** can encourage **more foreign investments**.

3. Unified Market Operations:

- **Reducing transaction costs and improving investor confidence** will strengthen market efficiency.

4. Strengthening Debt Recovery Mechanisms:

- Adopting **debt resolution frameworks** from **South Korea and the Philippines** can **streamline recoveries and reduce delays**.

Recommendations for Strengthening the Debt Market:

- **Lowering entry costs**, ensuring **greater transparency**, and creating a **robust secondary market** for corporate bonds.
- **Relaxing investment regulations** to allow **insurance and pension funds** to invest in **lower-rated bonds**, enabling **small and risky borrowers** to secure funding.
- **Enhancing debt recovery mechanisms** to improve **creditor confidence** and **reduce financial risks**.

Conclusion:

For India to develop a thriving debt market, it must **enhance accessibility**, **improve regulatory frameworks**, and **boost investor participation**. By **adopting global best practices** and **fostering financial inclusivity**, India can **unlock the true potential of its bond market**, fueling **economic growth and development**.

TOGETHER WE SCALE HEIGHTS

Faster Sanctioning of Homes for Tribes Under PM-JANMAN

Context: The Ministry of Tribal Affairs has streamlined the process for approving homes for Particularly Vulnerable Tribal Groups (PVTGs) under the PM-JANMAN package. Earlier, delays caused by the PM-GatiShakti portal's data verification process prevented timely approvals. Now, a faster mechanism has been introduced to ensure speedier home sanctions.



Revised Process for Sanctioning Homes:

- The Tribal Affairs Ministry coordinated with the Rural Development Ministry and State/UT governments to resolve delays.
- Housing units can now be sanctioned via the PM-AWAS portal, bypassing some procedural delays.
- Data will still be updated on the PM-GatiShakti portal to maintain transparency.

What is PM-JANMAN?

The Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) was launched on November 15, 2023, during Janjatiya Gaurav Diwas. It is a flagship initiative focused on the holistic development of PVTGs across 18 states and the Andaman & Nicobar Islands.

Key Objectives of PM-JANMAN:

- **Infrastructure Development** – Ensuring pucca houses, clean drinking water, sanitation, roads, and telecom connectivity for PVTG communities.
- **Social Welfare** – Improving access to education, healthcare, and nutrition services.
- **Economic Empowerment** – Creating sustainable livelihood opportunities tailored to PVTG needs.

Implementation Strategy:

- **Inter-Ministerial Convergence** – Involves nine central ministries to execute 11 key interventions.
- **Scheme Integration** – Aligns existing government schemes with PVTG-specific requirements, modifying guidelines where needed.
- **Budget Focus** – A major share of funding is allocated to housing and road development.

Progress & Achievements:

- lakh PM-AWAS homes were planned for PVTGs

As of November 2024:

- 3.3 lakh homes were sanctioned.
- Following new reforms, an additional 1 lakh homes were approved.
- Total homes sanctioned now exceed 4 lakh.
- 80,000 homes have already been completed.

Other Sanctions Under PM-JANMAN:

- 190+ hostels approved for PVTG students.
- 600 mobile medical units sanctioned for healthcare access.



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- 850+ multipurpose community centers approved.
- Mobile towers in 2,100 habitations to improve connectivity.
- Over 2,000 Anganwadi Centres cleared for early childhood development.

Conclusion:

The PM-JANMAN initiative is a **game-changer** for PVTGs, ensuring **faster approvals and better living conditions**. By **simplifying bureaucratic hurdles and enhancing infrastructure**, the government is **empowering tribal communities** and **accelerating their development**. 📌



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40-Million-Year-Old Whale Fossil Stolen in Meghalaya

Context: A rare whale fossil, estimated to be **35 to 40 million years old**, has been **stolen** from **Tolegre village** in the **South Garo Hills district** of Meghalaya. This fossil is believed to belong to an **extinct ancestor** of modern whales, possibly **Rodhocetus** or **Ambulocetus**, offering crucial insights into **whale evolution** and the ancient past of the region.



Discovery and Significance:

- The fossil was discovered in **May 2023** by a team of explorers.
- The **Geological Survey of India (GSI)** confirmed its **authenticity and age**.
- This fossil holds immense importance as it provides evidence of the **evolutionary transition** of whales from land to sea, contributing to the understanding of **Earth's prehistoric life**.

Understanding Fossils:

Fossils are the **preserved remains or traces of ancient organisms**, offering invaluable information about the **history of life on Earth**.

Types of Fossils:

1. **Body Fossils** – Direct remains of organisms, such as **bones, shells, and leaves**.
2. **Trace Fossils** – Indirect evidence of life, including **footprints, burrows, and feces**.
3. **Chemical Fossils** – Organic compounds left by ancient organisms, preserved in rocks.

Formation of Fossils:

Fossils form through different processes, including:

- **Permineralization** – Minerals in groundwater replace the organic material of bones or shells.
- **Replacement** – Original material is completely replaced by minerals.
- **Impression** – Organism leaves an imprint in soft sediments that later harden into rock.
- **Preservation in Amber** – Small organisms like **insects** get trapped in tree resin, which solidifies over time.

Importance of Fossils:

- **Evolutionary Evidence** – Fossils reveal how species have changed over time.
- **Understanding Geological History** – Help scientists **date rocks** and reconstruct past environments.
- **Paleontology** – The study of fossils aids in reconstructing **ancient ecosystems**.

Additional Aspects of Fossil Study:

- **Fossil Dating** – Techniques like **radiometric dating** and **stratigraphy** help determine fossil age.
- **Index Fossils** – Fossils of species that existed for a short period and were widespread, useful for dating rock layers.
- **Fossil Record** – The collection of all discovered fossils, creating a timeline of life's evolution.

Whales: Evolution and Modern Significance

Whales belong to the order **Cetacea** and are classified into two suborders:



Types of Whales:

1. **Odontocetes (Toothed Whales)** – Includes **dolphins, porpoises, sperm whales, and killer whales (orcas)**. They use **echolocation** for hunting.
2. **Mysticetes (Baleen Whales)** – Have **baleen plates** instead of teeth to filter-feed on small marine organisms like krill. Examples include **blue whales, humpback whales, and fin whales**.

Key Features of Whales:

- **Largest Animals** – The **blue whale** is the largest animal ever to exist.
- **Marine Mammals** – They breathe air, give birth to live young, and nurse their offspring with milk.

Threats to Whales:

Whales face several dangers, including:

- **Whaling** – Although commercial whaling has declined, **illegal hunting** still threatens whale populations.
- **Habitat Loss** – **Pollution, climate change, and coastal development** disrupt whale habitats.
- **Entanglement** – Whales often get **caught in fishing nets**, leading to injuries or death.
- **Climate Change** – Affects **ocean temperatures and food availability**, altering migration patterns.
- **Noise Pollution** – Increased **human activities like shipping and sonar** interfere with whale communication and navigation.

Conservation Efforts:

Several organizations and initiatives work to protect whale populations:

- **International Whaling Commission (IWC)** – Established in **1946**, regulates **whaling** and promotes conservation.
- **CITES** – Many whale species are **protected under the Convention on International Trade in Endangered Species**.
- **Marine Protected Areas (MPAs)** – Designated zones in oceans to **safeguard whale habitats** from human activities.

The Need for Fossil Conservation:

- Fossil sites must be **protected** to preserve **natural heritage**.
- They provide **invaluable insights** into Earth's history, helping scientists and researchers **understand past life forms**.
- **Education and awareness** play a key role in preventing the **illegal trade** of fossils.

The **theft of the ancient whale fossil** from Meghalaya is a significant loss to science and highlights the need for **better conservation efforts** to protect such irreplaceable discoveries.



Supreme Court Advocates Legal Protection for Domestic Workers

Context: In a historic decision, the **Supreme Court of India** has directed the **Union government** to explore the need for a **dedicated law** for **domestic workers**. The Court has also mandated the creation of an **inter-ministerial committee** to assess and propose a **comprehensive legal framework** to safeguard their **rights, benefits, and working conditions**.

Current Status of Domestic Workers:

Lack of Legal Protection:

- Despite playing a **vital role** in millions of households, **domestic workers** remain largely **excluded** from key **labour laws** like the **Minimum Wages Act** and the **Equal Remuneration Act**.
- While some **state governments** have introduced **local regulations**, there is **no national legislation** to ensure their **rights and fair treatment**.

Vulnerability and Exploitation:

- Domestic work** is predominantly a **female-dominated occupation**, with a significant number of workers belonging to **marginalized communities**.
- They endure **low wages, job insecurity, and excessive workloads** without fair compensation.
- Social security benefits** are almost **non-existent**, leaving them financially vulnerable.
- The profession is often **undervalued** and seen as an **inherent skill of women**, making it **invisible** in formal labour discussions.

Challenges and Legal Interventions:

Global Standards: ILO Convention 189:

- India has **not ratified** the **International Labour Organization (ILO) Convention 189**, which guarantees **fair wages, social security, and protection against abuse** for domestic workers.

Regulation of Placement Agencies:

- The **Supreme Court** has previously directed the **mandatory registration of placement agencies** to prevent **worker exploitation**, but **implementation remains weak**.

Complex Employment Structures:

- Domestic work varies between **full-time and part-time roles**, making **standardized regulations** difficult to enforce.

Why a Separate Law is Necessary:

A **dedicated legal framework** is crucial to address the **unique challenges** faced by domestic workers:

1. Proof of Employment:

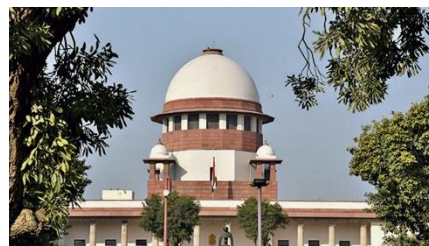
- Formal documentation** is essential to enforce **legal protections**, but domestic workers often lack **employment contracts**.

2. Employer Resistance:

- Many **households** do not consider themselves **formal employers**, making **legal accountability** difficult.

3. Power Imbalance:

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- The **employer's home** serves as the **worker's workplace**, limiting **regulation, oversight, and protection** against exploitation.

Opportunities and Challenges in Implementation:

Ensuring Fundamental Rights:

- A well-structured law can establish **minimum wages, regulated working hours, and social security**, drastically improving **working conditions**.

Redefining Power Hierarchies:

- **Recognizing housework and caregiving as legitimate labour** will help challenge **existing inequalities** and ensure **fair treatment**.

Regional Success Models:

- States like **Kerala and Delhi** have already **implemented measures** for domestic workers, which can serve as **guidelines** for national policies.

Challenges in Enforcement:

- Even with **new legal protections, monitoring mechanisms and employer accountability** will be essential to ensure **effective implementation**.

Conclusion:

The **Supreme Court's directive** provides a **critical opportunity** to advocate for a **national law** protecting **domestic workers**. While legislation **alone** may not bring **immediate change**, it is a **significant first step** toward ensuring **fair wages, better working conditions, and social security**. The real impact will depend on the **recommendations of the committee** and the **Union government's commitment** to meaningful reforms.

A **well-designed legal framework** will **empower domestic workers**, giving them the **recognition and rights they deserve** in a society that has long overlooked their contributions.

TOGETHER WE SCALE HEIGHTS

Rules for Registering Live-in Relationships Under UCC

Context: With the implementation of the **Uniform Civil Code (UCC)** in **Uttarakhand**, new **rules for registering live-in relationships** have been introduced. These regulations aim to **legally recognize** such relationships but have also sparked debates regarding **privacy and state surveillance**.



