



P.L.RAJ IAS & IPS ACADEMY

Building Bureaucrats Since 2006

4. Ease Of Doing Research & Development in India – Niti Aayog Report – Science & Technology

1. Why in News

1. NITI Aayog released report "Ease of Doing Research & Development in India" focusing on improving India's research ecosystem
2. India's Gross Expenditure on Research and Development (GERD) remained around 0.64% GDP (significantly lower than Israel-South Korea >4%, US-China >2%)
3. R&D funding heavily dependent on public sector (~64% contribution); leading innovation economies have >60% private sector contribution
4. Report identifies challenges – Low investment, excessive administrative burden, rigid procurement rules, fragmented governance, weak industry participation, brain drain, weak commercialization

2. Status of R&D in India

Low Expenditure on Research and Development

1. India's GERD – ~0.64% GDP (stagnant despite rapid economic growth)

Comparison –

2. Israel, South Korea – >4% GDP
3. United States, China – >2% GDP
4. R&D expenditure remained stagnant despite economic expansion

Dominance of Public Sector in R&D

1. India's R&D funding heavily dependent on public funding (~64% contribution)
2. **Leading innovation economies** – >60% R&D budget from private sector
3. Imbalance limiting innovation dynamism, commercial application

3. Major Challenges as per Report

Low Investment

1. Inadequate investment limits scientific infrastructure, advanced technology development, innovation capacity, global technological competitiveness

Excessive Administrative and Compliance Burden

1. Excessive bureaucracy reduces productive research time, slows scientific innovation
2. Multiple approval layers, documentation requirements

Rigid Procurement and Financial Rules

Researchers encounter restrictions in –

1. Procurement of specialized equipment (lengthy tender processes)
2. Reallocation of funds (inflexible budgets)
3. Hiring project staff (recruitment bottlenecks)
4. International collaboration (foreign exchange regulations, clearances)

Fragmented Governance and Lack of Coordination

1. R&D ecosystem spread across multiple ministries, departments, funding agencies operating independently

2. Creates – Duplication of research efforts, delayed approvals, lack of integrated planning, data-sharing systems

Weak Industry Participation

1. R&D ecosystem heavily dependent on government funding
2. Private-sector participation limited (unlike US, China, South Korea where private sector dominates R&D)
3. Industry-academia linkages weak

Human Resource Challenges and Brain Drain

1. Shortages of skilled researchers, laboratory technicians, interdisciplinary experts despite large STEM graduate output
2. Limited career progression, inadequate fellowships
3. Migration of talented researchers abroad (better opportunities, infrastructure)

Weak Commercialization of Research

1. India produces scientific publications, laboratory-level innovations
2. Conversion into patents, industrial technologies, start-ups, market-ready products limited
3. Innovation-to-market gap

4. Recommendations

Simplify Administrative, Financial, Procurement Procedures

1. Reduce excessive compliance burden
2. Introduce single-window digital systems, simplified approval procedures
3. Greater flexibility in utilization of research grants, project funds

Strengthen Industry-Academia Collaboration and Innovation Ecosystems

1. Build stronger partnerships between universities, industries, start-ups, government laboratories
2. Through – Research parks, innovation clusters, collaborative doctoral programs, joint industry-funded projects

Improve Research Careers and Human Resource Systems

1. Create attractive, stable career pathways for researchers
2. Improve fellowships, compensation structures, long-term funding opportunities
3. Increase postdoctoral fellowships in S&T by 20% annually
4. **Establish Vigyan Nidhi** – Digital fellowship platform enabling direct benefit transfers, structured support for postdocs, mobility grants, industry-linked research positions

Integrated Research Governance

1. Better coordination among ministries, funding agencies
2. Integrated databases, unified monitoring systems, streamlined governance frameworks improving efficiency

Other Recommendations

1. Increase private sector R&D participation through incentives (tax breaks, grants)
2. Strengthen intellectual property rights regime
3. International collaborations, exchange programs
4. Performance-based funding for research institutions

5. Government Initiatives

Research, Development and Innovation (RDI) Scheme

1. Approved with ₹1 lakh crore corpus
2. Energize private-sector R&D, deep-tech start-ups

3. Offers – Long-term low/zero-interest loans, equity investments, Deep-Tech Fund of Funds via Anusandhan National Research Foundation (ANRF)

Anusandhan National Research Foundation (ANRF, 2023)

1. Provides high-level strategic direction for research, innovation, entrepreneurship in science-technology
2. Aims to mobilize ₹50,000 crore (2023–28) through ANRF Fund, Innovation Fund, Science-Engineering Research Fund, Special Purpose Funds

Indian Space Policy, 2023

1. Builds on 2020 space reforms opening domain to non-governmental entities for end-to-end participation
2. Enhance space capabilities, promote commercial space industry, foster public-private collaboration

National Quantum Mission

1. Allocated ₹6,003.65 crore (2023–31)
2. Advance quantum technologies through scientific, industrial R&D

National Supercomputing Mission (NSM, 2015)

1. Empowers universities, research institutions, government agencies with state-of-the-art supercomputing systems
2. Connected through National Knowledge Network

India Semiconductor Mission (ISM, 2021)

1. Build robust ecosystem for semiconductor, display manufacturing
2. Approved 10 semiconductor projects across six states including first commercial Silicon Carbide fabrication facility in Odisha

India AI Mission

1. Vision – "Making AI in India and Making AI Work for India"
2. Increased computing capacity from initial 10,000 GPUs to 38,000 GPUs
3. Accessible AI infrastructure for start-ups, researchers, industries

Atal Innovation Mission (AIM)

1. Foster innovation at grassroots level
2. Support students, start-ups, entrepreneurs

6. Conclusion

NITI Aayog's "Ease of Doing Research & Development in India" report highlights India's R&D challenges with GERD stagnant at 0.64% GDP (versus Israel-South Korea >4%, US-China >2%), heavy public sector dependence (~64% funding versus >60% private in leading economies). Major challenges include low investment limiting infrastructure-competitiveness, excessive administrative burden, rigid procurement-financial rules, fragmented governance causing duplication-delays, weak industry participation, human resource challenges-brain drain, weak commercialization converting publications into patents-products. Recommendations include simplifying administrative-financial-procurement procedures, strengthening industry-academia collaboration through research parks-innovation clusters, improving research careers with Vigyan Nidhi digital platform increasing postdoc fellowships 20% annually, integrated research governance coordinating ministries-agencies. Government initiatives—RDI Scheme (₹1L crore corpus), ANRF (₹50,000 crore 2023–28), National Quantum Mission (₹6,003.65 crore), India AI Mission (38,000 GPUs), India Semiconductor Mission, Atal Innovation Mission—

addressing ecosystem gaps ensuring India's global technological competitiveness through enhanced public-private collaboration, streamlined governance, attractive research careers.

Source - <https://niti.gov.in/whats-new/ease-doing-research-development-India>