1. India and Bangladesh must not just renew Ganga Water Treaty. They should reimagine it (THE INDIAN EXPRESS)
2. To fix unemployment, fix the economy first (THE HINDU)
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India, Bangladesh must not just renew Ganga Treaty. They should reimagine it

SRINIVAS CHOKKAKULA

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AS THE 30-year term of the 1996 Ganga Water Treaty between India and Bangladesh approaches its conclusion, discussions about its future are gathering momentum. Much of the public debate is about whether the treaty will be renewed or revised. But a more consequential question is, what kind of agreement will it be? The political, institutional and ecological conditions that produced the 1996 treaty are vastly different. The negotiations are likely to be about much more than water sharing at Farakka.

The 1996 treaty had a single-point agenda of water sharing, following India's decision to build the Farakka barrage. The treaty provided a flow-dependent water-sharing arrangement that includes a 50:50 pro-rata sharing when the flows at Farakka dip below a limit. Bangladesh has often expressed its dissatisfaction about not receiving its due share during the dry seasons.

The next Ganga Treaty is not likely to be restricted to this one specific transborder issue. It will transcend territories and borders, within and outside, enlarging the scope of negotiations. The negotiations will be challenging, especially given the new political realities in Bangladesh. But they can also offer new opportunities for robust water diplomacy and enduring relations between India and Bangladesh.

There are two reasons why the negotiations will have an expanded agenda.

First, politics have become more complex. The 1996 treaty, signed after decades of deliberations, reflected a particular political moment of relatively stable bilateral relations. The treaty emerged from sustained Track 1 and Track 2 engagements that built trust and goodwill. Today, the negotiations are likely to be shaped as much by domestic political dynamics as by bilateral diplomatic considerations. Dhaka will find it challenging to navigate the antagonistic sentiment towards India at home. In India, too, the federal politics surrounding Ganga water-sharing are no less complex. West Bengal's resistance prioritising its own needs and Bihar's allegations of siltation upstream of Farakka leading to floods will both pose challenges.

Second, the agenda has expanded beyond Farakka. Besides the Teesta, the recent protracted source of tension, disagreements over multiple shared rivers in the past three decades will impact the negotiations. Further, the concerns are unlikely to be just about water resources sharing and development. The scope will expand to growing water-related risks, with greater uncertainty due to climate change. Climate change pushes the agenda beyond bilateral water allocations to regional-level responses to managing Himalayan glaciers, hydrological extremes, ecosystem resilience and shared vulnerabilities.

These changes have a few critical practical implications for the negotiations.

First, there is a need to avoid what political geographers call the "territorial trap" — the assumption that negotiations occur between the two sovereigns, represented by Delhi and Dhaka. Water diplomacy cannot be separated from internal diplomacy efforts, both in India and Bangladesh. Dhaka must figure out a way to navigate the polarised politics within. Further, posturing has its limits as a bargaining strategy. Signalling closer engagement with China in the Teesta basin may strengthen Bangladesh's negotiating position in the short term, but it also risks securitising negotiations and narrowing opportunities to explore mutual benefits. As the downstream riparian, Dhaka's long-term interests are better served through stable cooperation than through strategic posturing.

> The 1996 treaty, signed after decades of deliberations, reflected a particular political moment of relatively stable bilateral relations. The treaty emerged from sustained Track 1 and Track 2 engagements that built trust and goodwill

India, too, will need to invest in some amount of federal diplomacy despite the conducive equations after the recent elections in Bihar and West Bengal. Getting the states on board will not be easy. Water is an emotive subject and can offer opportunities for the parties in opposition to mobilise resistance from within.

Second, shared rivers create indispensable interdependencies — a less acknowledged but essential characteristic of transboundary rivers. It is not a zero-sum game when water-sharing considerations accompany those of coping with collective risks. The negotiations must build on this for an enduring bilateral relationship. The interdependencies may not always be bilateral. They may transcend to become regional in character. Framing it as interdependencies shifts the focus to shared gains. Better management of floods, fisheries, inland navigation for trade, improved flood forecasting, and joint ecological restoration efforts could create benefits that extend beyond questions of water allocation.

Third, an enabling response to the first two is to invest in institutional avenues. Both India and Bangladesh will need to invest in appropriate institutional processes to channel polarised domestic politics in support of negotiations. Bilateral institutions need revisiting as well. Earlier institutional choices of the overarching Joint Rivers Commission and the Joint Committee for implementing the Ganga Treaty will not be adequate. They were conceived to implement agreements, not to manage uncertainties. The changed realities and greater uncertainties, including water availability, will need robust and resilient transborder institutions to address the enhanced scope of issues — water sharing, data collection and monitoring, dispute resolution, responding to risks, etc.

Finally, both countries will have to reinvest the political capital that made the 1996 treaty possible, and reinvest in it. The treaty negotiations can be a means to do it. Alongside Track 1 diplomacy, both countries should encourage Track 2 dialogues to generate ideas, sustain dialogue and build intellectual and political constituencies to support the dialogue. The 1996 treaty benefitted from such engagement. The Centre for Policy Research was among those at the forefront of such initiatives and contributed to developing a working draft of the treaty.

The negotiations can offer an opportunity to revisit the regional vision that India and Bangladesh jointly championed when SAARC was conceived. The institutional form may have to evolve beyond SAARC, but the underlying strategic rationale has become stronger. The next Ganga Treaty, therefore, presents an opportunity not merely to renew a bilateral water-sharing arrangement but to reimagine a regional strategic vision to address challenges of this new age of shared vulnerabilities and fragmented global economy.

The writer is president and chief executive, Centre for Policy Research, New Delhi

Views are personal

- **Key Terms and Explanations**
- **1. 1996 Ganga Water Treaty**
- A bilateral agreement signed between India and Bangladesh to allocate the lean-season flow (January 1 to May 31) of the Ganga River at the Farakka Barrage. The treaty spans a 30-year duration and relies on a pre-determined, flow-dependent volumetric sharing formula.
- **Simple Example:** If river discharge at Farakka drops below 70,000 cusecs during the peak dry period, the treaty dictates a 50:50 allocation between both nations to ensure survival needs downstream while maintaining navigation upstream.
- **2. Territorial Trap**
- A concept in political geography formulated by John Agnew. It describes the intellectual bias of viewing political power, ecological issues, and policy solutions strictly through the lens of national borders and state sovereignty.
- **Simple Example:** Treating a natural river system—which flows seamlessly across borders—as two separate, nationalized bodies of water (an "Indian river" vs. a "Bangladeshi river") rather than a single, integrated ecological unit.
- **3. Farakka Barrage**
- A 2.24-kilometer-long dam built by India in West Bengal in 1975 across the Ganga River. Its primary design objective was to divert water into the Hooghly River to flush out silt and keep the Kolkata Port navigable.
- **Simple Example:** Acting as a water diversion point, it functions like a tap that regulates how much water moves toward Kolkata Port versus how much flows naturally downstream into Bangladesh's Padma River.
- **4. Track 1 and Track 2 Diplomacy**
- Diplomatic methodologies used to resolve transboundary disputes. **Track 1** refers to formal, official negotiations between government ministers and diplomats. **Track 2** involves informal, non-governmental dialogues among academics, retired officials, scientists, and civil society actors.
- **Simple Example:** Formal treaty talks between the Foreign Secretaries of India and Bangladesh represent Track 1, whereas a joint research initiative by think tanks and hydrologists from both countries to study river siltation represents Track 2.
- **5. Integrated River Basin Management (IRBM)**
- A process that promotes the coordinated development and management of water, land, and related resources within a river basin boundary. It aims to maximize economic and social welfare equitably without compromising the sustainability of vital ecosystems.
- **Simple Example:** Instead of merely dividing bucketfuls of water at a border checkpoint, IRBM manages upstream forest conservation, midstream dam safety, and downstream delta protection as one continuous ecosystem.

- **Main Arguments and Substantive Parts**
- **1. Exhaustion of the 1996 Paradigm**
- The foundational arrangement governing the Ganga River is approaching the end of its 30-year term. Built around a single point of focus—the volumetric allocation of water at Farakka—it was designed for a period characterized by relatively predictable hydrological patterns. Today, changing climate conditions, glacial retreat in the Himalayas, and altered seasonal flows render a simple renewal of volumetric sharing inadequate for long-term ecological and human security.
- **2. Pervasiveness of Internal Federal and Domestic Dynamics**
- Transboundary water negotiations do not occur in an isolated diplomatic vacuum. Sub-national entities strongly influence outcome scenarios.
- In India, West Bengal expresses deep concern over water diversion impacting its agricultural and municipal needs, while Bihar faces severe backwater flooding and heavy upstream siltation linked to Farakka.
- In Bangladesh, water sharing remains a politically sensitive topic across domestic electoral cycles. Negotiation strategies must navigate internal domestic politics alongside formal diplomatic channels.
- **3. Shift from Zero-Sum Allocation to Positive-Sum Interdependencies**
- Viewing water sharing purely through rigid volumetric formulas creates a zero-sum conflict: every cubic meter gained by one country is perceived as a loss by the other. Reimagining transboundary governance requires focusing on shared benefits across multiple sectors:
- Joint flood forecasting and disaster mitigation models.
- Ecosystem restoration and mangrove protection in the Sundarbans delta.
- Inland water transport and cross-border riverine trade routes.
- Sustainable development of deltaic fisheries.
- **4. Need for Modernized Institutional Mechanisms**
- Existing bilateral bodies, primarily the Joint Rivers Commission (JRC), were established to monitor routine flow data and implement fixed agreements. They lack the institutional agility, technological infrastructure, and mandate required to manage modern hydrological uncertainties, conduct basin-wide ecological studies, or resolve complex climate-induced challenges.

- **Historical Evolution of the Issue**
- **Pre-1971 Era: Preliminary Friction**
- **1950s:** India proposed the construction of the Farakka Barrage to divert water into the Bhagirathi-Hooghly system, aiming to prevent the silting up of Kolkata Port.
- **1960s:** East Pakistan raised diplomatic objections, arguing that diverting water from the main stem of the Ganga would severely jeopardize irrigation, cause salinity intrusion, and harm navigation in its downstream coastal regions.
- **1971–1975: Post-Independence Goodwill and Institutionalization**
- **1971:** The creation of Bangladesh led to a temporary surge in bilateral goodwill and strategic alignment.
- **1972:** The India-Bangladesh Joint Rivers Commission (JRC) was established as a permanent bilateral mechanism to maintain liaison and ensure the most effective joint efforts in maximizing water resource utilization.
- **1975:** Farakka Barrage was test-commissioned following a short-term agreement governing water diversion during the lean period.
- **1977–1988: Interim Agreements and Political Stagnation**
- **1977 Agreement:** A 5-year interim agreement was signed, establishing a basic sharing schedule during the dry season and introducing a minimum guarantee clause for Bangladesh.
- **1982 & 1985 Memorandums:** The expiration of the 1977 accord resulted in temporary MoUs. These short-term extensions lacked a long-term strategic vision or institutional mechanism to address basin-wide ecological health.
- **1996: Landmark Ganga Water Treaty**
- **1996 Signing:** Prime Ministers H.D. Deve Gowda and Sheikh Hasina signed a comprehensive 30-year treaty dedicated to water distribution at Farakka.
- **Key Mechanics:** Established a formula for water allocation between January 1 and May 31 based on 40-year historical flow averages, operating on 10-day schedules without requiring a upper-limit guarantee clause.
- **2000s to Present: Climate Pressures and Modern Realities**
- **Teesta Deadlock:** Attempts to finalize a parallel agreement on the Teesta River stalled due to domestic political opposition from the state government of West Bengal.
- **Approaching 2026 Expiration:** The impending conclusion of the 30-year treaty highlights structural gaps in managing siltation, Himalayan glacier melt, and changing river morphology.

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INDIA-BANGLADESH GANGA TREATY: REIMAGINING BEYOND RENEWAL

Glaciers

Farakka Barrage

MULTI-DIMENSIONAL ANALYSIS

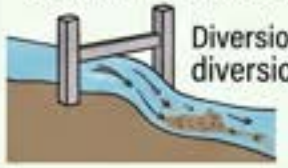
- **SOCIAL**: Livelihood, Delta migration
- **POLITICAL**: Federal, Domestic alignment
- **LEGAL**: Customary law, Institutional mandate
- **ETHICAL**: Downstream equity, Intergenerational rights
- **INTERNATIONAL**: Neighborhood strategy, Intergenerational rights, Third-party dynamics
- **ECONOMIC**: Blue economy, Inland navigation

REIMAGINING THE FRAMEWORK

PAST MODEL:
- Single Point Farakka
- Fixed Volumetric Sharing
- Siltation Neglect

FUTURE GOAL:
- Basin-wide Governance (IRBM)
- Adaptive climate-resilient rules
- Ecosystem health

FARAKKA BARRAGE



TERRITORIAL TRAP

TRACK 1 & 2 DIPLOMACY

WAY FORWARD & BALANCED SOLUTIONS

- **Federal-Union Consensus**
  - Ceighbrohonded Consensus
- **Joint Silt Management**
  - Joint Silt Management & Solutions
- **Integrated Basin Governance**
  - Integrated Basin Governance
- **Benefit Sharing**
  - Trade
  - Energy
  - Disaster Mitigation
- **Sub-regional Cooperation**

UPSC & APSC RELEVANCE & PYQ ANALYSIS

UPSC GS Linkages

- GS1-4 (Basirle concities)
- Essay (noncumentzation)
- Ethics (reltanse mons)

PREVIOUS YEARS' QUESTIONS SUMMARY

GS2 (2021, 2017): Federal dynamics, policy

GS3 (2020, 2018): Disaster, IRBM

APSC (2023, 2020): regional flood management, northeast connectivity

- **Logical and Philosophical Base**
- **1. Critique of Traditional Hydro-Hegemony**
- The traditional approach to transboundary river management relies heavily on realist statecraft. In this framework, the upper riparian state leverages its geographical advantage to assert physical control over natural flows, while the lower riparian state uses diplomatic leverage to demand fixed minimum guarantees. Moving beyond this paradigm requires acknowledging that unilateral water management creates strategic vulnerabilities for both nations through ecological destabilization and downstream displacement.
- **2. Environmental Realism and the 'Commons' Philosophy**
- The underlying logic shifts from treating water as national property to viewing river systems as integrated, indivisible ecological commons. Rivers flow according to topography, hydrological cycles, and natural ecosystems—not political borders. Effective river governance demands an alignment with ecological boundaries rather than Westphalian sovereign lines.
- **3. Principle of Equitable and Reasonable Utilization**
- Grounded in international water law jurisprudence, the underlying philosophy balances human needs with developmental imperatives. It rejects both the *Harmon Doctrine* (absolute territorial sovereignty of the upper riparian) and the principle of *Absolute Territorial Integrity* (unrestricted flow demand by the lower riparian). Instead, it prioritizes mutual accommodation and harm minimization.
- **4. Positive-Sum Bargaining and Co-benefit Logic**
- Moving away from standard zero-sum frameworks, positive-sum negotiation seeks to maximize total system value. Rather than arguing over the allocation of a declining volume of water during lean periods, the focus broadens to include joint investments in flood prevention, renewable energy, estuarine health, and cross-border trade networks.

