

## **Gist of Essential Magazines**

*(Yojana, Kurukshetra, Down to Earth and  
Science Reporter)*





# GIST OF YOJANA

*Topic*

Union Budget 2025-26

**March  
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## ROADMAP FOR VIKSIT BHARAT @ 2047

India's ambition to become a developed nation by 2047 is guided by economic, demographic and geopolitical shifts. The 1991 economic reforms laid the foundation for this transformation, opening the economy to global integration and market-driven growth. Achieving sustained high growth requires India to adapt to global trends while revitalizing internal growth drivers. Key areas of focus include deregulation, manufacturing expansion, energy security, and a balanced collaboration between the government, private sector and workforce.

### Deregulation for Growth

India unlocked significant economic potential by dismantling the intricate web of licenses and permits—collectively known as the Licence Raj. By reducing bureaucratic hurdles, the government fostered a more competitive business environment, encouraging innovation and attracting foreign investments. This deregulation promoted economic efficiency, improved ease of doing business and enabled entrepreneurial expansion, which in turn created employment opportunities and strengthened economic resilience.

### Manufacturing as a Force Multiplier

Manufacturing plays a crucial role in India's economic trajectory due to three key factors :

**1. Network Linkages :** Manufacturing growth creates both vertical (supply chains) and horizontal (complementary industries) linkages, driving economic expansion across sectors.

**2. Skill Development :** Industrial growth initiates skill development at the firm level, benefiting developing economies that lack the resources for large-scale educational investments.

**3. Infrastructure and Governance Improvements :** A thriving manufacturing sector demands robust infrastructure, efficient legis-

tics and regulatory simplifications, thereby enhancing governance and reducing compliance burdens.

### Ensuring Energy Security

Sustained economic growth requires a stable and diversified energy supply. India must prioritize investments in renewable energy, efficient energy grids, and strategic reserves to mitigate geopolitical risks and ensure uninterrupted industrial and economic activities. Strengthening energy security supports manufacturing expansion, enhances global competitiveness and ensures environmental sustainability.

### A Tripartite Compact for a Prosperous India

A strong economic framework requires a well-defined relationship between the government, the private sector and the workforce. Recognizing their interdependent roles is essential for long-term stability. Policies must ensure fair and reasonable income distribution between capital and labour to maintain social harmony and inclusive economic progress. A balance between worker welfare, and capital efficiency is crucial to fostering sustainable development.

### Conclusion

India's roadmap to becoming a developed nation by 2047 hinges on bold economic reforms, robust industrial policies, energy security and a collaborative economic model. The reforms of 1991 dismantled restrictive policies and set the stage for economic expansion. Going forward, sustained efforts in deregulation, manufacturing, and strategic governance will define India's journey toward Viksit Bharat. The next two decades will be instrumental in shaping a prosperous and self-reliant India, ensuring equitable growth and stability.

## FISCAL FEDERALISM IN INDIA : THE ROLE OF UNION BUDGET 2025-26

Fiscal Federalism (FF) in India refers to the financial relationship between the Union and State governments, ensuring a balanced and cooperative distribution of resources. Over the past decade, fiscal federalism has been strengthened through enhanced tax devolution, special assistance for capital expenditure, higher grants-in-aid, and relaxed borrowing ceilings. The Union Budget 2025-26 continues this trajectory,

reinforcing India's commitment to cooperative and competitive fiscal federalism under the vision of Viksit Bharat @ 2047.

### Strengthening Fiscal Federalism : A Decade of Progress

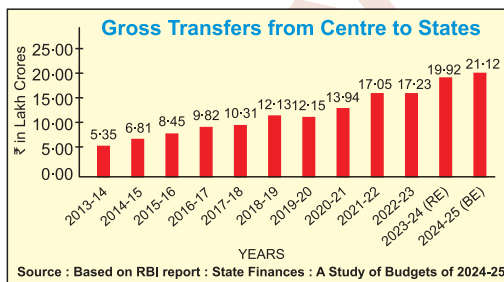
- **Increased Devolution :** The share of central taxes to states has been consistently increased.

- **Capital Expenditure Support** : Special assistance schemes introduced in 2020-21 continue.
- **Higher Grants-in-Aid** : Direct support to states for various development initiatives.
- **Higher Borrowing Ceilings** : Additional borrowing provision of 0.5% of GSDP announced in Budget 2025-26.

### Constitutional Provisions Pertaining to Fiscal Federalism in India

- **Article 270** : Deals with taxes levied and distributed between the Union and States.
- **Article 275** : Deals with grants from Union to States.
- **Article 279A** : Provides for Constitution of GST Council. The GST Council is responsible for providing recommendations to the Union and the State governments on matters related to Goods and Services Tax (GST).
- **Article 280** : Deals with the constitution of Finance Commission every 5 years to recommend the distribution of tax proceeds between the Union and States, grants to States, and measures to augment State and local government funds.
- **Article 282** : Mentions that the Union and States can make grants for any specific purpose, even if it is not within the scope of laws that Parliament/State Legislature can enact. It allows flexibility in funding various projects regardless of legislative authority.
- **Article 293** : Gives States the executive power to borrow money within the limits that the State legislature sets subject to consent of the Government of India in certain cases.

### Union Budget 2025-26 : The Four Models of Fiscal Federalism



**1. Enhanced Devolution of Taxes and Duties to States** : States receive a higher share of central taxes, empowering them for independent fiscal planning.

**2. Special Assistance to States for Capital Expenditure** : The Scheme for Special Assistance to States for Capital Expenditure (2020-21) continues.

₹ 5,41,850 crore Allocated for Centrally Sponsored Schemes (CSS).

### Agriculture Sector

- **PM Dhan Dhanya Krishi Yojana** : Developing Agricultural District Programs.
- **Atma Nirbharta in Pulses** : Boosting self-sufficiency in pulse production.
- **Comprehensive Program for Vegetables & Fruits** : Enhancing horticulture productivity.
- **Mission for Cotton Productivity** : Increasing yield and quality of cotton.

### Rural Development

- **Rural Prosperity & Resilience Initiative** : Strengthening rural livelihoods.
- **Jal Jeevan Mission extended till 2028** : Ensuring tap water supply in every household.

### Urban Development

- **Strengthening Urban Livelihoods** : Enhancing employment opportunities in cities.
- **PM SVANidhi** : Financial assistance for street vendors.
- **Urban Challenge Fund** : Infrastructure development in urban areas.
- **Social Security Scheme for Online Platform Workers** : Protection for gig economy workers.

### Education and Skilling

- **AI Centres of Excellence** : Advancing research and innovation in artificial intelligence.
- **Atal Tinkering Labs Expansion** : Fostering STEM education in schools.
- **Boosting Growth through Central Sector Schemes** : Strategic investments for skill development and innovation.

### Higher Borrowing Ceiling for States

- **0.5% of GSDP as an additional borrowing provision** : Unlocking ₹ 2 lakh crore for states to fund developmental projects.

### Conclusion

The Union Budget 2025-26 deepens cooperative and competitive fiscal federalism, aligning with India's long-term goal of Viksit Bharat @ 2047. By strengthening state autonomy, boosting capital expenditure and enabling targeted development in key sectors like agriculture, rural and urban development, education, and social security, the budget lays a robust foundation for inclusive and sustainable economic growth.



## BUDGET 2025 : CHARTING INDIA'S NEXT INFRASTRUCTURE FRONTIER

The Union Budget 2025-26 lays the foundation for India's transformation into a \$ 30 trillion economy by 2047. With a strategic focus on urban development, renewable energy and ship-building, this budget continues the momentum of the last decade's infrastructure push. It aims to position India as a global leader in infrastructure and maritime capabilities, aligning with the government's vision of self-reliance and economic expansion.

### The 2014-24 Legacy : Building Blocks of Progress

Over the past decade, India has witnessed a significant infrastructure overhaul, transforming its landscape with massive investments and policy reforms. Key highlights include :

- **Expansion of the National Highway Network** : Grew from 91,287 km in 2014 to 1,46,145 km in 2024—a 60% increase.
- **Reduction in Logistic Expenses** : Lowered by 15%, enhancing supply chain efficiency.
- **Rural Connectivity** : PM Gram Sadak Yojana (PMGSY) expanded rural road networks, connecting 99% of villages.
- **Port Modernization** : Sagarmala and Port-led development doubled cargo handling capacity.
- **Urban Housing Boom** : PM Awas Yojana-Urban (PMAY-U) facilitated affordable housing expansion.

**Investment in Infrastructure**

- > Each infrastructure-related ministry to come up with a 3-year pipeline of PPP infra projects
- > ₹1.5 lakh crore outlay for 50-year interest-free loans to states for capital expenditure and incentives for reforms
- > Second Asset Monetization Plan for 2025-30 to be announced to plough back capital of ₹10 lakh crore in new projects
- > Urban Challenge Fund of ₹1 lakh crore to be set up to implement proposals for 'Cities as Growth Hubs', 'Creative Redevelopment of Cities' and 'Water and Sanitation'.

These initiatives set the stage for India's next phase of infrastructure-driven growth.

### India's Infra Renaissance : Regulatory Reforms & Infrastructure Push (2014-2024)

A series of transformative regulatory reforms rewired India's infrastructure and real estate growth story.

#### Key Reforms :

- **Real Estate (Regulation and Development) Act (RERA), 2016** : Enhanced transparency and governance in the real estate sector.
- **Goods and Services Tax (GST), 2017** : Simplified tax structure, introduced Input Tax Credit (ITC) and streamlined logistics via the E-way Bill system.
- **Demonetization & Benami Transactions Act** : Targeted black money and strengthened financial compliance.
- **Rise of Private Equity & REITs** : Increased foreign and domestic investments in real estate.
- **National Infrastructure Pipeline (NIP) & PM Gati Shakti** : Launched as a multiplier effect strategy, integrating various infrastructure projects for seamless execution.

This decade-long transformation provided a robust base for the Budget 2025's ambitious vision.

**EXPANSION OF PM Gati Shakti PORTAL**

- PM Gati shakti Portal extended to Private Sector
- Company Access to relevant data, maps & logistics to assist in enhanced planning & delivery
- Major Boost to Cargo Movement with reduction in logistics cost

### Budget 2025 : Accelerating into the Future

The Union Budget 2025 accelerates infrastructure-led growth, prioritizing :

1. **Urban Transformation and Affordable Housing : Urban Challenge Fund** : ₹ 1 lakh crore allocated to drive urban renewal and smart city projects. **PMAY-U 2.0** : ₹ 2.2 lakh crore earmarked to construct 80 lakh affordable dwellings, ensuring housing remains a top priority.

**2. Shipbuilding Steals the Spotlight :** Recognizing maritime trade's critical role, the budget grants shipbuilding infrastructure status, aiming to propel India into the top 10 shipbuilding nations by 2030.

#### **Current Shipbuilding Scenario**

- **India's Share in Global Ship Ownership :** is 1.2% (compared to Greece (17.8%), China (12.8%) and Japan (10.8%).
- **Shipbuilding Market Share :** India – 0.07% Vs. China (46.6%), South Korea (29.2%), Japan (17.2%).
- **Dependence on Foreign Vessels :** 95% of international cargo is handled by foreign ships, causing a \$ 75 billion forex outflow in 2022-23.

#### **Key Shipbuilding Initiatives in Budget 2025**

- **Maritime Development Fund :** ₹ 25,000 crore allocated for boosting shipbuilding infrastructure.

- **Legislative Reforms :** Introduction of key maritime bills : 1. The Coastal Shipping Bill, 2024; 2. The Merchant Shipping Bill, 2024; 3. The Carriage of Goods by Sea Bill, 2024; 4. The Bills of Lading Bill, 2024.

These reforms aim to reduce India's reliance on foreign fleets, enhance domestic shipbuilding and position India as a leading maritime nation.

#### **Conclusion**

The Budget 2025-26 marks a bold step towards urban transformation, infrastructure modernization and maritime dominance. By integrating regulatory reforms, increased capital expenditure, and strategic investments, India is poised to emerge as a global infrastructure powerhouse. The focus on shipbuilding, urban renewal and connectivity reinforces the nation's vision for a self-reliant, \$ 30 trillion economy by 2047.

### **BUDGETING 2025-26 : TOWARDS TAX REFORMS**

The Union Budget 2025-26 introduces key tax reforms aimed at simplifying compliance, reducing taxpayer burden and fostering economic growth. By restructuring tax slabs, extending tax benefits, and leveraging AI-driven tax administration, the budget focuses on creating a fair, transparent and efficient tax system.

#### **Relief for the Middle Class**

- Restructuring of personal income tax slabs benefits the middle class, reducing tax liability for individuals earning up to ₹ 12 lakh per annum.
- The deadline for filing updated income tax returns extended from 24 months to 48 months, offering flexibility to taxpayers.
- Presumptive taxation for NRIs in electronic manufacturing services, ensuring clarity and ease of compliance.

