

**NEXT IAS**

**DAILY NEWS**

**ANALYSIS**



**08 July**

## Explained

1. Bioeconomy
2. BRICS Summit 2025
3. Golden Dome: Space-based Missile Shield
4. Women MSMEs

## Decoded

5. Maternal Death

**Playlist Link:**



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## India Targets \$300 Billion Bioeconomy by 2030: Dr. Jitendra Singh Unveils Vision at World Bioproduct Day

Biotech for Every Indian: The Minister Urges Citizens to See Themselves as Stakeholders in Bioeconomy

'Voices Across the Cities' Marks a First: Nation-wide Hourly Dialogue Showcases India's Biotech Diversity

Posted On: 07 JUL 2025 5:28PM by PIB Delhi

Union Minister of Science & Technology, Dr. Jitendra Singh today called for a wider public understanding and inclusive participation in India's biotechnology mission, stating that every Indian is a stakeholder in the country's bioeconomy. Speaking here during the nationwide celebration of World Bioproduct Day – The BioE3 Way, the Minister reiterated the government's commitment to realizing a \$300 billion bioeconomy by 2030.

The event, organized by the Department of Biotechnology (DBT) and its agencies BIRAC and iBRIC+, marked a novel national experiment — 'Voices Across the Cities: A Synchronized National Hourly Dialogue Series'. Over eight hours, select institutions across Indian cities hosted theme-based discussions on marine biomass, industrial valorisation, forest resources, and agri-residue innovations, reflecting the regional diversity of India's bioproduct capabilities.



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**Backdrop:** Celebration of World Bioproduct Day

**Relevance:** GS 3/Economy

## About the news



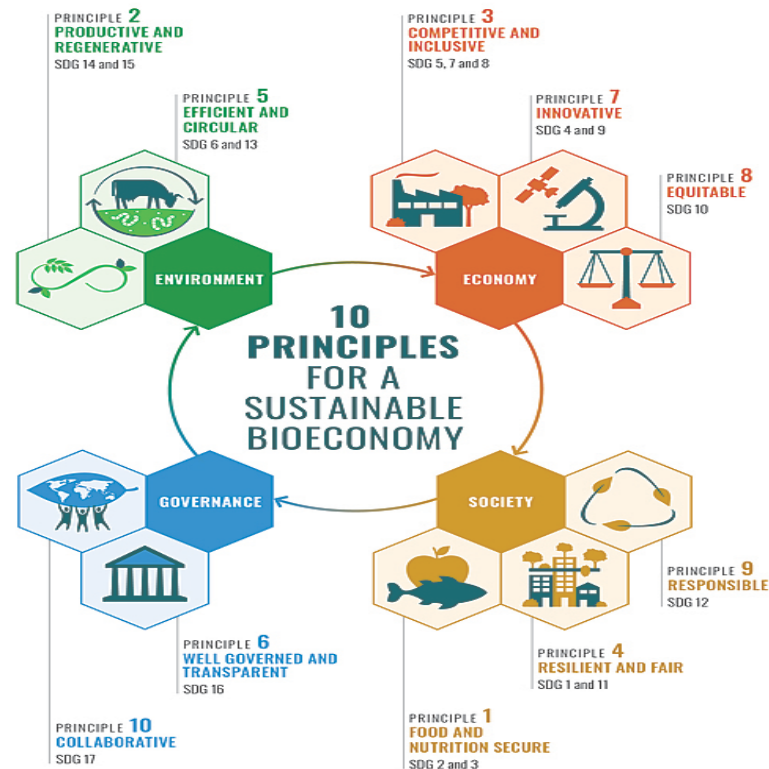
Union Minister Dr. Jitendra Singh emphasized the need for broader public awareness and inclusive participation in India's biotechnology mission, stating that every citizen is a stakeholder in the bioeconomy. During the celebration of World Bioproduct Day – The BioE3 Way, he reaffirmed the government's goal of achieving a **\$300 billion bioeconomy by 2030**.

## Meaning

- **Bioeconomy:** An economic system that uses **biological resources** (plants, animals, microorganisms) and **biological processes** to produce **sustainable goods and services**.
- **Bioproducts:** Materials, chemicals, or energy sources made from **renewable biological resources**, serving as **alternatives to fossil fuel-based products**.
  - Examples include **biofuels, bioplastics, biochemicals, fertilizers, pharmaceuticals, and cosmetics**.