Understanding Live-in Relationships in India:

Historical Perspective:

Traditionally, Indian society recognized only **marriage** as a legitimate form of committed relationship. **Live-in relationships** were stigmatized and socially unacceptable. However, with **globalization and cultural shifts**, societal acceptance of **cohabitation** has gradually increased.

Legal Recognition:

Indian courts have upheld the legality of live-in relationships, citing the **Right to Life and Personal Liberty** under **Article 21** of the Constitution.

Landmark Judgments:

- **S. Khushboo v. Kanniammal (2010):** Recognized that **live-in relationships** fall under **personal liberty**.
- **Indra Sarma v. V.K.V. Sarma (2013):** Classified **live-in relationships** into different categories and extended protection under the **Protection of Women from Domestic Violence Act, 2005 (PWDVA)**.
- **D. Velusamy v. D. Patchaiah (2010):** Clarified that **only relationships resembling marriage** qualify for legal protection under domestic violence laws.

Protection Under Domestic Violence Act (PWDVA, 2005):

- Women in live-in relationships can seek **legal protection** under this act.
- **Section 125 of the Criminal Procedure Code (CrPC)** allows women to claim **maintenance**.

Inheritance & Maintenance Rights:

- **Children born from live-in relationships** have the same **inheritance rights** as those from legal marriages.
- The **Supreme Court** has upheld these rights in multiple cases.

Rules for Registering Live-in Relationships Under UCC:

The **UCC in Uttarakhand** mandates **registration of live-in relationships** for both **state residents** and individuals from other parts of India.

Registration Process:

- Couples must register their relationship at both **commencement and termination** stages.
- Documents required include **Aadhaar-linked OTP verification**, a **registration fee**, and in some cases, a **certificate from a religious leader** confirming eligibility for marriage.

Prohibited Relationships:

- The **UCC Act** lists **74 prohibited relationships**—37 for men and 37 for women.
- Couples falling within these **restricted categories** must obtain **approval from religious leaders or community heads**.



- The **registrar** has the authority to **reject registrations** if the relationship is deemed **against public morality or customs**.

Key Concerns and Impacts:

Privacy Concerns:

- The registration requirement raises concerns over **privacy violations**, as seen in the **Justice K.S. Puttaswamy v. Union of India** case.
- It could lead to **increased state surveillance** over personal lives.

Barriers for Interfaith and Inter-Caste Couples:

- The **approval requirement from religious leaders** may pose hurdles for **interfaith and inter-caste** relationships.

Rights of Women and Children:

- While women in live-in relationships can claim **maintenance**, these rights are **not absolute**.
- **Inheritance and legitimacy** of children need further legal clarity.

Potential for Misuse:

- Some individuals may **enter live-in relationships without long-term commitment** but later claim **legal rights**, leading to **legal disputes**.

Social and Cultural Challenges:

- These rules challenge **traditional family values** and raise **moral and ethical concerns**, especially in **conservative communities**.

Conclusion & Way Forward:

The **UCC in Uttarakhand** is a step towards **legal recognition and protection** for live-in relationships. However, **balancing regulation with personal freedom** is crucial to maintaining **social harmony**.

Aatmanirbharta in Pulses: A Step Towards Self-Sufficiency

Context: The Finance Minister has launched a **six-year mission** to achieve **self-reliance (Aatmanirbharta) in pulses**. This initiative aims to **increase domestic production**, reduce import dependency, and ensure food security.

Key Highlights of the Mission:

Budget & Objectives:

- **Budget Allocation:** 1,000 crore
- **Primary Focus:** Boosting the production of **Tur/Arhar (Pigeonpea)**, **Urad (Black Gram)**, and **Masoor (Red Lentil)**
- **Goal:** Achieve **self-sufficiency in pulses by 2029**, eliminating the need for imports
- **Support Mechanisms:** **MSP-based procurement** and **post-harvest warehousing solutions**



India's Import Dependency:

- In **2023-24**, pulse imports surged **84% year-on-year** to **4.65 million tonnes**, the highest in six years.
- Import costs increased by **93%**, reaching **\$3.75 billion**.
- **Major Import Sources:** **Canada, Australia, Myanmar, Mozambique, Tanzania, Sudan, and Malawi**.
- The Union Home Minister has set a goal to **completely stop pulse imports by 2028-29**.

India's Pulses Production:

India's Global Standing:

- **Largest Producer** – Contributes **25% of global production**
- **Largest Consumer** – Accounts for **27% of world consumption**
- **Largest Importer** – Imports **14% of the world's total pulses**

Key Production Insights:

- **Pulses cover 23% of India's total foodgrain area** and contribute **9-10% of total foodgrain production**.
- **Rabi pulses contribute over 60% of total production**.

Major Pulses Produced:

- **Gram (Chana)** – **40% share** in total production
- **Tur/Arhar** – **15-20% share**
- **Urad & Moong** – **8-10% each**
 - **Top Producing States:** **Madhya Pradesh, Maharashtra, and Rajasthan**
 - **Production Growth:**
- **2013-14:** 192.55 lakh tonnes
- **2021-22:** 273.02 lakh tonnes
- **2022-23:** 260.58 lakh tonnes: The increase in production is mainly due to **Chana and Moong cultivation**.



Challenges Hindering Pulses Production:

1. **Low Productivity:** Pulses are often considered a **low-priority crop** due to **unstable yields**.
2. **Cultivation in Marginal Lands:**
 - Traditionally grown as a **residual crop**, often in **rain-fed conditions** with poor soil fertility.
 - The **Green Revolution** prioritized **rice and wheat**, pushing pulses to **less fertile lands**, reducing productivity.
3. **Lack of Technological Advancements:** No **significant breakthroughs** in technology or **high-yielding seed varieties**.
4. **Lower Profitability for Farmers:**
 - Farmers perceive pulses as **less profitable** compared to wheat and rice.
 - **Low adoption of high-yielding varieties (HYV)** due to **limited awareness and accessibility**.
5. **Post-Harvest Losses: Storage Issues:** Excess moisture leads to **spoilage and pest attacks**, particularly by **pulse beetles**.

Government Initiatives to Boost Pulses Production:

1. **National Food Security Mission (NFSM-Pulses):** Aims to **expand cultivation areas** and **increase productivity** across all districts.
2. **Research & Development:** Indian Council of Agricultural Research (ICAR) is developing **high-yielding and climate-resilient seed varieties**.
3. **PM-AASHA Scheme:** Includes **Price Support Scheme (PSS)**, **Price Deficiency Payment Scheme (PDPS)**, and **Private Procurement Stockist Scheme (PPSS)** to ensure **Minimum Support Price (MSP)** for farmers.
4. **Integrated Scheme of Oilseeds, Pulses, Oil Palm, and Maize (ISOPOM):** Launched in **14 major pulse-producing states** to support production and marketing.
5. **Rashtriya Krishi Vikas Yojana (RKVY):** Encourages **state-level pulse development programs** to boost production.

The Road Ahead: Achieving Self-Sufficiency:

1. **Establishing Model Pulses Villages:** The government will **set up model villages** for pulses cultivation, starting from the **kharif season**.
2. **Utilizing Fallow Land:** Plans to **bring unused land** under **lentil cultivation** to increase output.
3. **Creating Seed Hubs:** **150 hubs** will be developed to **distribute high-yielding seeds** across key farming regions.
4. **Promoting Climate-Resilient Varieties:** The government will collaborate with **agricultural research institutions** to develop **drought and disease-resistant pulses**.
5. **Incentivizing Farmers & Crop Diversification:** Encouraging farmers to **cultivate pulses alongside traditional crops** to ensure **better income and reduced dependency on imports**.

Conclusion:

The **Mission for Aatmanirbharta in Pulses** is a **transformative initiative** aimed at making **India self-reliant in pulse production**. By **boosting domestic production**, **investing in technology**, and **providing farmer incentives**, India is on track to **reduce imports and strengthen food security**.

With strategic planning and execution, India can achieve complete self-sufficiency in pulses by 2029

AI-Driven Genetic Testing: Navigating the Challenges and Risks

Context: Artificial intelligence (AI) has revolutionized genetic testing by significantly accelerating the processing of genetic information. While this allows for faster analysis, it also magnifies the **risk of data breaches** and **security leaks**, posing challenges for privacy and data protection.

**The Human Genome Project (HGP): A Milestone in Genetic Research**

Launched in **1990**, the **Human Genome Project (HGP)** was a monumental 13-year initiative aimed at mapping the complete **DNA sequence** of the human genome. The primary goals were to:

- Identify the **20,000-25,000** genes within the human genome.
- Develop technologies to store, organize, and analyze vast amounts of **genomic data**.
- Address **ethical, legal, and social implications (ELSI)** arising from genetic discoveries.

The human genome consists of around **3 billion base pairs**, with genes distributed unevenly across the genome. Interestingly, over **9% of the DNA sequence** is identical in all humans, while just **0.1%** accounts for our individual differences. A significant portion of the genome is made up of **repetitive DNA sequences** with still-unknown functions.

AI's Role in Genomics: Unlocking New Potential:

AI has played a crucial role in the transformation of **genomic research**. It enables researchers to process and analyze **larger datasets** at unprecedented speeds. For instance:

- **John Hopkins researchers** used **machine learning** to analyze **junk DNA** (non-coding DNA), discovering its connections to **tumors** and opening new pathways for **cancer research**.
- AI algorithms can detect complex patterns in vast genetic datasets that would be nearly impossible to identify manually.
- AI is also capable of predicting **genetic disease-causing traits**, interpreting **gene-environment interactions**, and offering **personalized health insights**.

AI models can be continuously updated with the latest **scientific research**, ensuring that genetic analyses stay current.

Challenges with AI in Genetic Testing:

While AI-driven genetic testing offers numerous benefits, there are several challenges to be aware of:

- **Predicting Complex Outcomes:** Genetic tests cannot reliably predict complex outcomes like **job success** or **academic achievement**. Genetics plays only a **partial role** (around 30%), with other factors such as environment, education, and lifestyle also having significant influences.
- **Uncertain Diagnoses:** Genetic testing results can sometimes be **inconclusive**, particularly when dealing with **variations of unknown significance**. These may require further testing or family history analysis.
- **Ethical Dilemmas:** Genetic testing can raise profound **ethical concerns**, particularly when unexpected findings arise or when predictions are made about **mental health conditions**.
- **Limited Scope:** For example, **genetic testing for Alzheimer's** may identify **risk genes**, but it doesn't guarantee the disease. A person without the gene can still develop Alzheimer's, and conversely, someone with the gene may never develop it.



- **Proactive Health Measures:** The goal of genetic testing should be to offer **insights for preventative health** rather than make definitive diagnoses.

Ensuring Genetic Data Privacy and Security:

To reduce the risk of genetic data breaches and protect individuals' **privacy**, several measures can be implemented:

1. **Encryption:** Employ strong **encryption methods** to protect genetic data both during **transmission** and while **stored**.
2. **Access Control:** Limit access to genetic data to **authorized personnel only**. Use **multi-factor authentication** to enhance security for users handling sensitive data.
3. **Secure Storage:** Store genetic data in secure, controlled environments, such as **dedicated servers** or **cloud platforms** with robust security protocols.
4. **Regular Security Audits:** Conduct frequent **security audits** to identify and address vulnerabilities in the system.
5. **Anonymization:** Whenever possible, **anonymize** or **de-identify genetic data** used for AI training and analysis to minimize the risk of linking it back to individuals.
6. **Software Development Practices:** Adopt **secure software development practices** to minimize vulnerabilities in AI algorithms and software.
7. **Employee Training:** Educate employees who handle genetic data on **security best practices, data privacy regulations**, and the importance of protecting sensitive information.
8. **Transparency and Consent:** Ensure transparency with users about how their genetic data is being used and obtain **informed consent** before collecting or analyzing it.