- **Multidimensional Analysis**
- **Social Dimension**
- **Livelihood Security:** Millions of smallholder farmers, boatmen, and inland fisherfolk depend directly on predictable river discharge patterns for their daily livelihoods.
- **Human Displacement:** Erratic flows, aggravated bank erosion, and deltaic salinization trigger seasonal migration, creating socio-economic pressure on urban centers in both nations.
- **Political Dimension**
- **Federal Dynamics:** Foreign policy imperatives intersecting with state-level electoral dynamics require New Delhi to build consensus with state governments like West Bengal and Bihar before finalizing international agreements.
- **Bilateral Stability:** Transboundary water issues remain central to domestic political discourse in Bangladesh, where perceived inequities can influence public sentiment toward bilateral relations.
- **Legal Dimension**
- **International Standards:** Aligning bilateral frameworks with customary international principles, such as those in the 1997 UN Watercourses Convention—specifically "equitable and reasonable utilization" and the duty to prevent "significant harm."
- **Institutional Mandates:** Reconfiguring legal mechanisms to manage dispute resolution, continuous data sharing, and regular policy adjustments beyond static volumetric charts.
- **Ethical Dimension**
- **Downstream Equity:** Upper riparian nations bear a moral duty of care to avoid actions that compromise the survival needs and ecological stability of downstream communities.
- **Intergenerational Equity:** Over-allocating water or degrading river basins harms future generations by destabilizing delta ecosystems and depleting natural resources.
- **International Dimension**
- **Neighborhood Strategy:** Establishing a cooperative, transparent water-sharing framework strengthens India’s position as a stable regional leader under its "Neighbourhood First" policy.
- **Geopolitical Realignment:** Clear, long-term bilateral water arrangements mitigate the risk of third-party geopolitical influence in sub-regional water infrastructure projects.
- **Economic Dimension**
- **Logistical Connectivity:** Maintaining adequate water levels enables inland water transit along National Waterway 1 (NW-1), expanding trade routes under the Protocol on Inland Water Transit and Trade (PIWTT).
- **Agricultural Resilience:** Predictable water delivery underpins regional food security, agricultural output, and rural economy stabilization in both countries.

- **Linkages with NCERTs**
- **1. Class 11 Geography: *India - Physical Environment***
- **Chapter 3: Drainage System**
- **Direct Relevance:** Outlines the origins, structural trajectory, seasonal flow dynamics, and transboundary features of the Ganga river system, including its major tributaries and deltaic branches (Bhagirathi-Hooghly and Padma).
- **2. Class 12 Political Science: *Contemporary World Politics***
- **Chapter 6: Environment and Natural Resources**
- **Direct Relevance:** Analyzes resource geopolitics, global commons, and international disputes over water allocation, illustrating how river systems can act as sites of geopolitical tension or regional cooperation.
- **3. Class 12 Political Science: *Politics in India Since Independence***
- **Chapter 4: India's External Relations**
- **Direct Relevance:** Traces the development of India-Bangladesh relations post-1971, highlighting key bilateral milestones, peaceful dispute resolution mechanisms, and ongoing neighborhood diplomacy challenges.
- **4. Class 10 Social Science: *Contemporary India II***
- **Chapter 3: Water Resources**
- **Direct Relevance:** Examines multi-purpose river projects, ecological impacts of large dam infrastructure, inter-state and transboundary water sharing conflicts, and community-led conservation practices.

- **Linkages with UPSC CSE Syllabus**
- **GS Paper 1: Geography**
- **Syllabus Focus:** *Salient features of world's physical geography; distribution of key natural resources (water bodies).*
- **Application:** Mapping river basin hydrology, sediment dynamics at Farakka, delta erosion in the Sundarbans, and the physical characteristics of Himalayan river systems.
- **GS Paper 2: Governance & International Relations**
- **Syllabus Focus:** *India and its neighborhood relations; Bilateral, regional and global groupings; Federal issues.*
- **Application:** Evaluating foreign policy strategies, the influence of domestic federalism on treaty negotiations, and institutional frameworks like the Joint Rivers Commission.
- **GS Paper 3: Environment, Economy & Disaster Management**
- **Syllabus Focus:** *Environmental degradation; Disaster management; Economics of transport (inland waterways).*
- **Application:** Developing climate adaptation plans, managing glacier retreat risks, resolving heavy siltation problems, and building inland water transport corridors (NW-1).
- **GS Paper 4: Ethics**
- **Syllabus Focus:** *Environmental ethics; Ethical considerations in international relations.*
- **Application:** Examining moral responsibilities of upper riparian states, fair distribution of global commons, and protecting marginalized downstream communities.
- **Essay & Optional Subjects**
- **Essay:** Prompts centered on "Resource Geopolitics," "Federalism in Foreign Policy," or "Climate Change and Transboundary Peacebuilding."
- **Political Science & IR (PSIR Paper II):** South Asian regional dynamics, neighborhood policy challenges, and non-traditional security threats.
- **Geography (Paper I & II):** River basin management, hydro-geomorphology, and regional planning in South Asia.

- **Way Forward**
- **1. Shift to Basin-Wide Integrated Governance**
- Transition from isolated, point-based water management (Farakka) to an Integrated River Basin Management (IRBM) framework. This approach should treat the entire Ganga-Brahmaputra-Meghna (GBM) basin as a single ecological continuum, managing upstream conservation, sediment movement, and deltaic stability holistically.
- **2. Formulate Formal Inter-Governmental Federal Consultations**
- Establish a structured domestic consultation mechanism connecting the Union Ministry of External Affairs with riparian state governments—primarily West Bengal and Bihar. Involving state leadership early in foreign policy discussions prevents domestic deadlocks and aligns local development priorities with national diplomatic goals.
- **3. Modernize Institutional Structures and Data Systems**
- Overhaul the Joint Rivers Commission (JRC) by integrating automated hydrometric stations, high-resolution satellite monitoring, and shared climate resilience models. Transitioning to real-time, transparent data sharing helps reduce political distrust during lean seasonal flows.
- **4. Prioritize Benefit-Sharing Over Volumetric Distribution**
- Reframe negotiation agendas around positive-sum opportunities:
- Expand cross-border trade through inland water transport infrastructure.
- Establish joint disaster warning systems for sudden floods and seasonal surges.
- Invest in collaborative research to protect the Sundarbans mangrove ecosystem.
- Develop joint blue economy initiatives in the Bay of Bengal estuarine region.
- **5. Expand Track 2 and Sub-Regional Engagement**
- Support continuous informal diplomacy through universities, independent think tanks, and local civil society groups. Leveraging sub-regional arrangements like the BBIN (Bangladesh, Bhutan, India, Nepal) grouping helps integrate transboundary water governance into broader energy, trade, and climate resilience frameworks across South Asia.

- **UPSC CSE Mains Questions**
- **GS Paper 2 (International Relations)**
- **2021:** "India’s 'Neighbourhood First' policy requires balancing foreign policy commitments with domestic federal aspirations." Discuss this statement in the context of the unresolved transboundary river issues between India and Bangladesh.
- **2017:** "Water sharing disputes among South Asian nations pose a significant threat to regional peace and economic integration." Examine how a shift from volumetric allocation to benefit-sharing can redefine India's hydro-diplomacy.
- **2013:** Analyze the major areas of cooperation and friction between India and Bangladesh. How far can bilateral institutional mechanisms like the Joint Rivers Commission resolve emerging environmental and security challenges?
- **GS Paper 3 (Environment, Hydrology & Connectivity)**
- **2020:** "Integrated River Basin Management (IRBM) is essential to combat climate change threats and sediment accumulation in major South Asian river systems." Elaborate with reference to the Ganga-Brahmaputra basin.
- **2018:** Discuss the economic and logistical significance of Inland Waterways in India. How can cross-border river transit arrangements with neighboring countries boost regional economic integration?

To fix unemployment, fix the economy first

The Cockroach Janta Party's movement has highlighted the political urgency for reforming the economy to create more employment for India's youth. Fixing the education system alone will not solve the unemployment problem. The basic structure of the economy must be reformed.

China and India, the only two countries in the world with populations exceeding one billion, have the greatest need for meaningful employment. If citizens are not fully employed, and incomes of masses do not rise, their economies cannot grow. China has done much better than India in this regard; the per capita income of Chinese citizens has risen roughly eight times faster than Indians' in the last 30 years.

India's leaders find themselves in the middle of conflicting trends. First, they are pushing ahead with reforms for 'ease of doing business'; diluting the rights of workers to organise; and weakening environmental protection. Second, they are promoting the wide-spread application of Artificial Intelligence (AI) to improve 'productivity' (and other benefits) in agriculture, industry, health and education, with productivity defined, purely in economic terms, as more output with less human input. Third, they also see the need to change the pattern of growth and increase employment elasticity. Employment elasticity is the amount of meaningful employment created with each unit of GDP growth, in which India has been a laggard since the liberal market economic reforms of the 1990s.

Since India has the largest population of youth in the world, its economic growth should have the highest employment elasticity. However, the increased adoption of AI will only make it worse.

The China model

China has invested billions to become an AI superpower and has raced to integrate the technology across a range of industries. By 2024, more than two million robots were already working in Chinese factories. And in Beijing, Shanghai and Shenzhen, Meituan, the nation's largest food delivery service, has experimented with using small autonomous robots to deliver food. But China's advances in AI have run headlong into a growing problem: anxiety over the workers who could be displaced.

China's political and economic history reveals that, despite being an authoritarian country, the Chinese government is very attentive to what people are thinking and saying on the Internet. History has taught them that another revolution will form if disenchanted and educated youth rise along with the disgruntled workers and peasants. They know they must respond.

Unemployment has been increasing in China. The unemployment rate for migrant workers rose to 5.7% in March this year, which has been the highest in nearly three years for China, while youth unemployment stood at 16.3% in April. Moreover, 70% of unemployed young people are university graduates, with older laid-off workers facing prolonged periods of joblessness.

However, Chinese courts have been swift to act. A court ruled in May that a tech company had illegally laid-off a worker after replacing him with AI software. Another ruled that, "the development of artificial intelligence technology should be applied to liberating labour, promoting employment and improving people's livelihood". And yet another ruled that "companies that benefit from technology must, at the same time, adopt social responsibilities and protect worker rights".

China's Ministry of Human Resources and Social Security announced in January that it would roll out policies to address the impact of AI on jobs, including targeted support for key industries. In June, the State Council issued a plan on implementing an "employment-first" strategy for the 2026-2030 period. Party officials have proposed sweeping government interventions such as requiring employers to offer training to help workers adapt to an AI-centric job market.

The Chinese government's 'people-first' ideology has served China's economy and its people well. China's leaders have remained socialists; they have always put the needs of common citizens, and the stability of China's society, above economists' demands for deregulation of markets and prices, especially with respect to labour, food, education, health, and housing.

The road ahead for India

Indian income levels must rise rapidly – in agriculture, manufacturing, and services. The government has added 'ease of living' to 'ease of doing business' as the purpose of the reforms required for India to become 'Viksit Bharat' by 2047. To make it a reality, it will have to put more teeth into its policies to increase employment and incomes, and stave off the negative impacts that AI will have on employment. Policies must require that employers take more responsibility for training their own workers; they must be restrained from laying them off.

New policies must put workers' rights ahead of capitalists' rights, as China has done. India's labour market reforms, with the four labour codes, are directed to improve 'ease of doing business', which is undoubtedly necessary. However, the 'ease of doing business' must now become subordinate to the ease of living and earning for all citizens.

India's leaders would do well to learn from China's leaders on how to navigate this moment in history. The rights of all workers must be firmly protected. While the views of financial investors must be heard, the views of workers and small-time entrepreneurs must be heard much more.