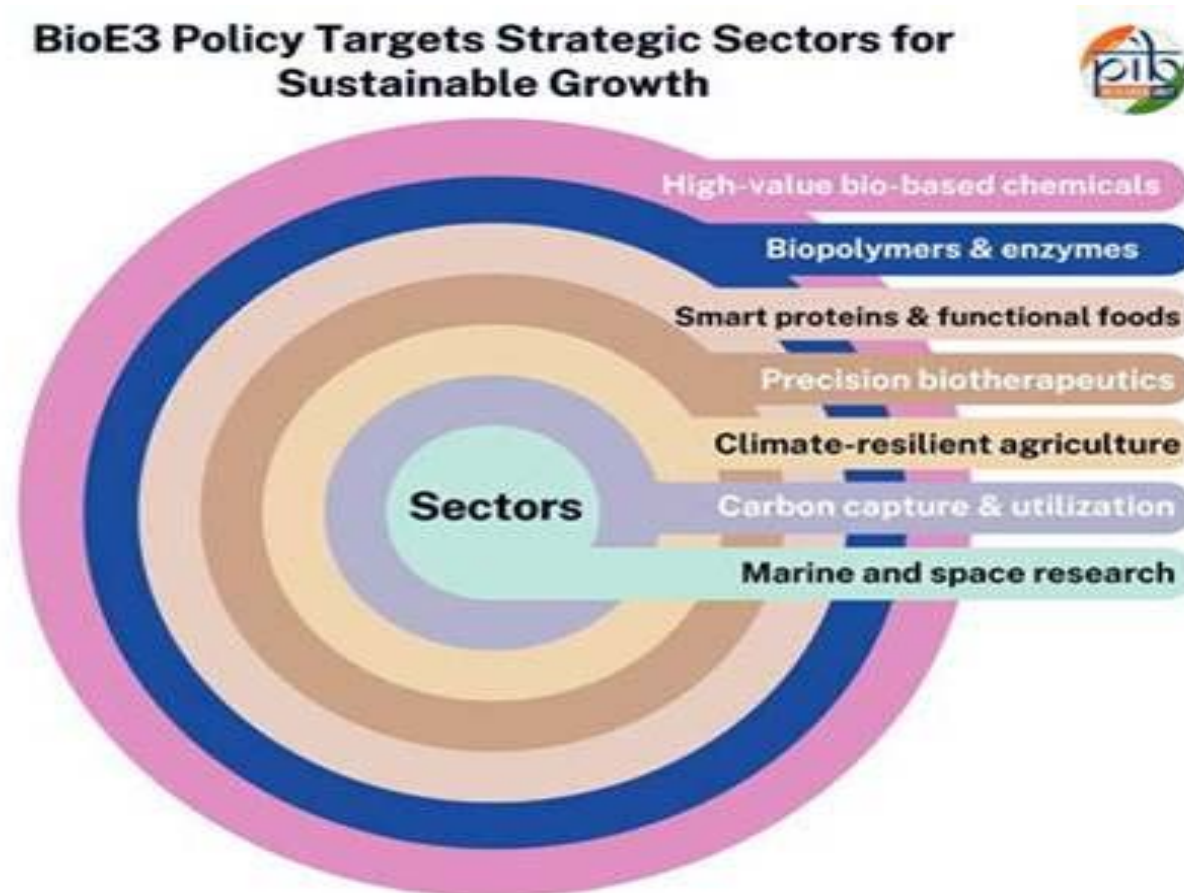
# India's Bioeconomy

- **Rapid Growth:** India's bioeconomy expanded from **\$10 billion** in 2014 to **\$165.7 billion** in 2024, with a target of **\$300 billion** by 2030.
- **Economic Impact:** It now contributes **4.25% to GDP**, with a **17.9% CAGR** over the last four years.
- **Strategic Vision:** The government envisions India as a **global biomanufacturing hub**, emphasizing **innovation, sustainability, and inclusive development**.



## BioE3 Policy (Biotechnology for Economy, Environment, and Employment):

- Aims to position India as a **global biotech leader**.
- Focuses on **high-performance biomanufacturing**, promoting **economic growth**, **environmental sustainability**, and **job creation**.



- **Key Features:**

- Innovation-driven support for **R&D and entrepreneurship**
- Establishment of **Biomanufacturing & Bio-AI hubs** and **Biofoundry**
- Focus on **regenerative bioeconomy** models for green growth
- Expansion of India's skilled **workforce**
- Alignment with '**Net Zero**' carbon economy and 'Lifestyle for Environment' (LiFE) initiatives.

## **National Biopharma Mission – Innovate in India (i3)**

- Led by the Department of Biotechnology (**DBT**) and implemented by **BIRAC**.
- **Objective:** Strengthen India's capabilities in **biopharmaceuticals, vaccines, biosimilars, medical devices, and diagnostics** by fostering collaboration between industry and academia.
- **Funding:**
  - **\$250 million** budget
  - **50% co-funded** by the **World Bank**
- **Infrastructure Support:**
  - The mission supports 101 projects, involving over 150 organization's and 30 MSMEs.

## Key Achievements in India's Pharma Sector

- **Global Pharma Leader:**
  - **3rd** in pharmaceutical production by **volume**, **14th** by **value**.
  - Manufactures **1 in every 3 tablets** consumed globally.
- **Vaccine Powerhouse:**
  - Produces **65% of the world's vaccines**, supporting low- and middle-income countries.
  - Developed the **world's first DNA vaccine** for COVID-19.
  - Launched the **first indigenous HPV vaccine** for cervical cancer prevention.

## Agriculture Biotechnology programme.

Initiative for Bio-agriculture

Agricultural biotechnology in India is advancing rapidly through innovations in genomics, transgenics, and gene editing under the Dept of Biotechnology's **Agriculture Biotechnology programme.**

- **Climate-Smart Crops:** A drought-tolerant, high-yielding chickpea variety, **SAATVIK (NC 9)** has been approved for cultivation.





- **Genome-Edited Rice:** Loss-of-function mutations in yield-limiting genes have led to improved rice lines like **DEP1-edited MTU-1010**, showing higher yields.
- **Genotyping Arrays:** India's first 90K SNP arrays—**IndRA** for rice and **IndCA** for chickpea—enable DNA fingerprinting and variety identification.
- **Amaranth Resources:** A genomic database, NIRS techniques, and a 64K SNP chip aid nutritional screening and development of anti-obesity amaranth varieties.
- **Biocontrol:** A nano-formulation from **Myrothecium verrucaria** offers eco-friendly control of powdery mildew in tomato and grape.
- **Kisan-Kavach:** An anti-pesticide protective suit enhances farmer safety from toxic exposure

## Biotech-KISAN (Biotech-Krishi Innovation Science Application Network)

- A **scientist-farmer partnership** programme to empower farmers, especially women and those in rural and tribal areas, through agricultural innovation and scientific interventions.
- It follows a **hub-and-spoke model** and is active across 115 Aspirational Districts in India.

Key Highlights of  
**Biotech-KISAN**

- ▣ 52 Biotech-KISAN Hubs established across all 15 agro-climatic zones in collaboration with ICAR.
- ▣ Over 3 lakh farmers benefitted (directly and indirectly).
- ▣ 200+ rural enterprises developed.
- ▣ Promoted formation of FPOs and SHGs for better market linkages.
- ▣ Focus on women empowerment: In some regions, 45–50% of beneficiaries are women, especially from tribal communities.

## Bioenergy Sector

- **Ethanol blending** has seen a significant rise—from 1.53% in 2014 to **15% in 2024**, with a target of 20% blending by **2025**.
- **Fuel diversification:** Launch of **E100 fuel** and **E20 fuel** at over 15,600 retail stations.

- Established by the **Department of Biotechnology** in 2012
- It plays a pivotal role in nurturing India's biotech startup ecosystem.
- **Key schemes:**
  - **Biotechnology Ignition Grant (BIG):** Up to ₹50 lakh for 18 months to support early-stage startups; nearly 1,000 innovators supported.
  - **SEED Fund:** ₹30 lakh equity support for proof-of-concept stage startups.
  - **LEAP Fund:** ₹100 lakh equity support for commercialisation-ready innovations.
  - **जनCARE – Amrit Grand Challenge:** Supported 89 digital health tech innovations in AI, ML, telemedicine, and blockchain, with a focus on tier-II, tier-III cities and rural areas.



## PRACTICE QUESTION

**Q1. With reference to India's initiatives for promoting the bioeconomy, consider the following statements:**

1. BioE3 Policy aims to promote economic growth, environmental sustainability, and employment.
2. National Biopharma Mission is co-funded by the World Health Organisation.
3. BIRAC's JanCARE – Amrit Grand Challenge supports health tech innovations in rural and tier-II, tier-III cities.
4. Biotech-KISAN promotes urban agri-startups through public-private investment in metropolitan cities.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only**
- (c) 2 and 4 only
- (d) 1, 3, and 4 only

## Developing world should have a greater role in key decisions, says Modi at Brazil BRICS meet

**Kallol Bhattacharjee**  
NEW DELHI

The majority of the world's population is not properly represented in key global institutions, Prime Minister Narendra Modi said on Sunday, addressing fellow leaders of emerging nations at the BRICS summit in Rio De Janeiro.