#### **Making Tax Compliance Easier and Less Stressful**

- Rationalization of TDS and TCS provisions, streamlining taxation for businesses and individuals.
- Extension of tax benefits for startups until April 1, 2030, fostering innovation and entrepreneurship.
- Simplification for small charitable trusts, extending their registration period from 5 years to 10 years.

#### **Encouraging Investment and Economic Growth**

- A new tonnage tax scheme for Indian shipping companies, boosting the maritime industry.
- Digitization of tax administration through AI-driven tax assessments, enhancing efficiency and transparency.
- India's Tax-to-GDP ratio at 11.9% in FY 2024-25, with Direct Taxes to GDP at 6.9%, reflecting a robust fiscal framework.

#### **A Smarter, Fairer Tax System**

- The tax reforms focus on a PRUDENT approach—Proactive, Responsive, User-friendly, Digitally-enabled and Environmentally inclusive.
- The emphasis is on a balanced, growth-oriented taxation model that promotes ease of doing business, fairness and economic expansion.

#### **Conclusion : A Balanced, Growth-Oriented Tax Approach**

The Budget 2025-26 introduces progressive tax measures that support the middle class, encourage investment, and simplify compliance. With a focus on digitization, fairness and economic stimulation, the tax system is evolving into a more efficient and inclusive framework, laying the groundwork for sustained growth and prosperity.

## GREEN BUDGETING IN INDIA : A STEP TOWARDS SUSTAINABLE DEVELOPMENT

India's FY2026 budget reinforces its commitment to climate action, sustainability, and green growth. With increased funding for clean energy, environmental conservation and sustainable urban development, the budget aims to balance economic priorities with ecological responsibility.

### Enhancements in Policy and Governance of Green Sectors

- Strengthened climate policies with increased budget allocations for clean energy and sustainability.
- Focus on net-zero targets, enhancing India's stature in global climate action.
- Integration of renewable energy goals with economic growth plans.

### Thrust on Distributed Solar and Clean Energy Manufacturing

- PM KUSUM scheme and solar energy initiatives receive a boost.
- Focus on distributed solar energy for rural and urban sustainability.
- Promotion of domestic clean-tech manufacturing to reduce import dependency.

### Balancing Priorities : Clean Energy Generation and Sustainability

- Increased funding for climate-resilient agriculture and green farming.
- Support for circular economy practices, including waste management and recycling.
- Alignment of economic growth with sustainable energy generation.

### Nuclear Energy : A New Dawn for India's Energy Security

- The Nuclear Mission is set to enhance India's long-term clean energy security.
- Investment in advanced nuclear technology to ensure stable and sustainable energy.
- A crucial step in India's green transition towards low-carbon growth.

### Green Mobility and Recycling Initiatives

- Strengthened policies for electric vehicle adoption and clean mobility solutions.
- Enhanced recycling mechanisms to promote a circular economy and reduce waste.

### Sustainable Agriculture & Food Security

- Focus on climate-smart agriculture to ensure sustainability and resilience.
- Strengthened agricultural support systems to balance productivity and environmental conservation.

### Sustainable Urban Development : Establishment of the Urban Development Fund

- Creation of an Urban Development Fund to support eco-friendly city planning.
- Thrust on green infrastructure, energy-efficient buildings and smart urban mobility.

### Conclusion

The FY2026 budget underscores India's commitment to sustainable economic growth by aligning climate policies with development goals. With strategic investments in renewable energy, nuclear power, clean mobility and circular economy initiatives, India is paving the way for a resilient, low-carbon and sustainable future.

## GENDER BUDGETING : A ROADMAP TOWARDS INCLUSIVITY

Gender budgeting is a fiscal strategy aimed at reducing gender disparities and empowering women by ensuring gender-specific concerns are integrated into financial policies. The Gender Budget (GB) 2025-26 focuses on allocations under various ministries to enhance women's participation in economic and social development.

### Concept of Gender Budgeting

- Gender budgeting is a structured method to analyze how budget allocations impact both men and women.
- It ensures that gender concerns are embedded in fiscal policies to promote equality.

- Helps in addressing women's empowerment and reducing gender-based disparities in economic participation.

### Trends in Gender Budgeting (2005-2025-26)

- Introduced in 2005, gender budgeting has seen consistent growth in allocations across sectors.
- Over the years, budgetary provisions have increased for women-centric programs in education, health, and employment.
- The World Bank Report 2023 states that women make up 48.4% of India's population, highlighting the need for sustained investment.



## Gender Budget 2025-26 : Key Highlights

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#### Gender Budget 2025-26

- The Gender Budget allocation has increased to **8-86%** of the total Union Budget
- **₹4-49 lakh crore** allocated for women and girls
- **49 Ministries/Departments** and **5 UTs** have reported allocations and boosting women's welfare, education, and economic empowerment
- The government will launch a **₹ 2-crore** term loan for **5 lakh first-time** women, SC and ST entrepreneurs



- Enhanced allocation for women's empowerment schemes under various ministries.
- Strengthening of gender-sensitive programs to bridge socio-economic gaps.
- Promotion of skill development, financial inclusion and social security for women.

#### Way Forward

- Institutionalizing gender-responsive budgeting across all ministries.
- Enhancing transparency in fund allocation and implementation.
- Strengthening monitoring mechanisms to assess impact and progress.

#### Conclusion

Gender budgeting is a crucial tool for achieving gender equality and fostering inclusive economic growth. The FY 2025-26 budget builds on past efforts to strengthen women's role in development, ensuring a more equitable and resilient future.

## COMBATING VIOLENCE AGAINST WOMEN : A MULTISECTORAL APPROACH

Violence against women remains a critical issue, requiring a multi-sectoral approach for effective prevention and response. Legal frameworks, education, technology, and economic empowerment play pivotal roles in ensuring women's safety and rights. Collaborative efforts from government, society, and private sectors are essential to create a safer and more equitable environment for women.

### Strengthening the Legal and Institutional Framework

India has implemented several laws to protect women from violence and discrimination :

- **The Protection of Women from Domestic Violence Act, 2005** : Provides protection, relief and redressal mechanisms for domestic violence survivors.
- **The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013** : Mandates Internal Complaints Committees (ICCs) and safeguards women in professional spaces.
- **The Criminal Law (Amendment) Act, 2013 (Nirbhaya Act)** : Strengthens laws against sexual offenses, including harsher punishments and fast-track courts.
- **The Dowry Prohibition Act, 1961** : Criminalizes dowry-related violence and harassment.

- **The Protection of Children from Sexual Offences (POCSO) Act, 2012** : Provides stringent punishments for sexual crimes against minors.



**Enhancing Community-Based Support Systems** : Community-led initiatives play a vital role in addressing gender violence. Awareness campaigns, women-led safety groups and help-line services help create a supportive ecosystem for survivors.

**Role of Education in Changing Mindsets** : Education is instrumental in breaking gender stereotypes. Gender-sensitive curricula, awareness programs in schools and community discussions can help transform social attitudes toward women's safety.



## Leveraging Technology for Women's Safety

Technology has become a powerful tool in combating gender-based violence :

- **Nirbhay App** : Provides emergency assistance and tracking for women in distress.
- **SHEROES** : A women-only social networking platform that supports emotional well-being, career opportunities and entrepreneurship.
- **Himmat Plus** : A safety app launched by Delhi Police that enables women to send SOS alerts to law enforcement.

## Economic Empowerment as a Shield Against Violence

Financial independence reduces women's vulnerability to violence. Key initiatives include :

- **Skill India** : Provides vocational training to enhance women's employability.
- **MUDRA Yojana** : Offers collateral-free loans for women entrepreneurs.
- **Stand-up India** : Encourages women from marginalized communities to start businesses.
- **Lakshpati Didi Scheme** : Empowers rural women by promoting self-employment and entrepreneurship.
- **Increasing Female Participation in STEM and the Digital Economy** : Encourages women's inclusion in emerging sectors to enhance financial independence.

**Addressing Cyber Violence Against Women** : With increasing online abuse, digital safety initiatives have become crucial :

- **Digital Shakti Program** : Enhances women's cyber literacy and online safety awareness.

## Strengthening Public-Private Partnerships (PPP) in Combating Gender-Based Violence

- **PPP Role** : Corporates collaborate with government bodies to ensure workplace safety.
- **Gender Audits** : Assess organizations' gender inclusivity and compliance with safety norms.
- **Internal Complaints Committees (ICCs)** : Mandated under the Sexual Harassment of Women at Workplace Act, 2013, to address workplace harassment.
- **Safe City Projects** : Develop urban infrastructure to enhance women's safety.

- **Internet Saathi** : Trains rural women in digital skills, fostering financial autonomy.
- **Investment in R&D** : Development of AI-driven safety tools, legal tech solutions and other innovations to prevent violence.
- **One-Stop Centers (OSCs) and Nirbhaya Fund** : Provide immediate support, shelter, legal aid and counseling to survivors.



## Addressing Gender-Based Violence in Conflict-Affected Regions

In areas affected by conflict and disasters, women face heightened vulnerabilities. Key measures include :

- **Gender-Responsive Disaster Policies** : Ensuring the safety and well-being of women in conflict zones.
- **POCSO Act & Domestic Violence Act** : Special provisions for safeguarding women and children in crisis situations.
- **Immoral Trafficking Prevention Act** : Aims to combat human trafficking and provide rehabilitation.
- **Comprehensive Approach to Expanding One Stop Centres (OSCs)** : Increasing accessibility of support centers in disaster-prone areas.
- **Women Protection Task Force** : Strengthens law enforcement against gender-based crimes.
- **Training Law Enforcement Officers and Humanitarian Workers** : Programs like **Mission Shakti** focus on sensitizing officials to handle cases effectively.
- **Women-Led Community Policing Initiatives** : Encourages grassroots participation in law enforcement.

### A Call for Collective Action

Violence against women requires a multi-sectoral, integrated approach, involving legal, educational, economic, technological and social

interventions. Collaboration between government, civil society and private stakeholders is crucial in building a safer and more equitable society for women in India.

## NEP 2020 IN ACTION : DRIVING ACCESSIBILITY & INCLUSIVITY

The National Education Policy (NEP) 2020 aims to create a nurturing learning environment, emphasizing foundational learning, cognitive development and life skills. The National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN) Bharat Mission supports this through innovative pedagogies, rural-focused strategies and teacher training. The Annual Status of Education Report (ASER) 2024 highlights significant improvements in foundational learning, with government schools showing progress and enrollment rates reaching their highest levels.

### Key Highlights :

**1. Government School Progress :** Government schools outperform private schools in foundational learning. Enrollment of children aged 6-14 has reached 98.1% in 2024. Underage enrollment in Standard 1 has declined, aligning with NEP recommendations.

**2. NIPUN Bharat Mission's Role :** Focuses on clear learning targets and innovative pedagogies. Improves rural education effectiveness and teacher training.

### 3. Key Trends in Education :

- **Pre-Primary Enrollment Growth :** Over 70% coverage for the 3-5 age group.
- **Anganwadis as Early Education Backbone :** Ensuring better childhood nutrition, vaccination and holistic development.
- **Teenagers & Digital Literacy :** 90% of rural adolescents have access to smartphones, aiding information retrieval and education.
- **Infrastructure Upgrades :** Schools improving sanitation, hygiene and classroom facilities.
- **State-Specific Progress :** Uttar Pradesh, Madhya Pradesh and Gujarat show strong performance in foundational learning.

### Conclusion

NEP 2020 and NIPUN Bharat Mission have strengthened accessibility, inclusivity and learning outcomes, particularly post-pandemic. Strategic investments in education continue to shape India's human capital, ensuring long-term national development and progress towards *Viksit Bharat @2047*.

## AGRICULTURE : ENGINE FOR INDIA'S DEVELOPMENT

The Union Budget 2025-26 reinforces agriculture as the backbone of India's economy, prioritizing self-reliance, financial inclusion and rural development. With a strong focus on productivity, credit access, and infrastructure, key initiatives aim to enhance farmer welfare, boost agricultural finance and ensure nutritional security. These reforms are set to drive sustainable rural prosperity while empowering millions of farmers across the nation.

Specific proposals proposed in the union budget to enhance sustainability and productivity in Agriculture are :

### Prime Minister Dhan-Dhaanya Krishi Yojana

- Inspired by the Aspirational Districts Programme.
- Covers 100 districts with low productivity and moderate crop intensity.
- Focus on agricultural productivity, diversification and post-harvest storage.
- Supports block-level infrastructure and facilitates credit access.

- Expected to benefit 1.7 crore farmers.