Arun Maira

Author of 'Reimagining India's Economy: The Road to a More Equitable Society'

The 'ease of doing business' must now become subordinate to the ease of living and earning for all citizens

- **Key Terms and Explanations**
- **Employment Elasticity of Growth**
- This metric measures the percentage change in employment associated with a one-percent change in Gross Domestic Product (GDP). It serves as a vital barometer for assessing whether economic growth is translating into actual job creation. High employment elasticity indicates labor-intensive growth, whereas low or negative elasticity reflects capital-intensive or "jobless" growth.
- **Ease of Doing Business vs. Ease of Living and Earning**
- **Ease of Doing Business:** A regulatory framework focused on simplifying corporate compliance, deregulating markets, protecting capital investment, and lowering operational costs to attract private and foreign investment.
- **Ease of Living and Earning:** A human-centered economic philosophy prioritizing citizen welfare, employment security, decent wage structures, affordable public goods (such as healthcare, education, and housing), and sustainable livelihoods over pure capital profitability.
- **Jobless Growth and Capital Deepening**
- **Jobless Growth:** A structural anomaly in an economy where aggregate national output (GDP) expands, but the rate of employment creation remains stagnant or declines.
- **Capital Deepening:** An economic process where the proportion of capital per worker increases, leading to higher labor productivity through automation and technology, often at the expense of net workforce expansion.
- **Example:** A manufacturing plant adopting automated assembly lines and industrial robotics may double its production output while laying off half its human workforce.
- **Technological Unemployment and AI Disruption**
- Technological unemployment occurs when structural innovation, automation, or artificial intelligence renders existing human skills obsolete faster than the economy can create new, accessible job opportunities. Unlike historical mechanization—which primarily displaced manual labor—modern Artificial Intelligence and generative automation disrupt both white-collar service sectors and blue-collar industrial jobs.
- **Example:** The replacement of customer service representatives, data analysts, or logistics schedulers with AI algorithms reduces the human labor input required per unit of corporate output.
- **Labor Market Flexibility and Regulatory Codification**
- Labor market flexibility refers to the ease with which employers can adjust their workforce (hiring, firing, altering wages, and modifying work hours) to respond to market fluctuations. It often exists in tension with worker protections, collective bargaining rights, and employment stability.
- **Example:** Consolidated labor codes that streamline compliance and ease retrenchment thresholds increase firm flexibility, but may reduce long-term job security for formal workers if not balanced with universal social safety nets.

- **Main Arguments and Substantive Parts**
- **Re-Engineering the Growth Engine for Livelihood Generation**
- A fundamental premise of modern political economy is that aggregate macroeconomic growth alone is insufficient to address widespread unemployment. When economic policy focuses primarily on GDP expansion and capital efficiency, it often yields gains concentrated among owners of capital and high-skilled labor. To solve structural jobless growth, the underlying design of the economic architecture must shift from capital-driven productivity to explicit, employment-first planning. Economic growth must be treated not as an end in itself, but as a vehicle for creating meaningful, well-remunerated, and secure employment for the population.
- **The Conflict Between Market Liberalization and Labor Protection**
- A core structural tension in developing nations lies between pushing for extreme market flexibility and safeguarding basic labor rights. Policies designed to improve industrial competitiveness frequently emphasize deregulation—simplifying corporate compliance, relaxing environmental norms, and weakening collective bargaining mechanisms. However, when these reforms are pursued without adequate social safeguards, they risk destabilizing the workforce. Weakening worker protection under the pretense of attracting investment erodes purchasing power across the broader population, ultimately constraining domestic aggregate demand and weakening long-term economic growth.
- **Technological Productivity vs. Labor Absorption**
- The widespread integration of advanced automation and Artificial Intelligence presents a major challenge to labor-rich developing economies. Historically, productivity increases allowed workers to produce more output per hour, often accompanied by expanding industrial sectors. Modern AI-driven productivity, however, is increasingly defined as maximizing output while strictly minimizing human input. When applied rapidly across services, agriculture, and manufacturing, capital-intensive technology drastically lowers employment elasticity. This creates a structural paradox: capital productivity rises, corporate profits increase, but aggregate job creation shrinks, deepening socio-economic inequality.
- **Alternative Models of State Intervention and Corporate Accountability**
- Examining comparative models of state-market relations highlights alternative approaches to managing technological transitions. State-directed market economies often utilize regulatory, legal, and planning instruments to cushion workers against arbitrary technological displacement. Judicial rulings that invalidate automated layoffs, mandates requiring corporate tech adopters to shoulder retraining costs, and explicitly planned national "employment-first" frameworks illustrate how state policy can steer technological deployment. In this framework, corporate entities that profit from technology-driven efficiencies are required to balance profit margins with social responsibilities to their workforce.
- **Rebalancing Stakeholder Interests in Economic Governance**
- Sustainable economic strategy requires rebalancing the political and institutional influence of capital investors alongside workers, small-scale enterprises, and informal sector participants. When policy formulation prioritizes the demands of institutional investors and large corporations over the structural needs of small business owners and wage laborers, the resulting growth framework turns fragile. Subordinating pure "Ease of Doing Business" metrics to "Ease of Living and Earning" ensures that economic policy actively broadens the national income base, strengthens internal demand, and maintains social cohesion.

- **Historical Evolution of the Issue**
- **Pre-1991 Era: State-Led Development and Import Substitution**
- **The Mahalanobis Framework:** Post-independence economic planning focused on heavy industrialization and capital-goods production under public enterprise control, aiming to build long-term industrial capability.
- **Structural Limitations:** While establishing a basic industrial foundation, the public-sector-led strategy was highly capital-intensive and failed to absorb the rapidly growing rural workforce into formal manufacturing.
- **Informalization and Agrarian Overcrowding:** Lacking labor-intensive export manufacturing, the vast majority of India's labor force remained tied to subsistence agriculture or low-productivity informal urban occupations.
- **1991 LPG Reforms: Liberalization and Service-Led Expansion**
- **Structural Adjustment:** The Liberalization, Privatization, and Globalization (LPG) reforms deregulated industrial licensing, opened markets to foreign capital, and reduced trade barriers.
- **Service-Sector Leapfrogging:** Unlike East Asian economies that transitioned from agriculture to low-skill manufacturing and then to high-skill services, India's post-1991 expansion skipped mass manufacturing, leaping straight into high-skill service exports (IT, financial services, telecommunications).
- **Divergence in Output vs. Employment:** The service sector contributed heavily to GDP expansion but remained accessible to only a small fraction of educated, urban workers, leaving structural underemployment intact across rural regions.
- **2000s–2010s: The Era of Jobless Growth and Safety Net Interventions**
- **Declining Employment Elasticity:** Despite achieving historic high growth rates in the mid-2000s, employment elasticity dropped sharply. Growth relied heavily on capital deepening, financial services, real estate, and telecommunications.
- **Rise of Informal Livelihoods:** The formal sector failed to create quality jobs proportional to demographic growth, pushing over $85\%$of the workforce into informal, vulnerable, and unregulated employment.
- **Institutional Distress Relief:** Recognizing structural deficits in formal job creation, the state introduced rights-based safety nets—most notably the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA, 2005)—to act as an economic floor for rural labor distress.
- **Post-2020 Era: Technological Disruption and Labor Reform Integration**
- **Convergence of Automation and AI:** The acceleration of Artificial Intelligence, industrial robotics, and gig-platform algorithms began threatening both service-sector desk jobs and traditional factory floor employment.
- **Labor Law Consolidation:** Central authorities rationalized 29 legacy labor laws into 4 consolidated Labor Codes (Wages, Industrial Relations, Social Security, and Occupational Safety). This reform aimed to enhance business flexibility while attempting to extend social security to gig and informal workers.
- **The Current Challenge:** Balancing the push for international investment competitiveness with the urgent need to absorb millions of young entrants entering the labor force annually.

AXIA IAS ACADEMY
RISE ABOVE THE REST

FIXING UNEMPLOYMENT:
STRUCTURAL REFORMS FOR AN INCLUSIVE ECONOMY

Based on Comprehensive Article Analysis

1) JOBLESS GROWTH

Output increases without proportional job creation.
Example: Capital-Intensive manufacturing.

2) EMPLOYMENT ELASTICITY

Responsiveness of employment to GDP growth.
(Low in modern context).

3) CAPITAL DEEPENING

High proportion of capital per worker.
Tech-driven productivity.

4) TECHNOLOGICAL UNEMPLOYMENT

AI Algorithm
Rapid displacement of labor across services & industry.

PRE-1991
State-Led, Mahalanobis Model

1991
LPG Reforms, Service-Led Growth

REBALANCING STATE & MARKET MODELS

2000s-10s
High Output, Low Jobs (Jobless Growth)

POST-2020
AI Disruption, Gig Economy

PILLAR 1: National Employment Policy

Comprehensive strategy with employment targets.

PILLAR 2: Labor-Intensive Manufacturing PLIs

Incentivize high-labor absorption sectors.

PILLAR 3: AI Governance & Retraining

Corporate duty to reskill workers.

KEY ACADEMIC LINKAGES

NCERT LINKAGES
e.g., Class 11-12 Economics/Political Science key chapters

UPSC SYLLABUS
Relevance GS 1-4, Essay Themes

UPSC PYQ THEMES
- 2023 Paper 3: Jobless Growth
- 2023 Paper 3: Acoleass
- 2023 Paper 3: Algorithm
- 2023 Paper 3: Robosts
- 2023 Paper 3: Dnplacenots
- 2023 Paper 3: Growth

- **Logical and Philosophical Base**
- **Amartya Sen’s Capability Approach**
- The Capability Approach redefines national economic development. Rather than evaluating economic success solely by aggregate national income or capital expansion, this framework argues that true development consists of expanding real human freedoms and building individual capabilities.
- Unemployment is viewed not merely as a loss of income, but as a severe deprivation of human capability, social dignity, and agency.
- Under this paradigm, an economic system that yields rising GDP alongside stagnant job growth fails a primary ethical duty: enabling citizens to lead lives they have reason to value.
- **Polanyian Critique of Labor as a Commodity**
- In *The Great Transformation*, Karl Polanyi posited that human labor, land, and money are "fictitious commodities." Labor is human life itself and cannot be treated purely as an inventory input or market variable without destroying the social fabric.
- When economic policies subject human labor to completely unregulated market dynamics—where capital moves freely to minimize labor costs through aggressive automation—social cohesion weakens.
- The philosophical justification for state intervention rests on the necessity to "de-commodify" labor through social protection, job security, and regulatory oversight, ensuring market mechanisms remain embedded within societal needs.
- **Rawlsian Distributive Justice and the Veil of Ignorance**
- John Rawls’s Theory of Justice asserts that socio-economic inequalities are acceptable only if they work to the maximum benefit of the least-advantaged members of society (the Difference Principle).
- Applying this principle to economic design, policy choices must be evaluated from the position of those with the fewest resources—such as unemployed youth, informal laborers, and displaced workers.
- A policy architecture that prioritizes capital efficiency, corporate tax concessions, and rapid automation at the expense of mass employment violates Rawlsian justice by heightening vulnerability at the lower strata of society to enrich capital owners at the top.
- **Re-Evaluating the Social Contract**
- The political philosophy of the modern nation-state rests on an implicit social contract: citizens respect state authority and contribute to economic productivity, while the state maintains public order, protects basic rights, and ensures access to sustainable livelihoods.
- When systemic jobless growth persists, the foundational legitimacy of the economic order comes under strain.
- State policy must actively balance capital property rights with the socio-economic rights of citizens to maintain public trust and preserve democratic stability.

- **Multidimensional Analysis**
- **Social Dimension**
- **Demographic Dividend vs. Liability:** India possesses the world's largest youth cohort. If provided with formal, productive employment, this demographic can drive multi-generational prosperity. Conversely, persistent unemployment transforms this potential dividend into a source of social frustration and demographic vulnerability.
- **Mental Health and Social Alienation:** Long-term joblessness among educated youth leads to rising anxiety, social alienation, and a loss of personal agency, contributing to elevated domestic stress and mental health crises.
- **Deepening Socio-Economic Stratification:** The divergence between high-earning knowledge workers and a massive informal labor force expands the gap between social classes, entrenching inequality across generations.
- **Political Dimension**
- **Electoral Imperatives and Public Agitations:** Widespread unemployment elevates job creation into a major political issue, prompting widespread demands for public sector recruitment, welfare expansions, and local reservation policies.
- **State Legitimacy and Stability:** Prolonged youth unemployment risks destabilizing political order, as historical precedents demonstrate that unemployed, educated youth are frequently at the forefront of major social and political unrest.
- **Policy Trilemma:** Democratic governments face conflicting priorities: attracting global capital through liberalized market policies while responding to voter demands for job security, social protection, and state-subsidized employment.
- **Legal Dimension**
- **Constitutional Mandates (DPSPs):** The Directive Principles of State Policy under the Constitution of India establish clear welfare goals:
    - **Article 39:** Mandates that the state direct its policy toward securing adequate means of livelihood for all citizens and preventing the concentration of wealth.
    - **Article 41:** Explicitly directs the state, within its economic capacity, to secure the right to work, to education, and to public assistance in cases of unemployment.
- **Labor Law Reforms:** The implementation of the 4 Labor Codes aims to unify legacy statutes, but requires judicial oversight to ensure that expanding corporate operational flexibility does not undermine constitutional guarantees of labor dignity.
- **Judicial Precedents on Tech Disruption:** Courts globally and domestically are starting to evaluate technological displacement. Emergency jurisprudence increasingly views arbitrary algorithmic layoffs without reskilling support as a challenge to fundamental livelihood protections.
- **Ethical Dimension**
- **Human Dignity vs. Pure Capital Efficiency:** Evaluating human beings strictly as cost units to be optimized or replaced by algorithms reduces worker agency to a spreadsheet metric.
- **Corporate Digital Responsibility:** Companies that achieve profitability through rapid technology adoption hold an ethical obligation to retrain displaced personnel, mitigate worker dislocation, and reinvest gains into human capital.
- **Intergenerational Equity:** Concentrating economic gains in capital-intensive, automated industries deprives future labor cohorts of entry-level career pathways, raising fundamental questions about distributive justice.
- **International Dimension**
- **Global Supply Chain Competitiveness:** Developing nations must balance domestic workforce absorption with maintaining export competitiveness against nations utilizing automated, low-cost smart-manufacturing supply networks.
- **Global Labor Standards (ILO Conventions):** Adhering to International Labour Organization (ILO) standards on decent work, core labor rights, and workplace safety is vital to avoid trade protectionism from international partners targeting labor exploitation.
- **Comparative Regulatory Approaches:** Countries handle automation differently: some prioritize market flexibility to speed tech adoption, while others enforce strict labor protections, mandated retraining, and robust social safety nets.
- **Economic Dimension**
- **The Trap of Low Employment Elasticity:** A persistent decline in employment elasticity restricts aggregate demand. When the majority of citizens lack rising real wages, consumer market demand flattens, depressing domestic private investment.
- **Sectoral Misalignment:** The historical failure to transition surplus agricultural labor directly into labor-intensive industrial manufacturing leaves a structural deficit, forcing labor into low-productivity informal services.
- **Risk of the Middle-Income Trap:** Without a robust manufacturing base capable of absorbing millions of low-to-medium-skilled workers, an economy risks stalling before transitioning into a high-income status.