The BRICS Leaders' Declaration, adopted at the summit in the Brazilian city on Sunday, reflected India's key concerns, especially on cross-border terrorism and global governance reforms.

Noting that the Global South has often faced "double standards", the Prime Minister, speaking at the BRICS session on "Peace and security and reform of global governance", called for a greater role for the developing world in international decision-making.

"Two-thirds of humanity still lack proper representation in global institutions built in the 20th century. Many countries that play a key role in today's global economy are yet to be given a seat at the decision-making table. This is not just about representation, it's also about credibility and effectiveness," Mr. Modi said, reiterating that global institutions have "failed to offer effective solutions".

Mr. Modi also welcomed



**Reform drive:** Prime Minister Narendra Modi with other leaders of BRICS in Rio de Janeiro on Sunday. *AP*

the expansion of BRICS, saying that it shows the grouping's ability to "evolve with the times", as the leaders welcomed Indonesia as a new member state of BRICS.

Reflecting some of India's core concerns, the declaration adopted by BRICS leaders condemned the Pahalgam terror attack in the "strongest terms", and called for a more "representative" international order.

BRICS leaders expressed commitment to combat terrorism, including "cross border" terrorism, and called for "expeditious finalization" of the Comprehensive Convention on International Terrorism within the framework of the United Nations.

They described the Israel-U.S. military strikes

against Iran as a violation of international law and the Charter of the United Nations, and expressed "serious concern" over the "deliberate" attack on Iran nuclear facilities.

The declaration also recorded support from Russia and China, two permanent members of the UN Security Council, "to the aspirations of Brazil and India to play a greater role in the United Nations, including its Security Council".

The summit welcomed the "new BRICS partner countries" - Belarus, Bolivia, Kazakhstan, Cuba, Nigeria, Malaysia, Thailand, Vietnam, Uganda, Uzbekistan, and called for promotion of "dialogue and consultations" among developing countries.

**EDITORIAL**  
» PAGE 6

**Backdrop:** 17th BRICS Summit held in Rio de Janeiro, Brazil

**Relevance:** GS 2/International Relations

Prime Minister Narendra Modi participated in the 17th BRICS Summit in Rio de Janeiro (6–7 July 2025), where leaders discussed global governance reform, Global South representation, peace and security, multilateralism, development, and AI.

### Joint Declaration BRICS 2025

Strengthening Global South Cooperation for More Inclusive and Sustainable Governance.

It highlights the group's commitment to strengthening multilateralism, defending international law, and striving for a more equitable global order.

Reaffirmation of **mutual respect, sovereign equality, inclusion, and consensus-based cooperation.**

Built on **three pillars:**

- Politics & Security
- Economy & Finance
- Cultural & People-to-People Cooperation

## Global Governance & Multipolarity:

- Call for **greater participation** of Africa, Latin America & Caribbean nations in global decision-making.
- Emphasis on **multipolarity** as a tool for inclusive globalization and Global South empowerment.

## Finance:

- Demand for **IMF quota realignment** without disadvantaging developing countries.
- Push for **increased shareholding in the World Bank** for developing/emerging economies.

## Health:

- Commitment to **strengthen global health governance** with equity and inclusion.  
Launch of the **Partnership for the Elimination of Socially Determined Diseases**.

## Artificial Intelligence:

- AI governance is included for the first time in BRICS agenda.
- Call for a **shared global AI governance model** rooted in values, risk mitigation, trust, and inclusivity.



## Climate Change:

- Recognition of **Tropical Forest Forever Fund (TFFF)** for forest conservation finance.
- Release of **Climate Framework Declaration**: 5-year roadmap for climate funding and green development.

## Peace, Security & Stability:

- Strong stand against rising **military spending** and neglect of developmental finance.
- Support for **multilateral conflict resolution**, inclusive global security, and de-linking security from climate agendas.

## Additional Declarations Adopted:

1. Climate Finance Framework
2. AI Global Governance Declaration
3. Socially Determined Diseases Partnership

## Peace, Security & Terrorism

- **Condemned the Pahalgam Terror Attack** as a blow to humanity and India's dignity.
- **No double standards on terrorism:**
  - Sanctions should be imposed **without hesitation**.
  - **Victims and sponsors of terrorism cannot be treated equally.**
  - **Global unity** needed to counter terrorism effectively.

## Global Conflicts & Humanitarian Crises

- Expressed concern over:
  - The humanitarian situation in **Gaza**.
  - Geopolitical instability from **West Asia to Europe**.
  - The **Israel-U.S. strikes on Iran**, calling them a violation of international law.
- India reaffirmed its **non-violence-based global approach**, rooted in Gandhian and Buddhist principles.

## India's Position on AI & Technology

- India supports "**AI for All**":
  - AI should enhance **human values and capabilities**.
  - Equal focus on **innovation** and **governance** to address ethical concerns.
- Seeks to promote **responsible and inclusive tech cooperation** within BRICS.

## Representation and Reform in Global Institutions

- PM Modi emphasized:
  - **Global South is underrepresented** in 20th-century institutions like the UN and IMF.
  - **Two-thirds of humanity** still lack proper voice in global decision-making.
  - Reforms are needed not just for **representation**, but also for **credibility and effectiveness**.
- India called for a **more representative international order**, echoing its long-standing demand for **UNSC reform**.
- **Support from Russia and China** for India and Brazil's aspirations for a greater UN role.

## BRICS Expansion and Global South Unity

- BRICS welcomed new partner countries:
  - **Indonesia (full member)**
  - New dialogue partners:  
**Belarus, Bolivia, Kazakhstan, Cuba, Nigeria, Malaysia, Thailand, Vietnam, Uganda, Uzbekistan.**
- Emphasis on promoting **South-South dialogue and consultation.**

- **New Form of BRICS:**

PM Modi announced that under India's presidency, BRICS will be redefined as: **B**uilding **R**esilience and **I**nnovation for **C**ooperation and **S**ustainability.

- **People-Centric Approach:**

India aims to carry forward BRICS with the same **Global South-first** and **humanity-first** approach as shown during its G20 presidency.