### Building Rural Prosperity and Resilience

- Multi-sectoral approach to employment, infrastructure and technology.
- Generates job opportunities in rural areas to curb migration.
- Supports women, young farmers and landless families.
- Encourages diversification and financial independence.

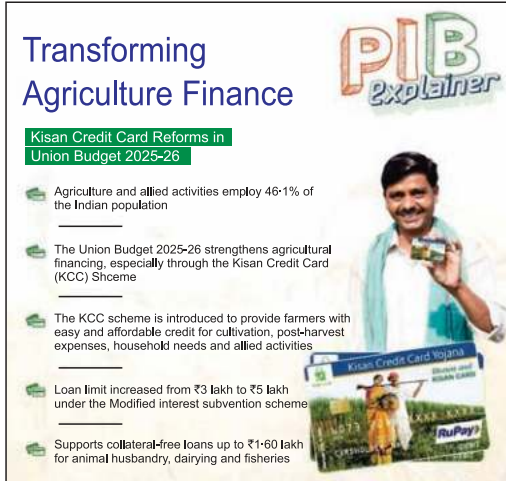
### Aatmanirbharta in Pulses

- National Mission for Edible Oilseeds achieved near self-sufficiency in pulses.
- New 6 year "Mission for Aatmanirbharta in Pulses" targets Tur, Urad and Masoor.
- Focus on : 1. Climate-resilient seeds, 2. Productivity enhancement, 3. Post-harvest storage & management, 4. Procurement by NAFED & NCCF

### Transforming Agricultural Finance

- **Kisan Credit Card (KCC) Reforms :** Supports 46.1% of the Indian workforce. The

loan limit increased from ₹ 3 lakh to ₹ 5 lakh under the Interest Subvention Scheme. Collateral-free loans up to ₹ 1-60 lakh for animal husbandry, dairy and fisheries.



### Comprehensive Programme for Vegetables and Fruits

- Rising awareness of nutrition and healthier diets.
- Government to launch a program for vegetable & fruit production.
- Ensures efficient supply, processing and remunerative prices.
- Farmer Producer Organizations (FPOs) and cooperatives will be promoted.

### Grameen Credit Score

- Public Sector Banks to develop Grameen Credit Score.
- Aims to improve financial inclusion for rural communities.

These initiatives reflect the Union Budget 2025-26's focus on agriculture, self-reliance, financial support and rural prosperity.

### Investment as an Engine of Growth : Union Budget 2025-26

The Union Budget 2025-26 underscores the pivotal role of Agriculture, MSME, Investment and Exports as key drivers of economic development. With a strong emphasis on investment in people, the economy, and innovation, the budget aims to foster inclusive and sustainable growth in alignment with the 'Viksit Bharat 2047' vision.

#### Key Budgetary Focus Areas :

#### 1. Investment in Research, Development and Innovation

- ₹ 20,000 crore allocated for private-sector-driven R&D to enhance technological advancements.

- Establishment of the PM Research Fellowship, offering 10,000 fellowships over the next five years for technological research in premier institutions like IITs and IISc.
- Deep Tech Fund to support emerging startups.
- Establishment of a Second Gene Bank with 10 lakh germplasm lines for food and nutritional security.



#### 2. Infrastructure and Development Initiatives

- ₹ 1,50,000 crore interest-free loans to states for capital expenditure.
- ₹ 25,000 crore allocated for the Maritime Development Fund to strengthen long-term financing in the sector.
- ₹ 1,00,000 crore Urban Challenge Fund to develop cities as growth hubs.
- Nuclear Energy Mission for Viksit Bharat focusing on small modular nuclear reactors with a ₹ 20,000 crore allocation.

#### 3. Investment in People and Education

- The budget prioritizes people-centric governance, enhancing choices and capabilities to improve the quality of life.
- ₹ 500 crore allocated for a Centre of Excellence in AI for Education.
- Expansion of Atal Tinkering Labs with 50,000 new labs over the next five years.
- Increase in medical (UG & PG) seats, with 10,000 additional seats in 2025-26 and a target of 75,000 seats in five years.
- Day-care cancer treatment centres to be set up in every district, covering 200 centres by 2026.



- Bharatiya Bhasha Pushak Scheme introduced to strengthen learning in Indian languages through digital resources.

#### **4. Social Welfare and Nutrition Initiatives**

- Strengthening of Saksham Anganwadi and Poshan 2.0 programs, providing nutritional support to 8 crore children.
- Focus on holistic and sustainable development, ensuring poverty alleviation, quality education, and comprehensive healthcare.

#### **Way Forward : Roadmap for Futuristic India-2047**

The Union Budget 2025-26 aligns with India's long-term vision by focusing on strategic economic growth and structural reforms. By integrating social welfare, economic investment, and innovation, the budget paves the way for a resilient, globally competitive India. The emphasis on 'Sabka Saath, Sabka Vikas' ensures that development reaches every section of society, reinforcing India's potential to emerge as a 'Vishwamanya Model' for inclusive and sustainable growth.

Pratiyogita Dark





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*Topic*

**Union Budget 2025-26 Progressive  
Rural India**

**March  
2025**

## UNION BUDGET 2025-26 : DEVELOPMENT DIMENSIONS

The Union Budget 2025-26 has placed a significant emphasis on rural development, economic decentralization, women's empowerment and employment generation. With a vision to strengthen grassroots growth and improve the standard of living in rural areas, the budget focuses on agriculture, rural infrastructure, skill development, and financial inclusion. The Economic Survey 2024-25 also highlights India's economic resilience amidst global manufacturing slowdowns and supply chain disruptions, emphasizing competitiveness improvements.

Few Agriculture and rural development related focus areas prioritized in the Budget :

### Agriculture and Farmer Welfare

- **PM Dhan Dhanya Krishi Yojana** : A new initiative aimed at boosting agricultural productivity through sustainable practices and modern technology.
- **PM-KISAN Samman Nidhi Scheme Strengthened** : The government has Strengthened the scheme to ensure timely financial support to small and marginal farmers.
- **Reduction in Urea Subsidy** : The government has restructured fertilizer subsidies to reduce the fiscal burden while focusing on balanced fertilizer use.
- **Nutrition-Based Subsidy** : A shift towards a more nutrient-focused subsidy model to promote soil health and sustainable farming.
- **PM Krishi Sinchai Yojana** : Increased funding to enhance irrigation facilities, ensuring better water management and efficiency.

### Food Processing and Agro-Industries

- **PM Formalisation of Micro Food Processing Enterprises (PMFME) Scheme** : The budget has allocated a 4-8% hike in funding to promote food processing, value addition and rural entrepreneurship in the sector.

### Rural Employment and Livelihoods

- **MGNREGA** : The Mahatma Gandhi National Rural Employment Guarantee Act continues to receive significant budgetary support to provide employment and strengthen rural infrastructure.
- **Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)** : The scheme remains a priority, empowering self-help groups and fostering women-led entrepreneurship.

### Rural Housing and Connectivity

- **Pradhan Mantri Awas Yojana-Gramin (PMAY-G)** : The budget has seen a 0-6% increase in funding to support affordable rural housing initiatives.
- **Pradhan Mantri Gram Sadak Yojana (PMGSY)** : Continued investment in rural roads and connectivity to improve accessibility and economic opportunities.

### Dairy and Fisheries Development

- **Focus on Dairy Sector Productivity** : The government is implementing measures to improve milk yield, enhance cold storage infrastructure and promote value-added dairy products.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY)** : A 5-7% hike in allocation to boost fisheries productivity, infrastructure development and market linkages.

### Skill Development and Education

- **Multisectoral Rural Prosperity and Resilience Program** : A comprehensive approach integrating skill development, financial inclusion and rural entrepreneurship.
- **Samagra Shiksha Yojana** : An allocation of ₹ 41,250 crore to enhance school education and teacher training.
- **PM Vishwakarma Yojana** : Strengthened to support artisans and small-scale entrepreneurs through skill enhancement and financial support.

### Re-Energizing MSMEs

- The budget includes targeted incentives and credit support for MSMEs to boost production, enhance exports and strengthen supply chains.

### Conclusion

The Union Budget 2025-26 continues to prioritize rural development, employment and economic resilience. By focusing on agricultural reforms, infrastructure enhancement, employment generation and skill development, the government aims to drive inclusive growth and sustainable development. The Economic Survey's call for a multisectoral approach underscores the need for long-term policy measures to ensure rural prosperity and national economic stability.

### Initiative to Boost Income and Consumption

India's economic growth is crucial for ensuring inclusive development and self-reliance. However, the current financial year has witnessed a slowdown due to global economic uncertainties and structural challenges. To counteract this, the government is focusing on investment, consumption and infrastructure development. Strengthening the rural economy through targeted policies will play a key role in achieving sustainable growth.

### Slow Pace of Development in the Current Financial Year

The Indian economy is experiencing a slowdown in growth. The National Statistical Office (NSO) has projected a GDP growth rate of 6.4% for FY 2024-25, which is lower than the last three financial years. The Reserve Bank of India (RBI) has projected GDP growth to be 6.6% for FY 2024-25 and 6.7% for FY 2025-26. This deceleration is attributed to global economic uncertainties and internal structural challenges.

### Why is it Necessary to Increase the Growth Rate ?

A higher growth rate is essential to counteract the impact of global policy changes, which have led to economic instability and slowed GDP growth. For inclusive growth, it is crucial to focus on investment, consumption, and export.

- **Investment** : Higher capital expenditure can boost infrastructure and industrial growth.
- **Consumption** : Increased disposable income can drive demand and economic activity.
- **Export** : Strengthening export-oriented industries can improve the balance of trade.
- **Fiscal Balance** : Capital expenditure must be utilized effectively to maintain fiscal stability.
- **Ease of Doing Business** : Reducing bureaucratic hurdles and fostering entrepreneurship will further accelerate growth.

The government has set a target of raising revenue of ₹ 42.70 lakh crore in the financial year 2025-26, which is about 11% more than the revised estimate of ₹ 38.53 lakh crore targeted in the financial year 2024-25. The focus on tax collection and expenditure aims to increase consumption and drive economic momentum.

## MEASURES TO STRENGTHEN THE RURAL ECONOMY

**Boosting Farmers' Income by Increasing KCC Loan Limit** : The government aims to increase farmers' access to credit by enhancing the loan limit of the Kisan Credit Card (KCC). This will provide them with better financial resources to invest in seeds, fertilizers and technology.

**Emphasis on Low Grain-Producing Districts for Increasing Production** : To ensure food security and balanced agricultural development, the government is focusing on low grain-producing districts. Special incentives and technological interventions are being introduced to enhance productivity in these areas.

**Working on Mission Mode for Augmenting Farmers' Income** : Agricultural reforms, better logistics and access to global markets are being prioritized to double farmers' income. The Pradhan Mantri Dhaanya Krishi Yojana aims to improve seed quality and increase production of cotton, pulses and fishery resources.

**Highlighting the Importance of Fisheries Production** : The fisheries sector plays a vital role in rural employment and economic growth. Strengthening infrastructure, promoting fish farming, and introducing technological advancements can enhance productivity and exports, contributing to self-reliance.

**Endeavour to Become Self-Reliant** : The focus is on making various economic sectors self-sufficient by promoting domestic manufacturing, infrastructure development and MSMEs. This will reduce dependence on imports and strengthen India's global economic position.

**Efforts Towards Empowering Women** : Women in deprived sections are being encouraged to become self-reliant through entrepreneurial support, financial aid and skill development programs. Start-ups led by women and MSMEs are being given special provisions to promote their participation in economic activities.

**Initiatives for the Betterment of the Poor** : The government's efforts include direct benefit transfers, affordable housing schemes, rural employment programs and social security measures to uplift the marginalized sections of society.

**Strengthening Infrastructure** : Investments in rural roads, irrigation, electricity and digital connectivity are critical to economic expansion. Strengthening infrastructure will facilitate trade, improve productivity and attract further investments.

**Making the Growth Engine Even Stronger** : Economic growth requires a multi-pronged approach, including technological innovation,



efficient governance and financial inclusivity. Policies aimed at increasing tax collection and targeted government expenditure are expected to drive sustained economic growth.

**Ensuring Growth Through Startups :** Startups, particularly in agriculture, technology, and manufacturing, are key to creating employment and driving economic expansion. Incentives for rural startups and increased investment in innovation will significantly boost rural incomes.

## Conclusion

A balanced approach to investment, infrastructure and social welfare is crucial to accelerating rural economic growth. By focusing on farmers, women, MSMEs, and digital connectivity, India can achieve sustainable and inclusive growth. Ensuring higher consumption, improving ease of doing business, and fostering innovation will further strengthen the nation's economic foundation.