Conclusion:

While **AI-driven genetic testing** holds immense promise in advancing healthcare, the associated **risks** and **ethical concerns** cannot be ignored. By addressing these challenges through improved data protection measures and ethical practices, we can ensure that the benefits of AI in genomics are realized without compromising individual privacy and security.

Health Insurance Coverage for 1 Crore Gig Workers

Context: The Union Finance Minister has announced that **gig workers** will now be eligible for **healthcare benefits** under the **Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (PMJAY)** scheme. This move aims to provide essential medical coverage to workers engaged in the growing **gig economy**.



Key Highlights of the Announcement:

- The overall **health budget** has seen an increase of over ₹9,000 crore this year.
- The funds will be utilized for **health infrastructure development**, expansion of the **Ayushman Bharat scheme**, and allocations for **All India Institute of Medical Sciences (AIIMS) Delhi**.
- The **PMJAY scheme** offers **health coverage of ₹5 lakh per family per year** for **secondary and tertiary care** across **public and private hospitals**.
- However, it remains unclear whether the **families of gig workers** will also be covered under the scheme.

Current Health Insurance Coverage in India (NITI Aayog Report):

- Only **10% of Indians** have purchased **private health insurance**.
- Nearly **60%** of the population is covered by **government-funded health schemes**.
- Around **400 million people (30%)** still **lack any form of health insurance**, leaving them vulnerable to medical expenses.

Who Are Gig Workers?

Gig workers are individuals engaged in **non-traditional, flexible, and temporary employment**. Unlike regular full-time employees, they **work as freelancers or independent contractors**, earning income through **short-term contracts** or **on-demand services**.

The term "gig" is borrowed from the music industry, where artists book **one-time performances** or short-term engagements. The **gig economy** thrives on **digital platforms** that connect freelancers with customers for services like:

- **Ride-hailing** (e.g., Uber, Ola)
- **Food delivery** (e.g., Zomato, Swiggy)
- **Freelance work** (e.g., Fiverr, Upwork)
- **Holiday rentals** (e.g., Airbnb)

The Growth of India's Gig Economy:

- In **2020**, approximately **7.7 million workers** were engaged in gig-based employment.
- By **2029-30**, the number is expected to **increase to 23.5 million**, making up **4.1%** of India's total workforce.
- The gig workforce comprises **47% medium-skilled**, **22% high-skilled**, and **31% low-skilled** jobs.
- The sector is projected to contribute **1.25% to India's GDP by 2030**, with the potential to create **90 million jobs** in the long run.



Why Are Gig Workers on the Rise?

1. **Post-Pandemic Surge** – The **COVID-19 pandemic** accelerated gig work as people sought flexible employment while homebound consumers relied on delivery services.
2. **Work-from-Anywhere Flexibility** – Gig work allows individuals to **choose their own work hours** without being tied to an office.
3. **Technological Advancements** – **Smartphones and high-speed internet** have made remote and freelance work more accessible.
4. **Cost-Effective for Businesses** – Small companies that cannot afford **full-time employees** often hire freelancers for **short-term projects**.
5. **Employer Benefits** – Companies save money by **not providing health insurance, provident funds, or bonuses**, making gig workers a more economical option.

Challenges Faced by Gig Workers:

- **Lack of Work-Life Balance** – The **unstructured nature** of gig jobs can disrupt **personal life**, sleep schedules, and mental health.
- **Reduction in Full-Time Jobs** – As companies **replace permanent employees** with gig workers, job security is threatened.
- **No Employment Benefits** – Unlike regular employees, gig workers **do not receive health insurance, paid leave, or retirement benefits**.
- **Uncertain Income** – Gig workers face **income instability**, as work availability is **inconsistent**.

Government Initiatives for Gig Workers:

1. Code on Social Security, 2020:

- The **Indian government** introduced this code to ensure **social security benefits** for gig and platform workers.
- It covers **life and disability insurance, accident protection, health benefits, maternity benefits, and retirement security**.
- However, these provisions **have not yet been implemented**.

2. e-Shram Portal (2021):

- Launched to create a **comprehensive national database** of **unorganized workers**, including gig workers.
- Allows self-registration across **400 occupations**, ensuring easier access to **welfare schemes**.

Conclusion:

Unlike traditional employees, **gig workers lack employer-backed health coverage**, making them highly vulnerable to **unexpected medical expenses**. Many of them struggle to afford private health insurance, and **catastrophic healthcare costs** could push them into financial distress.

Providing **government-backed health insurance** through **PMJAY** is a crucial step in ensuring **financial security** and **better healthcare access** for gig workers. However, **clearer guidelines** are needed regarding whether **families of gig workers** will also benefit. As India's **gig economy expands**, ensuring the **well-being and social security** of gig workers will be essential for sustainable growth.



100% FDI in India's Insurance Sector: A Game-Changer

Context: Finance Minister **Nirmala Sitharaman** has announced the **increase in Foreign Direct Investment (FDI) limit in the insurance sector to 100%**, up from the previous cap of **74%**. This move aims to **attract more foreign investment**, boost the sector, and improve financial security for Indian citizens.

Global Perspective on FDI in Insurance:

Several **major economies** have already allowed **100% FDI** in their insurance sectors, including:

- **Canada**
- **Brazil**
- **Australia**
- **China**

Aligning **India** with these global standards is expected to **make the Indian insurance market more attractive to foreign investors** and **foster competition and innovation**.

Transformation of India's Insurance Sector

India's **insurance industry** has come a long way from being **dominated by the Life Insurance Corporation (LIC)** to a dynamic market with multiple players.

Key Factors Driving the Transformation:

- **Economic growth** leading to higher disposable incomes.
- **Technological advancements** enabling digital insurance platforms.
- **Changing demographics** with a younger, financially aware population.
- **Increased consumer awareness**, especially post-COVID-19, about financial security.

The insurance industry continues to play a **crucial role in India's economic stability** and development.

A Historical Perspective on Insurance in India:

Did you know? The **concept of insurance in India** dates back to **ancient times**!

- References to **insurance-like practices** can be found in **Manusmriti**, **Yagnavalkya's Dharmashastra**, and **Kautilya's Arthashastra**.
- These texts discuss **pooling resources** to provide **financial aid during calamities** like fires, floods, epidemics, and famines.
- Early forms of **marine trade loans and carrier contracts** were used to **mitigate trade and transport risks**.

Current Insurance Penetration in India:

Despite **steady growth**, **insurance penetration in India** remains **below the global average**:

- **India's insurance penetration** dropped from **4% in FY23 to 3.7% in FY24**, despite a **7.7% increase in total premiums** (₹11.2 lakh crore).
- **Life insurance penetration** fell from **3% in FY23 to 2.8% in FY24**.
- **Non-life insurance penetration** remains at **1%**.
- **Global average insurance penetration** is **7%**, highlighting the **huge growth potential** in India.

Why Is Insurance Penetration Low in India?

- **Limited awareness** about the benefits of insurance.
- **Economic constraints** preventing people from purchasing policies.





- Preference for traditional financial practices, such as gold and fixed deposits.

Conditions for 100% FDI in Insurance:

- The **increased FDI limit** will only apply to **companies that invest the entire premium amount in India**.
- The **Insurance Regulatory and Development Authority of India (IRDAI)** will **continue to regulate the sector**, ensuring compliance with Indian laws and protecting policyholders.
- The government is reviewing and **simplifying foreign investment regulations** to encourage more participation.

Impact of 100% FDI on the Insurance Industry:

Since **2000**, India's insurance sector has **already attracted ₹82,847 crore in FDI**, boosting the market's expansion.

Potential Benefits:

- The sector is expected to **grow at a rate of 7.1% annually** over the next five years.
- **Increased foreign capital** will help **reduce insurance under-penetration** in India.
- Adoption of **global best practices** will lead to **better products and services**.
- Access to **long-term capital**, advanced **technology**, and improved **distribution networks**.
- Higher **competition**, resulting in **better pricing and service for customers**.

How Will Customers Benefit?

- **More insurers in the market** will create **competitive pricing** and **better policy options**.
- Increased foreign participation will **improve customer service standards**.
- **Higher insurance penetration** will **close the protection gap**, offering financial security to more Indians.
- **Premiums will be invested in India**, contributing to domestic economic growth.

Challenges for Foreign Insurers:

While **100% FDI** brings many opportunities, foreign insurers **may face challenges** in entering the Indian market:

1. **Complex Distribution Networks** – India's **private life insurance sector** relies heavily on **bank-led distribution**, while **non-life insurance** depends on **agency channels**.
2. **Adapting to Indian Market Needs** – Many foreign insurers **will need to adjust their business models** to suit India's **unique regulatory environment and customer preferences**.
3. **Existing Joint Ventures (JVs)** – Many foreign players are already in **JVs with Indian companies**. Restructuring these agreements could **take time**.

Conclusion and Way Forward:

The **insurance sector** is a **critical pillar of India's economy**, providing financial stability and protection to millions.

- The **100% FDI policy** will help attract **global insurers** seeking **greater control over their Indian operations**.
- It aligns with the government's vision of **"Insurance for All" by 2047**, which will require **substantial capital investment**.
- The government is also considering **policy revisions** related to **management structures and board composition** to encourage foreign participation.
- According to the **Economic Survey**, insurers should **focus on Tier 2, Tier 3 cities, and rural areas** to improve penetration.
- **Innovative distribution models** can help include underinsured populations, especially those covered under government schemes like:
 - Pradhan Mantri Jeevan Jyoti Bima Yojana
 - Pradhan Mantri Fasal Bima Yojana
 - Pradhan Mantri Jan Arogya Yojana



Rupee Falls Below 87 Against the Dollar: Causes, Impact & Way Forward

Context: The Indian Rupee (INR) has hit a **record low**, breaching the **87-mark** against the **US Dollar**, reflecting both **global economic shifts** and **domestic financial challenges**. This depreciation has raised concerns across markets, businesses, and policymakers.

**Key Reasons Behind the Rupee Depreciation:****1. Strengthening of the US Dollar:**

- The **US Dollar Index** surged **1.24% to 109.84**, indicating increased investor confidence in the **US economy**.
- Strong **US job data** and **higher interest rate expectations** have made the **dollar more attractive** for investors.
- Rising **US Treasury yields** have further boosted demand for the dollar, leading to capital outflows from emerging markets like **India**.

2. Intensifying Global Trade Tensions:

- The **US-China trade war** has escalated, with **tariffs on Canadian, Mexican, and Chinese goods** creating uncertainty in global trade.
- **Canada and Mexico**, which export goods worth **\$840 billion** to the **US**, have introduced **retaliatory tariffs**.
- **China** is facing a **10% tariff**, leading to a **weaker Yuan**, which has **indirectly impacted the Indian Rupee**.

3. Foreign Investor Outflows:

- **Foreign Institutional Investors (FIIs)** have been **offloading Indian assets**, pulling out **\$11 billion** in **Q3 FY25** alone.
- This significant **capital flight** has put immense **pressure on the rupee**.

4. Rising Trade Deficit:

- **India's trade deficit** has ballooned to **\$188 billion**, marking an **18% rise** from the previous fiscal year.
- The country's **heavy reliance on crude oil imports** has further **intensified currency pressure**.

5. RBI's Forex Intervention & Policy Response:

- The **Reserve Bank of India (RBI)** has been **actively intervening in the forex market**, selling **\$3.3 billion** in reserves over the last **seven weeks** to stabilize the rupee.
- However, with **inflation concerns mounting**, markets are **closely watching** the upcoming **RBI monetary policy review** for possible measures.