- **Agenda Focus Areas:**

- Environment and climate action
- Global health systems
- Post-pandemic recovery
- Responsible AI development and governance
- Enhancing trade and digital cooperation

- Origin: Coined as BRIC (excluding South Africa) by Jim O'Neill, Goldman Sachs (2001)
- South Africa joined in 2010, making it BRICS
- BRICS Secretariat: Rotational presidency; no permanent secretariat.
- Population Share: ~40% of global population
- Economic Share: ~25% of global GDP
- Objective: To act as a counterweight to Western-dominated institutions like G7, IMF, World Bank

# BRICS Members List

| S. No. | Country Name               | Year of Joining |
|--------|----------------------------|-----------------|
| 1.     | Brazil                     | 2006            |
| 2.     | Russia                     | 2006            |
| 3.     | India                      | 2006            |
| 4.     | China                      | 2006            |
| 5.     | South Africa               | 2011            |
| 6.     | Egypt                      | 2024            |
| 7.     | Ethiopia                   | 2024            |
| 8.     | Iran                       | 2024            |
| 9.     | Saudi Arabia               | 2024            |
| 10.    | United Arab Emirates (UAE) | 2024            |
| 11.    | Indonesia                  | 2025            |

## Partner Countries:

Belarus, Vietnam, Nigeria, Cuba, Bolivia, Thailand, Uganda, Kazakhstan, Uzbekistan.

## Structural Challenges of BRICS

- **Internal Divides:** Geopolitical tensions, economic competition, and China's dominance hinder cohesion.
- **Low Intra-BRICS Trade:** Members trade more with China than with each other.
- **Leadership Imbalance:** China, Russia, and India overshadow Brazil and South Africa.
- **Overlapping Forums:** Duplication with IBSA causes strategic ambiguity.

## Currency & De-Dollarization Issues

- **Divergent Views:** No consensus on BRICS currency; Brazil supports it, others remain wary.
- **Implementation Hurdles:** Fiscal union, trade balance, and global currency adoption remain major obstacles.



## Viability Concerns

- **Heterogeneity:** Members have diverse priorities and it weakens collective action.
- **Economic Gaps:** Inequality, infrastructure deficits, and weak governance mechanisms persist.

## India-Specific Challenges

- **Strategic Tightrope:** Navigating between China-led and Western-led world orders.
- **Sino-Indian Rivalry:** Border tensions and trade deficits strain cooperation within BRICS.



## PRACTICE QUESTION

**Q2. With reference to BRICS, consider the following statements:**

1. The term "BRIC" was originally coined in 2001 by an economist from Goldman Sachs.
2. BRICS has a permanent secretariat located in Shanghai, China.
3. Indonesia became a member of BRICS in 2025.
4. BRICS accounts for about 40% of the world's population and 25% of global GDP.

Which of the statements given above are correct?

**(a) 1, 3 and 4 only**

(b) 2 and 4 only

(c) 1 and 2 only

(d) 1, 2, 3 and 4

# Golden Dome: Space-based missile shield

## On the Golden Dome: how Trump's missile shield tests space law

Such a shield would involve deploying a constellation of satellite interceptors, potentially armed with kinetic or directed-energy weapons, to form a protective layer over the U.S. This has left India, a key U.S. partner in space situational awareness, tactically aligned but normatively conflicted

Shrawani Shagun

From golden citadels to divine shields, rulers across time have dreamt of impenetrable security. But in every age, these ambitions have either collapsed under their own weight or have provoked greater instability. In 2025, this ancient dream went to orbit.

In May, U.S. President Donald Trump unveiled a bold new national defence initiative called the "Golden Dome", a \$175-billion space-based missile shield designed to fend off ballistic, hypersonic, and orbital threats. The plan involves deploying a constellation of satellite interceptors, potentially armed with kinetic or directed-energy weapons, to form a protective layer over the U.S.

Framed as a defence move, the project has sparked concerns worldwide for its geopolitical ramifications as well as for its implications under international space law. In particular, the Golden Dome challenges the Outer Space Treaty's limits, raises constitutional concerns within the U.S., and puts pressure on key strategic partners such as India.

### Loophole or legal red line?

At the heart of the legal debate is Article IV of the Outer Space Treaty (OST), 1967. It prohibits placing "nuclear weapons or other weapons of mass destruction" in orbit or stationing them "in outer space in any other manner". It further mandates that celestial bodies shall be used "exclusively for peaceful purposes".

The language of Article IV, particularly its explicit focus on Weapons of Mass Destruction (WMDs), has created a loophole for conventional weapons in space. The term "peaceful purposes" has been subject to various interpretations, with some nations claiming that it permits all non-aggressive military use, while others insist it implies complete demilitarisation.

The treaty further states: "The

establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden." The use of military personnel for scientific research or any other peaceful purposes isn't prohibited, however. The use of any equipment or facility necessary to peacefully explore the moon and other celestial bodies is also not prohibited (Article IV).

Because the Golden Dome's interceptors are not classified as WMDs, they don't violate the letter of Article IV per se. There are a few concerns nonetheless. In arms control, the practical outcome must always take precedence over the technical details or official classifications of a weapon. This means what a weapon is called matters far less than its actual strategic effect.

For instance, if kinetic interceptors are used to disable or destroy missiles or satellites, their impact could fundamentally alter the balance of power in space. This capability could create a dangerous first-strike advantage for one nation, thereby eroding the principle of mutual deterrence, which relies on the threat of retaliation to prevent an attack. Such a development would undermine the core goal of arms control treaties, which is to foster stability through restraint, and could trigger a significant and destabilising shift in the dynamics of power in outer space.

UN General Assembly resolutions under the Prevention of an Arms Race in Outer Space (PAROS) Treaty, while lacking legal enforceability, have successfully established an interpretive norm against the militarisation of space. The deployment of space-based interceptors, therefore, directly threatens this norm and could trigger a cascade of similar actions by other nations.

These systems are plagued by dual-use ambiguity. A kinetic interceptor, ostensibly for missile defence, possesses

the inherent capability to be instantly repurposed to neutralise an adversary's vital communication or surveillance satellites. This inherent uncertainty risks inflaming suspicion and driving miscalculation, especially during heightened crises involving major space powers like China and Russia, both of which have already explicitly condemned the proposed deployment.

### Partners in crossfire

India, a rising space power and a key U.S. partner in satellite tracking and space situational awareness, now finds itself tactically aligned but normatively conflicted. Quiet cooperation in areas like debris monitoring could tacitly link India to the Golden Dome's strategic ecosystem. However, India is also a vocal champion of peaceful space use. It has consistently supported PAROS resolutions and has positioned itself as a leader of the Global South in advocating for equitable and demilitarised space governance.

Supporting or even appearing to tolerate the Golden Dome could undermine that credibility, damaging India's image as a responsible spacefaring nation and a potential norm-setter in future treaty negotiations. Conversely, non-cooperation might strain its growing strategic ties with Washington. This dilemma becomes even more consequential in the context of India's pending Space Activities Bill, which will shape how the country defines and regulates dual-use platforms, private-sector participation, and treaty compliance.