## BUDGETARY INITIATIVES FOR WOMEN EMPOWERMENT

The Government of India has consistently prioritized gender-responsive budgeting to promote women's empowerment and inclusive development. The Gender Budget, which was introduced in the financial year 2005-06, serves as a crucial mechanism to address gender disparities and ensure that women-centric policies receive adequate financial support. Over the years, its scope has expanded significantly, reflecting its importance in national development.

### Expansion of the Gender Budget

- The allocation for the women-oriented budget has increased substantially from 6.8% in 2024-25 to 8.86% in 2025-26 of the total Union Budget.
- When first introduced in 2005-06, the Gender Budget comprised 2.79% of the total budget and was implemented across 9 ministries/departments. By 2025-26, it has expanded to cover 49 ministries and departments along with five Union Territories, demonstrating its increasing role in governance and inclusive growth.

### Significance of Gender Budgeting

- Gender Budgeting plays a vital role in ensuring financial resources are directed towards women-centric schemes, policies, and programs that promote education, healthcare, employment and social security.
- It serves as an instrument to bridge gender disparities by allocating funds for initiatives

that address issues such as women's safety, financial independence and entrepreneurship.

- The continuous increase in allocation underlines the government's commitment to empowering women and integrating them into mainstream economic and social development.

### Inclusive Development Approach

India's economic development strategy has always emphasized inclusive growth and welfare for all its citizens. The Union Budget framework is structured to ensure a balance between economic progress and social justice, making the empowerment of women an integral component of national planning. The Gender Budget exemplifies how institutional progress, government policies, and budgetary provisions contribute to sustainable and inclusive growth.

## Conclusion

The expansion of the Gender Budget over the years signifies its success in addressing gender-related concerns and promoting women's participation in economic and social spheres. By allocating a higher percentage of the budget towards gender-responsive initiatives, the government reaffirms its commitment to fostering a more equitable and empowered society. The Gender Budget remains an essential tool in India's journey towards inclusive and sustainable development.

## UNION BUDGET 2025-26 : ENHANCING HEALTHCARE ACCESS

The Union Budget 2025-26 marks a significant step towards strengthening India's health-care system and inclusive growth. With a major focus on infrastructure development, medical education, cancer care and medical tourism, the budget reinforces the government's commitment to public welfare. Key initiatives such as Ayushman Bharat, medical education expansion, social security for online workers, and agriculture

sector reforms highlight a multi-dimensional approach to national development.

### Enhancing Healthcare Access

**Increased Allocation for Health and Family Welfare :** The Ministry of Health and Family Welfare has been allocated ₹ 99,858.56 crore, an 11% increase from the previous fiscal year. ₹ 95,957.87 crore is designated for the Department of Health and Family Welfare, while



₹ 3,900-69 crore is allocated to the Department of Health Research.

**Ayushman Bharat Initiative – Strengthening the Healthcare System :** The government has reinforced its commitment to universal healthcare through the Ayushman Bharat initiative, which consists of four key components :

1. **Ayushman Arogya Mandir :** Strengthening healthcare infrastructure at the grass-roots level.

2. **Pradhan Mantri Jan Arogya Yojana (PM-JAY) :** Expanding healthcare coverage for economically vulnerable sections.

3. **PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM) :** Strengthening healthcare infrastructure across the country, with a special focus on district-level hospitals and emergency preparedness.

4. **Ayushman Bharat Digital Mission (ABDM) :** Digitalizing health records and ensuring efficient delivery of healthcare services.

#### **Expansion of Medical Education**

- The budget proposes adding 75,000 new medical seats over the next five years to tackle the shortage of healthcare professionals.
- Additionally, 10,000 new medical seats will be added this year, expanding access to medical education across India.

#### **Cancer Care and Day-Care Centers**

- The budget proposes establishing 200 day-care cancer centers in district hospitals to improve accessibility to early diagnosis and treatment.
- This initiative aims to reduce cancer mortality rates by providing timely and affordable treatment options.

#### **Medical Tourism and ‘Heal in India’ Initiative**

- The ‘Heal in India’ initiative aims to position India as a global medical tourism hub by enhancing quality healthcare services and streamlining medical visa processes.
- The initiative will attract international patients while boosting India’s healthcare economy.

#### **Custom Duty Exemptions for Life-Saving Medicines**

- The budget provides custom duty exemptions on essential life-saving drugs, including medicines for rare diseases and critical illnesses.
- This move will make advanced treatments more affordable and accessible for Indian patients.

### **SOCIAL SECURITY AND WELFARE MEASURES**

**Social Security Scheme for Online Platform Workers :** Recognizing the gig economy’s contribution, the government has introduced a social security scheme for online platform workers. This scheme will provide benefits such as health insurance, pension plans, and accident coverage, ensuring financial security for gig workers.

**Jal Jeevan Mission : Extended Until 2028 :** The Jal Jeevan Mission has been extended until 2028, with an enhanced outlay to ensure safe drinking water to all rural households. The focus remains on sustainability and water conservation measures.

### **AGRICULTURE AND RURAL DEVELOPMENT INITIATIVES**

**PM Dhan Dhanya Krishi Yojana – Developing Agricultural Districts :** The PM Dhan Dhanya Krishi Yojana aims to develop agricultural districts by promoting modern farming techniques, irrigation efficiency and value-chain integration.

**Aatmanirbharta in Pulses and Comprehensive Program for Fruits & Vegetables :** A self-reliance (Aatmanirbharta) initiative in pulses has been launched to reduce dependency on imports. A comprehensive program for fruits and vegetables will ensure improved cold storage infrastructure and better supply chain management.

**Grameen Credit Score : Enhancing Financial Inclusion :** The introduction of a Grameen Credit Score system aims to improve financial inclusion for rural farmers and small entrepreneurs, facilitating easy access to credit.

**Makana Board in Bihar :** The establishment of a Makana Board in Bihar is aimed at promoting makhana (fox nut) cultivation, increasing farmer income, and ensuring export-oriented production.

**National Mission on High-Yielding Seeds :** The National Mission on High-Yielding Seeds will promote the research and distribution of high-yield varieties, ensuring food security and higher productivity.

## NUTRITIONAL SUPPORT AND WOMEN EMPOWERMENT

**Saksham Anganwadi and Poshan 2.0 :** nutritional support, ensuring better healthcare for pregnant women, lactating mothers, and young children. Saksham Anganwadi and Poshan 2.0 aim at enhancing early childhood nutrition and maternal health. The focus is on strengthening

## ENHANCING SWACHH BHARAT AND JAL JEEVAN MISSION : BUDGET 2025-26 PERSPECTIVE

India faces persistent challenges in safe drinking water, sanitation and waste management across rural and urban areas. The Union Budget 2025-26 reaffirms its commitment by extending Jal Jeevan Mission (JJM) until 2028 and maintaining funding for Swachh Bharat Mission 2.0 (SBM 2.0). However, concerns remain over stagnated and reduced allocations.

### Historical Context and Evolution

- Swachh Bharat Mission (SBM) was launched in 2014 to achieve Open Defecation Free (ODF) India and improve sanitation. Achievements include 100 million toilets and ODF+ status in several districts.
- SBM 2.0 (launched in 2021) focuses on sustainable solid and liquid waste management and urban sanitation challenges.
- Jal Jeevan Mission (JJM) was launched in 2019 to ensure piped water supply (Har Ghar Jal) to every household.

### Synergies Between Swachh Bharat and JJM

- **Integrated WASH Planning :** Linking sanitation, water supply and hygiene for sustainable impact.
- **Wastewater Treatment & Reuse :** Utilizing treated wastewater for irrigation to conserve water.
- **Institutional Strengthening & Capacity Building :** Enhancing local governance and training personnel.

## ARTIFICIAL INTELLIGENCE IN EDUCATION

Artificial Intelligence (AI) is transforming India's education system, making learning more personalized, inclusive and efficient. Aligned with the National Education Policy (NEP) 2020, AI plays a crucial role in bridging rural-urban gaps, improving teacher support and integrating technology-driven education. Various initiatives by NITI Aayog, the Ministry of Skill Development and the Union Budget 2025-26 reflect India's commitment to leveraging AI for education.

### Comparative Analysis & Challenges

- **Infrastructure & Service Gaps :** Unequal progress in urban and rural areas.
- **Sanitation & Waste Management Deficiencies :** Poor waste collection, processing, and disposal systems in urban slums and rural belts.

### Budget 2025-26 : Strengthening SBA and JJM

- **SBM 2.0 :** ₹ 12,192 crore allocated (unchanged since 2022, raising concerns about financial stagnation).
- **JJM :** ₹ 67,000 crore allocated but saw a massive cut in the revised estimate stage, affecting implementation.

### Recommendations for Improvement

Increase budgetary allocation for SBM 2.0 and JJM to address funding gaps. Enhance Public-Private Partnerships (PPPs) to improve efficiency and sustainability. Strengthen local governance & capacity building to ensure better implementation. Implement performance-based fund disbursement for accountability. Adopt digital monitoring systems for real-time tracking and effective intervention.

### Conclusion

While, India's Budget 2025-26 continues support for clean water and sanitation, stagnant allocations and funding cuts pose challenges. Addressing these concerns through increased investments, strategic planning, and innovative partnerships is critical for achieving universal sanitation and water security.

### NEP 2020 and AI Integration

NEP 2020 emphasizes technology in education to ensure access, equity and quality. AI is seen as a key enabler in :

- **Early Childhood & Vocational Education :** AI-powered adaptive learning systems to customize learning paths.
- **Bridging Rural-Urban Gaps :** AI-based platforms enable virtual classrooms, online courses and real-time language translation for better outreach.

- **Personalized Learning** : AI tailors learning experiences based on student progress and needs.

#### AI in the Teaching and Learning Process

- **AI-Powered Professional Development** : AI tools help teachers locate resources, create personalized lesson plans and automate administrative tasks.
- **24/7 Assistance for Learners** : AI chatbots like TARA on the DIKSHA portal provide round-the-clock support.
- **Assessment & Classroom Monitoring** : AI automates grading, performance tracking and feedback mechanisms.

#### AI for Inclusive Education

- **Supporting Students with Disabilities** : Speech-to-text for hearing-impaired students. Text-to-speech for visually impaired learners. Real-time language translation for multilingual education.
- **PRASHAST App** : AI-enabled early screening of students for disabilities.

#### Government Initiatives for AI in Education

- **NITI Aayog's 'AI for All' Strategy** : Aims for inclusive AI adoption.
- **Skill India AI Portal & AI for India 2.0** : Focus on AI skilling programs.

- **Union Budget 2025-26** : Allocates ₹ 500 crore to set up AI Centers of Excellence for research and data analytics.

#### AI for Rural Education

- **Language Learning Solutions** : AI-powered real-time translations to overcome language barriers.
- **Virtual Classrooms & Online Courses** : Connect rural students with qualified educators worldwide.
- **VR&AR-based Learning** : Enhancing experiential education in remote areas.

#### Way Forward

- **Investment in AI Infrastructure & R&D** : Strengthening AI-powered teaching aids and assessment tools.
- **Public-Private Partnerships** : Collaboration with EdTech firms for large-scale AI integration.
- **Policy & Ethical AI Use** : Ensuring data privacy and unbiased AI algorithms in education.

#### Conclusion

AI in education, driven by NEP 2020, NITI Aayog, and budgetary support, holds immense potential to revolutionize learning, empower teachers and make education inclusive and accessible. Proper policy implementation, investment and training can position India as a global leader in AI-powered education.



# GIST OF DOWN TO EARTH

*Topic*

Uninsured (28 Feb., 2025)  
Who Gets Credit (15 Mar., 2025)

**March  
2025**



(16-28 February, 2025)

## BUDGET SQUEEZE

### 1. Key Challenge

- The budget aimed to boost employment and disposable incomes amid a slowing economy.
- Economic Survey 2024-25 flagged declining real incomes over the past five years.
- Tax exemptions for the salaried middle class (up to ₹ 12 lakh annually) but ignored 94% of informal workers.
- Focus on reducing the fiscal deficit led to limited welfare spending.