Impact of a Weak Rupee:**Challenges of Rupee Depreciation:****Higher Import Costs & Inflation:**

- A **weaker rupee** makes imports—especially **crude oil, electronics, and machinery**—more expensive.



- This leads to **higher production costs**, causing **inflationary pressures** on the economy.

Increased Debt Burden for Companies:

- **Businesses with foreign currency loans** will now **pay more** due to rupee depreciation.
- This could impact their **profitability and future investment plans**.

Capital Outflows & FDI Concerns:

- A falling rupee may **discourage foreign direct investment (FDI)**, as **global investors seek more stable markets**.
- This could lead to **economic volatility and slower growth**.

Weakened Consumer Sentiment:

- A **weaker rupee reduces purchasing power**, making goods and services costlier.
- This could **dampen demand** and impact **overall economic growth**.

Potential Benefits of a Weak Rupee:

Boost for Exporters:

- A **weaker rupee makes Indian exports more competitive**, benefiting industries such as:
 - **IT & Software Services**
 - **Pharmaceuticals**
 - **Textiles & Manufacturing**
- Companies earning in **dollars will see increased profits** when converted into rupees.

Higher Remittances from NRIs:

- **Indians working abroad** will benefit from **better exchange rates**, leading to **higher remittance inflows**.
- This can **support domestic consumption and economic stability**.

Encouraging Self-Reliance:

- The depreciation highlights the **need for India to focus on self-sufficiency**, rather than relying on **exchange rate advantages** to boost trade.
- Encouraging **domestic manufacturing** and **reducing import dependency** could help in the long run.

Conclusion & The Road Ahead:

The **rupee's depreciation** is a result of **global economic factors, trade tensions, and domestic challenges**. While the short-term effects include **higher inflation and capital outflows**, the long-term impact depends on **India's economic policies and resilience**.

The **government and RBI** must take **strategic measures** such as:

- **Strengthening forex reserves** to combat currency volatility.
- **Encouraging domestic manufacturing** to reduce import dependency.
- **Enhancing export competitiveness** through policy support.

As the **global economic scenario evolves**, **India's economic strategy** will play a crucial role in **stabilizing the rupee and ensuring sustained economic growth**.



India's Nuclear Energy Roadmap: Vision 2047 & Union Budget 2025-26

Context: The Indian government has unveiled an ambitious plan to achieve **100 GW of nuclear power capacity by 2047**, aligning with the **Viksit Bharat** vision. This initiative aims to **enhance energy security, ensure sustainability, and reduce dependence on fossil fuels**.

Key Highlights of India's Nuclear Energy Mission:**1. Expanding Nuclear Capacity:**

- **Target:** 100 GW by 2047 (Current capacity: 8 GW).
- **Ongoing Construction:** 10 new nuclear reactors (8 GW) across Gujarat, Rajasthan, Tamil Nadu, Haryana, Karnataka, and Madhya Pradesh.
- **New Project Approval:** A 6×1208 MW nuclear plant in Andhra Pradesh, in collaboration with the United States.

**2. Boosting Small Modular Reactors (SMRs):**

- **Budget Allocation:** ₹20,000 crore for R&D and indigenous SMR development.
- **Goal:** Five operational SMRs by 2033.
- **Objective:** Deploy scalable and efficient power solutions for industries and remote locations.

3. Strengthening Nuclear Legislation:

To facilitate private sector participation, the government plans to amend key legislations:

- **Atomic Energy Act, 1962** – Establishes a regulatory framework for nuclear energy development.
- **Civil Liability for Nuclear Damage Act, 2010** – Ensures compensation mechanisms for nuclear-related incidents.

Bharat Small Reactors (BSRs) & Bharat Small Modular Reactors (BSMRs)

The government is introducing BSRs and BSMRs to create **cost-effective, safer, and scalable nuclear solutions**.

Bharat Small Reactors (BSRs):

- **220 MW Pressurized Heavy Water Reactors (PHWRs)** with a strong safety record.
- **Compact land requirement**, making them ideal for industrial hubs like steel, aluminum, and manufacturing units.
- **Public-Private Model:**
 - Private sector provides land, cooling water, and capital.
 - NPCIL ensures design, quality assurance, and operations.

Bharat Small Modular Reactors (BSMRs):

- **Definition:** Advanced nuclear reactors with a capacity of up to 300 MW(e) per unit.
- **Advantages:**
 - Modular construction for faster deployment.
 - Can be used to repurpose coal plants and stabilize renewable energy grids.



- Potential for hydrogen production through high-temperature gas-cooled reactors.

Government Initiatives for Nuclear Expansion:

The Union Budget 2025-26 has laid out a **comprehensive roadmap** to boost **nuclear capacity**, enhance **R&D**, and adopt advanced reactor technologies.

1. Scaling Up Nuclear Power:

- **Capacity Growth:** From 8,180 MW to 22,480 MW by 2031-32.
- **New Projects:** 10 additional reactors in the pipeline, expected to be operational by 2031-32.

2. Fast Breeder Reactor (FBR) Development:

- **Prototype Fast Breeder Reactor (PFBR)** – 500 MW achieved **critical milestones** in 2024.
- **Supports India's closed nuclear fuel cycle strategy**, ensuring **sustainable fuel utilization**.

3. Uranium Exploration & Resource Utilization:

- Recent discoveries have extended the life of **Jaduguda Mines** by over 50 years.
- **Ongoing R&D on Thorium-based reactors**, leveraging **India's vast Thorium reserves**.

4. Public-Private Collaboration:

- **NPCIL & NTPC formed the ASHVINI JV** to develop nuclear power projects.
- **Encouraging private sector investments** while ensuring regulatory compliance.

Ensuring Safety, Sustainability & Global Commitments:

1. Stringent Safety Standards:

- **Indian nuclear power plants** maintain **radiation levels** well below **global benchmarks**.
- **Regular safety assessments and technology upgrades** enhance **plant security**.

2. Aligning with International Climate Goals:

- **Commitment to COP26 targets** – Achieving **500 GW of non-fossil fuel energy** by 2030.
- **Fulfilling Paris Agreement obligations** for a **sustainable energy transition**.

3. Advancing Thorium-Based Technology:

- **Research on Molten Salt Reactors (MSRs)** to harness **India's abundant Thorium reserves**.
- **Potential to establish India as a global leader** in **next-generation nuclear energy**.

Conclusion: The Future of India's Nuclear Power

The Union Budget 2025-26 highlights the **government's commitment** to **nuclear energy expansion**, ensuring **energy security**, **reduced carbon emissions**, and **long-term sustainability**.

The **Nuclear Energy Mission for Viksit Bharat** is a **strategic step** towards making India a **global hub** for **advanced nuclear technology**. With **strong policy backing**, **innovative reactor designs**, and **public-private partnerships**, **India's nuclear sector** is poised for **unprecedented growth**, securing the nation's place in a **clean energy-driven future**.

**Asteroid 2024 YR4: A Potential Threat to Earth & NASA's Planetary Defense Measures**

Context: NASA and the **European Space Agency (ESA)** are closely tracking **asteroid 2024 YR4**, which has a **1.2% chance of colliding with Earth on December 22, 2032**. While experts suggest there is a **99% probability it will miss**, further observations are needed to refine its trajectory.

**What is an Asteroid?**

- **Asteroids** are **rocky celestial bodies** orbiting the Sun, primarily found in the **asteroid belt** between **Mars and Jupiter**.
- Unlike planets, they have **irregular shapes and smaller sizes**.
- Formed **4.6 billion years ago**, they are remnants of the **early solar system**.
- Some asteroids cross **Earth's orbit** and are classified as **Near-Earth Objects (NEOs)**, requiring **continuous monitoring**.

How Often Do Asteroids Hit Earth?**Frequent but Harmless Entries:**

- **Thousands of asteroids** enter **Earth's atmosphere daily**, but most **burn up due to friction**, appearing as **meteors or fireballs**.
- Small fragments may **reach the surface** but usually cause **minimal damage**.

Impact of Large Asteroids:

- **Asteroids over 1 km wide**, like the one that led to the **dinosaur extinction**, strike Earth **once every 260 million years**.
- Given the **vastness of space**, such **catastrophic collisions are rare**.

Threat from Smaller Asteroids:

- While smaller asteroids **don't cause mass extinctions**, they can cause **regional devastation**.
- **Example:** The **Chelyabinsk meteor (2013)**, which was just **20 meters wide**, exploded with the force of **500 kilotons of TNT**, **injuring 1,500 people** and **damaging thousands of buildings**.
- An asteroid **40 meters wide** could **destroy an entire city**, depending on its **speed and angle of impact**.

NASA's Asteroid Deflection Strategies:

NASA and other space agencies are **actively working on planetary defense mechanisms** to **prevent asteroid collisions** with Earth.

DART Mission: A Breakthrough in Asteroid Deflection:

- **NASA's Double Asteroid Redirection Test (DART)** was the **first mission** to test asteroid deflection.
- **In 2022**, the **DART spacecraft** successfully **collided with the asteroid Dimorphos**, altering its trajectory.
- Although **Dimorphos was not a threat**, the mission **proved that asteroid deflection is possible**.

Asteroid 2024 YR4: A Closer Look**Discovery and Characteristics:**

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- **Discovered:** December 2023 by a **telescope in Chile**.
- **Size:** Estimated to be between **40 to 100 meters** (similar to a football field).
- **Recent Close Approach:** Passed **800,000 km from Earth** on **Christmas Day 2023**—twice the **Moon's distance**.
- **Next Appearance:** Will re-enter visibility in **2028**.

Current Observations & Challenges:

- **Scientists are racing against time** to study 2024 YR4 before it becomes **too faint by mid-April**.
- Determining its **exact size** is difficult, as brightness depends on **reflectivity**. A **small bright asteroid** can appear as luminous as a **large dark one**.

Potential Destruction from 2024 YR4:

NASA's Risk Assessment: Torino Scale Rating:

- **NASA's Center for Near-Earth Object Studies (CNEOS)** has given **2024 YR4** a **Torino Scale** rating of **3 (moderate risk)**.
- **The Torino Scale** categorizes potential asteroid threats on a scale of **0 to 10**, where **higher numbers** indicate **greater danger**.
- **For comparison:** The asteroid **Apophis** was initially rated **4**, but further studies **downgraded its risk**.

Energy Release & Impact Comparison:

- If **2024 YR4 collides with Earth**, it could release **8 to 10 megatons of energy**.
- **By contrast:**
 - The **Chelyabinsk meteor** released **500 kilotons** and caused **widespread damage**.
 - **2024 YR4 is nearly twice the size**, meaning its **impact could be far more devastating**.

Conclusion: Should We Be Concerned?

While **2024 YR4 poses a potential risk**, the **chances of impact remain low**. **Ongoing observations** will refine its trajectory and help determine **if defensive measures are needed**.

NASA's advancements in **asteroid tracking and deflection technology**, including missions like **DART**, ensure that **humanity is better prepared than ever to handle asteroid threats**. However, **continued research and planetary defense strategies** remain crucial in **protecting Earth from future space hazards**.

**India's Ethanol Blending Success: Achieving 20% Ethanol in Petrol Ahead of Schedule**

Context: India is set to achieve its **20% ethanol blending target** within the next two months—**well ahead of the original 2026 deadline**. This major milestone will see the country producing **1,100 crore litres of ethanol annually**, strengthening **energy security**, reducing crude oil imports, and benefiting farmers.