The Golden Dome is thus more than a U.S. policy issue: it's a litmus test for India's own legal and diplomatic posture and could significantly influence the direction and content of the Space Activities Bill.

### Less than golden precedent

The broader concern is that the Golden Dome will normalise the weaponisation

of outer space. If the U.S. crosses this threshold without facing legal repercussions, China, Russia, and other actors are likely to follow suit. This could trigger a destabilising cycle of orbital arms races, forcing smaller nations to resort to asymmetric capabilities, such as cyberattacks, jamming or even the deliberate generation of debris in orbit.

Such developments would not only weaken the OST's authority but could also unravel the fragile consensus that has governed space for over half a century. In the absence of updated and enforceable treaties, outer space risks becoming a legal grey zone or, worse, a battlefield governed by force rather than law.

Thus, the Golden Dome is more than a military gamble or a political spectacle. It's a legal inflection point for space governance in the 21st century. It exposes loopholes in a 58-year-old treaty, reveals structural weaknesses in domestic oversight, and underscores the urgent and immediate need for modern legal instruments that can keep pace with technological realities.

Strategic partners, such as India, along with like-minded spacefaring nations, should notably push to clarify and modernise the OST, especially the parts pertaining to dual-use and conventional space-based weapons. Advocacy for legally binding instruments on the non-deployment of weapons in space is of paramount importance. This pursuit of international agreements, which play a crucial role, should be complemented by establishing comprehensive transparency mechanisms for military space projects to reduce ambiguity and mistrust.

It's also crucial that national laws, such as India's Space Activities Bill, include clear guidelines for defence cooperation in space, fostering responsible practices both domestically and globally.

Shrawani Shagun is pursuing a PhD at National Law University, Delhi, focusing on environmental sustainability and space governance.

**Backdrop:** Implications of Golden Dome Initiative of USA  
**Relevance:** GS 3/Science and Technology

## About the news



In May, U.S. President Donald Trump announced the "Golden Dome," a space-based missile defense initiative that, while framed as a security measure, has raised global concerns for its geopolitical impact, a potential violation of the Outer Space Treaty, constitutional issues within the U.S., and diplomatic challenges for partners like India.

## Golden Dome

- A \$175-billion **space-based missile shield** designed to fend off ballistic, hypersonic, and orbital threats.
- It involves deploying a constellation of **satellite interceptors**, potentially armed with kinetic or directed-energy weapons, to form a protective layer over the U.S.

- **Challenge to Outer Space Treaty (OST) of 1967**
  - **Article IV** prohibits **nuclear or WMDs** (Weapons of Mass Destruction) in space but says nothing explicitly about **conventional weapons**.
  - Since Golden Dome's **kinetic or directed-energy interceptors** are not WMDs, they **do not technically violate** the treaty, **exploiting a legal loophole**.
- **Undermining Arms Control Principles**
  - If such interceptors offer a **first-strike advantage**, they weaken **mutual deterrence** and could **destabilize space security**.
  - This erodes the core arms control aim: **stability through restraint**.
- **Threat to the Prevention of an Arms Race in Outer Space (PAROS) Treaty**
  - Though **non-binding**, the UN General Assembly's **PAROS resolutions** have shaped global consensus **against space weaponization**.
  - The Golden Dome undermines this consensus and could **trigger an arms race** in space.

- **Dual-Use Ambiguity**
  - Golden Dome systems can be **repurposed instantly** for offensive roles (e.g., destroying satellites), creating **uncertainty and mistrust**.
  - Such **dual-use ambiguity** increases the chances of **miscalculation**, especially among major powers like **China and Russia**, both of whom have strongly opposed the U.S. move.
- **Risk of Normalising Weaponisation:**
  - It may set a dangerous precedent, encouraging space weaponisation by major powers like China and Russia.
- **Orbital Arms Race & Asymmetric Threats:**
  - A new arms race in orbit could prompt smaller nations to use asymmetric tactics like cyberattacks, jamming, or generating space debris.

- **Strained Strategic Ties:** Non-alignment with the U.S. initiative may **strain India–U.S. strategic cooperation**, especially in the evolving space domain.
- **Impact on Space Activities Bill:** The dilemma highlights the importance of India's upcoming **Space Activities Bill**, which will define policies on **dual-use technologies**, private sector involvement, and **international treaty obligations**.
- **Risk to India's Credibility:** Associating with the **Golden Dome** project could hurt India's image as a **responsible space power** and weaken its role in future **space law negotiations**.

## What needs to be done?

- **Need for Modern Legal Instruments:** To tackle the **gaps in international law** and domestic oversight, there is an urgent need for updated, enforceable space governance frameworks.
- **India's Role in Reforming Space Law:** Nations like **India** should lead efforts to modernise the OST, focusing on regulating **dual-use and conventional space weapons**.
  - Also, India's **Space Activities Bill** must include clear rules for **defence cooperation in space**, ensuring responsible and lawful conduct.
- **Advocacy for Binding Agreements:** Legally binding treaties and **transparency in military space projects** are crucial to reduce global ambiguity and mistrust.



## PRACTICE QUESTION

**Q3. What is “Golden Dome”, sometimes seen in the news?**

- (a) An Israeli radar system
- (b) India’s indigenous anti-missile programme
- (c) Planned US missile defense system**
- (d) Air defence system of NATO countries



# Women MSMEs Still struggle for credit despite schemes

## Women MSMEs still struggle for credit despite schemes

Limited access to formal credit and the widening credit gap continue to prevent women entrepreneurs from achieving their financial goals

### DATA POINT

B. Renuka Ramakrishna

Micro, Small and Medium Enterprises (MSMEs) have become instrumental in shaping India's generating employment, creating revenue, and its global outreach. In 2024, MSMEs contributed nearly 30% to the GDP. The aim is to raise this to 35% in the current year. This vast sector also provides opportunities for many women-led enterprises. The government has implemented several financial schemes specifically designed to promote women's participation.

However, the issues and challenges faced by women-led MSMEs are often inadequately addressed. The problems of limited access to formal credit and the widening credit gap continue to prevent these entrepreneurs from achieving their financial goals. While ensuring adequate credit availability to MSMEs has long been a key policy objective, gaps between banks and beneficiaries often persist at the implementation stage.

Women-owned businesses account for up to 20% of all MSMEs registered in India. This level of female participation remains low despite the handful of schemes aimed at encouraging self-employment and financial independence. What is more striking is that women-led MSMEs contribute only about 10% of the total turnover, while receiving around 11-15% of the total investment in the sector (Chart 1). These numbers highlight the persistent gaps in both financial inclusion and credit accessibility for women in the MSME ecosystem.