### 2. Budgetary Cuts in Key Schemes

- **Centrally Sponsored Schemes** : Only a 7% increase in allocation :
  - ❑ **Pradhan Mantri Awas Yojana-Urban** : 34% cut
  - ❑ **Livestock Health Programme** : 20% cut
  - ❑ **National River Conservation Plan** : 5.7% cut
  - ❑ **Price Stabilisation Fund** : 59% cut (despite high food inflation)
  - ❑ **PLI Scheme (Automobiles & Auto Components)** : 19% cut
- **Agriculture Sector** : 2.5% budget cut (₹ 1.41 lakh crore → ₹ 1.37 lakh crore) :
  - ❑ **Pradhan Mantri Fasal Bima Yojana** : 23% cut (lowest since 2019-20)
  - ❑ **Krishi Vigyan Kendras** : 13% cut
  - ❑ **Natural Farming Mission** : Funding increased to ₹ 616 crore
- **Rural Development** : 6% increase in allocation (₹ 1.9 lakh crore) :
  - ❑ **MGNREGA & PM Krishi Sinchai Yojana** : Stagnant funding
  - ❑ **PM Gram Sadak Yojana** : 37% increase

- **Jal Shakti Ministry** : 4.6% increase (₹ 99,503 crore)
  - ❑ **Jal Jeevan Mission extended till 2028** (funding reduced to ₹ 67,000 crore)

### 3. Health & EV Sector Push

- **Health Budget** : 10% increase (₹ 99,858 crore)
  - ❑ **36 life-saving drugs** added to the exempted medicines list
  - ❑ **Ayushman Bharat coverage extended to gig workers**
  - ❑ **National Health Mission** : 3.4% rise
- **Electric Vehicles & Battery Production** :
  - ❑ **PLI for Advanced Chemistry Cell Batteries** : Increased from ₹ 15.42 crore to ₹ 155.76 crore
  - ❑ **PM Electric Drive Revolution (PME-Drive)** : Funding doubled to ₹ 4,000 crore
  - ❑ **Basic customs duty exemption** on 16 critical minerals (cobalt, lithium, zinc, etc.)

### 4. Lack of Focus on Decarbonisation

- No major announcements on carbon reduction or green initiatives.
- No mention of carbon markets or National Green Hydrogen Mission in the budget speech.

### Conclusion

The budget focused on fiscal consolidation, tax relief for the salaried middle class, and boosting domestic manufacturing but at the cost of welfare schemes and agriculture support. While health and EV sectors saw some gains, decarbonisation efforts received little attention.

## OUTBREAK OF GUILLAIN-BARRÉ SYNDROME IN INDIA

A rare neurological disorder, Guillain-Barré Syndrome (GBS), has seen a sudden outbreak in India, with over 280 confirmed cases and 13 deaths reported across seven states between January and February 2025. Pune, Maharashtra, is the worst affected, accounting for over 155 cases.

### Causes & Triggers

- GBS is an autoimmune condition where the immune system attacks nerves, causing limb weakness and paralysis.
- It is often triggered by infections like *Campylobacter jejuni*, norovirus, *Haemophilus*

*influenzae*, Epstein-Barr virus, hepatitis E, etc.

- Pune's outbreak is suspected to be water-borne, linked to contaminated drinking water in newly merged civic areas that lack proper potable water supply.

### Geographical & Environmental Factors

- Almost 50% of Pune's cases are clustered within a 3 km radius in the city's southwest areas.
- Poor water quality complaints in these areas suggest fecal contamination and inadequate water treatment.

- Local residents have reported rashes, itching, diarrhea, vomiting and fever.

### Health System Challenges

- GBS is not a notifiable disease, making it difficult to track cases accurately.
- Pune authorities found 195 cases of GBS in 2023, indicating that the disease is not new but has gone largely unnoticed.
- Lack of post-mortem examinations and proper diagnostic approaches makes it difficult to identify and address mysterious illnesses in India.

### Broader Concerns on Public Health

- India has witnessed several unexplained health crises, such as litchi-linked child

deaths in Bihar and pesticide poisoning in Maharashtra.

- Environmental factors and chemical contamination in food, water and air are often ignored in medical investigations.
- Rural populations affected by pesticide exposure or chemical toxicity are dismissed as cases of poor hygiene or lifestyle choices.

### Conclusion

The GBS outbreak highlights India's gaps in public health infrastructure, especially in water sanitation, disease surveillance and medical diagnostics. There is a need for urgent interventions, including better water treatment, active disease monitoring and environmental health research, to prevent future outbreaks.

## DRAFT NATIONAL POLICY ON AGRICULTURAL MARKETING

The draft National Policy Framework on Agricultural Marketing (released on November 25, 2024) has raised concerns among farmer groups about privatisation of wholesale markets. Farmer unions, particularly Samyukt Kisan Morcha, have called it a 'backdoor resurrection' of the repealed farm laws of 2020-21.

### Key Provisions of the Draft Policy

**1. Expansion of Private Wholesale Markets :** India has 7,057 APMC markets, 125 private wholesale markets and 500 unregulated whole-sale markets. The draft proposes setting up one private market per revenue division and later expanding to one per district.

**2. Public-Private Partnership (PPP) in APMC Markets :** States are encouraged to adopt PPP models to improve APMC infrastructure. Critics argue this could hand over mandi operations to private entities.

**3. Market Fees Rationalization :** Market fees capped at 1% for perishables and 2% for non-perishables, down from the current 3%. Punjab opposes this, stating mandi fees help in rural road networks and infrastructure.

**4. Gaps in Agricultural Marketing Infrastructure :** 1,144 APMC markets are non-functional. Cold storage exists in less than 10% of markets. Grading facilities are available in only

one-third of markets. Electronic weigh-bridges are limited.

**5. Repackaging of Existing Policies :** Many suggested reforms already exist in 15-25 states. No new mechanisms for farmer grievances in private markets.

**6. Omission of Livestock Marketing :** Livestock is a major source of income, yet the policy ignores livestock mandis.

### Concerns and Criticism

- **Lack of Long-Term Vision :** The policy aims for a 10 year reform but lacks immediate solutions.
- **Excessive Centralization :** Suggests an Agricultural Marketing Reform Committee chaired by the Union Agriculture Minister, resembling the GST Council.
- **Failure of Previous Private Market Initiatives :** 15 states allowed private markets, but only 5 states implemented them with limited success.

### Conclusion

The draft policy acknowledges market challenges but relies too much on privatisation without offering strong alternatives. Critics argue it rehashes old ideas rather than presenting a comprehensive, farmer-centric solution.

## GENOME INDIA PROJECT : A BREAKTHROUGH IN INDIAN GENOMIC RESEARCH

The Genome India project has successfully sequenced 10,074 DNA samples from healthy individuals, creating India's largest genetic reference database. This initiative aims to enhance disease detection, prevention and personalized medicine by identifying genetic variations unique to the Indian population.

### Key Highlights of the Genome India Project

**1. Objective :** To create a genomic sequence database representing India's genetic diversity. To aid in personalized medicine by identifying genetic variants affecting drug efficacy and disease susceptibility.

**2. Execution and Findings :** Launched in 2017 and funded by the Department of Biotechnology (DBT). Sample collection started in 2020 from volunteers across various Indian population groups. Whole genome sequencing revealed unique genetic variations in the Indian population. Data is stored at the Indian Biological Data Center, Faridabad and the Centre for Brain Research, IISc, Bengaluru.

**3. Significance :** Helps in personalized medicine—ensuring better treatment outcomes by considering genetic factors. Assists in early disease detection and research on genetic disorders like diabetes, cancer and mental illnesses. Addresses gaps in genomic studies, which have historically relied on Western genetic datasets. Provides a foundation for developing DNA-based diagnostic tools and precision medicine.

### Indian Genetic Research : Past and Present

- **Previous Efforts :** The Indian Genome Variation Consortium (2010) analyzed genomic diversity across linguistic groups. The first Indian genome was sequenced in 2009, much later than the global Human Genome Project (1990-2003).
- **Challenges and Next Steps :** More data is needed for comprehensive reference genomes across India's diverse populations. Expansion into studying genetic markers for brain disorders, metabolic diseases, and rare genetic conditions.

## CLIMATE CHANGE AND THE EVOLVING INSURANCE CRISIS

Climate change is fundamentally reshaping the global insurance industry. The increasing frequency and severity of extreme weather events have made traditional probability-based risk assessment models unreliable. This has led to soaring premiums, the withdrawal of major insurers from high-risk areas and growing concerns about financial instability. The situation in California, where wildfires have caused massive losses and led insurers to restrict coverage, is a stark warning of the challenges ahead. At the same time, new insurance models like parametric insurance are emerging as potential solutions, especially in vulnerable regions like India.

### Climate Change and the Disruption of Insurance Models

Traditionally, insurance companies assess risk based on historical probabilities. However, climate change has altered these patterns, making extreme weather events such as hurricanes, floods and wildfires more unpredictable. The result is a growing number of claims, leading to higher premiums and, in some cases, making insurance unaffordable or unavailable.

### Ethical and Privacy Concerns

**1. Risk of Genetic Discrimination :** Historical cases, such as sickle cell disease testing in the US, highlight potential misuse. Need for legal frameworks to prevent genetic bias in employment, insurance and healthcare.

**2. Global Best Practices :** US Genetic Information Non-discrimination Act (2008) protects against genetic-based discrimination. EU General Data Protection Regulation (2016) safeguards genetic data privacy.

### 3. India's Regulatory Gaps & Initiatives :

- ❑ **Indigenome :** A database ensuring identity-masked, consent-based data sharing.
- ❑ **Biotech-PRIDE Guidelines (2021) :** Aim to regulate genetic data usage and ensure ethical research practices.

### Conclusion

The Genome India project is a significant step in advancing precision medicine, genetic research, and healthcare innovation in India. However, strong data protection laws and ethical guidelines are crucial to safeguard individuals' genetic information. The project's success paves the way for future breakthroughs in personalized healthcare, disease prevention and biotechnology advancements.

The crisis is particularly evident in California, where wildfires in January 2025 burned 23,000 hectares and caused damages exceeding \$ 250 billion. With insured losses between \$ 35-45 billion, major insurers, covering 80% of the market, have withdrawn or restricted new policies. Between 2020 and 2022, 2.8 million homeowner policies were not renewed, putting significant strain on the housing market. If properties cannot be insured, they cannot be mortgaged, potentially triggering an economic crisis similar to the 2008 financial meltdown.

Governments have attempted to intervene through state-backed insurance programs like California's FAIR Plan, but demand has surged beyond sustainable levels. Additionally, global reinsurance companies like Swiss Re and Munich Re have increased their rates, making coverage even costlier.

### Insurance Market Adaptation and Emerging Solutions

The crisis has prompted insurers and policymakers to explore new risk management strategies. One such approach is **parametric**



**insurance**, which provides payouts based on predefined weather conditions rather than post-event assessments. This model ensures faster claim settlements and reduces disputes. Countries and organizations worldwide are increasingly considering parametric insurance as a tool for climate adaptation, as recognized under international agreements like UNFCCC Article 4.8.

In India, climate change has severely impacted agriculture, with extreme weather recorded on 255 of 274 days in 2024, affecting 3.2 million hectares of crops. The Pradhan Mantri Fasal Bima Yojana (PMFBY) is a key insurance initiative aimed at protecting farmers, but its effectiveness remains debatable. While enrollment has increased, claim payouts have declined, particularly in high-risk districts where farmers face the highest premiums but receive lower compensations.

A notable innovation in India's insurance landscape is Nagaland's **Disaster Risk Transfer Parametric Insurance Solution (DRTPS)**. In August 2024, Nagaland became the first Indian state to insure its entire area under this scheme. The initiative, backed by the Nagaland State Disaster Management Authority (NSDMA) and SBI General Insurance, provides ₹ 150 crore in coverage, with payouts triggered by predefined rainfall thresholds. Claims are authenticated through blockchain technology and geotagging, ensuring transparency and efficiency.

## Challenges and the Future of Insurance in a Changing Climate

While parametric insurance offers promising benefits, challenges remain in setting accurate payout-trigger thresholds. Previous attempts in Nagaland (2021-2023) failed due to unreliable satellite data. The new system now integrates 50 years of IMD data with ground weather stations, improving reliability. However, grassroots organizations still struggle to access IMD datasets freely, often relying on European sources for weather forecasting.

Looking ahead, insurers are incorporating Shared Socioeconomic Pathways (SSPs) under the IPCC framework to predict risks for 2030, 2050, and beyond. Advanced risk models must consider cascading climate impacts and compounding disasters to ensure financial stability. Governments and insurers must work together to reassess premium structures, improve climate resilience and enhance financial safeguards.

## Conclusion

The growing insurance crisis underscores the urgent need for innovative solutions to manage climate risks. Traditional models are failing in the face of extreme weather, leading to rising premiums and insurer withdrawals from vulnerable areas. The introduction of parametric insurance, as seen in Nagaland, represents a significant step toward building climate resilience. However, addressing challenges related to data accuracy, accessibility and risk modeling is crucial. With climate change accelerating, proactive policy measures and financial innovations will be essential to ensure sustainable insurance markets and economic stability.

## PATENTLY ABSURD - DEEPSEEK AI MODEL IS A SOBERING IDEA FOR INDIA

### 1. China's DeepSeek AI Breakthrough

- DeepSeek AI, developed in China by hedge fund manager Liang Wengfeng, has disrupted the global AI market.
- Its cost-effective approach has significantly impacted major players like OpenAI and Nvidia, wiping off nearly \$1 trillion in market value.
- The AI model, known for its reasoning capabilities (R1 model), has been praised as one of the most impressive breakthroughs in AI.