Key Sources of Ethanol Production:

To maintain a **stable ethanol supply**, the government is diversifying its sources. The main contributors include:

- **Sugar and Molasses** – Estimated to produce **400 crore litres** per year.
- **Food Corporation of India (FCI) Rice** – Expected to generate **110 crore litres** of ethanol.
- **Broken Rice and Maize** – Combined contribution of **400 crore litres** annually.

With **distillery capacity expanded to 1,600 crore litres**, the government is ensuring production stability through **subsidies, incentives, and infrastructure investments**.

Maize: A Key Player in Ethanol Production

Maize is emerging as a **crucial ethanol feedstock**, with its **cultivation and imports** rising significantly.

Recent Developments in Maize Production:

- **Maize imports soared** in 2024, with India **importing 100 crore worth of maize** between April and June alone.
- **Cultivation expanded by 10%**, leading to increased yields and greater availability.
- **Major maize-producing states:** Karnataka, Madhya Pradesh, Maharashtra, Andhra Pradesh, Rajasthan, Bihar, and Uttar Pradesh.
- **Ethanol Year 2024-25** is expected to produce **42 million tonnes of maize**, with **9 million tonnes** allocated for ethanol.

Experts predict that **higher domestic maize production** will **reduce import dependency** and create a **sustainable ethanol supply chain** in the future.

Government Initiatives to Boost Ethanol Production:

The government has introduced several **policy measures and incentives** to accelerate ethanol production:

- **Lowered FCI Rice Prices** – The cost of FCI rice for ethanol production has been reduced from **28/kg to 22.5/kg**, making production more cost-effective.
- **Dual-Feed Distilleries** – Sugar mills are being modified to **produce ethanol from both sugarcane and maize**, increasing flexibility.
- **Financial Incentives** – Ethanol producers benefit from **subsidized loans, guaranteed procurement, and long-term contracts**, encouraging large-scale production.

These measures are not only **strengthening ethanol output** but also ensuring **better economic benefits for farmers**.

Economic & Environmental Impact of Ethanol Blending:**Cutting Down India's Oil Import Bill:**

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India spends **10.5 lakh crore annually** on crude oil imports. By blending ethanol, the country can **save 6,000 crore** for every 100 crore litres of ethanol produced.

Boosting Farmer Incomes:

Rising ethanol demand is encouraging **farmers to cultivate maize**, offering **higher earnings** compared to traditional crops.

Promoting a Sustainable Fuel Alternative:

Ethanol is a **clean, renewable fuel** that significantly **reduces carbon emissions**, aligning with **India's climate goals** and **energy security strategies**.

Challenges & The Road Ahead:

Despite the rapid progress, there are some **challenges that need to be addressed**:

- **Impact on Food Security** – Diverting **more maize for ethanol** may impact **poultry, livestock feed, and food availability**.
- **Infrastructure Development** – More **distilleries and supply chain improvements** are required to **handle increased production**.
- **Price Stability** – Maintaining **ethanol affordability** while ensuring that **food prices remain unaffected** is a key challenge.

The Future of Ethanol in India:

Despite these hurdles, **ethanol blending is transforming India's energy landscape**. It is promoting **self-reliance, sustainability, and economic growth**.

Conclusion:

India's early achievement of **20% ethanol blending** is a **landmark step** toward a **cleaner and more energy-secure future**. With **strong policy backing, increased maize production, and expanding ethanol distilleries**, the country is poised to:

- **Reduce dependence on oil imports**
- **Empower farmers with better income opportunities**
- **Enhance environmental sustainability**

Moving forward, **continued investment, advanced technology, and a balanced approach to food security and fuel production** will be crucial in making **India a global leader in biofuels**.

The Future of USAID: Global Implications and Potential Shutdown

Context: The **United States Agency for International Development (USAID)** faces an uncertain future as the **Trump administration** considers merging it with the **U.S. Department of State**. This move would involve **major funding cuts** and a possible **downsizing of USAID's workforce**, raising concerns about the future of **U.S. humanitarian aid** and its global impact.



What is USAID? Understanding Its Role and Importance

Origins and Mission:

Established in the **1960s** under the **Foreign Assistance Act of 1961**, USAID is legally mandated by **Congress** to oversee and administer **U.S. international aid programs**.

Key Areas of Focus:

Operating in **over 60 countries** with a workforce of nearly **10,000 personnel**, USAID plays a vital role in:

- **Food Security** – Provides famine relief and operates an advanced **food shortage prediction system**.
- **Healthcare** – Funds **vaccination programs**, **pandemic prevention**, and **global disease control efforts**.
- **Infrastructure & Development** – Supports **clean water initiatives**, **disaster relief**, and **economic growth programs**.
- **Humanitarian Assistance** – Aids war-affected regions such as **Ukraine** and **sub-Saharan Africa**.

USAID's Budget and Global Spending:

The **U.S. remains the world's largest donor**, allocating **\$68 billion** to international aid in 2023. USAID received the **largest share—\$40 billion**—most of which was directed toward **Asia, Africa, and Europe**, particularly **Ukraine**.

In comparison, **the U.K. and other global powers** spend significantly less on international aid, highlighting the **U.S.'s dominant role in global humanitarian efforts**.

Why is the Trump Administration Targeting USAID?

Criticism of Foreign Aid Spending:

- **Donald Trump** has long criticized **foreign aid**, claiming it **wastes U.S. taxpayer money**. He issued an **executive order pausing international spending** for 90 days, causing **multiple aid programs to be suspended**.
- **Public Opinion** – Polls show that many **American voters favor reducing foreign aid**, aligning with Trump's stance.
- **Elon Musk's Influence** – A key **Trump advisor**, Musk has **pushed for drastic spending cuts**, leading to tensions between USAID and the administration.

Consequences of the Spending Freeze:

- **Critical programs**, such as **medical aid and clean water initiatives**, faced immediate disruptions.
- **Security concerns** arose when reports suggested that **prison guards in Syria**, responsible for detaining **Islamic State militants**, nearly **abandoned their posts** due to funding shortages.



- **International humanitarian organizations** described the spending freeze as a **severe disruption** to global aid efforts.

Can the U.S. President Unilaterally Shut Down USAID?

Although the Trump administration is considering **dismantling USAID**, completely shutting it down would require congressional approval.

A **possible alternative** would be to **merge USAID with the State Department**, similar to how the **U.K. integrated its international aid department with the Foreign Office in 2020**. This restructuring would **limit USAID's independence** while keeping some aid functions intact.

What Would Be the Global Impact of USAID's Closure?

Humanitarian Consequences:

- **Critical aid programs**, such as **mine clearance**, **pandemic response**, and **prosthetic aid for war victims**, would be at risk.
- Millions of vulnerable populations **rely on USAID funding** for **healthcare**, **food security**, and **disaster relief**.

Foreign Policy Implications:

- Critics argue that **reducing U.S. foreign aid** would **weaken American global influence** and **harm diplomatic relationships**.
- Countries that depend on **U.S. assistance** could **turn to other global powers** for aid, altering global alliances.

Security Risks:

- USAID funding plays a role in **stabilizing conflict zones**—its removal could lead to **greater instability and security threats**.
- **Counterterrorism efforts** may be undermined, especially in **regions where USAID supports governance and development programs**.

Geopolitical Shifts:

- A weakened **U.S. aid presence** could create an **opportunity for China** to expand its **global influence** by offering alternative **development projects and investments**.

Conclusion:

The **proposed restructuring or closure of USAID** marks a **major shift in U.S. foreign policy**, aligning with **Trump's "America First" strategy**. While **supporters argue that reducing foreign aid saves taxpayer money**, critics warn that such a move **could have severe humanitarian, diplomatic, and security consequences**.

Beggar-Thy-Neighbour Policies: A Growing Threat to Global Trade

Context: The term "Beggar-Thy-Neighbour" has resurfaced as a major concern amid **rising trade tensions** and **currency devaluations**, particularly between economic giants like the **United States and China**. These policies, aimed at boosting **domestic economies**, often come at the expense of other nations, triggering **trade wars** and economic instability.



What Are Beggar-Thy-Neighbour Policies?

Beggar-thy-neighbour policies refer to **protectionist economic strategies** that benefit one nation while harming others. These policies typically include:

- **High Tariffs** – Imposing taxes on imported goods to protect domestic industries.
- **Strict Import Quotas** – Limiting the number of foreign products allowed in the market.
- **Currency Devaluation** – Weakening the domestic currency to make exports cheaper and imports more expensive.

While these measures may provide short-term benefits to **domestic industries**, critics warn that they can **cripple international trade**, leading to **economic slowdowns**, as seen during **the Great Depression**.

How Do These Policies Work?

Governments adopt beggar-thy-neighbour policies to **shield local industries from foreign competition**. However, these actions often provoke **economic retaliation** from other countries, creating a **dangerous cycle of protectionism**.

Key Examples:

1. **Trade Barriers** – Nations impose **high tariffs** and **import restrictions**, making foreign goods **more expensive**.
2. **Currency Manipulation** – Countries **deliberately weaken** their currency to **boost exports** and discourage imports, causing trade imbalances.

Historical Origins:

The term was first introduced by **Scottish economist Adam Smith** in his 1776 book, "**The Wealth of Nations**."

Smith **criticized mercantilist policies**, arguing that **free trade benefits all nations**, while **protectionism leads to long-term economic decline**.

Arguments in Favor of These Policies:

Protecting Domestic Industries & Jobs:

- Governments often **shield key industries** to **preserve jobs** and **ensure national security**.
- **New industries** may require **temporary protection** to become competitive in the global market.

Boosting Exports Through Currency Devaluation:

- A weaker domestic currency makes **exports cheaper** and **more competitive**, leading to a **trade surplus**.
- **Higher exports** and **lower imports** can **strengthen the national economy**.

Criticism & Global Consequences:

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Trade Wars & Economic Retaliation:

- **Tit-for-tat tariffs** often escalate into full-blown **trade wars**, reducing global trade and economic growth.
- The **interwar period (1918-1939)** saw widespread protectionist policies, **worsening the Great Depression**.

Recent Examples of Protectionism:

- **China & Japan** have been accused of **currency devaluation** to maintain their **trade surpluses**.
- The **U.S.-China Trade War (2018-2020)** involved **heavy tariffs**, disrupting global markets.

Impact on Consumers

Higher Prices for Goods:

- **Tariffs on imports** raise the cost of **foreign goods**, increasing **consumer expenses**.
- Example: **U.S. tariffs on Chinese products** helped **American manufacturers** but **raised prices** for **American consumers**.

Reduced Purchasing Power:

- **Currency devaluations** may boost **exports**, but they also **weaken purchasing power**, making **domestic goods** more expensive.

An Alternative Approach: Unilateral Free Trade

Avoiding Retaliatory Tariffs:

Some economists argue that **imposing tariffs harms domestic consumers** more than it helps.

- Example: If the **U.S. imposes tariffs on Chinese goods**, China retaliating with **its own tariffs** will **further harm its own consumers**.

The Free Trade Advantage:

- Free trade advocates believe that **one country can benefit** by avoiding **retaliatory tariffs**, allowing it to **profit from another nation's protectionist mistakes**.

Conclusion:

Beggar-thy-neighbour policies may **seem beneficial** for a country in the short run, but they **threaten global economic stability** in the long term. **Trade wars, rising prices, and reduced global cooperation** are just some of the negative consequences.

Home Ministry's Directive: Preventing the Misuse of the State Emblem of India

Context: The Union Home Ministry has directed State Governments to take strict measures to prevent the misuse and improper depiction of the State Emblem of India. The Ministry emphasized that the Lion Capital emblem is incomplete without the national motto, "Satyameva Jayate" written in Devanagari script.