According to reports by the Small Industries Development Bank of India (SIDBI), women face significant discrimination in fund disbursement, with a credit gap of around 35% – meaning that over a third of their financial requirements go unmet – compared to a

the 20% credit gap faced by men (Chart 2). The credit gap refers to the difference between the amount of credit requested by the borrower and the amount actually received. These inadequate funds are one of the major challenges for women in the MSME sector, affecting about 26% of them, followed closely by the challenge of high competition.

The Pradhan Mantri MUDRA Yojana (PMMY), launched nearly a decade ago to support individuals seeking self-employment, has also enabled women to open loan accounts and fund their MSMEs. PMMY offers collateral-free loans to MSMEs operating in the non-farm sector. As of 2024, women owned 42,492,288 loan accounts under PMMY out of a total of 66,777,013 accounts, which is approximately 64%. This shows that women form a significant group seeking financial assistance.

However, the sanctioned amount tells a different story. Of the total ₹5,41,012.86 crore allocated for that year's target, only ₹2,25,887.08 crore (about 41%) was directed towards women-led MSMEs. This disparity points to an economic inefficiency in delivering highly liquid, low-cost, and easily accessible loans to the underserved sections of the sector.

These underperforming schemes are pushing women to rely on informal sources of credit, which are often riskier and unreliable. These challenges are not confined to MSMEs alone; they also affect informal micro-enterprises (IMEs) run by women. Informal businesses are typically excluded from formal credit processes due to the lack of legal documentation and collateral. To address this gap, the government launched the Udyam Assist Portal, which helps such IMEs become eligible for priority sector lending by facilitating their formal recognition.

This year, over 1.86 crore IMEs have been registered through the portal. Notably, 70.5% of these are owned by women. This achieve-

ment has significantly boosted employment, with women-led IMEs contributing 70.8% to employment generation within this segment (Chart 3).

However, despite being registered, these businesses continue to face challenges in accessing formal credit. Dr. Ashwin Ram, Professor at RV University, said the main reasons for this are lack of awareness and limited access to formal credit. He said, "A majority of first-generation women entrepreneurs, particularly in smaller towns and rural areas, have low financial literacy and are not well-informed about various government schemes and their benefits. There is also little support from traditional commercial banks and local government agencies to educate and assist women entrepreneurs in availing financial subsidies."

Women entrepreneurs are also often perceived as risky borrowers, largely because they lack adequate collateral or property ownership. In India, a significant proportion of women run micro and small businesses predominantly in the informal sector, which further discourages them from seeking finance through formal institutions. According to the International Finance Corporation, it takes a man an average of two visits to a bank to get a loan sanctioned, whereas women typically need to make at least four.

Amid these discriminatory barriers, the Reserve Bank of India has cut the repo rate to 5.50%, the lowest since 2022, and reduced the Cash Reserve Ratio by 100 basis points. This policy is aimed at injecting more liquidity into the economy, leaving commercial banks with greater funds to extend as loans to the public. Both banks and women entrepreneurs are in a favourable position, with increased liquidity at their disposal.

The government's schemes have been launched with a strong intent, but their implementation has often fallen short due to administrative inefficiencies.

### Gender gap in MSMEs

The data for the charts were taken from Reserve Bank of India, Press Information Bureau, SIDBI, Ministry of Micro Units Development & Refinance Agency Ltd. (MUDRA)



Chart 1: The share of women-led MSMEs, share of women employed in MSMEs, share of investment attracted by women-led MSMEs and share of turnover of women-led MSMEs

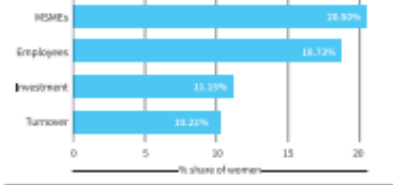
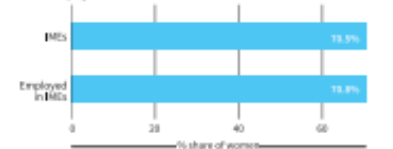


Chart 2: The credit gap across genders. Credit gap refers to the difference between the amount of credit requested by the borrower and the amount actually received



Chart 3: The share of women-led informal micro-enterprises (IMEs) and share of women employed in IMEs



B. Renuka Ramakrishna is interviewing with The Hindu Data Team

**Backdrop:** The aim is to raise MSMEs contribution to 35% of GDP in the current year.

**Relevance:** GS3 - Changes in industrial policy and their effects on industrial growth.

## About the news



Micro, Small, and Medium Enterprises (MSMEs) play a vital role in India's economy by generating employment, revenue, and boosting exports. In 2024, they contributed nearly 30% to the GDP, with a target of 35% in the current year.

As part of its policy response to boost credit access, especially for women entrepreneurs, the RBI cut the repo rate to 5.5% and reduced the Cash Reserve Ratio (CRR) by 100 basis points to enhance liquidity in the economy.

## Role of MSMEs in India

- Contributed ~30% to India's GDP in 2024; target is 35% in 2025.
- Vital for employment generation and exports.
- Women-owned businesses form ~20% of registered MSMEs, but only contribute ~10% of total turnover and receive ~11–15% of investments.

- **Credit Gap:**

- Women face a 35% credit gap vs. 20% for men (SIDBI report).
- Affects ~26% of women-led MSMEs.
  - Credit gap refers to the difference between the total demand for credit and the amount of credit actually supplied.

- **Disparity in Fund Allocation:**

- Under PM MUDRA Yojana (2024), women held 64% of loan accounts but received only 41% of total disbursed funds.

- **Perception Issues:**

- Women are viewed as risky borrowers due to lack of collateral or property ownership.

- **Informal Sector Disadvantage:**

- Many women-led micro-businesses are informal and excluded from formal credit due to lack of documentation.

## **Persistent Barriers**

- **Low Financial Literacy:** Especially among rural, first-generation entrepreneurs.
- **Lack of Awareness:** Many are unaware of schemes and subsidies.
- **Poor Institutional Support:** Banks and local agencies offer minimal guidance.
- **Gender Bias:** Women make 4 bank visits on average for loan approval vs. 2 for men (IFC data).