### 2. India's Response and AI Aspirations

- The Indian government, which usually downplays China's tech advancements, has shown unexpected interest in DeepSeek.

- IT Minister Ashwini Vaishnaw praised DeepSeek and announced plans to host its models on Indian servers.
- This shift is surprising given India's earlier bans on Chinese apps over security concerns.
- The appeal of DeepSeek lies in its open-source nature, which India hopes to leverage to accelerate its own AI ambitions.

### 3. Challenges for India's AI Development

- India's IndiaAI Mission has an outlay of ₹ 10,300 crore—modest compared to Silicon Valley giants.
- The government claims it will develop a secure and cost-effective indigenous AI model, but the timeline remains unclear.

- OpenAI's CEO Sam Altman, who previously dismissed India's AI capabilities, has now changed his stance, seeing India as a key AI player.

#### 4. Structural Issues in India's Innovation Ecosystem

- The government's emphasis on Indian Knowledge Systems (including subjects like reincarnation) in premier institutes like IITs is seen as counterproductive.
- Political interference in education and research could hinder the emergence of visionary innovators like Liang.
- Without fostering genuine scientific curiosity, India risks lagging behind in the global AI race.

#### 5. Lessons from DeepSeek's Success

- Liang Wengfung's innovation relied on efficiency : Used 2,000 Graphics Processing Units (GPUs) instead of 100,000. Optimized computing precision to reduce memory usage. Used gaming GPUs instead of high-cost specialized hardware.
- His philosophy emphasizes originality, curiosity and innovation over mere imitation—something India has yet to foster fully.

#### Conclusion

India's engagement with DeepSeek marks a significant shift in its tech policy. While the country hopes to learn from China's AI advancements, it must address deeper issues—funding, research culture, and freedom in academia—to truly compete in the AI space.

### ORGANIC MOVE

**1. Transition to Organic Farming :** Over 10,000 farmers in 110 villages of Dantewada, Chhattisgarh, received organic certification under the Large Area Certification (LAC) scheme in 2023-24. The district aims to become fully organic by including 117 more villages.

**2. Organic Farming Practices :** Farmers use **jeevamrit**, a natural fertilizer made from cow dung, urine, jaggery, gram flour and soil. Traditional methods, combined with modern organic techniques like the System of Rice Intensification (SRI), have improved yields and soil quality.

**3. Policy and Support Initiatives :** The shift began in 2013 with district administration and agriculture department interventions. The Mocho Badi scheme, supported by NMDC, provided subsidies for fencing, solar pumps, and tools, increasing farmer income by 600%. By 2015, farmers demanded a ban on chemical fertilizers, leading to government shops stopping sales and private shops losing licenses.

**4. Challenges and Future Goals :** Only 40% of the district's food demand is met through organic production. Plans to integrate organic produce into midday meals, PDS and ICDS schemes. Cropping intensity (101%) is below the national average (155.4%), requiring better productivity. Funding for future certification, capacity building and market support remains uncertain. Lack of premium pricing for organic products is a major deterrent for farmers.

**5. Way Forward :** Ensuring no farmer reverts to chemical farming. Increasing organic production and diversification to include vegetables, fruits, pulses and millets. Better market incentives and continued funding are necessary to sustain the organic transition.

If successful, Dantewada could emerge as a model organic farming district, addressing both sustainability and nutritional security.

### TERMITE TRAP

**1. Termite Infestation and Chemical Risks :** Termites cause severe damage to buildings, crops (maize, wheat, cotton, sorghum, paddy), and forests. Chemical pesticides used for termite control (organophosphates, pyrethroids, organochlorines, fipronil) pose serious health risks to humans, pets and the environment. Organophosphate poisoning can cause respiratory failure, nausea, cancer and soil and groundwater contamination.

**2. *Trididium bengalense* – A Natural Solution :** Accidental discovery in Harike

Wildlife Sanctuary, Punjab, where the grass, locally called **kana**, was planted around a rest house. The grass acts as a 'termite magnet', attracting termites away from buildings while continuing to grow. Local communities confirm that this method was a part of traditional knowledge, now largely forgotten.

**3. Other Natural Termite Control Methods** ICAR studies mention alternative plant-based solutions like :

- **Gliricidia** as a shade tree reducing termite damage.

- **Black plum (*Vitex doniana*)** attracting termites away from crops.
- **Castor bean (*Ricinus communis*)** acting as a deterrent. Essential oils from eucalyptus, neem, lemon grass and aloe vera also help in termite control.

### EMPLOYED, BUT NOT PAID

**1. Employment Growth Vs. Income Growth :** Employment is crucial for leveraging India's demographic dividend, especially with increasing female workforce participation. However, despite rising employment, income levels have not significantly improved.

**2. Economic Survey 2024-25 Highlights :** The report celebrates the decline in unemployment due to a rise in self-employment. Self-employed workers now constitute 58.4% of the workforce (up from 52.2% in 2017-18). Meanwhile, regular salaried jobs have declined from 22.8% to 21.7% (2018-2024). Casual employment has decreased from 24.9% (2017-18) to 19.8% (2023-24).

**3. Rise of Self-Employment Among Women :** More women are now self-employed than men. However, in rural India, female participation in regular wage jobs dropped from

**4. Need for Scientific Validation :** *Triplidium bengalense* is not documented in official studies as a termite-control plant. The discovery highlights the importance of local ecological knowledge and the need for scientific research to integrate traditional solutions into mainstream pest management.

10.5% (2017-18) to 7.8% (2023-24). Similar declines are noted in urban areas as well.

**4. The Reality of Self-Employment in India :** Self-employment is not necessarily entrepreneurial but rather a last resort due to a lack of formal jobs. Daily-wage jobs often provide higher earnings than self-employment, making them attractive to small farmers and landless workers. A 2023 study found that real earnings for urban self-employed workers in 2022 were 11% lower than in 2019. Rural self-employment earnings are 40% lower than urban areas.

**5. Conclusion : Employment Crisis :** The rise in self-employment masks a deeper employment crisis rather than indicating economic progress. The government needs to focus on creating more stable, salaried jobs instead of relying on self-employment growth as an economic indicator.

(1-15 March)

### STEM THE ROT

**Context : Sugarcane Crisis in Western Uttar Pradesh**

- Muzaffarnagar, known as the 'sugar bowl of India', has seen a decline in sugarcane cultivation due to the spread of red rot disease.
- Farmers are shifting to poplar cultivation due to financial losses from declining sugarcane yield.

**Impact of Red Rot Disease**

- **Caused by :** *Colletotrichum falcatum*, a fungal disease that rots sugarcane stalks.
- **Spread across districts :** Muzaffarnagar, Bijnor, Moradabad and other regions.
- **Production decline :** Sugarcane output fell from 224.25 million tonnes (2022-23) to 215.81 million tonnes (2023-24). Sugar production declined slightly from 10.48 million tonnes to 10.41 million tonnes. Farmers have spent ₹ 50,000 per acre on pesticides but faced heavy losses.

**Co 0238 Variety : A Double-Edged Sword**

- Highly cultivated variety in UP, covering 87% of sugarcane farms by 2020-21.
- Initially resistant to red rot but became vulnerable due to over-reliance on a single variety.
- A new virulent strain CF13 of the fungus evolved, breaking the variety's resistance.
- Excessive rainfall and floods (2020-23) worsened the spread of red rot.

**Solution : Diversification & New Varieties**

- Scientists recommend reducing dependence on Co 0238 and adopting diverse varieties.
- The UP Sugarcane Department advises replacing it with CoS 19231, CoSe 17451, Co 15023, Co 0118, etc.
- Farmers hesitate due to lower yield and lack of ratooning ability in alternative varieties.
- Seed shortage has further slowed the transition, with large farmers selling seeds at inflated prices.



## Conclusion

The crisis highlights the risk of monoculture farming and the need for crop diversification to

prevent future outbreaks. While new varieties are being promoted, seed availability and farmer adoption remain key challenges.

## URBAN TRAP

Many villages across India are protesting their reclassification as urban areas due to fears of losing government benefits and local autonomy. Residents argue that urbanization leads to economic insecurity, loss of rural employment guarantees and increased financial burdens.

### Key Concerns of Villagers

- **Loss of Rural Employment Schemes :** Villagers, especially daily wage labourers, will no longer be eligible for MGNREGA, a legal right ensuring 100 days of employment. Urban employment schemes like Mukhyamantri Shahri Rozgar Guarantee Yojana lack the same legal backing.
- **Threat to Agriculture :** Urban status risks agricultural land being repurposed for development, forcing farmers into low-paying jobs.
- **Financial Burdens :** Urbanization imposes new taxes (property, water, drainage, waste management), making life costlier.
- **Loss of Local Governance :** Rural areas are governed by elected gram panchayats, whereas urban areas fall under bureaucratic municipal councils, distancing people from decision-making.

### Wider Trend of Resistance

- Protests have erupted in multiple states, including Rajasthan, Uttarakhand, Uttar

Pradesh, Haryana, Tamil Nadu and Chhattisgarh.

- Population growth and administrative expansion are key drivers of urbanization.
- Many villagers previously supported urbanization, hoping for rising land values, but now realize the disadvantages outweigh the benefits.

### Political and Administrative Issues

- Urban expansion often occurs without proper planning, leading to unstructured growth and mismanagement.
- Politicians have used urbanization for electoral gains, merging villages into municipal areas without public consultation.
- Legal provisions like Article 243Q(2) of the Indian Constitution and state laws require specific criteria and public objections before urbanizing villages, but these are often ignored.

### Conclusion

The forced urbanization of villages without structured development or public consensus is leading to widespread resistance. While urban growth is inevitable, it must be planned and inclusive, ensuring economic security and governance participation for affected rural populations.

## US FOREIGN AID FREEZE AND ITS IMPACT ON AFRICA

### 1. Impact on Food Security

- Around 800 soup kitchens in Khartoum, Sudan, serving displaced families, were shut down due to the US freezing foreign aid on January 20, 2025.
- Sudan faces a hunger crisis, with 26 million people—more than half its population—at risk of starvation.

### 2. Humanitarian and Health Crisis

- The aid freeze has disrupted USAID's emergency response programs in South Sudan, Somalia, DRC, Liberia, Sudan, Uganda and Ethiopia.
- The HIV/AIDS crisis in South Africa is worsening as PEPFAR funding, which supports 5.5 million HIV patients, is halted.
- Zimbabwe, where 98% of medicines are donor-funded, faces severe health risks.

### 3. Refugee Crisis

- Africa hosts 45.9 million forcibly displaced people (UNHCR, 2024).
- Uganda, hosting 1.1 million refugees, saw a funding cut from \$ 22.0M in 2017 to \$ 141 M in 2023.
- The US contributed \$ 86M to Uganda's refugee programs in 2024, which is now at risk.

### 4. Economic Fallout

- 40 African nations benefited from the African Growth and Opportunity Act (AGOA), providing duty-free US market access.
- AGOA is under threat as the US plans new trade tariffs and fossil fuel expansion, which could hurt South Africa's citrus and auto

industries, as well as Nigeria and Angola's energy exports.

- The non-profit sector, a major employer in Africa, faces job losses—e.g., 30,000 workers in Kenya's US-funded health projects are at risk.

## Conclusion

The US aid freeze threatens food security, healthcare, refugee programs and economic stability across Africa, potentially leading to widespread hunger, disease and economic decline.

## IRRIGATION BY SNOW

Farmers in Kinnaur, Himachal Pradesh, are facing a severe water crisis due to declining rainfall and snowfall. To sustain apple orchards, they are resorting to collecting and transporting snow from higher altitudes, referring to it as 'white manure'.

### Key Issues

**1. Declining Rainfall and Snowfall :** Kinnaur received 91% less rainfall than normal (15.1 mm instead of 165.7 mm) in January-February 2025. Rising temperatures have led to reduced snowfall and faster melting.

**2. Impact on Horticulture :** A study (published in *Mausam*, 2024) shows rising temperatures have negatively impacted apple, apricot and grape production. Pear and almond productivity has declined over 20 years, while walnut production has marginally increased. Lack of moisture reduces nutrient absorption, affecting crop growth and yield.

**3. New Challenges for Farmers :** Increase in pests like canker, woolly aphids and mites due to changing climate. Farmers are shifting to early fruit varieties to adapt. Beekeeping for pollination has become expensive and challenging.

**4. Wider Impact on the Trans-Himalayan Region :** The phenomenon of reduced snowfall extends to Spiti and Lahaul valleys, affecting the entire horticulture sector. Land under horticulture in Himachal Pradesh increased from 163,330 ha (1990-91) to 236,466 ha (2022-23), but climatic changes pose a major threat to sustainability.