Concerns Raised by the Government:

Incorrect Use of the Emblem:

- Many government agencies display the State Emblem on official documents, seals, vehicles, buildings, and websites without including the motto "Satyameva Jayate."
- Such an incomplete representation does not conform to Appendix I & II of the Schedule under the State Emblem of India (Prohibition of Improper Use) Act, 2005.
- Violating these guidelines amounts to a legal offense.

What is the State Emblem of India?

The State Emblem of India is the official seal of the Government of India, adapted from the Sarnath Lion Capital of Emperor Ashoka.

Key Features of the Emblem:

- Three lions standing on an abacus (the fourth lion is hidden from view).
- A Dharma Chakra (Wheel of Law) at the center of the abacus.
- A bull on the right and a galloping horse on the left of the Dharma Chakra.
- Smaller Dharma Chakras on the extreme right and left.
- The national motto "Satyameva Jayate" written in Devanagari script below the emblem.

Misuse by Unauthorized Individuals and Organizations:

- Many unauthorized individuals and authorities illegally use the State Emblem on their stationery, vehicles, and websites.
- The State Emblem of India is reserved only for specific government authorities as per:
 - The State Emblem of India (Prohibition of Improper Use) Act, 2005.
 - The State Emblem of India (Regulation of Use) Rules, 2007.

Strict Action Against Misuse:

Legal Consequences for Violators:

- Officials responsible for the incomplete display of the emblem will face action.
- Unauthorized individuals and organizations using the emblem illegally will be penalized.
- Punishment includes:
 - Imprisonment of up to 2 years.
 - A fine of up to 5,000.
 - Or both.



- **Falsely claiming** the right to use the emblem is also a **punishable offense**.

Government's Authority to Enforce the Law:

- The **Central Government** holds the authority to **frame rules, regulate use, and impose restrictions** on the **State Emblem of India**.
- The government can **seize or confiscate** any **unauthorized usage** of the emblem.

Conclusion:

The **State Emblem of India** is a **symbol of national dignity and sovereignty**. The **Home Ministry's directive** ensures that it is **used responsibly and displayed correctly**. By enforcing **strict laws and punishments for misuse**, the government aims to **protect the integrity** of this **national symbol** and uphold **legal compliance**.



**Supreme Court to Assam: Deport Foreigners, Don't Detain Them Indefinitely**

Context: On February 4, 2025, the Supreme Court of India strongly criticized the Assam government for keeping foreigners in detention camps indefinitely instead of deporting them. The court emphasized that individuals declared as foreigners should not be detained for eternity and urged authorities to resolve nationality verification and deportation issues effectively.

**Nationality Verification Crisis:**

- The Assam government revealed that nationality verification forms had not been sent to the Ministry of External Affairs due to a lack of proper addresses of the detainees in their native country.
- This has resulted in foreigners being stuck in detention centers for over a decade, making them effectively stateless individuals.

Supreme Court's Directives to the Centre and State:

- The Union Government was ordered to clarify how cases involving individuals with unknown nationality are being handled.
- The Centre must submit a detailed report listing:
 - The number of declared foreigners.
 - The total number of deportations so far.
- The Assam government was asked to file a proper affidavit detailing the steps taken for compliance with the court's directives.

Challenges in the Deportation Process:

- India and Bangladesh have been unable to resolve the issue of repatriation.
- India claims these individuals are not Indian citizens, while Bangladesh refuses to accept them, leaving them stateless.
- As a result, some foreigners have remained in detention for over 10 years with no resolution in sight.

Monitoring of Detention Camps:

- The Supreme Court instructed the Assam State Legal Services Authority to conduct surprise inspections at the Matia transit camp for foreigners.
- The purpose of these visits is to:
 - Ensure proper hygiene.
 - Check food quality provided to detainees.
- The court reiterated that Article 21 of the Indian Constitution guarantees the right to life and personal liberty to all individuals, including foreigners.

Understanding Foreigners Tribunals (FTs):

Foreigners Tribunals (FTs) are quasi-judicial bodies set up under the Foreigners (Tribunals) Order, 1964, framed under Section 3 of the Foreigners Act, 1946.

**Functions of FTs::**

- They determine the **citizenship status** of individuals **suspected to be foreigners**.
- They handle cases **referred by local authorities**.

Foreigners (Tribunals) Order, 2019 – Key Amendments:

- **Outlines the procedure** for appeals against **National Register of Citizens (NRC)** decisions.
- **Empowers District Magistrates** across India to establish **Foreigners Tribunals**.
- **Although the law applies nationwide**, FTs currently operate only in Assam.

Structure of a Foreigners Tribunal:

- Each FT is led by a **judge, advocate, or civil servant** with **judicial experience**.
- Appointments are made based on **government guidelines** under the **Foreigners Tribunal Act, 1941** and the **Foreigners Tribunal Order, 1964**.

Powers and Responsibilities of FTs:

- FTs function with **civil court powers**, including:
 - **Issuing summons**.
 - **Examining documents**.
- **Notices must be served within 10 days** of receiving a reference.
- **Cases must be decided within 60 days**.
- Under **Section 9 of the Foreigners Act, 1946**, the **burden of proof** lies on the individual to establish their **Indian citizenship**.
- If **unable to prove their nationality**, individuals may be sent to **detention centers** for **deportation**.

Appeal and Review Process:

- A **review application** can be filed within **30 days** of the FT's order.
- **Adverse decisions** can be **challenged in the High Court**, and if necessary, further appealed in the **Supreme Court**.

Conclusion:

The **Supreme Court's directive** serves as a **strong reminder** that **foreigners must be deported, not detained indefinitely**. The **failure to verify nationality** has left **many individuals stateless**, creating a **humanitarian and legal crisis**. The court's intervention aims to **push the government** towards finding a **just and efficient solution** while **ensuring that fundamental rights are upheld**.

Turkey-Syria Talks: Kurdish Fighters and Defense Agreements Take Center Stage

Context: In a major diplomatic development, **Turkish President Recep Tayyip Erdogan** met with **Syria's interim President Ahmed al-Sharaa** in Ankara. This meeting marks a **significant shift in Turkey-Syria relations**, focusing on **security concerns and potential defense agreements**.



This was **al-Sharaa's second international visit** since taking office, following discussions with **Saudi Arabia's Crown Prince Mohammed bin Salman**.

Key Points from the Meeting:

- The two leaders discussed **strengthening security cooperation**, particularly against **Kurdish fighters in northeastern Syria** and the **Islamic State (ISIS/ISIL)**.
- Erdogan **reaffirmed Turkey's support for Syria's anti-terror efforts**, specifically against groups like **ISIS and the Kurdistan Workers' Party (PKK)**, which Turkey classifies as a **terrorist organization**.
- **Turkey is considering establishing additional military bases in Syria** as part of a **new defense agreement** between the two nations.
- Al-Sharaa **opposed Kurdish self-rule** and demanded the **disarmament of the Syrian Democratic Forces (SDF)**, signaling Syria's commitment to maintaining **territorial integrity**.

Ongoing Turkey-Syria Tensions:

- The **Turkey-Syria border stretches 909 kilometers**, from the **Mediterranean Sea in the west to Iraq in the east**.
- A key source of friction is the **presence of Kurdish militant groups** in northern Syria.
- The **Kurdistan Workers' Party (PKK)** has been engaged in an insurgency against Turkey since the **1980s** and is **designated as a terrorist group by Turkey**.
- The **Kurds**, a major ethnic group in the Middle East, are spread across **Turkey, Syria, Iraq, Iran, and Armenia** and have long sought an independent state, **Kurdistan**.
- The **Syrian Democratic Forces (SDF)**, a **Kurdish-led militia**, was a **key U.S. ally against ISIS**, but **Turkey views the group as an extension of the PKK**, raising concerns over its growing influence near Turkey's borders.

What's Next?

The **Turkey-Syria security discussions** could reshape **regional power dynamics**, with potential **military agreements and anti-terror measures** affecting not just these two countries, but also the **broader Middle East conflict**. The **fate of the SDF and Kurdish groups** remains uncertain as **Turkey and Syria push for stronger territorial control**.

Harnessing Bacteria to Combat Plastic Waste: Potential and Challenges

Context: The global plastic waste crisis has prompted scientists to explore innovative biological solutions using bacteria and enzymes to break down plastics.

Numerous research institutions and companies are actively working to develop and commercialize these technologies. However, scalability, efficiency, and industry acceptance remain significant hurdles.



Why is Plastic Waste a Problem?

- **Plastics take centuries to degrade**, causing long-term environmental damage.
- In the last 65 years, an estimated **8.3 billion tonnes** of plastic have been produced.
- **Less than 10%** has been recycled, while approximately **4.9 billion tonnes** continue to pollute the environment.

Biological Approaches to Plastic Degradation:

1. Enzyme-Based Degradation:

- Scientists have developed **engineered enzymes** to break down **PET (Polyethylene Terephthalate)**, a common plastic used in bottles and packaging.
- In **2016**, **Kōhei Oda's team** discovered **IsPETase**, an enzyme capable of degrading PET, though at a slow rate.
- Recent advancements have led to engineered enzymes that can **degrade 90% of PET in just 17 hours**, breaking it down into reusable components like **terephthalic acid** and **ethylene glycol**.

Challenges:

- Enhancing the **speed and efficiency** of enzymatic degradation.
- Reducing **costs for large-scale industrial applications**.

2. Microbial Degradation: Bacteria That Eat Plastic:

- Scientists are exploring **bacteria that consume plastics** as an energy source.
- **Example:** A bacterium known as **X-32** can break down plastics into **carbon dioxide (CO₂)**, **water**, and **biomass**—but takes around **22 months** to do so.

Key Process:

1. **Bacteria attach** to the plastic surface.
2. They use the **plastic as a carbon source** for energy.
3. They release **enzymes** that break down the polymer structure.

Challenges:

- **Slow degradation rates** compared to enzymatic solutions.
- Requires further **optimization for industrial use**.

3. Spore-Based Biodegradable Plastic: A Revolutionary Approach:

- Scientists at **Harvard University** and the **Wyss Institute** have developed a **bacteria-infused thermoplastic** that degrades naturally.



- The technology uses **heat-resistant bacterial spores** (*Bacillus subtilis*) embedded in plastic.
- These spores **remain inactive** during use but **activate in composting conditions**, accelerating plastic breakdown.

Advantages:

- ✓ Increases **plastic durability** while in use.
- ✓ **Speeds up decomposition** in composting environments.
- ✓ Offers a **potentially industry-friendly alternative**.

Challenges:

- Requires **regulatory approval** for use in consumer products.
- Scaling up **spore purification** for mass production remains difficult.

Bringing These Solutions to the Industry:

- Companies and researchers are working to make **bacteria- and enzyme-based plastic degradation commercially viable**.
- **Notable examples include:**
 - **Carbios (France):** Developed a **PET-digesting enzyme** that breaks down plastic in just **10 hours**.
 - **North Carolina-based biomaterial firms:** Experimenting with **spore-infused thermoplastics** to enhance biodegradability.

Major Hurdles for Industrial Adoption:

- **Improving degradation efficiency** to match industry demands.
- **Lowering the cost** of enzyme production and bacterial processing.
- Encouraging **manufacturers to integrate these solutions** into existing production models.

Conclusion: The Future of Bacteria in Plastic Waste Management

While **bacteria and enzymes** present a **game-changing opportunity** to tackle plastic pollution, their success depends on **overcoming challenges in scalability, efficiency, and industry adoption**. Future research should focus on **optimizing enzymatic reactions, advancing microbial degradation techniques, and ensuring cost-effective commercial application**.

Bhopal Bans Begging: A Step Towards Regulation or a Challenge to Rights?