## 1. Stand-Up India Scheme

- Bank loans from ₹10 lakh to ₹1 crore
- For women and SC/ST entrepreneurs

## 2. Pradhan Mantri Mudra Yojana (PMMY)

- Collateral-free loans up to ₹20 lakh
- Targeted at micro-enterprises
- Encourage High participation of women borrowers

## 3. TREAD Scheme (*Trade Related Entrepreneurship Assistance and Development*)

- Grants to NGOs for training, promoting, and researching women-led businesses

#### 4. Mahila Samriddhi Yojana

- Interest rebate on loans up to ₹1.4 lakh
- Aimed at promoting financial inclusion for women entrepreneurs

#### 5. Udyogini Scheme (*State-level – Karnataka*)

- Promotes self-employment and economic independence among women
- Focus on trade and service sectors

#### 6. Mahila Coir Yojana

- Skill training for women in the **coir industry**
- Encourages traditional livelihood enhancement

#### 7. Public Procurement Policy

- 25% of CPSE/Central Dept. annual procurement from MSEs
- **3% reserved for Women-owned MSEs**

# Enhancing Women's participation MSME Sector



- **Ease Regulations:** Simplify compliance through single-window systems and digital platforms.
- **Improve Credit Access:** Expand digital lending, involve NBFCs, increase collateral-free loans, and strengthen credit guarantees.
- **Skill Development:** Align training with Industry 4.0; collaborate with industry and academia.
- **Digital Market Integration:** Promote e-commerce, digital marketing, and onboarding on platforms like GeM.
- **Infrastructure Push:** Develop industrial parks, logistics hubs, and improve connectivity in rural areas.
- **Export Facilitation:** Set up export cells, provide market insights, and train MSMEs on trade procedures.
- **Strengthen IPR Support:** Provide affordable legal aid, IPR registration, and awareness training.



## PRACTICE QUESTION

**Q4. Consider the following statements regarding MSME-related schemes in India:**

1. The Udyam Assist Platform enables informal micro-enterprises to access formal credit by gaining official recognition.
2. Under the Public Procurement Policy, 3% of annual procurement by CPSEs is reserved for Women-owned-owned MSEs.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2**
- (d) Neither 1 nor 2



# Fostering a commitment to stop maternal death

## *Fostering a commitment to stop maternal deaths*

In childbirth in India, why should 93 women lose their life while one lakh women have a safe delivery? For the time period 2019-21, the Maternal Mortality Ratio (MMR) estimate for India was 93, in other words, the proportion of maternal deaths per 1,00,000 live births, reported under the Sample Registration System (SRS). "Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes". But the MMR in India has declined over the years – it was 103 in 2017-19, then 97 in 2018-20 and now 93 in 2019-21.

To understand the maternal mortality situation better, States have been categorised into three: "Empowered Action Group" (EAG) States that comprise Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh, Uttarakhand and Assam; "Southern" States which include Andhra Pradesh, Telangana, Karnataka, Kerala and Tamil Nadu; and "Other" States that cover the remaining States/Union Territories.

In the group of "Southern" States, Kerala has the lowest MMR (20) and Karnataka the highest (63). The rest of the data is Andhra Pradesh (46) Telangana (45) and Tamil Nadu (49). In the EAG States, Assam has a very high MMR (167); the rest of the data is Jharkhand (51), and Madhya Pradesh (175). Bihar, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand are in the 100-151 range. In the category of "Other" States, Maharashtra is 38 and Gujarat 53; the rest of the data is Punjab 98, Haryana 106 and West Bengal 109.

We need to have a differential approach in strategy to reduce maternal deaths in the different clusters of States. In this, addressing three issues is fundamental. There are "three delays" that lead to a mother dying, according to Deborah Maine of Columbia University – I had incorporated this in the training module on 'Safe Motherhood in India' in 1992.

### Key factors that endanger a life

The first delay is in recognising impending danger and making a decision to rush and seek expert care. The husband and other family members often experience inertia, thinking that all deliveries are a natural process and so the mother-to-be can wait. Or they may not have enough money or other issues at the family level that prevent them from going to a hospital. If the educational level of family members and their financial position are weak, delaying decision making is detrimental. But empowered, neighbourhood mothers and women's self-help groups have resulted in a remarkable change; no longer is a mother-to-be neglected by lethargic family members. Ever since Accredited



**Dr. K.R. Antony**  
is a Public Health Consultant in Kochi, Kerala, who drafted the first Safe Motherhood module for the Ministry of Health on behalf of UNICEF

Social Health Activists (ASHA) began networking with Auxiliary Nurse Midwives (ANM) since 2005 (when the National Rural Health Mission (NHRM) was launched), institutional over home deliveries have become the better option. The financial incentives for the mother and ASHA were the turning point.

The second delay is in transportation. From remote rural hamlets and forest settlements or faraway islands it may take many hours, or an overnight journey for a mother-to-be to reach a health facility with a skilled birth attendant (midwife/staff nurse) or a doctor or an obstetrician. Many women die on the way. However, the 108 ambulance system and other Emergency transport mechanisms under the National Health Mission has made a difference.

### Other problems

The third delay, an unpardonable one, is in initiating specialised care at the health facility. The excuses are plenty and difficult to justify – a delay in attending to a woman in the emergency room; a delay in reaching the obstetrician; a delay in getting a blood donor, in laboratory support, the operation theatre not being ready, an anaesthetist not being available is a list that can go on. The concept of the operationalisation of a 'minimum four FRUs [first referral units] per district of two million population, is crucial. The "first level referral unit" with specialists such as an obstetrician, anaesthetist, paediatrician, blood bank and operation theatre was aimed at preventing maternal death at the doorstep of a hospital.

Unfortunately, this has not worked out as expected since 1992. There are problems such as 66% vacancies of specialists in 5,491 community health centres out of which 2,856 are supposed to be FRUs in 714 districts. The lack of blood banks or blood storage units in these designated FRUs was another reason for many mothers not receiving adequate blood transfusion within two hours of the onset of massive bleeding after delivery, leading to fatalities.

The biggest killer is bleeding after delivery. This could be due to inadequate and timely contraction of an overstretched uterus with a baby of three-kilogram weight floating in amniotic fluids. When the placenta is separated after delivery, the raw opened surfaces of the uterine wall will bleed profusely unless it immediately contracts. From a total reserve of five litres of blood, more than half is lost in such a short duration, resulting in the mother going into shock and death. If there is underlying anaemia, which has not been treated with iron folic acid supplements in pregnancy, it will also result in tragedy. Thus, there is a need for immediate blood transfusion and emergency surgical care.

The next emergency is obstructed labour where the contracted bony pelvis of an already

stunted young mother (who is also malnourished and has low body mass index) does not allow the normally grown baby to emerge. Prolonged labour can lead to foetal distress and a lethal rupture of the uterus. This can be avoided by a Caesarean section. Thus, there is a need for a well-equipped operation theatre and obstetrician/ surgeon and an anaesthetist on call.

The third medical cause is hypertensive disorders of pregnancy that are not recognised and treated on time. They can result in a dire emergency with convulsions and coma and very little time to medically control high blood pressure. There are some home deliveries by untrained birth attendants which lead to trauma and puerperal infection, resulting in sepsis and death. Antibiotics could have saved their lives, but the patient is admitted to hospital late. A failure of contraceptive devices, resulting in unwanted pregnancies and crude abortion techniques by quacks, also leads to sepsis and death. In EAG States, associated illnesses such as malaria, chronic urinary tract infections and tuberculosis are also high risk factors.