- **Linkages with NCERT Textbooks**
- **Class 11 Economics: *Indian Economic Development***
- **Chapter 7: Employment: Growth, Informalisation and Other Issues**
    - **Core Linkage:** Explores the structural concepts of employment elasticity, informalization of the Indian workforce, jobless growth, and changing participation rates across primary, secondary, and tertiary sectors.
    - **Application:** Provides the direct theoretical baseline for analyzing why GDP expansion post-1991 reforms failed to generate proportional formal employment, validating the necessity of an employment-centric economic strategy.
- **Class 11 Political Science: *Political Theory***
- **Chapter 8: Social Justice & Chapter 10: Development**
    - **Core Linkage:** Evaluates John Rawls's principles of distributive justice, the balance between market efficiency and state intervention, and critiques of purely top-down growth models.
    - **Application:** Helps students evaluate the philosophical conflict between prioritizing "Ease of Doing Business" (capital freedom) and "Ease of Living and Earning" (distributive justice and state welfare).
- **Class 12 Political Science: *Politics in India Since Independence***
- **Chapter 3: Politics of Planned Development**
    - **Core Linkage:** Examines the historic shift from state-led planned industrialization (Mahalanobis model) to market-driven liberalization post-1991, detailing the resulting socio-political fallout.
    - **Application:** Enables students to trace how political priorities shifted from state-directed employment generation to private investment facilitation, providing historical context for current economic dilemmas.
- **Class 12 Sociology: *Social Change and Development in India***
- **Chapter 5: Change and Development in Industrial Society**
    - **Core Linkage:** Details the impact of industrialization, automation, deskilling of labor, flexible employment practices, and the growth of informal labor markets on traditional social structures.
    - **Application:** Contextualizes the human cost of corporate flexibility and automated technology adoption within the broader framework of Indian labor history.

- **Linkages with UPSC CSE Syllabus**
- **General Studies Paper 1: Indian Society & Demographics**
- **Syllabus Headings:** Population and associated issues, poverty, development challenges, urbanization, and social empowerment.
- **Relevance:** Analyzes how structural youth unemployment affects social mobility, accelerates distress-driven rural-to-urban migration, deepens urban poverty, and shifts family structures across urban and rural demographics.
- **General Studies Paper 2: Governance, Polity & Public Policy**
- **Syllabus Headings:** Welfare schemes for vulnerable sections; mechanisms, laws, institutions, and bodies constituted for the protection and betterment of vulnerable sections; government policies and interventions.
- **Relevance:** Examines state legislative frameworks—specifically the four consolidated Labor Codes, national skilling missions, and constitutional mandates under Articles 39 and 41—balancing regulatory compliance with social security protections for informal and platform workers.
- **General Studies Paper 3: Indian Economy, Technology & Employment**
- **Syllabus Headings:** Indian Economy and issues relating to planning, mobilization of resources, growth, development, and employment; Inclusive growth; Effects of industrial policies; Science & Technology / Artificial Intelligence.
- **Relevance:** Forms the primary structural core of the analysis. Maps the structural causes of low employment elasticity, jobless growth trends, the economic impact of capital-intensive industrialization, and the disruptive role of AI and automation on industrial and service employment.
- **General Studies Paper 4: Ethics, Integrity & Aptitude**
- **Syllabus Headings:** Human Values, Corporate Governance, Ethical dilemmas in public and private institutions, Distributive Justice.
- **Relevance:** Explores the ethical dimensions of corporate technology adoption, examining whether corporate managers hold a social duty to retrain workers displaced by AI. Assesses the balance between utility maximization (capital efficiency) and rights-based ethical duties to workers.
- **Essay & Optional Subjects**
- **Essay Themes:** Socio-economic development, "Demographic Dividend: Asset or Liability?", "Growth vs. Equity," "Technology as a Double-Edged Sword for Livelihoods."
- **Economics Optional:** Growth Models, Labor Economics, Employment Elasticity, Sectoral Shifts in Developing Economies.
- **Sociology Optional:** Work and Economic Life, Class Structure, Changing Nature of Work and Labor Informalization.
- **Public Administration:** Welfare Administration, Policy Implementation Deficits, Public Sector vs. Private Sector Employment Strategies.

- **Way Forward**
- **Macroeconomic Re-Orientation: Prioritizing Employment Targets**
- **National Employment Policy (NEP):** Formulate a comprehensive National Employment Policy that integrates job creation targets directly into macroeconomic planning, fiscal policies, and central bank targets alongside inflation and GDP metrics.
- **Employment Elasticity Benchmarks:** Establish mandatory "Employment Impact Assessments" for large-scale public investment projects and industrial incentive frameworks before granting major state subsidies or land allocations.
- **Revitalizing Labor-Intensive Industrial Sectors**
- **Targeted Production-Linked Incentives (PLI):** Restructure industrial incentive frameworks like PLIs to incentivize labor-intensive manufacturing sectors (such as textiles, apparel, leather, food processing, toy manufacturing, and construction) rather than exclusively favoring capital-intensive, high-tech domains.
- **Strengthening the MSME Ecosystem:** Micro, Small, and Medium Enterprises (MSMEs) form the backbone of labor absorption. Policy must prioritize reducing credit access costs, resolving supply chain bottlenecks, and easing compliance burdens specifically for small-sized enterprises.
- **Human-Centric AI and Automation Governance**
- **Mandatory Corporate Retraining Initiatives:** Require medium and large enterprises adopting labor-displacing technology (such as AI algorithms or industrial robotics) to establish worker reskilling funds, keeping workers employed in altered or higher-value roles.
- **Phased Technological Integration:** Establish transition guidelines for public services and key industrial sectors to ensure that advanced automation enhances human labor capability rather than driving sudden, unmanaged mass layoffs.
- **Upgrading the Social Security Architecture**
- **Operationalizing the Social Security Code:** Swiftly implement rules under the Social Security Code to extend universal health, accident, and retirement benefits to gig workers, platform laborers, and informal sector workers.
- **Decent Wage Mandates:** Transition from basic minimum wage benchmarks to a legally enforceable, region-adjusted "Living Wage" standard, ensuring that employed individuals earn enough to maintain household purchasing power and stability.
- **Institutionalizing Tripartite Consultative Frameworks**
- **Restoring Social Dialogue:** Re-establish regular, formal tripartite consultations involving state regulators, industry representatives, and labor associations to design balanced labor reforms.
- **Promoting Local Industrial Clusters:** Foster localized industrial ecosystems and rural non-farm economic clusters that build on local skills, natural advantages, and regional supply chains to curb distress migration to tier-one metropolitan hubs.

- **UPSC CSE Mains**
- **GS Paper 3: Indian Economy & Employment**
- **2023:** "How far is the current growth pattern in India capable of absorbing the growing labor force? Critically analyze the reasons for low employment elasticity in the post-reform period."
- **2022:** "Economic growth without distributive justice leads to concentration of wealth and social polarization. Discuss this statement in the context of India's labor market dynamics."
- **2021:** "Examine the impact of rapid automation, Artificial Intelligence, and technological advancement on structural employment in developing economies like India. What policy changes are needed to protect labor interests?"
- **2019:** "Do you agree that the Indian economy has recently experienced jobless growth? Support your answer with empirical arguments and suggest measures for labor-intensive growth."
- **GS Paper 4: Ethics**
- **2022:** "Technological advancement without social responsibility risks widening economic disparities. In light of increasing AI adoption by corporate entities, discuss the ethical responsibilities of employers towards displaced human labor."
- **2020:** "Distributive justice demands that the benefits of national economic development must reach the most vulnerable sections. Evaluate how public policy can balance capital efficiency with human dignity."
- **UPSC Essay**
- **2023:** "Economic growth is a means to human welfare, not an end in itself."
- **2021:** "Technology as a silent transformer: Livelihood creator or employment destroyer?"
- **2018:** "Demographic Dividend of India: Strategic Asset or Impending Liability?"

MADAN SABNAVIS

FCNR (B) scheme — a range of possibilities

MONEY MATTERS. This scheme helps in boosting forex reserves and liquidity but hinges on making provisions for redemptions in future

The Reserve Bank of India's announcement on FCNR (B) deposits, made as part of the credit policy, has lifted sentiments on the forex front. Estimates of expected inflows vary from $50-100 billion. Intuitively, if even around $50 billion comes in (which looks likely based on the current data), it will mean an additional liquidity of around ₹5 lakh crore for the economy.

This can be a boost to banks at a time when credit growth has outpaced deposit growth. The equation will change when the dollars are swapped for rupees by banks.

Some banks are offering leverage on such deposits, provided the same is put back in these deposits. This is a unique way of garnering dollars and inducing liquidity.

But there are some key issues that need to be factored in.

First, since the scheme is time-bound till September, the entire flow of dollars will come in the next two months or so. Therefore, RBI's forex reserves should increase by a similar amount in gross terms. Banks too will receive the rupee equivalent which has to be deployed. While this provides comfort, there will be time lags between their flows and their deployment over the next six months (from September-end to March-end).

This will mean holding on to surpluses which will get transferred to the MSF window. The RBI would have to be active with the VRRR auctions where surpluses are transferred. The money market should see lower rates which can get reflected in bond yields, though that cannot be taken for granted.

MOPPING EXCESS LIQUIDITY

In fact, there are two other options for mopping up excess liquidity.

One is OMOs where RBI sell securities to banks. Simultaneously, the RBI can also choose to change the calendar for primary G-sec issuances to frontload them in October to divert these funds. The other is a temporary increase in CRR or incremental CRR, which will have monetary policy implications as it can lead to tightening of liquidity conditions.

Second, FCNR (B) deposits could substitute other deposits such as the NRO deposits which are in rupees. This will also have a bearing on the overall level of NRI deposits. Outstanding NRI deposits stand at around $165 billion (₹16 lakh crore) as of April 2026 which is 6.5 per cent of total deposits in the system. Within this, FCNR was just 20 per cent of total NRI deposits, with the increase in FY26 being just $272 million. Some of the remittances may get transferred to these deposits with the interest serving as the annuity payments for recipients. Hence this will substitute domestic deposits.

Third, the swap cost of the dollars is being taken on by the RBI. Assuming the cost to be around 3 per cent which is the forward rate today, it would mean around ₹15,000 crore a year, which under *ceteris paribus* conditions can be interpreted as a decline in net surplus which goes to the government. For the central bank, this is not really a concern though.

Fourth, banks are better-off, even after paying 6.5-7 per cent on these deposits the cost will be lower than on domestic deposits as these are free from the CRR and SLR. Therefore, there are gains to be made in terms of spread. The median NICLR for banks as per RBI is 8.5 per cent, which means a clear spread of 2 per cent. If the same is EBLR based lending the spread can be higher. Deploying these funds in government paper (in case the loan portfolio is not growing) may not give the same kind of returns as that on loans. This is something individual banks will be cognisant of, when structuring their interest rates and targeting flows.

The redemptions in 3-5 years' time may lead to a dip in forex reserves. To offset this there must be robust inflows from exports, FPI and FDI

Fifth, the FCNR scheme allows for swapping only the principal amount and not the interest. For payment of interest of 6-7 per cent which banks are offering, appropriate hedging should be in place as this will add to the cost.

REDEMPTION FACTOR

Sixth is the question of redemption of these deposits in three or five years. Now, the dollars that will come in now will be swapped with the RBI and the reserves built up. Depending on the tenures of these deposits, there could be drop in forex reserves unless there are robust inflows from exports, FPIs and FDI.

The RBI will have to prepare for this and probably build buffers. This will be over and above the buy-sell swaps that the RBI has used to bolster liquidity in the market. In this process, banks will need to have liquidity to buy dollars.

Last, from the point of view of the saver, these funds would be locked in for the contracted period. Hence, it becomes a premier long-term investment. So the depositors will have to contend with the tax rules in their countries regarding interest earnings. However, for those who have leveraged their deposits to take loans to invest in these deposits, the changing interest rate in the home country as well as the structuring of the leverage would be important considerations when putting their money in these FCNR deposits.