Context: The Bhopal district administration has imposed a **ban on begging**, along with restrictions on **giving alms** or **buying goods from beggars**. This action has been enforced under **Section 163 of the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023**, which empowers the **District Magistrate (DM)** or an **Executive Magistrate** to intervene in cases of **public nuisance**.

Additionally, **Section 223 of BNSS** prescribes **punishment for non-compliance** with such orders.



Begging in India: A Persistent Concern

- As per **Census 2011**, India has **over 4.13 lakh beggars and vagrants**.
- Several cities have implemented similar bans before major events.
 - 2017:** Hyderabad **banned begging** before the **Global Entrepreneurship Summit**.
 - 2010:** Delhi **removed beggars** ahead of the **Commonwealth Games**.
- Such measures often attract criticism for **targeting vulnerable communities** instead of addressing **poverty and homelessness**.

Why Criminalize Begging?

- Public Nuisance & Beautification:** Beggars are seen as a **hindrance to tourism and investment**, especially before major international events.
- Traffic & Safety Concerns:** Begging at busy intersections **causes accidents and disrupts traffic flow**.
- Exploitation by Organized Syndicates:** Many beggars are part of **criminal networks**, where **children and disabled persons** are forced into begging.
- Public Health & Hygiene:** The presence of beggars in **crowded urban areas** raises **concerns about sanitation and disease transmission**.

Legal Framework on Begging in India:

Although there is **no national law** banning begging, **several states** have their own anti-begging laws, many of which **date back to colonial times**:

- European Vagrancy Act, 1869:** A British-era law meant to **prevent poor Europeans in India from resorting to begging**.
- Bombay Prevention of Begging Act, 1959:** Considered a **model law**, adopted by multiple states like Gujarat, Karnataka, Uttar Pradesh, and Andhra Pradesh.
- Bengal Vagrancy Act, 1943 & Madras Prevention of Begging Act, 1945:** Pre-independence laws criminalizing begging and promoting **rehabilitation through workhouses**.
- Vagrancy Laws under Concurrent List (Entry 15):** Allows both **Union and state governments** to regulate vagrancy and destitution.
- Article 23 of the Indian Constitution:** Prohibits **human trafficking, forced labor (begar), and other exploitative practices**.

Why Does Begging Persist in India?

- Poverty & Unemployment:** Widespread **economic disparities** leave people with **no means of survival**.
- Lack of Social Security:** Inadequate access to food, healthcare, and shelter **forces people onto the streets**.

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3. **Forced Begging & Human Trafficking:** Many children and disabled persons are forced into begging by organized crime syndicates.
4. **Migration & Urbanization:** Rural migrants seeking jobs often fail to find work and end up as beggars.
5. **Disability & Mental Health Issues:** The absence of proper healthcare leaves disabled and mentally ill individuals without support.

Impact of Criminalizing Begging:

1. **Violation of Human Rights:** Criminalizing begging targets the poorest sections of society, violating their right to dignity and equality.
2. **Arbitrary Detention:** Many anti-begging laws allow authorities to detain beggars without due legal process.
3. **Failure to Address Root Causes:** Simply banning begging does not eliminate poverty or homelessness.

Judicial Interventions:

1. **Delhi High Court (2018):** Struck down parts of the Bombay Prevention of Begging Act, calling them unconstitutional.
2. **Jammu & Kashmir High Court (2019):** Declared the Prevention of Beggary Act unconstitutional.
3. **Supreme Court (2021):** Recognized begging as a socio-economic issue, refusing to impose a blanket ban during COVID-19.

Government Initiatives for Rehabilitation:

1. **SMILE Scheme (2021)**
 - Support for Marginalized Individuals for Livelihood and Enterprise
 - A Central Sector Scheme focused on rehabilitating beggars and providing them with livelihood opportunities.
2. **Persons in Destitution (Protection, Care and Rehabilitation) Model Bill, 2016** Proposed by the Ministry of Social Justice and Empowerment but later dropped.
3. **Shelters & Skill Development Programs:** Several states provide temporary shelters, food centers, and vocational training to help beggars reintegrate into society.

Way Forward: Solutions Beyond Criminalization

1. **Legal Reforms** India needs a comprehensive national law that focuses on rehabilitation instead of punishment.
2. **Strengthening Social Welfare Schemes:** Expanding social security programs, healthcare, and employment can address the root causes of begging.
3. **Regulation of Street Vending:** Many beggars resort to selling goods. Legalizing and supporting street vending can offer sustainable livelihoods.
4. **Partnership with NGOs & Private Sector:** Collaborations with NGOs and private organizations can create structured rehabilitation programs.

Final Thoughts:

While banning begging may address immediate urban concerns, it does not solve the deeper socio-economic issues that drive people to beg. A holistic approach combining rehabilitation, employment, and social welfare is needed to truly uplift the most vulnerable sections of society.

Rajasthan Introduces Bill to Curb 'Unlawful' Religious Conversions

Context: The Rajasthan government has introduced a new Bill aimed at preventing religious conversions carried out through force, fraud, coercion, or inducement.

Background:

- Rajasthan's first attempt to pass an anti-conversion law was in 2006, but it faced strong opposition and was later returned by the President.
- In 2017, the Rajasthan High Court issued guidelines to regulate forced conversions in the absence of a dedicated law.
- The current Bill is modeled on similar anti-conversion laws already enforced in Madhya Pradesh and Uttarakhand.



Key Provisions of the Bill:

1. Definition of Unlawful Conversion:

The Bill defines unlawful religious conversion as conversion carried out through:

- Coercion
- Force
- Allurement (monetary benefits, gifts, or other incentives)
- Fraud or misrepresentation

2. Burden of Proof:

- The responsibility to prove that a conversion was not unlawful lies with the accused.

3. Right to File Complaints:

- Blood relatives such as parents or siblings of the affected person can file an FIR in case of suspected unlawful conversion.

4. Punishments for Unlawful Conversions:

Offence	Punishment	Fine
General unlawful conversion	1 to 5 years in jail	15,000
Conversion of minor, woman, or SC/ST person	2 to 10 years in jail	25,000
Mass conversions	3 to 10 years in jail	50,000
Repeat offenders	Double the punishment	-

- All offences are cognizable and non-bailable, meaning immediate arrest without a warrant.

5. Voluntary Conversion Procedure:

- Anyone willing to convert must submit a declaration to the District Magistrate (DM) 60 days in advance.
- The conversion ceremony organizer must notify the DM at least 30 days prior.
- Authorities will conduct an investigation to verify the intent and legitimacy of the conversion.



- After conversion, the individual must **appear before the DM within 21 days** to confirm the **change of faith**.

Why is the Bill Necessary?

The government argues that:

- Many **vulnerable individuals** are being **manipulated into conversion**.
- The law is **not against religious freedom** but seeks to **prevent fraudulent conversions**.
- It **ensures that religious conversions** occur **voluntarily** and without **external pressure**.

The Constitutional Debate:

- During the **Constituent Assembly debates**, some members feared that allowing the "**propagation of religion**" could lead to **forced conversions**.
- They suggested **replacing** the word "**propagate**" with "**practise privately**" to avoid misuse.
- However, **Article 25(1) of the Indian Constitution** was adopted, granting all individuals:
 - **Freedom of conscience**
 - **Right to profess, practise, and propagate religion**
- These rights, however, come with **reasonable restrictions** in the **interest of public order, morality, and health**.

Final Thoughts:

The Rajasthan government believes that this law will **protect individuals from coercion**, while critics argue it may **curb religious freedom**. The **balance between personal choice and legal oversight** will be crucial in **determining the impact** of this legislation.

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US Reassesses Sanctions Waiver for India's Chabahar Port Project

Context: The **United States** is currently **reviewing** the **sanctions waiver** granted to **India** for its involvement in the **Chabahar Port** project in **Iran**. This move could have **major implications** for India's **connectivity plans** with **Central Asia**.

Background:

- The **US** has imposed **multiple sanctions** on **Iran**, primarily targeting its **nuclear program** and **economic activities**.
- **India** was granted a **waiver** for its role in developing **Chabahar Port**, recognizing its **humanitarian** and **strategic importance**.

**US Sanctions Waivers for Chabahar:**

- **First Waiver (2018):** The **US** **exempted India** from **sanctions** related to **Chabahar**, acknowledging its role in **regional connectivity** and **humanitarian efforts**.
- **Renewed Waivers:** The waiver was **extended** in subsequent years, allowing India to **continue operations** at the **Shahid Beheshti Terminal** and pursue **connectivity projects**.

Impact of US Sanctions on India:**1. Disruption in Chabahar's Development:**

- The **new US review** could restrict **India's ability** to continue its **operations** at the port.
- India has already faced **global pressure** for continuing to **import oil from Russia**, despite **US** and **Western sanctions**.

2. Trade and Connectivity Concerns:

- Since **2018**, the **Chabahar Port** has handled over **90,000 TEUs** (twenty-foot equivalent units) of **container traffic** and more than **8.4 million metric tons** of cargo.
- Any **new restrictions** could **slow down progress** and reduce **trade efficiency**.

3. Declining Trade with Iran:

- **US sanctions** have led to a **significant decline** in **India-Iran trade**.
- In **2018-19**, India **imported crude oil** from **Iran** worth **\$13 billion**.
- Post **2019**, imports **dropped drastically** to **less than \$1 billion annually**.

Chabahar Port: A Strategic Gateway:

- Located on the **Gulf of Oman**, **Chabahar Port** is **Iran's only oceanic port**, situated in **Sistan and Baluchestan Province**.
- The port has **two key terminals**:
 - **Shahid Kalantari Port** – An older facility with **limited capacity** for feeder vessels.
 - **Shahid Beheshti Port** – Currently undergoing **four-phase development**, aiming to reach **82 million tons** annual capacity upon completion.

Why Chabahar Port is Crucial for India?**1. Strategic Importance:**

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- **Bypasses Pakistan**, providing India with a **direct trade route** to **Afghanistan and Central Asia**.
- Strengthens **India's regional presence** and offers an alternative to **China's Belt and Road Initiative (BRI)**.

2. Economic Benefits:

- Facilitates trade through the **International North-South Transport Corridor (INSTC)**, cutting **transport costs** and **reducing transit time**.
- The **Economic Survey 2024-25** reported a **43% rise** in **vessel traffic** and a **34% increase** in **container traffic** at the **Shahid Beheshti Terminal**.

3. India's Investment in Chabahar:

- Under the **2024 agreement**, **India Ports Global Ltd (IPGL)** has committed **\$120 million** to equip the port.
- India has also extended a **\$250 million credit facility** for **infrastructure development** linked to Chabahar.

What Lies Ahead?

- India has **successfully balanced** its **strategic relations** with both the **US and Iran**.
- The potential **revocation of the Chabahar waiver** poses a **diplomatic challenge** for India.
- Given its **regional importance**, India must continue to **invest** in **Chabahar** while engaging in **careful diplomatic negotiations** with both **Washington and Tehran**.

The **future of Chabahar** remains crucial for **India's foreign policy**, **trade ambitions**, and **regional connectivity** with **Central Asia and Afghanistan**.

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India Shifts Fiscal Anchor from Fiscal Deficit to Debt-GDP Ratio

Context: The Indian government has announced a **strategic shift** in its **fiscal policy**, moving from the **fiscal deficit** as the primary **fiscal anchor** to the **debt-GDP ratio**. This transition will take effect from the **2026-27 financial year**, aiming for **greater fiscal sustainability** and **long-term economic stability**.

