

Daily Editorial Analysis 19 May 2026

May 19, 2026 • vajiramandravi.com



Gender, Caregiving, the Law in Indian Research Funding

Context

- India's achievements in **space missions, pharmaceutical innovation, and scientific research** demonstrate its growing global influence.
- Despite this progress, many women researchers continue to face institutional barriers that restrict their academic growth.
- To reduce such inequality, funding agencies introduced **age relaxation policies** for women researchers.
- However, these measures alone cannot fully address the structural disadvantages embedded within Indian academic institutions.

Constitutional Basis for Gender-Sensitive Policies

- **Equality and Affirmative Support**
 - The Indian Constitution provides a strong legal foundation for policies supporting women researchers.
 - **Article 15(3)** permits the state to create special provisions for women and children, while **Article 16** guarantees equality of opportunity in public employment.

- Together with the **Directive Principles**, these provisions support affirmative measures that correct historical and social disadvantages faced by women.
- **Dignity and Institutional Responsibility**
 - The constitutional duty under **Article 51A(e)** calls upon citizens and institutions to reject practices harmful to the dignity of women.
 - Persistent underrepresentation of women in research funding and academic leadership reflects structural inequality rather than individual failure.
 - Therefore, research institutions and funding bodies carry a constitutional responsibility to ensure fair opportunities for women scholars.

The Legislative Gap at the Heart of the Problem

- **Limitations of the Maternity Benefit Act**
 - The **Maternity Benefit (Amendment) Act, 2017** expanded paid maternity leave to **26 weeks** and introduced provisions for **crèche facilities** in larger workplaces.
 - Although beneficial in principle, these protections often exclude women researchers working through fellowships, temporary contracts, or project-based appointments.
 - As a result, many early-career scholars remain outside the effective scope of the law.
- **Challenges After Childbirth**
 - Women frequently face interrupted laboratory work, delayed collaborations, and pressure to regain immediate productivity.
 - Academic institutions continue to function around uninterrupted career models that rarely account for maternity-related breaks.
 - The absence of structured support systems such as **re-entry fellowships**, flexible reporting schedules, or reduced workloads further weakens women's long-term participation in research.
- **Absence of Paternity Leave**
 - India also lacks a comprehensive statutory **paternity leave**. Limited leave provisions exist only for certain government employees and do not apply uniformly to researchers funded through grants.
 - This imbalance reinforces the assumption that caregiving is primarily a woman's responsibility.
 - Consequently, institutional policies focus mainly on women-specific support instead of recognising caregiving responsibilities more broadly.

Persistent Gender Disadvantage in Academia

- **Unequal Representation**
 - According to the All-India Survey on Higher Education (2021–22), women constitute only 43% of faculty positions in higher education and remain significantly underrepresented in science and technology institutions.
 - Reports by the **Science and Engineering Research Board (SERB)** also indicate lower grant application and success rates among women researchers.
- **Domestic Responsibilities and Career Impact**

- Women often enter postdoctoral and early-career research during years associated with marriage, childcare, and family obligations.
- Studies on **dual-career households** show that women continue to bear a greater share of domestic work despite equal professional qualifications.
- These unequal responsibilities contribute to delayed publications, weaker grant records, reduced international visibility, and slower career progression.
- In such circumstances, **age relaxation policies** function as corrective measures rather than preferential treatment.

Judicial Perspective on Substantive Equality

• The Vijay Lakshmi Case

- In *Vijay Lakshmi vs Punjab University And Others* (2003), the Supreme Court distinguished between **formal equality** and **substantive equality**.
- Formal equality promotes identical treatment for all individuals, whereas substantive equality recognises that unequal social conditions may require special protections to achieve genuinely fair outcomes.

• Relevance to Research Funding

- This principle directly supports age relaxation policies for women researchers.
- Extending eligibility windows compensates for interruptions caused by caregiving and maternity-related responsibilities.
- However, eligibility extensions alone are insufficient because they do not address everyday institutional barriers such as childcare support, reintegration after career breaks, or flexible grant management systems.

Need for More Inclusive Policy Reforms

• Expanding Support Mechanisms

- The **National Education Policy 2020** encourages institutional flexibility and faculty wellbeing, but these commitments have not been fully translated into research funding frameworks.
- Funding agencies should introduce **no-cost grant extensions**, structured childcare assistance, flexible reporting systems, and stronger **re-entry programmes** for researchers returning after caregiving breaks.