## Conclusion

Farmers in Kinnaur are adapting innovative methods like snow collection for irrigation, but long-term solutions, including government intervention, are necessary to sustain horticulture in the region.

## CARBON MARKET

The carbon market has emerged as a key tool for mitigating climate change by incentivizing activities that reduce or remove greenhouse gas (GHG) emissions. In India, agroforestry-based carbon credit projects have gained traction, with major corporations like Meta, Microsoft, and Google investing in afforestation and reforestation initiatives. However, despite the promise of financial benefits, many farmers face challenges related to transparency, delayed payments and unfair revenue-sharing mechanisms. This cover story delves into the realities of India's agroforestry carbon market, highlighting its potential, shortcomings and the urgent need for regulatory reforms.

### 1. The Carbon Market and Agroforestry Boom

- The carbon credit system rewards activities that capture or reduce carbon emissions, with agroforestry emerging as a key sector due to its ability to sequester carbon.
- India has 91 out of 460 global afforestation/reforestation projects (as of January 2025), attracting investment from large corporations seeking carbon offsets.

- Major players like Meta, Microsoft, and Google purchase carbon credits from agroforestry projects, but farmers remain uncertain about their share of the revenue.

### 2. The Farmer's Predicament : Unfulfilled Promises

- Farmers, like Arun Dutta Kadale in Maharashtra, were promised substantial earnings from carbon credits and timber sales, but many have yet to receive payments.
- **Case Study—Punjab Agroforestry Projects :** Two large-scale projects covering eucalyptus and poplar plantations were issued carbon credits. Farmers earned \$ 577/ha (₹ 50,011) over five years, but initial costs (~ ₹ 2 lakh/ha) left them with minimal profits. Some farmers did not receive the promised subsidies under the Crop Diversification through Agroforestry (CDAF) scheme.
- **Mahogany Plantations—A Questionable Investment :** Mahogani Vishwa Agro Pvt Ltd (MVAPL) claims its project will remove 230,982 tonnes of CO<sub>2</sub>e over 30 years, yet financial returns for farmers remain unclear.

Despite Verra certification and credit issuance, farmers continue to struggle with non-transparent revenue-sharing models.

### 3. Lack of Transparency and Market-Based Pricing

- Investigations by Down to Earth found widespread distress among farmers due to unclear contracts and withheld benefits.
- **Revenue-sharing issues** : In Punjab projects, farmers received \$ 6-8 per carbon credit, about 50% of the revenue. In Chhattisgarh projects, farmers received only 12% after deductions.
- Many agreements lack clear revenue-sharing clauses and are often written in English, making them difficult for farmers to comprehend.
- **Challenges in Carbon Credit Pricing** : The market-based pricing system lacks regulation, meaning carbon credit prices depend entirely on buyer-seller negotiations. Intermediaries and project developers often earn more than farmers, leaving them with limited financial benefits.

### 4. Technical Challenges in Carbon Credit Calculation

- **Estimating carbon sequestration is complex and indirect** : The standard method involves sampling 10% of the land and extrapolating carbon stock. Third-party auditors and IPCC guidelines are used for verification. Factors considered include baseline emissions, leakage and buffer pool calculations.
- **Sustainability concerns** : Similar agroforestry projects in Bastar, Chhattisgarh, led to

farmer debts, raising doubts about the long-term viability of these schemes.

### 5. Regulatory Efforts and Government Interventions

- The Integrity Council for the Voluntary Carbon Market (ICVCM) introduced Core Carbon Principles (CCPs) in 2023 to improve transparency.
- **India's Climate Commitments** : The government aims to create 2.5-3 billion tonnes of CO<sub>2</sub>e carbon sinks by 2030 as part of its Nationally Determined Contributions (NDCs). The 2023 India State of Forest Report shows India's carbon stock has increased to 30-43 billion tonnes CO<sub>2</sub>e.
- **New Policy Developments** : A 2024 Verra policy update mandates greater transparency in benefit-sharing mechanisms. Government push for agroforestry aligns with India's carbon sequestration goals but needs stronger regulatory oversight.

### Conclusion : Need for Stronger Governance and Farmer Protections

The carbon market in India holds immense potential, both for climate change mitigation and as an additional income source for farmers. However, the lack of transparency, high upfront costs and unfair revenue distribution raise concerns about its long-term viability. To ensure equitable benefit-sharing, the government must introduce clear regulatory frameworks, enforce third-party audits and mandate farmer-friendly contracts. Only through greater transparency and fair pricing mechanisms can agroforestry carbon credit projects truly empower Indian farmers while contributing to global climate goals.

## DUBIOUS DISTINCTION : HOW MADHYA PRADESH DISPLACED PUNJAB AS THE COUNTRY'S LEADING STATE IN STUBBLE BURNING

Madhya Pradesh has surpassed Punjab as India's top state for stubble burning, a phenomenon largely attributed to the rapid expansion of paddy cultivation in recent years. Once primarily associated with Punjab and Haryana, the issue of crop residue burning has now gripped central India, with districts like Sheopur reporting the highest incidents. This shift raises concerns about environmental pollution, agricultural policies and climate change adaptation strategies.

### The Rise of Stubble Burning in Madhya Pradesh

**1. Data Insights : A Shift in Trend** : According to the Consortium for Research on

Agroecosystem Monitoring and Modelling from Space (CREAMS), Madhya Pradesh recorded 16,360 stubble-burning incidents between September 15 and November 30, 2024, the highest in the country. The state accounted for 44% of the total stubble-burning cases reported across six states (Punjab, Haryana, Uttar Pradesh, Delhi, Rajasthan and MP). Sheopur district alone reported 2,508 cases, making it the worst-affected district in India.

**2. Decline in Punjab, Rise in Madhya Pradesh** : Punjab, historically the leader in stubble burning, saw a 300% decline in incidents in 2024 compared to 2023. Meanwhile, Madhya Pradesh experienced a 30% rise, climbing from



12,500 cases in 2023 to 16,360 in 2024. In 2022, MP was second to Punjab, but its rapid increase has made it the new hotspot.

### Reasons Behind the Increase in Stubble Burning

**1. Expansion of Paddy Cultivation :** Paddy farming in Madhya Pradesh has doubled in the last five years. Sheopur's paddy cultivation expanded from 43,127 hectares in 2018-19 to 85,000 hectares in 2024, with projections of reaching 100,000 hectares in 2025. Across MP, paddy acreage increased from 2.8 million hectares (2019) to 3.6 million hectares (2024).

**2. Shift from Other Crops to Paddy :** Farmers have replaced soybean and black gram with paddy due to better profitability. Black gram cultivation reduced from 2.4 million hectares (2019) to 0.98 million hectares (2024). Soybean cultivation also declined, albeit at a slower rate, from 5.5 million hectares to 5.38 million hectares.

**3. Profitability Factor :** Paddy cultivation is seen as more lucrative :

- **Cost per bigha (0.16 hectares) :** ₹ 15,000
- **Yield per bigha :** ~1 tonne
- **Market price in 2024 :** ₹ 34,000 per tonne
- **Profit per bigha :** ₹ 20,000

In comparison, soybean fetches only ₹ 12,000 to ₹ 20,000 per tonne for half the yield, making paddy more attractive.

**4. Favourable Climatic Conditions :** Sheopur received 1,323 mm rainfall in 2024, nearly 100% above normal levels, making paddy cultivation more viable. The trend of unseasonal heavy rains has led farmers to abandon water-sensitive crops like black gram in favour of water-intensive paddy.

### Environmental and Policy Implications

**1. Air Pollution and Health Hazards :** Stubble burning releases harmful pollutants

such as PM2.5, carbon monoxide, and methane, worsening air quality. Health risks include respiratory diseases, lung infections, and eye irritation, particularly affecting rural populations.

**2. Water Scarcity and Soil Degradation :** Paddy is a high-water-consuming crop, and its expansion could deplete groundwater reserves, particularly in central India. Continuous stubble burning depletes soil organic matter, reducing fertility over time.

**3. Policy Challenges and Solutions :** Unlike Punjab and Haryana, where Happy Seeders and crop residue management subsidies have reduced burning, Madhya Pradesh lacks large-scale interventions. Solutions include :

- Promotion of crop diversification with incentives for pulses and oilseeds.
- Government procurement policies to discourage excess paddy cultivation.
- Subsidized machinery for residue management, such as Super SMS and Happy Seeders.
- Awareness campaigns about alternative uses for stubble, such as biomass fuel and organic composting.

### Conclusion

Madhya Pradesh's rise as India's leading stubble-burning state underscores the urgent need for sustainable agricultural policies and innovative crop residue management solutions. The state must learn from Punjab's success in reducing stubble burning while addressing the economic, climatic and infrastructural challenges driving farmers towards paddy. Without timely interventions, the problem could exacerbate environmental pollution, water crises and agricultural sustainability in central India.

## THE MYTHOS OF ANCIENT INDIA'S SCIENTIFIC EXCELLENCE

The article critiques the growing trend of conflating India's ancient heritage with modern scientific advancements, particularly in educational and policy decisions. The discussion is sparked by a proposal to allow patent filings in Sanskrit, which the author argues is impractical.

### Key Arguments

**1. Impracticality of Sanskrit for Scientific Precision :** Patents require extreme precision in language, which Sanskrit, with its interpretative nature, may not provide. A misplaced or omitted word in patents can lead to legal disputes and operational hurdles.

**2. Politicization of Science and Education :** The government's push for Indian Knowledge Systems (IKS) in IITs and universities is seen as an attempt to revive ancient traditions at the cost of scientific rigor. Academics appointed to key positions often promote pseudoscientific claims, such as the medicinal value of cow urine or linking meat consumption to natural disasters.

**3. Critique of India's Scientific Progress :** While, India celebrates achievements like Chandrayaan, the article argues that true scientific breakthroughs—such as AI, 6G, or high-speed transportation—are lacking. China is cited as a model, where universities prioritize

forward-looking research, leading to cutting-edge innovations like hypersonic jets and advanced batteries.

**4. Concerns Over Regressive Policies :** Organizations like the All India People's Science Network (PSN) warn that IKS courses often misrepresent or distort traditional knowledge. There is a risk of scientific institutions being

influenced by ideological narratives rather than empirical research.

### Conclusion

The article argues that India's obsession with an imagined glorious past is hindering its scientific progress. While cultural heritage is important, real progress comes from a forward-looking education system and technological innovation.

## A LEGACY THAT STINKS

India faces major challenges in eliminating legacy waste, which threatens its goal of becoming garbage-free by 2025-26 under Swachh Bharat Mission (Urban) 2.0.

### Key Challenges in Legacy Waste Management

- **Scale of the Problem :** India still has 119.1 million tonnes of legacy waste spread across 3,498 hectares (as of February 2025).
- **Fresh Waste Adding to Burden :** Only 46.27% of fresh Municipal Solid Waste (MSW) was processed in 2021-22, leaving 28.77 million tonnes untreated.
- **Lack of Formal Definition :** While MSW older than a year is considered legacy waste, there is no official definition, complicating its management.
- **Environmental Hazards :** Leachate contamination, methane emissions and frequent fires degrade air quality and threaten water sources.

### Approaches to Managing Legacy Waste

**1. Capping :** Seals waste with a protective lining but does not enable resource recovery.

**2. Biomining & Bioremediation (Preferred Method) :**

- **Biomining :** Excavates, treats, segregates and repurposes waste.
- **Bioremediation :** Uses microorganisms to break down waste, producing **bio-soil**, refuse-derived fuel (RDF) and materials for construction.

### Economic and Operational Challenges

- **Low Profitability :** Legacy waste lacks recyclables, reducing revenue potential.
- **Declining Tipping Fees :** Payments to biomining operators fell from ₹ 1,200/tonne (2016) to ₹ 500-550/tonne, making projects financially unviable.
- **Delayed Payments :** Payment turnaround time varies between 90-180 days, increasing financial strain.
- **Malpractices :** Poor-quality bio-soil and RDF lead to rejection by cement and waste-to-energy plants.

### Way Forward

- **Stronger Oversight and Quality Control :** Ensuring compliance through regular monitoring (on-site & digital).
- **Vendor Selection Based on Quality and Cost :** Assessment of technical and commercial credentials.
- **Financial Support for MSMEs :** Reducing or eliminating earnest money deposits and performance guarantees to encourage participation.
- **Penalties for Non-Compliance :** Enforcing strict regulations to improve remediation quality.

India must address these challenges to meet its 2025-26 target for eliminating legacy waste and achieving a sustainable waste management system.

## PANDEMIC'S LONG SHADOW

**COVID-19 Status :** Though the WHO declared COVID-19 is no longer a global health emergency (as of May 2023), the SARS-CoV-2 virus continues to evolve, infecting and killing people worldwide.