The scheme introduced helps in building forex reserves and providing liquidity simultaneously. As banks swap the dollars with the RBI, the supply in the market remains unchanged so the rupee will not appreciate. However, the mechanics have to be studied for all savers and the financial system must take into account future provisions to handle redemptions. This adds to the interest in the scheme.

The writer is Chief Economist, Bank of Baroda. Views expressed are personal

- **Key Terms and Explanations**
- **Foreign Currency Non-Resident (Bank) Deposit Scheme — FCNR(B)**
- The FCNR(B) scheme allows Non-Resident Indians (NRIs) and Persons of Indian Origin (PIOs) to hold fixed deposit accounts in Indian commercial banks denominated in designated foreign currencies such as US Dollars, Euros, or British Pounds.
- **Mechanism:** Unlike standard rupee-denominated accounts, the depositor bears zero foreign exchange rate risk because both the principal and interest are repaid in the original foreign currency.
- **Example:** An NRI deposits $100,000 in an Indian bank under FCNR(B) at a 6% annual interest rate. At maturity, the bank returns $106,000 regardless of whether the Indian Rupee has appreciated or depreciated against the US Dollar.
- **Dollar-Rupee Buy/Sell Swaps**
- A monetary policy operation where the Reserve Bank of India (RBI) buys foreign currency (US Dollars) from commercial banks in exchange for domestic currency (Rupees) at the prevailing spot rate, while simultaneously entering into an agreement to sell back the dollars at a pre-determined forward rate at a specified future date.
- **Mechanism:** It temporarily converts foreign currency inflows into domestic rupee liquidity without causing immediate, aggressive rupee appreciation in the spot market.
- **Sterilization and Liquidity Management Tools (VRRR, OMO, I-CRR)**
- Sterilization refers to action taken by a central bank to counteract the effects of foreign exchange interventions on the domestic money supply.
- **Variable Rate Reverse Repo (VRRR):** An auction conducted by the RBI to absorb temporary excess rupee liquidity from commercial banks by offering them government securities as collateral in exchange for cash overnight or for specified tenures.
- **Open Market Operations (OMOs):** The outright sale or purchase of government securities (G-Secs) by the central bank in the open market to permanently adjust systemic liquidity. Selling G-Secs sucks out domestic currency.
- **Incremental Cash Reserve Ratio (I-CRR):** A temporary mandate requiring banks to hold a higher percentage of their fresh net demand and time liabilities (NDTL) as cash with the central bank, locking away excess liquidity during sudden surges.
- **Cost of Funds and Spread (MCLR Comparison)**
- **Cost of Funds:** The effective interest rate a financial institution pays to acquire capital to lend out.
- **Marginal Cost of Funds based Lending Rate (MCLR):** The minimum interest rate below which a commercial bank in India cannot lend, calculated based on the incremental cost of raising funds.
- **Spread:** The difference between the lending rate (MCLR) and the cost of acquiring deposits. Exemptions from standard regulatory reserves like Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) lower the overall effective cost of FCNR funds, yielding a wider net profit spread for commercial banks.

- **Core Analytical Framework & Macroeconomic Thesis**
- **The Dual-Benefit Thesis: Reserve Augmentation and Liquidity Inflow**
- Opening targeted foreign currency deposit windows serves as a potent macro-stabilization tool during periods of structural domestic credit-deposit divergence. When domestic credit growth outpaces domestic deposit creation, commercial banks face severe liquidity tightness. Directing foreign currency inflows into FCNR(B) structures allows the banking system to gather substantial external dollars, which, when swapped with the central bank, immediately transforms into low-cost rupee liquidity. Simultaneously, this process fortifies the central bank's gross foreign exchange reserves, sending positive signaling effects to global financial markets.
- **The Mechanics of Bank Profitability and Yield Spreads**
- From the operational perspective of commercial banks, FCNR deposits offer a compelling cost-structure advantage over domestic fixed deposits.
- Because regulatory reserve requirements such as CRR and SLR are routinely waived or reduced for these special inflows, the effective cost of funds remains significantly lower than nominal domestic deposit rates.
- Even after factoring in nominal interest payments of 6.5% to 7% offered to non-resident depositors, banks can deploy these swapped rupee funds into domestic loans at median lending rates (such as an MCLR of ~8.5%), securing a clean, predictable interest rate spread of 150 to 200 basis points.
- **Liquidity Friction and Time-Lag Bottlenecks**
- While foreign exchange inflows enter the system rapidly within a short, targeted policy window, their actual deployment into productive domestic economic channels is far from instantaneous.
- **Deployment Lag:** A time lag typically exists between the arrival of funds and their eventual lending out over subsequent quarters.
- **Surplus Accumulation:** This lag creates a temporary pool of excess rupee liquidity in the domestic banking system.
- **Yield Curve Impact:** Unchecked excess liquidity risks distorting short-term money market rates and artificially depressing sovereign bond yields, necessitating active, ongoing central bank intervention through tools like Variable Rate Reverse Repo (VRRR) auctions or frontloaded Open Market Operation (OMO) bond sales.
- **The Swap Cost Burden and Central Bank Balance Sheets**
- Swapping foreign currency for domestic currency carries non-trivial fiscal and monetary costs. The forward swap rate—reflecting the interest rate differential between the domestic and foreign economies—represents a direct operational expense.
- Net Swap Cost $=$ Forward Rate Premium $\times$ Total Swapped Volume
- When the central bank absorbs foreign currency at a forward premium (e.g., around 3% annually), this expense reduces the net operational surplus of the central bank, which indirectly diminishes the annual dividend transfer available to the sovereign government.
- **The Medium-Term Redemption Dilemma**
- The fundamental drawback of mobilizing foreign currency via deposit schemes lies in their short-to-medium-term debt liability nature. FCNR deposits are not permanent capital equity; they carry fixed maturities, typically ranging between 3 and 5 years.
- **Maturity Shock:** When these deposits mature, the process reverses: banks must repurchase dollars from the central bank using rupees to pay back foreign depositors.
- **Reserve Depletion Risk:** Unless the economy generates matching structural foreign exchange inflows through organic export expansion, Foreign Direct Investment (FDI), and steady Foreign Portfolio Investment (FPI) over the intervening years, the eventual redemption phase risks causing a sharp, sudden drain on gross foreign exchange reserves.

- **Historical Evolution of Capital Inflow & Deposit Schemes in India**
- **The Pre-1991 Era and the Vulnerabilities of FCNR(A)**
- Following the oil price shocks of the 1970s, India sought non-debt-creating foreign exchange inflows by introducing the Foreign Currency Non-Resident Account scheme in 1975, known as FCNR(A). Under this early iteration, the Reserve Bank of India undertook the complete foreign exchange risk, guaranteeing depositors and commercial banks against any loss arising from rupee depreciation.
- During the historic Balance of Payments crisis of 1991, as the rupee depreciated significantly, the liabilities generated by this exchange rate guarantee mounted exponentially. The central bank suffered severe financial losses, highlighting the danger of the sovereign absorbing currency market volatility on behalf of private depositors.
- **Post-1991 Structural Reforms and the Shift to FCNR(B)**
- Recognizing the structural flaw of FCNR(A), the government and the RBI phased out the scheme and launched the Foreign Currency Non-Resident (Bank) scheme—FCNR(B)—in 1993. The foundational shift was simple yet profound: the exchange rate risk was transferred entirely away from the central bank. Commercial banks accepting these deposits were now required to manage the exchange risk themselves through market-based hedging, forward contracts, or central bank currency swaps, aligning India's external sector management with market principles and capital account liberalisation.
- **The 2013 "Taper Tantrum" and the Emergency Swap Window**
- The most notable milestone in the evolution of the FCNR(B) scheme occurred during the 2013 "Taper Tantrum." When signals from the US Federal Reserve regarding the unwind of quantitative easing caused rapid capital outflows from emerging markets, the Indian Rupee plummeted to record lows.
- In response, the RBI opened a specialized, subsidized FCNR(B) dollar-swap window for commercial banks. By offering attractive swap rates, India successfully raised over $34 billion within a few months. This massive influx stabilized the rupee, replenished foreign exchange reserves, and restored international investor confidence, demonstrating the utility of non-resident deposit windows as emergency macroeconomic stabilization levers.
- **The 2016 Redemption Phase and Contemporary Fine-Tuning**
- A major test of this policy occurred in late 2016 when the three-year FCNR(B) deposits mobilized during the 2013 crisis matured simultaneously. Through forward market operations, structural accumulation of dollar buffers, and clear forward guidance, the central bank managed the repayment of over $20 billion without disrupting domestic currency markets or interbank liquidity.
- In contemporary monetary management, FCNR deregulation, interest rate cap adjustments, and temporary reserve requirement exemptions are routinely deployed as strategic instruments to smooth out periodic divergences between domestic bank credit demand and deposit growth.

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RISE ABOVE THE REST

UPSC COMPREHENSIVE GUIDE: MANAGING CAPITAL FLOWS AND FCNR(B) SCHEMES

1. KEY TERMS & EXPLANATIONS

FCNR(B)
- **Multi-currency deposit**
- Zero exchange risk

Dollar-Rupee Buy/Sell Swaps
- Bank deposites dollars is the RBI for the rupees for the RBI
- Rupees for exonsous and reversal after a defined tenure

Sterilization
Money supply absorpten to money supply to reversut of money economy, I-CRR

VRRR OMO

2. MAIN ARGUMENTS & SUBSTANTIVE PARTS

Pros (Forex Boost & Domestic Liquidity)	VS	Cons (Swap Costs & Redemption Shock)
• Deposit-Credit Mismatch relief		• Deposit-Credit Mismatch -relief
• Forex Fruts Mismatch orpoot		• Deposit-Credit Mismatch relief
		• Deposit-Credit Redemptio shock

3. HISTORICAL EVOLUTION OF THE ISSUE

1975
FCNR(A)
Flaws of condiltinn

1991–1993
Structural Shift to FCNR(B)

2013
Taper Tantrum Swap Window
Raises ~$34 Billion

2016–Present
Redemption & Contemporary Fine-Tuning

4. LOGICAL AND PHILOSOPHICAL BASE

5. MULTIDIMENSIONAL ANALYSIS

Social: Remittance & Consumption

Political: Macro-stability cross-border tax

Legal: FEMA rules & cross-border tax

Ethical: Fair credit allocation, Moral hazard

International: Interest rate spillovers

Economic: Credit mismatch, money supply

6. LINKAGES WITH NCERTs

Macroeconomics
(Class 12 - Ch. 3 & Ch. 6)
- Open economy theory
- Recoumanion theory
- External sector management

Indian Economic Development
(Class 11 - Ch. 3)
- Open economy theory
- Pixnecsection
- External sector management

7. LINKAGES WITH UPSC CSE SYLLABUS

GS 1	GS 1: Banking & Dominutiary, Concessed Crisis, Banking & Recenetration
GS 2	GS 2: Banking & Reserve Reserve Management
GS 3	GS 3: Banking & Reserve Management
Essay	GS 4: Banking & Card and Development, and Economy
Ethics	GS 5: Banking & Tunting

8. WAY FORWARD: PRACTICAL POLICY

- Staggered Maturity Structures
- Active Sterilization (OMO/VRRR)
- Domestic Savings Incentives
- Structural FDI (Equity) Focus

- **Logical and Philosophical Foundations**
- **The Impossible Trinity (Mundell-Fleming Model)**
- At the heart of foreign currency deposit dynamics lies the classical economic concept of the Mundell-Fleming Trilemma or the "Impossible Trinity." This theory dictates that an economy cannot simultaneously maintain all three of the following:
- A fixed or managed exchange rate.
- An independent domestic monetary policy.
- Free capital mobility across national borders.
- By encouraging foreign currency inflows via special deposit windows while actively absorbing dollars through central bank buy-sell swaps, policymakers attempt to navigate this trilemma. The central bank seeks to maintain monetary policy independence (controlling domestic interest rates) and curb currency volatility, while simultaneously benefiting from open capital flows. However, this balance requires continuous, active market intervention and sterilization, proving that trade-offs between capital mobility and monetary autonomy are unavoidable.
- **Intertemporal Policy Choice and Resource Allocation**
- The logical foundation of utilizing deposit-based foreign capital hinges on the principle of intertemporal choice—decisions made today that impact financial positions in future periods.
- **Immediate Gain:** Deploying foreign currency deposit incentives provides immediate, high-potency relief to domestic banks facing a structural deficit of domestic deposits.
- **Future Obligation:** Because these deposits carry fixed maturity dates, the policy effectively borrows future foreign exchange liquidity to solve a present-day domestic liquidity constraint.
- **Prudential Assumption:** The underlying logic rests on an assumption that over the 3-to-5-year lifecycle of these deposits, the real economy will generate sufficient organic foreign exchange (via structural exports and FDI) to comfortably settle the future redemption burden.
- **Risk Redistribution and Prudential Architecture**
- From a policy design perspective, the architecture of foreign deposit management centers on the deliberate allocation of systemic risk:
- **Currency Risk:** In the modern FCNR framework, currency risk is shifted away from the sovereign balance sheet and distributed between commercial banks and foreign depositors.
- **Liquidity Risk:** When commercial banks swap dollars with the central bank, liquidity risk is transferred to the central bank, which must manage the resulting excess domestic rupee liquidity.
- **Fiscal Dividend Impact:** The financial cost of executing these swaps (the forward premium) is absorbed by the central bank, which marginally reduces its operational surplus transferred to the government. Thus, the system carefully balances private banking incentives against public balance-sheet capacity.