• Balancing Gender-Specific and Caregiving Support

- Although women continue to experience the greatest caregiving burden in Indian academia, other caregivers may also face career disruption.
- A balanced policy approach should therefore retain women-specific protections while adding broader caregiving-based support.
- Several **European research councils** have already adopted such models successfully.

Conclusion

- The inequalities faced by women researchers arise from deeply rooted institutional and social structures rather than lack of merit or ability.
- Removing such protections in the name of neutrality would **ignore the realities of unequal caregiving burdens** and career interruptions.
- A more effective approach requires **layered reforms** that combine women-specific measures with broader caregiving support.

Gender, Caregiving, the Law in Indian Research Funding FAQs

Q1. Why are age relaxation policies important for women researchers?

Ans. Age relaxation policies help women researchers compensate for career interruptions caused by caregiving and maternity responsibilities.

Q2. Which constitutional articles support gender-sensitive policies in India?

Ans. Articles 15(3), 16, and 51A(e) support affirmative measures and equality for women in India.

Q3. What is a major limitation of the Maternity Benefit Act, 2017?

Ans. Many women researchers working on fellowships or temporary contracts are excluded from its protections.

Q4. What did the Supreme Court emphasise in the Vijay Lakshmi case?

Ans. The Supreme Court emphasised the importance of substantive equality over mere formal equality.

Q5. What reforms are needed in Indian research institutions?

Ans. Indian research institutions need childcare support, re-entry fellowships, flexible deadlines, and caregiving-based policies.

Source: **The Hindu**

Improving Efficiency of Fertilizer Use in India

Context

- The West Asia conflict and rising fuel and fertilizer costs have created an opportunity for India to improve fertilizer use efficiency and reduce excessive demand.
- While India produces about 80% of its urea requirement domestically and is expanding capacity for self-reliance, the sector remains heavily **dependent on imported fuel**.
- Green ammonia is a possible alternative, but its viability is limited in water-scarce regions.
- The challenge is more severe for **phosphatic fertilizers**, as India lacks domestic rock phosphate reserves and depends largely on imports.
- Since nitrogen and phosphorus fertilizers are critical for food security, the government continues to provide heavy subsidies to keep prices affordable.
- However, a significant share of the ₹2 lakh crore annual fertilizer subsidy is effectively wasted due to inefficient use and pollution rather than contributing to food production.

The Fertilizer Trap in India

- Excessive, unbalanced, and inefficient use of fertilizers not only wastes public resources but also harms soil health, water quality, air quality, biodiversity, human health, and contributes to climate change.
- Excess fertilizer use depletes **soil organic matter** and reduces the soil's ability to retain water and nutrients. This lowers crop productivity over time, forcing farmers to apply even more fertilizers, creating a self-reinforcing "**fertilizer trap**."
- This cycle explains why India's fertilizer demand continues to grow despite decades of increased supply, showing the limitations of a supply-focused approach.
- The focus must shift from simply increasing supply to **improving fertilizer use efficiency**—either by producing more crop per kilogram of fertilizer used or maintaining yields with lower fertilizer input.

Limits of Existing Policy Measures

- **Nutrient-Based Subsidy (NBS)** – The government's nutrient-based subsidy scheme failed to significantly improve efficiency or reduce demand because urea was excluded.
- **Neem-Coated Urea** – Although introduced to improve nitrogen-use efficiency, neem-coated urea could not prevent substantial nitrogen loss as ammonia emissions, contributing to air pollution.
- **Phosphatic Fertilizers** – A large share of phosphatic fertilizers is also lost through runoff, contributing to water pollution.

Policy Gaps and the Need for Crop Diversification

• Lack of Coordinated Policy Action

- Although alternatives such as pulses, leguminous cover crops, manure, compost, and **biochar** can significantly reduce fertilizer dependence, they are no longer central to India's farming systems.
- Policy efforts have remained fragmented, with poor coordination between ministries and departments, preventing an integrated agricultural strategy.

• MSP and Procurement Distort Cropping Choices

- While the government announces Minimum Support Prices (MSPs) for more than 20 crops, effective procurement is largely limited to rice, wheat, and sugarcane.
- This encourages farmers to focus on these fertilizer-intensive crops, which consume over two-thirds of India's urea, weakening traditional crop rotations with pulses and legumes.