Understanding the Shift:

The government has outlined **three scenarios** for **fiscal consolidation**, depending on the **nominal GDP growth rate**:

- **Mild Scenario** – 10% GDP growth
- **Moderate Scenario** – 10.5% GDP growth
- **High Growth Scenario** – 11% GDP growth

Debt-GDP Ratio in India:

- The **central government's debt-GDP ratio** is projected to be **57.1% in 2024-25** and **56.1% in 2025-26**.
- The government aims to **reduce this ratio to 50% ± 1% by 2031**.

Why the Shift?

1. Improved Transparency and Flexibility:

- The **debt-GDP ratio** offers a **more holistic** and **long-term** view of the country's **fiscal health**, unlike the **rigid annual fiscal deficit targets**.

2. Global Best Practices:

- Many **advanced economies** prioritize **debt sustainability** over **deficit reduction**, ensuring that fiscal policies **remain adaptable** to **economic changes**.

3. Stronger Fiscal Management:

- A **debt-based framework** enables the government to **allocate resources more effectively**, **rebuild financial buffers**, and invest in **growth-enhancing expenditures**.

4. Greater Clarity in Borrowings:

- The new approach will ensure **transparent disclosure** of **off-budget borrowings**, addressing past concerns about **fiscal opacity**.

Challenges in Implementation:

1. Delayed FRBM Act Targets:

- The shift means a **significant delay** in achieving the **Fiscal Responsibility and Budget Management (FRBM) Act's** target of a **40% debt-GDP ratio**.

2. Balancing Fiscal Discipline with Growth:

- Maintaining **strict fiscal discipline** while ensuring **adequate public spending** for **economic growth** will be a **major challenge**.

3. Rising State-Level Debt:





- The **combined debt burden** of both the **central and state governments** remains **high**, necessitating **coordinated fiscal planning**.

Key Recommendations by the NK Singh Committee:

The **NK Singh Committee** had previously emphasized the importance of **debt sustainability** in fiscal policy. Its key recommendations include:

- **Debt-to-GDP Ratio Target:**
 - A **60% overall target**
 - **40% for the Centre**
 - **20% for States by FY23**
- **Fiscal Deficit Target:**
 - Reduce **fiscal deficit to GDP ratio** to **2.5% by FY23**
- **Formation of a Fiscal Council:**
 - An **independent body** with a **Chairperson** and **two members**, appointed by the Centre.
 - Responsibilities include:
 1. **Preparing multi-year fiscal forecasts**
 2. **Recommending changes to fiscal strategies**
 3. **Enhancing the quality of fiscal data**
 4. **Advising the government** on deviations from fiscal targets
- **Clear Guidelines for Deviation:**
 - The **grounds for deviating** from fiscal targets must be **clearly defined**, preventing **arbitrary adjustments**.
- **State-Specific Debt Trajectories:**
 - The **Finance Commission** should recommend **individual debt trajectories** for each state.

Conclusion:

The transition to a **debt-GDP ratio** as the **fiscal anchor** marks a **major reform** in **India's fiscal policy framework**. While this shift **offers greater flexibility** and **long-term sustainability**, its **success depends on effective implementation**, maintaining **fiscal discipline**, and ensuring **balanced economic growth**.



India's Overseas Mobility Bill 2024: Ensuring Safe and Legal Migration

Context: The Indian government is actively working on a new legislative framework to streamline and safeguard overseas employment for its citizens. The Overseas Mobility (Facilitation and Welfare) Bill, 2024 aims to replace the outdated Emigration Act of 1983, ensuring safe, legal, and structured migration.



This move comes at a critical juncture as the US administration under President Donald Trump 2.0 has begun deporting illegal Indian immigrants. The bill is designed to protect Indian workers abroad while enhancing legal migration pathways.

Why is the Overseas Mobility Bill 2024 Needed?

Challenges with the Existing Emigration Act (1983)

- The current Emigration Act is outdated and does not reflect the realities of modern migration trends.
- It lacks provisions for structured overseas employment and migrant welfare.
- Irregular migration routes expose Indian workers to exploitation and fraud.

Urgency for a New Migration Framework:

- The Parliamentary Standing Committee on External Affairs, led by Shashi Tharoor, has emphasized the need for comprehensive migration reform.
- The Ministry of External Affairs (MEA) is working on a legislative overhaul to ensure safe and orderly migration.
- The bill will help curb fraudulent recruitment agencies and promote transparency in overseas employment opportunities.

Key Highlights of the Overseas Mobility Bill 2024:

1. Establishing a Safe and Orderly Migration System:

- The bill introduces a structured framework to facilitate legal migration.
- It ensures transparency, safety, and protection against exploitation.

2. Public Consultation & Stakeholder Engagement:

- The Ministry of External Affairs is collaborating with multiple government ministries before finalizing the draft.
- The public will have 15-30 days to submit feedback on the bill.
- It will undergo inter-ministerial consultations before being presented to the Cabinet.

3. Strengthening the Role of the Protector of Emigrants (PoE):

- The PoE offices will work closely with Indian embassies and consulates to safeguard migrant welfare.
- The bill ensures that PoE offices address grievances, employment disputes, and assist in worker protection.

4. Raising Awareness & Preventing Exploitation:

- Indian embassies abroad will launch awareness campaigns to educate prospective migrants.



- Official advisories will guide emigrants on **safe migration practices** and warn against **fraudulent recruitment agencies**.

5. Grievance Redressal & Repatriation Support:

- The bill aims to **strengthen support systems** for **Indian workers facing mistreatment abroad**.
- **Legal aid and repatriation assistance** will be provided to migrants in distress.

Significance of the Bill Amid US Deportations:

- The **US government** has **intensified deportations** of **illegal Indian immigrants**, increasing the need for **strict migration laws**.
- **Key statistics on Indian migrants in the US:**
 - **20,000 undocumented Indians** are currently **facing deportation** under **Trump 2.0**.
 - The **total undocumented Indian population** in the **US** stands at **approximately 725,000**, making it the **largest non-Latin American undocumented group**.
 - The **first batch of deportees** has already been **sent back to India**.

Impact of the Bill on Indian Migrants & Economy:

For Indian Workers Abroad:

- ✓ **Protection from fraudulent recruitment agencies.**
- ✓ **Stronger support system** through **embassies and government agencies.**
- ✓ **Legal migration pathways** ensuring **job security and fair wages.**

For the Indian Economy:

- ✓ **Legal migration** will **increase remittances**, a **major contributor** to **India's GDP.**
- ✓ **Strengthening India's labor force** presence in **Gulf nations, the US, and Europe.**
- ✓ **Reducing illegal migration** will **improve diplomatic ties** with **host countries.**

Timeline & Next Steps:

- The **MEA** has assured that the **bill's draft** will be **finalized within a year.**
- The **Parliamentary Committee** has **demanding an update within three months** on the progress.
- Once enacted, the bill will **replace the Emigration Act of 1983**, **modernizing India's migration policies.**

Conclusion:

The **Overseas Mobility (Facilitation and Welfare) Bill, 2024** is a **landmark reform** aimed at **ensuring safe, legal, and structured migration** for Indian workers. With **tightening immigration policies** in countries like the **US**, India must create **robust migration frameworks** to **protect its workers** and **boost overseas employment opportunities.**

With **public consultations** and **ministerial reviews** underway, the bill is expected to be **enacted within a year**, ensuring **safer migration** and **stronger global opportunities** for **Indian workers.**

NavIC: India's Indigenous Satellite Navigation System

Context: India's Navigation with Indian Constellation (NavIC), developed by ISRO, is a **homegrown satellite navigation system** designed for both **civilian and defense applications**. However, the program has faced multiple setbacks, including **satellite failures and technical issues**.



The latest blow came on **February 2, 2025**, when the **NVS-02 satellite** failed to reach its intended orbit due to an **engine malfunction**. This marks another challenge for the **Indian Regional Navigation Satellite System (IRNSS)**, which has been struggling with **satellite failures and replacements** since its inception.

Background and Challenges Faced by NavIC:

1. The Vision Behind NavIC:

- NavIC was **conceptualized after the 1999 Kargil War**, highlighting India's need for an **independent navigation system**.
- The goal was to establish a **seven-satellite constellation** by **2016** to provide **accurate positioning data** across India and surrounding regions.
- Despite ISRO's declaration of **completion in 2016**, recurring **failures and replacements** have hindered progress.

2. Failures in IRNSS Satellites:

a) Atomic Clock Malfunctions (2016 Onward):

- Rubidium atomic clocks**, crucial for precise timing, **malfunctioned** in multiple satellites.
- Each **IRNSS satellite** is equipped with **three atomic clocks**.
- In **July 2016**, ISRO confirmed that **all clocks in IRNSS-1A** had **stopped working**.
- Similar **clock failures** were later reported in **IRNSS-1C, 1D, 1E, and 1G**.

b) Satellite Launch & Deployment Failures:

- IRNSS-1H (2017)**, meant to replace IRNSS-1A, **failed** as its **heat shield did not detach**.
- IRNSS-1K (NVS-02, 2025)** suffered an **engine failure**, leaving it in a **sub-optimal orbit**.
- Out of **11 IRNSS satellites launched**, **six have encountered failures**, affecting the system's efficiency.

Current Operational Status of NavIC:

- According to **ISRO's 2023-24 report**, only **five satellites** remain **fully operational**:
 - IRNSS-1B, 1C, 1F, 1I, and NVS-01.**
- However, some reports suggest **IRNSS-1C is only partially operational** due to **clock malfunctions**.

Satellite Generations and Technological Upgrades:

- First-generation satellites (IRNSS-1H, 1I)** carried **modified European atomic clocks**.
- Second-generation satellites (NVS-01, NVS-02)** use a **combination of indigenous and foreign clocks**.
- Despite these upgrades, **NVS-02 failed** due to an **engine malfunction**, raising concerns over the **system's reliability**.



Why is NavIC Crucial for India?

1. Key Services Provided by NavIC:

- **Standard Positioning Service (SPS):** Available for **general and commercial users**.
- **Restricted Service (RS):** Exclusive for **defense and strategic applications**.
- Offers **better than 20-meter accuracy** across **India and 1,500 km beyond its borders**.
- Provides **dual-frequency navigation** in **L5 and S bands**, making it more **resilient** than other systems.

2. Strategic Importance for Defense:

- **Ensures secure and independent navigation**, unlike **GPS**, which is controlled by the **US military**.
- Other global navigation systems like **GLONASS (Russia)**, **Galileo (EU)**, **BeiDou (China)**, and **QZSS (Japan)** are primarily **military-driven**.
- NavIC allows **India's armed forces** to operate without reliance on **foreign satellite networks**.

3. Commercial and Consumer Adoption:

- **ISRO is working with mobile and automotive companies** to integrate NavIC into commercial products.
- **Qualcomm**, a leading chip manufacturer, announced NavIC support in its chipsets in **December 2023**.
- Adoption of NavIC in **smartphones, vehicle tracking, and logistics** will enhance **India's navigation ecosystem**.

Future Plans for NavIC Expansion:

- ISRO plans to **launch three more second-generation satellites**:
 - **NVS-03, NVS-04, and NVS-05** to strengthen the NavIC constellation.
- These new satellites will:
 - **Improve positioning accuracy and enhance reliability**.
 - Ensure **continuity of services** despite failures like **NVS-02**.
 - Reduce dependence on **foreign navigation systems**.

Conclusion:

Despite setbacks, NavIC remains a crucial initiative for India's technological and strategic independence. The failures highlight technical challenges, but with upcoming next-generation satellites, ISRO aims to overcome these hurdles and fully operationalize NavIC.

With enhanced commercial adoption and continuous upgrades, NavIC has the potential to become a global alternative to existing navigation systems, ensuring India's leadership in space-based positioning services.