- **Multidimensional Analysis**
- **Social Dimension**
- Foreign currency deposit schemes closely intersect with the socio-economic realities of the Indian diaspora.
- **Remittance Behavior:** High-net-worth NRIs often utilize FCNR deposits not merely for wealth preservation, but as a structured vehicle to support extended families in India through annuity-like interest transfers.
- **Substitution Effects:** High yields on foreign currency deposits can cause non-residents to shift funds away from standard Rupee-denominated Non-Resident Ordinary (NRO) or Non-Resident External (NRE) accounts.
- **Domestic Consumption:** While this provides wealth stability for diaspora households, the influx of rupee liquidity into domestic banking, if deployed unwisely, can drive localized asset price inflation (e.g., in real estate), indirectly affecting domestic housing affordability.
- **Political Dimension**
- Foreign exchange reserve levels and currency stability carry substantial political significance in developing economies.
- **Sovereign Credibility:** Robust foreign exchange buffers shield the national economy from foreign economic shocks, reinforcing public trust and political stability.
- **Fiscal Trade-offs:** The operational expenses borne by the central bank in executing currency swaps directly reduce the annual surplus transferred to the central government's budget. This creates an indirect political trade-off, as reduced dividend transfers reduce the fiscal headroom available for public welfare spending and infrastructure investment.
- **Legal and Regulatory Dimension**
- The architecture of non-resident deposit flows is governed by a strict regulatory framework designed to prevent capital flight and foreign exchange manipulation.
- **FEMA Framework:** The Foreign Exchange Management Act (FEMA), 1999, along with periodic RBI notifications, lays down strict guidelines governing account eligibility, repatriation rights, and permissible leverage.
- **Cross-Border Tax Laws:** Depositors must navigate dual-taxation arrangements and tax compliance guidelines across both their host countries and domestic legal jurisdictions.
- **Regulatory Arbitrage:** Regulators must continually update compliance guidelines to ensure that financial institutions do not misuse reserve exemptions or cross-border leverage to engage in speculative currency trading.
- **Ethical Dimension**
- The deployment of targeted state incentives to attract foreign foreign-currency capital introduces ethical questions regarding domestic economic equity.
- **Credit Allocation Equity:** When banks receive reserve-exempt, subsidized funds via international deposit channels, a disproportionate share of this liquidity often flows toward creditworthy large corporations, while Small and Medium Enterprises (MSMEs) and agricultural borrowers remain credit-starved.
- **Moral Hazard:** Guaranteeing backstop liquidity and organized swap facilities for commercial banks during deposit shortages can create moral hazard, encouraging banks to rely on short-term foreign capital fixes rather than building resilient, organic domestic savings networks.
- **International Dimension**
- Foreign currency deposit policies are deeply tied to global financial conditions and international monetary trends.
- **Interest Rate Spillovers:** The attractiveness of foreign currency deposits in India depends heavily on the policy interest rates set by foreign central banks, particularly the US Federal Reserve. When Western central banks raise benchmark rates, Indian deposit schemes must offer higher yields to remain competitive.
- **Geopolitical Resilience:** In an increasingly fragmented global economy, holding robust foreign exchange buffers built through diversified diaspora deposits enhances a country's geo-economic resilience against external trade shocks and international sanctions.
- **Economic Dimension**
- The primary economic impact of foreign deposit management lies in its ability to address structural imbalances in the domestic banking system.
- **Credit-Deposit Mismatch:** When credit demand grows significantly faster than domestic bank deposits, foreign capital inflows fill the liquidity gap, enabling banks to maintain lending without driving domestic interest rates to unsustainable highs.
- **Sterilization and Money Supply:** Converting large dollar inflows into rupees expands the domestic monetary base (M_3). If left unmanaged, this expansion can lead to demand-pull inflation. Consequently, the central bank must perform continuous sterilization operations to keep broad money supply aligned with inflation targets.

- **Linkages with NCERT Textbooks**
- **Class 12 Macroeconomics — Chapter 6: Open Economy Macroeconomics**
- **Conceptual Connection:** This chapter introduces the core components of the Balance of Payments (BoP), specifically distinguishing between the Current Account and the Capital Account.
- **Relevance:** FCNR(B) deposits are classified under the Capital Account of the Balance of Payments as foreign currency debt liabilities. Understanding how capital flows alter the overall BoP balance, influence foreign exchange reserve accumulation, and impact exchange rate determination directly builds upon the core theoretical concepts presented in this chapter.
- **Class 12 Macroeconomics — Chapter 3: Money and Banking**
- **Conceptual Connection:** Covers the functions of the central bank, commercial bank credit creation, monetary instruments (CRR, SLR, Repo Rate), and liquidity management mechanisms.
- **Relevance:** Analyzing how the central bank uses Variable Rate Reverse Repo (VRRR), Open Market Operations (OMOs), and reserve requirement exemptions (CRR/SLR waivers on FCNR deposits) provides a practical, real-world case study of the theoretical monetary management tools outlined in this chapter.
- **Class 11 Indian Economic Development — Chapter 3: Liberalisation, Privatisation and Globalisation: An Appraisal**
- **Conceptual Connection:** Traces the structural economic crisis of 1991, external sector reforms, foreign exchange deregulation, and the transition from strict capital controls to a managed floating exchange rate system.
- **Relevance:** The evolution from the pre-1991 FCNR(A) scheme—where the central bank absorbed all currency risk—to the post-reform FCNR(B) scheme illustrates the broader shift toward market-driven economic governance and external sector liberalization discussed throughout this textbook.

- **Linkages with UPSC CSE Syllabus**
- **General Studies Paper 3: Indian Economy and Issues Relating to Planning, Mobilization of Resources, Growth, Development, and Employment**
- **Core Topic:** Mobilization of resources, banking sector health, monetary policy mechanisms, external sector stability, and management of foreign exchange reserves.
- **Analytical Application:** Students must evaluate how foreign currency deposit schemes address structural liquidity deficits in commercial banks, analyze central bank sterilization operations, and assess the medium-term balance-of-payments risks associated with capital redemptions.
- **General Studies Paper 2: India and its Neighborhood / Indian Diaspora**
- **Core Topic:** Role of the Indian Diaspora in national economic development and external sector resilience.
- **Analytical Application:** Highlights how the diaspora acts as a vital financial stabilizer during external economic shocks through non-debt and debt-creating capital contributions, transforming soft power into tangible financial security.
- **General Studies Paper 4: Ethics and Human Interface / Governance**
- **Core Topic:** Ethical issues in financial governance, systemic equity, and moral hazard in economic policy.
- **Analytical Application:** Evaluating whether providing regulatory exemptions and preferential returns to non-resident foreign capital creates a systemic inequity against domestic micro-savers and small businesses.
- **Optional Subjects: Economics (Paper I & Paper II)**
- **Economics Paper I (Open Economy Macroeconomics & Monetary Theory):** Application of the Mundell-Fleming Trilemma, sterilization dynamics, forward rate pricing, and monetary transmission channels.
- **Economics Paper II (Indian Economy - Trade and Finance):** Historical trends in India's Balance of Payments, external debt profile, reserve adequacy indicators, and post-1991 financial sector reforms.

- **Way Forward: Practical Policy Recommendations**
- **1. Implementing Staggered Maturity Structures to Prevent Redemption Bunches**
- To avoid sudden shocks to foreign exchange reserves when FCNR deposits mature, the central bank and commercial banks should implement structured, staggered maturity profiles.
- **Tranche-based Issuances:** Banks should actively offer incentives for varying tenures (e.g., matching combinations of 1-year, 3-year, and 5-year deposits) rather than concentrating deposits into a single popular window.
- **Forward Cover Planning:** Central banks should utilize long-dated forward market purchases well in advance to smooth out future dollar redemptions without disrupting spot market liquidity.
- **2. Fine-Tuning Liquidity Sterilization Frameworks**
- To prevent short-term domestic rupee liquidity surpluses from driving down money market interest rates or distorting the government yield curve, central banks must maintain active, dynamic sterilization.
- **Calibrated VRRR Operations:** Using flexible Variable Rate Reverse Repo auctions of varying tenures to absorb surplus interbank liquidity smoothly.
- **Strategic G-Sec Issuances:** Coordinating with the sovereign treasury to frontload primary issuances of government securities (G-Secs) or utilize Open Market Sales during periods of large foreign dollar inflows.
- **3. Addressing the Structural Domestic Deposit Deficit**
- While foreign deposit windows offer quick relief during liquidity crunches, they should serve as temporary stabilization tools rather than permanent fixes for domestic bank deposit shortfalls.
- **Real Positive Rates:** Commercial banks must offer attractive, real positive interest rates on domestic deposits to encourage domestic household savings.
- **Financial Inclusion Products:** Expanding innovative financial products—such as inflation-indexed bonds and tax-efficient fixed-income instruments—to mobilize untapped domestic savings into the formal banking system.
- **4. Transitioning Preference toward Non-Debt-Creating Capital Inflows**
- From an external balance-sheet perspective, policy should prioritize non-debt-creating long-term capital inflows over debt-creating short-to-medium-term foreign deposits.
- **FDI Environment Reforms:** Continuously improving the ease of doing business, reducing regulatory friction, and offering stable policy frameworks to attract durable Foreign Direct Investment (FDI).
- **Deepening Local Corporate Bond Markets:** Expanding domestic corporate bond liquidity to enable infrastructure projects to raise long-term debt domestically, reducing the corporate sector's dependence on foreign currency borrowing and bank loans.

- **UPSC CSE Mains Questions**
- **Question 1 (2023 - GS Paper 3)**
- **Question:** Do you agree that the Indian economy has recently experienced V-shaped recovery? Give reasons in support of your answer. Analyze how external sector management, particularly foreign exchange reserves, supported economic resilience during recent global uncertainties. *(15 Marks, 250 Words)*
- **Question 2 (2020 - GS Paper 3)**
- **Question:** Explain the meaning of investment in an economy. Discuss the various factors that influence investment decisions. How do foreign debt capital and non-resident deposit flows impact domestic capital formation in India? *(15 Marks, 250 Words)*
- **Question 3 (2019 - GS Paper 3)**
- **Question:** Do you agree that the Reserve Bank of India's monetary policy framework has been successful in containing inflation while maintaining liquidity for growth? Evaluate the role of sterilization tools like OMOs and VRRR in managing foreign capital surges. *(15 Marks, 250 Words)*
- **Question 4 (2015 - GS Paper 3)**
- **Question:** "Success of 'Make in India' program depends heavily on the stability of the Indian Rupee and efficient management of external sector vulnerabilities." Discuss in the context of capital account convertibility and NRI deposit flows. *(12.5 Marks, 200 Words)*

India's manufacturing blind spot

Building an industrial powerhouse requires thousands of mature products, not just frontier technologies

ILLUSTRATION: AJAY MOHANTY

India's industrial strategy has a costly blind spot. While policymakers have rightly poured resources into semiconductors, electric vehicles, batteries, drones, robotics, and artificial intelligence, they have largely ignored the thousands of industrial products that every successful manufacturing economy is built on.

These include machine tools, bearings, pumps, valves, electric motors, compressors, gears, fasteners, industrial chemicals, transformers, cables, and thousands of other engineering products. They are the foundation of advanced manufacturing.

India should continue investing in frontier technologies, but unless it becomes globally competitive in these industrial backbone products, it will remain an assembly economy rather than become a true manufacturing powerhouse.

Manufacturing can be viewed as a three-layer ecosystem. At the bottom are industrial raw materials such as steel, aluminium, chemicals, and petrochemicals. At the top are frontier industries such as semiconductors, AI, electric vehicles, batteries, aerospace and robotics. Between them lies the largest layer — industrial backbone products that connect raw materials to finished goods.

AJAY SRIVASTAVA

Every electric vehicle requires motors, bearings, gears, fasteners, wiring, moulds, dies and machine tools before it reaches a customer. Ignore this middle layer, and the entire manufacturing ecosystem becomes dependent on imports.

Over the past two decades, India's industrial policy has focused overwhelmingly on frontier industries. Initiatives such as Make in India, the production-linked incentive (PLI) schemes, the India Semiconductor Mission, FAME, the National Green Hydrogen Mission and electronics and drone programmes have channelled billions of dollars into semiconductors, electronics, batteries and clean-energy technologies.

The strategy has produced gains. Electronics assembly has expanded, and startups are building battery systems, drones, robotics, medical devices and semiconductor packaging solutions. Yet much of this manufacturing remains assembly-based. India continues to import semiconductors, sensors, precision components, speciality materials and industrial sub-assemblies because the domestic supplier ecosystem remains weak. Frequent duty exemptions on imported components further reduce incentives to manufacture them locally, keeping domestic value addition low.

The policy focus on frontier industries has also shaped entrepreneurship. Most new manufacturing startups target electric vehicles, drones, satellites, and solar equipment. Few entrepreneurs aspire to build world-class companies that make bearings, industrial valves, machine tools, compressors, moulds, or precision engineering components. Yet these "boring" industries form the foundation of Germany's Mittelstand, Japan's precision manufacturing, and China's status as the factory of the world. No country becomes a manufacturing leader by focusing only on high-tech products while neglecting the industrial base beneath them.

China understood this early. It did not become the world's factory by starting with semiconductors or electric vehicles. It first mastered tens of thousands of industrial backbone products, creating dense supplier networks, tooling companies, component manufacturers and engineering firms. Once that foundation was in place, the consumer electronics, automotive, battery, and renewable energy industries expanded rapidly. India is attempting almost the reverse — promoting frontier sectors while leaving much of its industrial base underdeveloped.