• Food Surplus but Resource Misallocation

- India produces far more cereals and sugarcane than domestic requirements:
 - Around 40% of rice output is exported
 - Another 9% is diverted for grain-based bioethanol production
 - India also produces excess wheat and sugarcane

- This creates competition between food and fuel for land, water, fertilizers, and subsidies, highlighting the need to restrict bioethanol production to molasses or waste biomass instead of food grains.

• Why Pulses Matter

- **Natural Fertilizer Efficiency** – Traditional pulse-cereal rotations sustained agriculture for centuries because legumes naturally fix atmospheric nitrogen, reducing or eliminating the need for urea.
- **Climate and Nutritional Benefits** – Pulses are well-suited to rain-fed and drought-prone regions, making them valuable during weak monsoon years. They are also crucial for tackling protein malnutrition, especially in India's large vegetarian population.

• Declining Pulse Cultivation

- Cereal-focused policies have reduced pulse cultivation, causing shortages and higher import dependence:
 - India now imports around **20% of its pulses**
 - Telangana's pulse production has halved since statehood
 - Shifting even **20% of rice acreage to pulses** could save water, urea, and improve nutrition
- **Weak Implementation of Dalhan Aatmanirbharta Mission**
 - The Dalhan Aatmanirbharta Mission (2025) promised full MSP procurement for key pulses and allocated ₹11,440 crore to boost production to 350 lakh tonnes annually within five years.
 - However, implementation remains weak:
 - Pulse cultivation area increased by only 1.26% in 2026
 - This is negligible compared to the 10% decline in area between 2021-22 and 2024-25
 - Groundnut sowing rose only 1.3%
 - This highlights the urgent need for stronger policy execution and structural agricultural reforms.

Measures to Enhance Fertilizer Use Efficiency

- **Greater Use of Organic Alternatives** – India needs to significantly increase the use of manure, compost, and biochar (biogas residue) to reduce dependence on chemical fertilizers and improve soil health.
- **Revising Fertilizer Application Practices** – Fertilizer recommendations should be redesigned so that organic inputs form the base nutrient dose, with chemical fertilizers used only as supplementary top-ups after exhausting locally available organic sources.
- **Evidence from Crop Trials** – Coordinated crop trials across India have shown that up to 50% of recommended fertilizer use can be replaced by manure, compost, or biochar without reducing crop yields.
- **Need for Better Nutrient-Efficient Crop Varieties** – Investment should focus on improving existing crop varieties for better nutrient-use efficiency, rather than relying mainly on expensive technologies or capital-intensive solutions.
 - India's research indicates that rice germplasm alone has the potential to double nitrogen-use efficiency, measured in terms of grain output per unit of urea applied.

- **Need for Institutional Coordination** – To ensure coordinated implementation across sectors, the Union government should revive the Interministerial National Nitrogen Steering Committee, whose tenure ended before its recommendations could be implemented.

Conclusion

- India's food security requires not more fertilizer, but smarter fertilizer use through pulse-based farming, organic inputs, efficient crop varieties, and coordinated long-term agricultural policy reforms.

Improving Efficiency of Fertilizer Use in India FAQs

Q1. What is the 'fertilizer trap' in Indian agriculture?

Ans. The fertilizer trap is a cycle where excessive fertilizer use degrades soil health, lowers productivity, and forces farmers to use even more fertilizers.

Q2. Why has India's fertilizer subsidy system failed to improve efficiency?

Ans. Urea remained outside the nutrient-based subsidy regime, while existing measures like neem-coated urea failed to significantly reduce nutrient losses or fertilizer overuse.

Q3. How do current MSP and procurement policies increase fertilizer consumption?

Ans. Government procurement heavily favours rice, wheat, and sugarcane, encouraging cultivation of fertilizer-intensive crops and weakening traditional pulse-based crop rotations that naturally enrich soil.

Q4. Why are pulses important for improving fertilizer efficiency?

Ans. Pulses fix atmospheric nitrogen, require little or no urea, improve soil fertility, support protein nutrition, and are better suited for rain-fed and drought-prone regions.

Q5. What measures can improve fertilizer use efficiency in India?

Ans. Greater use of organic manure, compost, biochar, nutrient-efficient crop varieties, crop diversification, and stronger inter-ministerial coordination can significantly reduce fertilizer dependence.

Source: TH

Source: <https://vajiramandravi.com/current-affairs/daily-editorial-analysis-19-may-2026/>

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