**Pandemic Data :** Since its declaration as a pandemic in March 2020, COVID-19 has infected 777 million people and caused over 7 million deaths. As of January 2025, 80 countries still

report cases, with 24 of them also reporting deaths. WHO estimates that actual cases are underreported, with wastewater surveillance indicating much higher infection rates.

**Global Amnesia :** WHO epidemiologist Maria Van Kerkhove warns that the world seems to be ignoring COVID-19, acting as if the pandemic never happened.

#### **Health and Life Expectancy Impact :**

- The pandemic reversed a decade of progress in global life expectancy, reducing it by 1.8 years and healthy life expectancy by 1.5 years between 2019-2021.
- A Lancet study estimated the real COVID-19 toll at 16 million deaths, with mortality rates among older adults reaching a 70 year high.
- India experienced a 2.6 year drop in life expectancy in 2020 compared to 2019, with marginalized groups suffering the most.

#### **Long COVID and Ongoing Morbidity :**

- Over 400 million people suffer from Long COVID, characterized by persistent symptoms lasting beyond three months.
- With 200 known symptoms, Long COVID could become a major global morbidity factor, keeping the pandemic's impact alive.

#### **Conclusion**

Despite the world moving on, COVID-19's health, social and economic effects persist. Long COVID remains a serious concern and the loss in life expectancy highlights the pandemic's lasting impact.

Pratiyogita Darshan





**GIST**  
**OF**  
**SCIENCE REPORTER**

*Topic*

**Forest Fire: A Threat to Ecological  
and Food Security**

**March  
2025**

## FOREST FIRES : A THREAT TO ECOLOGICAL AND FOOD SECURITY

### 1. Forest Cover and Ecological Importance

- According to the National Forest Policy, forests should cover 33% of India's area, but India State of Forest Report (ISFR) states that only 25-17% is under forest cover.
- Forests provide biodiversity conservation, nutrient cycling and hydrological balance.
- They serve as a source of food and livelihood for tribal communities through minor forest produce.

### 2. Threats to Forests

- Natural and human-induced threats include deforestation, developmental activities, invasive species, and disease outbreaks.

- Forest fires further exacerbate these issues, leading to habitat destruction and loss of biodiversity.

### 3. Impact on Ecological and Food Security

- **Ecological impact** : Disrupts carbon sequestration, climate regulation and soil fertility.
- **Food security impact** : Loss of wild edibles, honey, tubers, affecting tribal and forest-dependent communities.

### 4. Need for Conservation Measures

- Strengthening fire management strategies, afforestation and sustainable forest policies is essential to mitigate these threats.

## STRATEGIES FOR FISHERIES DEVELOPMENT OF KHARAGPUR LAKE, BIHAR

### 1. Aquatic Resource Potential in Bihar

- Bihar has abundant inland water resources, including rivers, floodplain wetlands, oxbow lakes, reservoirs, ponds and tanks.
- Despite these resources, fish supply remains inadequate to meet the demand.

### 2. Challenges in Fisheries Development

- Underutilization of available water bodies.
- Lack of scientific fish farming practices.
- Poor infrastructure and post-harvest management.
- Limited financial and technical support for fish farmers.

### 3. Government Initiatives and Potential Strategies

- **Scientific Aquaculture** : Adoption of modern fish farming techniques like polyculture, biofloc technology and cage culture.

- **Stocking and Seed Production** : Development of hatcheries and quality fish seed supply.

- **Infrastructure Development** : Establishing cold storage, processing units and fish markets.

- **Training and Capacity Building** : Skill development programs for fishermen and entrepreneurs.

- **Financial and Policy Support** : Government subsidies, credit support and insurance for fish farmers.

### 4. Way Forward

- An integrated approach involving government, research institutions and private stakeholders.

- Sustainable fisheries management to ensure long-term productivity and economic benefits.

## UNION BUDGET 2025 – ADVANCING INDIA'S SCIENCE & TECHNOLOGY LANDSCAPE

1. **Increased Allocation for S&T** : The Union Budget 2025 emphasizes innovation, infrastructure development, and sustainability in the science and technology (S&T) sector.

### 2. Focus Areas :

- **Research & Innovation** : Higher funding for R&D institutions, AI, quantum computing and biotechnology.
- **Infrastructure Development** : Investments in scientific labs, startups and space technology.

- **Sustainability** : Promotion of green technologies, clean energy and climate resilience through scientific advancements.

3. **Strategic Importance** : The budget aligns with India's goal of becoming a global leader in science and technology, fostering self-reliance and economic growth.

**Conclusion** : The Union Budget 2025 lays a strong foundation for technological progress, innovation-driven growth and sustainable development, reinforcing India's commitment to a robust S&T ecosystem.

## PADMA SHRI JADAV PAYENG – THE SILENT SAGE WHO PAINTED THE EARTH GREEN

Jadav Payeng, the 'Forest Man of India', transformed a barren sandbar in Assam into the 1,400 acre Molai Forest over 40 years, creating a thriving ecosystem for wildlife.

**Impact on Environment & Food Security :** His work highlights the crucial role of forests in biodiversity conservation, climate resilience and sustainable food systems.

**Recognition & Global Influence :**

- Awarded Padma Shri (2015) for his environmental contributions.

- Invited to international forums in France, Scotland, Taiwan and Dubai to share insights on conservation.
- Subject of the acclaimed documentary 'Forest Man'.

**Key Message**

His journey demonstrates how individual efforts can drive large-scale environmental change, reinforcing the connection between forests and food security.

## 150 GLORIOUS YEARS OF THE KOLKATA ZOOLOGICAL GARDEN

**Sesquicentennial Celebration :** The Alipore Zoological Garden celebrated its 150th anniversary on 24 September, 2024.

**Historical Background :** Established on 24 September, 1875, opened to the public on 1 May, 1876. Inaugurated by Edward VII, then Prince of Wales, who gifted its first the zoo elephants.

**Founding & Growth :** Supported by the British India government, Indian princes and noblemen. Designed under botanist George King, featuring lush gardens, a rink, boating & fishing facilities, a bandstand, a hospital, a library, and a state-of-the-art lab.

**Legacy & Global Recognition :** Became a renowned zoological institution, attracting dignitaries and researchers over the years.

## JHALANA LEOPARD RESERVE – A HIDDEN GEM IN INDIA'S URBAN JUNGLE

**Urban Wildlife Sanctuary :** Located within Jaipur's urban sprawl, covering 23 sq. km. A rare example of human-animal coexistence.

**Leopard Conservation Efforts :** Home to a significant population of leopards (*Panthera pardus*). Gained prominence with Project Leopard (2017) by the Rajasthan government.

Leopards enjoy legal protection under Schedule I of the Wildlife Protection Act (WPA, 1972), similar to tigers.

**Biodiversity & Ecosystem :** Supports rich flora and fauna. Showcases a successful conservation model in an urban landscape.

## TURNING TRASH INTO TREASURE – TRANSFORMING WASTE INTO CLEAN ENERGY

**The Problem of Urban Waste :** Indian cities struggle with increasing garbage, including food scraps and organic waste. Decomposing waste releases methane, a harmful greenhouse gas, worsening environmental issues.

**Scientific Innovation :** CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, has developed a breakthrough

solution. Introduced the Anaerobic Gas Lift Reactor (AGR) technology.

**Significance of AGR Technology :** Converts organic waste into biogas, promoting clean energy. Helps reduce landfill waste and curb greenhouse gas emissions. Supports India's sustainability goals and circular economy initiatives.

## THE ASTONISHING WATER SHOW – MYSTERIES OF THE CROCODILE BARK TREE

**The Crocodile Bark Tree (Terminalia elliptica) :** Named for its rough, scaly bark, resembling a crocodile's skin. Found in

Papikonda National Park, Andhra Pradesh, and other forested regions. Possesses a unique ability to release water from its bark.



**Indigenous Knowledge & Significance :** The Konda Reddi tribe has long known about its water-producing properties. Serves as a natural water source for wildlife and local communities during dry seasons.

**Scientific and Environmental Relevance :** A remarkable adaptation to dry environments. Holds potential for drought resilience and conservation efforts. Further research could uncover new ecological and medicinal benefits.

### INVISIBLE FOREST

**Anthropocene Era & Environmental Crisis :** The Anthropocene marks a period of intense human influence on the environment. Industrialization since the 18th century has led to rising pollution levels. Human arrogance in technology has fueled ecological destruction.

**Global Warming & Climate Change :** Anthropogenic CO<sub>2</sub> & GHG emissions have raised global temperatures. 2020's global temperature was 1.2°C above pre-industrial levels.

Temperature rise has accelerated from 0.05°C to 0.16°C per decade. Earth is experiencing warming levels unseen in a million years.

**Urgency for Action :** The metaphor of a slowly boiling frog represents human complacency. Immediate climate action is necessary to mitigate irreversible damage. Sustainable policies and ecological conservation are critical for the future.

### 150TH ANNIVERSARY OF DICHLORODIPHENYL TRICHLOROETHANE (DDT)

**Historical Significance of DDT :** 2024 marks 150 years since the synthesis of DDT. DDT played a major role in synthetic organic chemistry and global disease control. It was first synthesized in 1874 but gained prominence in 1939 when Paul Hermann Müller discovered its insecticidal properties.

**Evolution of Organic Chemistry :** The field of synthetic organic chemistry began with the synthesis of urea by Friedrich Wöhler in the 19th century. J.J. Berzelius introduced the distinction between organic and inorganic compounds in 1807. The belief in a 'vital force' necessary for

organic compound formation was disproved with laboratory synthesis.

**Impact and Controversies of DDT :** Initially hailed as a breakthrough for controlling malaria and typhus. Later, its toxic environmental effects led to its ban in many countries under the Stockholm Convention (2001). Despite bans, some nations still use DDT for disease control under WHO regulations.

**Scientific and Cultural Legacy :** The DDT story highlights the intersection of scientific discovery, public health and environmental concerns. It serves as a reminder of the consequences of synthetic chemical usage.

### BREATH BEYOND GILLS – RESPIRATORY ORGANS IN FISH OTHER THAN GILLS

**Primary Respiratory Organ :** Gills are the primary breathing organs in fish. Lamellae in gills are highly vascularized, ensuring efficient gas exchange.

**Why Do Fish Need Additional Respiratory Organs ?** In oxygen-deficient environments, gills alone are insufficient. Certain fish develop accessory respiratory organs to supplement oxygen intake.

**Accessory Respiratory Organs in Fish :**

- **Lungs & Lung-like Structures :** Seen in lungfish, which can survive in low-oxygen waters.
- **Labyrinth Organ :** Found in anabantoid fish (e.g., betta, gourami), allowing them to breathe atmospheric air.

- **Skin Respiration :** Some fish like mudskippers absorb oxygen directly through their skin.

- **Buccopharyngeal Respiration :** Some catfish species use their mouth cavity for gas exchange.

- **Intestinal Respiration :** In fish like the loach, the intestine plays a role in oxygen absorption.

**Evolutionary Significance :** Adaptations in respiratory organs help fish survive in diverse aquatic environments. These adaptations illustrate evolutionary responses to environmental challenges.

## FLOWERS, FRAGRANCE & FUN! A ROSE & GLADIOLUS FLOWER SHOW AT CSIR-NBRI

**Event Overview :** CSIR-National Botanical Research Institute (NBRI), Lucknow, organized a Rose & Gladiolus Flower Show on 18–19 January, 2025 at the Botanical Gardens. The event showcased the beauty, fragrance and diversity of these flowers.

**Key Highlights :** Inaugurated by Mrs. Monika Garg, APC, Government of Uttar Pradesh. Attracted a diverse audience : anthophiles, horticulturists, floriculturists, botanists,

photographers, social media content creators, college students and researchers. Visitors engaged in interactive sessions, photography, and discussions on floriculture.

**Significance :** Promoted awareness and appreciation of floriculture. Encouraged scientific discussions on flower cultivation and hybridization. Provided a platform for networking among plant enthusiasts and researchers.

## HYPOTHETICAL VOIZONS – THE 8TH STATE OF MATTER

**Concept Introduction :** The article explores a hypothetical new state of matter, termed 'Voizons'. It involves a unique interaction between sound waves, light waves and vacuum.

**Discovery and Experiment :** Jack, a scientist, conducted an experiment where he enabled sound waves to travel through a vacuum alongside light waves. This interaction led to the discovery of Voizons, a state where sound and light coexist and interact with vacuum.

**Scientific Significance :** Challenges the fundamental understanding that sound cannot travel through a vacuum. Opens new avenues in quantum physics, space exploration and material science. Could potentially revolutionize communication technologies in space and extreme environments.

**Future Implications :** Understanding Voizons may lead to groundbreaking advancements in physics. Could enhance our knowledge of the universe and energy transfer mechanisms.



Pratiyogita