### The focus areas for States

The prescription for averting maternal deaths is early registration and routine antenatal care and ensuring institutional delivery. Many of these systemic deficiencies will be highlighted in the mandatory reporting and audit of all maternal deaths under the NHM. While the EAG States have to focus on the implementation of basic tasks, the southern States group and probably Jharkhand, Maharashtra and Gujarat need to fine tune the quality of their emergency and basic obstetric care.

The Kerala model of a Confidential Review of Maternal deaths, initiated by Dr. V.P. Paily, has some analytical leads on how Kerala can further reduce its already low MMR of 20. It is a model other southern States can emulate. The use of uterine artery clamps on the lower segment, application of suction canula to overcome atonicity of the uterus, and a sharp lookout for and energetic management of amniotic fluid embolism, diffused intravascular coagulation, hepatic failure secondary to fatty liver cirrhosis are strategies taught to obstetricians, which even developed countries have yet to practise routinely. They even address antenatal depression and post-partum psychosis as there were a few cases of pregnant mothers ending their life.

Finally, if there is a commitment and a will to stop preventable maternal deaths there is no limit to the varieties of proactive interventions.

*The writer acknowledges inputs on the Confidential Review of Maternal Deaths in Kerala from Dr. Smithy Sanel, a Spokesperson of the Kerala Federation of Obstetrics and Gynaecology*

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**Backdrop:** Maternal Mortality Ratio in India is on the decline, but there are States that need to focus on basic and systemic issues.

**Relevance:** GS 2/Issues relating to Health

According to WHO Maternal Mortality is defined as -

The annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy.

### Maternal Mortality Rate

The number of maternal deaths per 100,000 live births during a specific time period

# WHO - Key facts about Maternal Mortality



- Every day in 2023, over 700 women died from preventable causes related to pregnancy and childbirth.
- A maternal death occurred almost every 2 minutes in 2023.
- Between 2000 and 2023, the maternal mortality ratio (MMR, number of maternal deaths per 100 000 live births) dropped by about 40% worldwide.
- Just over 90% of all maternal deaths occurred in low- and lower-middle-income countries in 2023.
- Care by skilled health professionals before, during and after childbirth can save the lives of women and newborns.

- India's **Maternal Mortality Ratio (MMR)** declined to **93** per 1,00,000 live births in 2019–21, showing steady improvement from **103 in 2017–19**, as per the Sample Registration System.
- **However, Disparities persist across states**
  - **Empowered Action Group (EAG) States:** Bihar, Jharkhand, MP, Chhattisgarh, Odisha, Rajasthan, UP, Uttarakhand, and Assam.
    - Shows alarming figures with **MP (175)** and **Assam (167)** among the worst.
  - **Southern States:** Andhra Pradesh, Telangana, Karnataka, Kerala, and Tamil Nadu.
    - **Kerala** has the **lowest MMR (20)**, while **Karnataka** has the highest (63).
  - **Other States:** Remaining States/Union Territories.
    - **Maharashtra (38)** and **Gujarat (53)** perform relatively well, while **Punjab, Haryana, and West Bengal** report higher MMRs, ranging from 98 to 109.

Maternal deaths in India are often caused by **three critical delays**:

- **Delay in Decision-Making:** Families may fail to recognize impending danger or delay seeking care due to a lack of awareness, education, or financial constraints.
  - However, **ASHA workers, and women's self-help groups** have helped improve institutional deliveries since the launch of the **National Rural Health Mission (2005)**.
- **Delay in Reaching Health Facilities:** Geographic isolation (E.g, Remote rural hamlets and forest settlements, faraway islands, etc) and poor transportation impacts emergency response in case of pregnancy complications.
  - However, the **108 ambulance system** and other Emergency transport mechanisms under the **National Health Mission** have improved access.
- **Delay in Receiving Care at Facilities:** Even after reaching a hospital, care is often delayed due to a
  - **shortage of specialists,**
  - lack of **blood banks,** or
  - unprepared **operation theatres.**

Many **First Referral Units (FRUs)** are non-functional due to **66% vacancies** in specialists.

Lack of proper and timely facilities reduces effectiveness of institutional deliveries as -

- **Postpartum hemorrhage (bleeding after delivery)**, worsened by **untreated anaemia**, is the leading cause for maternal deaths.
- **Obstructed labor**, common in **malnourished, stunted mothers**, can lead to uterine rupture and death if Caesarean section is not available.
- **Hypertensive disorders, sepsis, and unsafe abortions** also contribute significantly, especially in rural areas with poor antenatal care.
- **Associated illnesses** like malaria, TB, and UTIs further increase maternal risk in high-burden states.

## State-specific measures:

- **EAG States** need to focus on basic healthcare implementation.
- **Southern states**, along with **Jharkhand, Maharashtra, and Gujarat**, need to **enhance the quality of** emergency and basic obstetric care.

## Overall measures:

- **Strengthen Health Infrastructure and Human Resources**
  - **Operationalize all FRUs (First Referral Units)** with full-time specialists (obstetricians, anaesthetists, paediatricians).
  - **Fill vacant specialist posts** in Community Health Centres.
  - Ensure **fully functional blood banks/storage units** at FRUs for emergency transfusions.
- **Improve Emergency Transport and Referral Systems**
  - Expand and maintain services like the **108 ambulance system**, especially in remote and rural areas.
  - Create **fast-track referral pathways** for high-risk pregnancies.



- **Community Awareness:** Educate families to recognize danger signs during pregnancy.
- **Focused Interventions for High-Risk Groups**
  - Monitor and manage **anaemia, malnutrition, and teenage pregnancies**.
  - Target **co-morbidities** like malaria, tuberculosis, and urinary infections in EAG states.
- **Replicate Kerala's Confidential Review model**, which includes:
  - Use of **uterine artery clamps** and **suction canula** for postpartum haemorrhage.
  - Training for management of **amniotic fluid embolism** and liver complications.
- **Accountability and Monitoring**
  - Mandatory **reporting and audit** of all maternal deaths under the NHM.
  - Use data for **real-time interventions and course corrections**.
- **Strengthen ASHA and ANM Networks** with training, incentives, and integration into referral systems.

## **Conclusion:**

Timely recognition, access to emergency services, and immediate specialised care backed by well-staffed and equipped facilities are vital to prevent maternal deaths.





## PRACTICE QUESTION



- Q. Despite a declining Maternal Mortality Ratio (MMR), India continues to face significant regional disparities in maternal health outcomes. Discuss the major causes and suggest measures especially for high-burden states.**
- (250 words)*