India and China started from broadly similar manufacturing levels in the late 1980s, but their paths diverged after the 1990s. China steadily strengthened its manufacturing ecosystem, while India's industrial backbone weakened.

Few policy choices contributed to this outcome. India protected upstream industries such as steel, aluminium and petrochemicals through tariffs and other support. While this benefitted a few large producers, it raised input costs for thousands of downstream manufacturers that made machinery, components, and engineering goods.

As Chinese manufacturing became cheaper and more efficient, many Indian firms found it more profitable to import than to produce locally. In many sectors, trading gradually replaced manufacturing. Even India's pharmaceutical industry shifted from making many active pharmaceutical ingredients to importing them from China and focusing on producing finished medicines. High electricity tariffs, costly logistics, lending rates of 9-10 per cent, regulatory uncertainty and complex compliance requirements further weakened the competitiveness of Indian manufacturers.

China invested aggressively in emerging industries while continuing to strengthen its traditional manufacturing base. India lags in both.

A national strategy: India should continue investing in semiconductors, batteries and electronics. But it also needs a National Reverse Engineering Programme for Manufacturing (NREPM) to strengthen its industrial backbone. The objective is straightforward: Enable Indian firms to manufacture thousands of industrial products at world-class quality and globally competitive costs.

The first task is to identify over a thousand industrial products that account for most of India's engineering imports. These include bearings, pumps, cast, bolts, compressors, machine tools, and fasteners. Most rely on mature technologies, where competitiveness depends on engineering, precision manufacturing, quality, reliability and cost — not scientific breakthroughs. Thousands of Indian micro, small and medium enterprises and mid-sized firms already manufacture many of these products but often fall short of global standards. NREPM should help them bridge that gap, replace imports and build export competitiveness.

The second task is to build technology capabilities. Unlike the PLI schemes, which assumed firms already had the necessary technology, NREPM should focus on building those capabilities. The Indian Institutes of Technology, the National Institutes of Technology, the Council of Scientific and Industrial Research laboratories, and other leading engineering institutions should become the programme's anchor institutions. Based on their expertise, each should take responsibility for a set of industrial products, study the world's best designs, reverse engineer them, develop improved prototypes and transfer the technology to Indian manufacturers. Success should be measured by products commercialised, imports replaced and exports generated — not by research papers. Institutions and teams that achieve these outcomes should be rewarded accordingly.

Funding for NREPM can come from the government's ₹1 trillion Research, Development and Innovation Fund (RDIF) under the Anusandhan National Research Foundation. The RDIF was created to support industry-led research, technology development and commercialisation. Expanding its mandate to finance technology development for manufacturing would help India build indigenous capabilities across advanced industrial sectors.

The third task is to expand the programme beyond engineering products. Once established, NREPM should cover organic chemicals, pharmaceuticals, synthetic textiles and other industrial inputs where India has manufacturing capability but continues to depend heavily on imports.

India's goal should not be to become the world's assembly line for advanced products. It should be to become the world's workshop for the industrial products that make those advanced products possible. That is the foundation on which every manufacturing superpower has been built.

The writer is the founder of the Global Trade Research Initiative

- **Key Terms and Explanations**
- **Industrial Backbone Products:** These are mature, standardized engineering components and intermediate capital goods—such as high-precision bearings, hydraulic valves, pumps, compressors, industrial fasteners, gears, moulds, and dies—that serve as the essential connective tissue between basic raw materials and finished goods.
    - *Example:* In an electric vehicle, while the battery chemistry gets public attention, the vehicle cannot function without high-precision steel bearings, custom fasteners, and specialized cooling pumps that keep the electric powertrain operating reliably.
- **Frontier Technologies:** Cutting-edge, high-technology domains situated at the expanding boundary of scientific capabilities. These include artificial intelligence, advanced semiconductors, quantum computing, green hydrogen systems, advanced robotics, and autonomous systems.
    - *Example:* Fabricating 3-nanometer microprocessors or developing solid-state battery cells for next-generation energy storage.
- **Assembly Economy vs. True Manufacturing Powerhouse:** An assembly economy imports low-level and high-level core sub-assemblies from abroad and simply executes final assembly locally, creating low domestic value addition. Conversely, a true manufacturing powerhouse produces the full spectrum of intermediate components, tooling, and capital machinery within its domestic borders.
    - *Example:* Importing fully assembled printed circuit boards (PCBs) and camera modules to assemble smartphones locally versus manufacturing the underlying silicon, sensors, and passive components indigenously.
- **The *Mittelstand* Model:** A structural economic model originating in Germany characterized by a dense, highly specialized network of small and medium-sized enterprises (SMEs). These firms focus heavily on niche, high-precision industrial components, process engineering, and long-term quality reliability rather than mass consumer branding.
    - *Example:* A family-owned German enterprise that exclusively manufactures high-pressure industrial valves for deep-sea drill rigs, dominating 70% of the global market.
- **Reverse Engineering:** The process of disassembling, analyzing, and detailing the design, material composition, and manufacturing tolerances of an existing product in order to replicate or redesign it locally without relying on original proprietary design files.
    - *Example:* A research lab taking apart an imported high-end CNC machine tool spindle, analyzing its alloy structure and heat-treatment properties, and recreating a locally manufactured prototype with comparable reliability.
- **Inverted Duty Structure:** An anomaly in tariff design where import duties on raw materials or intermediate inputs are higher than duties on the finished imported good, making domestic component production uncompetitive against foreign finished goods.
    - *Example:* Imposing a 15% tariff on imported special alloy steel required for making industrial gearboxes while allowing finished imported gearboxes to enter at a 7.5% duty rate.

- **Main Arguments and Substantive Parts**
- **The Three-Layer Ecosystem Structural Model**
- Manufacturing is best understood as a integrated, three-layer stack:
- **The Bottom Layer (Raw Materials):** Basic bulk inputs including steel, aluminum, basic petrochemicals, and industrial chemicals.
- **The Middle Layer (Industrial Backbone):** The expansive, complex ecosystem of mature engineering components, tooling, fasteners, and precision sub-assemblies.
- **The Top Layer (Frontier Industries):** High-profile sectors including advanced electronics, green energy hardware, electric vehicles, and robotics.
- The core structural weakness of contemporary industrial strategy lies in attempting to build a world-class Top Layer directly on top of a Basic Raw Materials base, while ignoring the massive Middle Layer. Without a self-sufficient intermediate layer, the top layer remains vulnerable to supply interruptions and foreign dependencies.
- **The Blind Spot in Contemporary Industrial Initiatives**
- While targeted incentive programs—such as Production-Linked Incentives (PLI), the National Green Hydrogen Mission, FAME, and national semiconductor initiatives—have successfully incentivized downstream assembly and battery packaging, they have left the domestic component ecosystem underdeveloped.
- Domestic firms rely heavily on foreign suppliers for high-precision components, specialized sensors, and advanced industrial sub-assemblies.
- Frequent duty exemptions on imported components reduce incentives for foreign and domestic players to establish deep manufacturing roots within the domestic market.
- **Distortion of Entrepreneurial Capital and Factor Cost Realities**
- Public policy signaling has concentrated venture capital and entrepreneurial effort into high-tech, venture-backed startups focused on consumer-facing green technologies.
- Very few new entrepreneurs are entering foundational engineering fields like precision machine tools, industrial hydraulics, or specialized casting and molding.
- High factor costs—including commercial lending rates of 9% to 10%, elevated industrial power tariffs, expensive logistics, and complex regulatory compliance—disproportionately harm small and medium enterprises attempting to manufacture intermediate components.
- Historically, policy protections on upstream raw materials (e.g., steel and petrochemicals) raised input costs for downstream domestic component makers, making importing intermediate goods more cost-effective than manufacturing them locally.
- **Proposed Strategic Roadmap: National Reverse Engineering Programme**
- To fix this structural imbalance, policy should establish a **National Reverse Engineering Programme for Manufacturing (NREPM)** focused on technological absorption and intermediate self-reliance:
- **Target Identification:** Identify over 1,000 mature industrial products that make up a large portion of engineering imports (e.g., specialized bearings, industrial pumps, micro-motors, and fasteners).
- **Institutional Anchoring:** Deploy leading technical institutions—such as the Indian Institutes of Technology (IITs), National Institutes of Technology (NITs), and CSIR research laboratories—to reverse-engineer imported items, design open-access technical blueprints, and transfer commercialized prototypes to local firms.
- **Dedicated R&D Financing:** Leverage dedicated research funds, such as the Research, Development and Innovation Fund (RDIF) under the Anusandhan National Research Foundation (ANRF), to fund reverse engineering, prototyping, and testing infrastructure.
- **Ecosystem Expansion:** Broaden capability-building programs beyond mechanical engineering into specialized chemical synthesis, active pharmaceutical ingredients (APIs), and synthetic textiles.

- **Historical Evolution of the Issue**
- **Pre-1990s: State-Led Heavy Capital Goods Push**
- **Post-Independence Mahalanobis Strategy:** The Second Five-Year Plan (1956–1961) prioritized basic heavy industries and capital goods manufacturing (e.g., steel plants, heavy electricals, and machine tools like HMT and BHEL).
- **License Raj Bottlenecks:** Highly restrictive industrial licensing, rigid technology import limits, and state monopolies discouraged private innovation. This left domestic firms with outdated technologies and inadequate component supply networks.
- **1991 Reforms and the Post-Liberalization Divergence**
- **Shift to Services:** Economic liberalization in 1991 removed industrial licensing and lowered trade tariffs. While the service sector expanded rapidly, the domestic manufacturing sector struggled to compete with low-cost imports.
- **Divergence from East Asian Models:** While East Asian economies systematically built dense component supply chains, tooling networks, and sub-assembly clusters, India's manufacturing value added as a share of GDP stagnated around 14% to 16%.
- **2000s–2010s: Cost Inversions and Structural De-industrialization**
- **Upstream Protection vs. Downstream Vulnerability:** Tariff protections on bulk raw materials (e.g., steel and basic chemicals) protected large primary producers but increased input costs for small-scale engineering firms.
- **Shift to Intermediates Import:** Rising domestic production costs led industries like pharmaceuticals to move away from local synthesis of Active Pharmaceutical Ingredients (APIs) in favor of cheaper foreign imports, leaving key industries vulnerable to global supply disruption.
- **2014–Present: Targeted Incentives and the Frontier Tech Push**
- **Launch of Make in India (2014):** Focused public attention on improving manufacturing performance, simplifying administrative procedures, and modernizing physical infrastructure.
- **Introduction of PLI Schemes (2020 onward):** Shifted public support toward financial incentives tied to incremental production, driving rapid growth in electronic assembly, solar modules, and mobile phones.
- **The Component Gap:** Despite growth in final assembly, domestic value addition in high-tech sectors remains relatively low due to continued reliance on imported precision components, tooling, and specialized intermediate inputs.

INDIA'S MANUFACTURING BLIND SPOT: CRITICAL ANALYSIS & SOLUTIONS

MASTERING THE INDUSTRIAL BACKBONE for UPSC CSE Prep

AXIA IAS ACADEMY

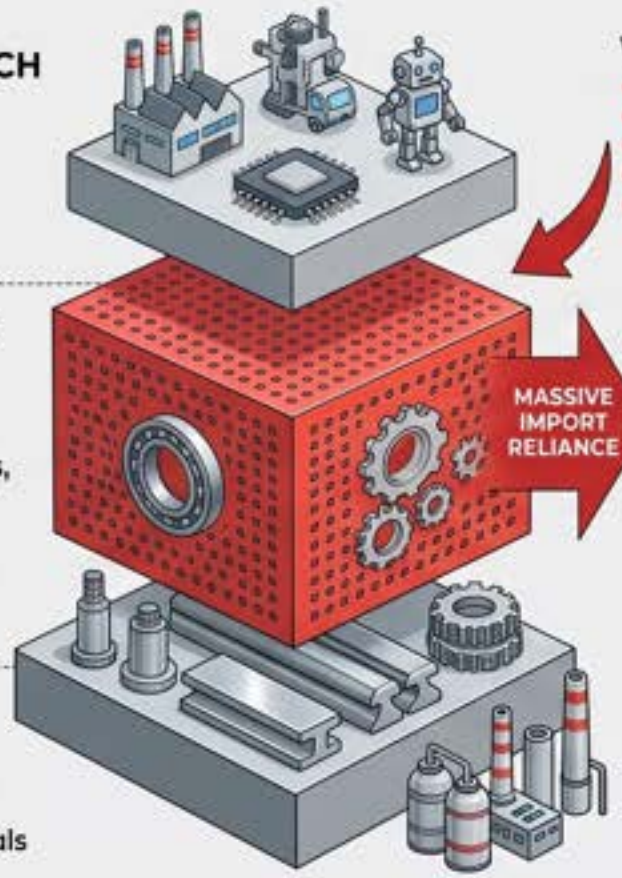
THE PROBLEM

THE GAPPED INDUSTRIAL ECOSYSTEM (ASSEMBLY-ONLY PATH)

FRONTIER TECH & ASSEMBLY
Semiconductors, AI, EVs, Drones, Robotics
HIGH INVESTMENT, LOW VALUE-ADD

OVERLOOKED INDUSTRIAL BACKBONE PRODUCTS
Precision Bearings, Pumps, Valves, Machine Tools, Fasteners, Gears, Moulds

BASIC RAW MATERIALS
Steel, Aluminum, Petrochemicals, Industrial Chemicals



MASSIVE IMPORT RELIANCE

WHY THE GAP?
- Logistical costs
- Inverted duties
- Upstream protectionism
- Lending rates (9-10%)
- Regulatory compliance

CHINA'S PATH:
MASTERED BACKBONE FIRST
→ DENSE NETWORKS
→ FRONTIER EXPANSION
(emulating Germany's Mittelstand)

VS.

INDIA'S ATTEMPT:
→ FRONTIER FIRST
→ WEAK INDUSTRIAL BASE
→ ASSEMBLY RELIANCE

THE SOLUTION

NATIONAL REVERSE ENGINEERING PROGRAMME FOR MANUFACTURING (NREPM)

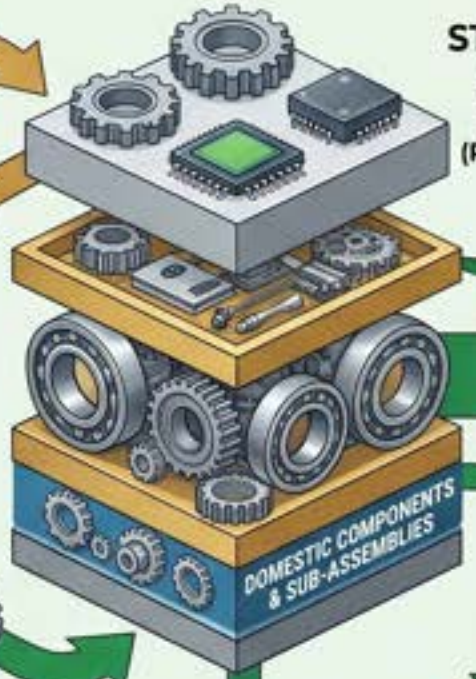
TARGET IDENTIFICATION
IDENTIFY 1,000+ KEY IMPORTED PRODUCTS
- Bearings, Pumps
- Fasteners

INSTITUTIONAL CAPABILITY BUILDING

IITs + NITs + CSIR-like

REVERSE ENGINEERING & PROTOTYPING, TECHNOLOGY TRANSFER TO INDIAN MSMEs

SUCCESS MEASURED BY COMMERCIALIZED PRODUCTS, NOT RESEARCH PAPERS



STRENGTHENED INDUSTRIAL ECOSYSTEM
(POWERHOUSE PATH)

INDIGENOUS SUPPLY CHAINS, WORLD-CLASS QUALITY, EXPORT COMPETITIVENESS

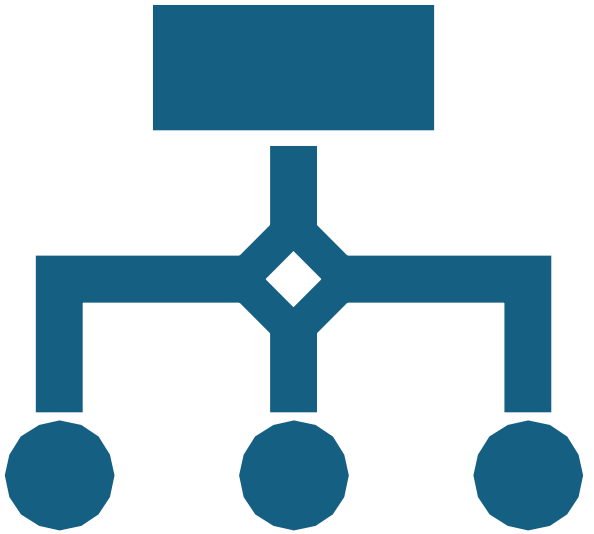
FUNDING SOURCE
(RDIF under ANRF)

EXPAND BEYOND ENGINEERING
(Organics, Pharma APIs, Textiles)

- **Logical and Philosophical Base**
- **Top-Down Modernization vs. Foundational Capability**
- **The Top-Down Assumption:** Modern industrial policies often operate on the assumption that funding frontier technologies (such as semiconductors or quantum computing) will automatically pull the broader industrial base along, creating local component supply chains organically.
- **The Foundational Counter-Logic:** Historical industrial development demonstrates that mastery over basic industrial capabilities—precision machining, metallurgy, heat treatment, tolerances, and chemical synthesis—is a prerequisite for supporting advanced manufacturing. Without a strong intermediate base, high-tech sectors remain reliant on imported inputs.
- **The "Mittelstand" Philosophy vs. The Frontier Hype Paradigm**
- **Frontier Hype Paradigm:** Modern venture capital and industrial policy often favor high-profile, disruptive innovations. This diverts talent, capital, and institutional support toward consumer-facing or highly publicized tech sectors.
- **Process Engineering Philosophy:** Industrial strength in nations like Germany and Japan rests on continuous, incremental improvements in unglamorous engineering domains. This philosophy values product reliability, precise specifications, and long-term technical skill over short-term market valuations.
- **Public Goods Justification for Institutional R&D**
- **Market Failure in Technical Upgrading:** Individual Small and Medium Enterprises (SMEs) face high financial risks, expensive R&D costs, and thin profit margins, making it difficult for them to invest in reverse engineering or technology absorption independently.
- **State Provision of Applied Technology:** Re-engineering foreign industrial products and creating open-access technical designs function as public goods. Using public research institutions (e.g., CSIR, IITs) to absorb technological risk addresses this market failure, allowing smaller domestic firms to manufacture high-quality components at competitive costs.

- **Multidimensional Analysis**
- **Social Dimension**
- **Job Creation Potential:** Frontier tech industries (e.g., automated semiconductor fabrication) are highly capital-intensive and create relatively few direct jobs. Middle-layer MSMEs (e.g., tooling, casting, machining) are labor-intensive, offering widespread employment opportunities for skilled and semi-skilled technicians.
- **Vocational Skill Development:** Expanding intermediate engineering industries strengthens local technical education and industrial training institutes (ITIs), creating clear career paths for practical engineering talent.
- **Political Dimension**
- **National Sovereignty and Strategic Autonomy:** Over-reliance on foreign suppliers for critical industrial components creates strategic vulnerabilities during geopolitical conflicts or trade disputes.
- **Federal Realities and Industrial Politics:** Energy pricing, land allocation, and local regulatory enforcement fall under state government jurisdiction. Aligning national industrial goals with state-level factor cost reductions is essential for industrial growth.
- **Legal Dimension**
- **Intellectual Property Rights (IPR) and Reverse Engineering:** Navigating reverse engineering requires compliance with international intellectual property frameworks, including TRIPS. Re-engineering must focus on public-domain technical standards, expired patents, and unpatented manufacturing processes to avoid legal disputes.
- **Regulatory Simplification:** Reducing administrative delays and simplifying compliance regimes (e.g., environmental clearances, labor filings, local inspections) helps small-scale manufacturing enterprises operate efficiently.
- **Ethical Dimension**
- **Equitable Resource Allocation:** Concentrating state subsidies exclusively on large corporate conglomerates in frontier sectors can worsen economic inequality. Supporting middle-tier MSMEs helps distribute state support more evenly across the industrial economy.
- **Quality and Safety Responsibilities:** Producing sub-standard intermediate components can cause equipment failures in transportation, health, or energy systems. Ensuring strict quality standards across domestic component makers is an ethical requirement for public safety.
- **International Dimension**
- **Integrating into "China Plus One" Strategies:** Global corporations seeking to diversify their supply chains require reliable component suppliers, not just final assembly locations. Developing local precision engineering capabilities helps attract long-term foreign direct investment.
- **Managing Global Trade Policy Friction:** Implementing targeted reverse-engineering programs and component incentives requires careful design to ensure compliance with World Trade Organization (WTO) rules on subsidies and local content requirements.
- **Economic Dimension**
- **Increasing Domestic Value Addition:** Moving from simple assembly to component manufacturing increases domestic value capture, ensuring a larger share of a product's final value remains within the home economy.
- **Reducing Trade and Current Account Deficits:** Engineering components, specialized machinery, and intermediate chemicals account for a large share of non-oil trade deficits. Manufacturing these items locally helps reduce persistent current account pressures.

- **Linkages with NCERTs**
- **Class 10 Geography: Chapter 6 – Manufacturing Industries**
- **Core Linkage:** Explains the classification of manufacturing units into *Basic/Key Industries* (which supply raw materials or machinery to other industries) and *Consumer/Finished Goods Industries*.
- **Analytical Application:** Highlights why policy support must extend to basic key industries and intermediate machinery makers rather than focusing solely on consumer-facing final products.
- **Class 11 Economics: Chapter 3 – Liberalisation, Privatisation and Globalisation: An Appraisal**
- **Core Linkage:** Details the structural impact of the 1991 economic reforms on Indian industry, including trade tariff reductions, the removal of quantitative restrictions, and the exposure of domestic firms to international competition.
- **Analytical Application:** Provides historical context for understanding how cheap foreign imports displaced local capital goods production, leading to high reliance on imported intermediate inputs.
- **Class 12 Geography (India: People and Economy): Chapter 8 – Manufacturing Industries**
- **Core Linkage:** Examines major industrial regions, industrial location theory, raw material access, power availability, and major policy measures like National Investment and Manufacturing Zones (NIMZs).
- **Analytical Application:** Helps students analyze factor costs—such as industrial electricity tariffs, transport linkages, and land access—that directly influence the competitiveness of intermediate component manufacturing clusters.



- **Linkages with UPSC CSE Syllabus**
- **General Studies Paper 1**
- **Syllabus Topic:** *Location factors of primary, secondary, and tertiary sector industries in various parts of the world (including India).*
- **Application:** Analyzing how factor costs, industrial infrastructure, and proximity to engineering clusters influence the distribution of intermediate engineering and precision manufacturing units.
- **General Studies Paper 2**
- **Syllabus Topic:** *Government policies and interventions for development in various sectors and issues arising out of their design and implementation.*
- **Application:** Evaluating the design of incentive structures like the PLI scheme, addressing policy gaps regarding MSMEs, and reforming trade tariff frameworks.
- **General Studies Paper 3**
- **Syllabus Topic 1:** *Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.*
- **Application:** Examining structural bottlenecks in industrial growth, moving from assembly-led growth to value-added manufacturing, and expanding employment through labor-intensive component industries.
- **Syllabus Topic 2:** *Science and Technology- developments and their applications and effects in everyday life; Indigenization of technology and developing new technology.*
- **Application:** Assessing institutional R&D frameworks like the Anusandhan National Research Foundation (ANRF), reverse engineering programs, and capability transfers from CSIR labs to local manufacturers.
- **General Studies Paper 4**
- **Syllabus Topic:** *Public/Civil service values and Ethics in Public administration; Ethical dilemmas in policy design.*
- **Application:** Balancing public subsidy allocations between large industrial conglomerates and small-scale manufacturing enterprises to ensure equitable policy outcomes.

- **Way Forward**
- **Institutionalize the National Reverse Engineering Programme (NREPM)**
- **Establish a Dedicated Task Force:** Form a joint action team composed of representatives from the Ministry of Heavy Industries, Ministry of MSME, CSIR, and industry associations to identify 1,000 top imported engineering items.
- **Targeted R&D Allocations:** Dedicate a specific portion of the Anusandhan National Research Foundation (ANRF) funding pipeline directly to applied reverse engineering, prototyping, and testing projects for domestic MSMEs.
- **Reorient Technical and Academic Institutions Toward Industry**
- **Deploy Anchor Technical Institutes:** Assign specific IITs, NITs, and CSIR laboratories to partner with localized industrial clusters (e.g., Rajkot for pumps/valves, Coimbatore for motors, Ludhiana for fasteners/tooling).
- **Reform Evaluation Metrics:** Shift academic performance metrics for applied engineering faculties from research paper publications toward commercialized technologies, reverse-engineered designs, and active industry patents.
- **Rationalize Factor Costs and Tariff Structures**
- **Correct Inverted Duty Structures:** Review tariff schedules to ensure intermediate inputs and specialized raw materials do not face higher import duties than finished components.
- **Reduce Power and Logistics Costs:** Introduce competitive industrial power tariffs for precision manufacturing units and expand dedicated freight corridors under the PM Gati Shakti framework to lower logistics overheads.
- **Build Shared Infrastructure for MSME Capability Growth**
- **Shared Testing and Tooling Centers:** Establish state-funded precision tooling centers, rapid prototyping labs, and quality certification hubs within existing industrial clusters, giving small manufacturers access to advanced technology without high capital expenditures.
- **Targeted Credit Support:** Create specialized, low-interest credit lines through SIDBI dedicated to purchasing precision CNC machinery, heat-treatment furnaces, and advanced quality assurance equipment.

- **UPSC CSE Mains Questions**
- **2023 (GS Paper 3):** *"Faster economic growth requires increased share of manufacturing in GDP particularly of MSMEs. Comment in the context of the present policy framework of the Indian Government."*
- **2022 (GS Paper 3):** *"What are the key bottlenecks in achieving the target of the manufacturing sector contributing 25% to India's GDP? Discuss how the Production Linked Incentive (PLI) scheme helps overcome these bottlenecks."*
- **2020 (GS Paper 3):** *"Explain the rationale behind the Production Linked Incentive (PLI) scheme. How far can it help India become a global manufacturing hub instead of just an assembly node?"*
- **2018 (GS Paper 3):** *"How can technology transfer, reverse engineering, and indigenous R&D strengthen the 'Make in India' initiative? Suggest actionable steps for strengthening institutional tie-ups between universities and industries."*
- **2015 (GS Paper 3):** *"Discuss the key features of the National Manufacturing Policy and evaluate its effectiveness in strengthening domestic capital goods production and MSME technology absorption."*

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