



Reforming India's Manufacturing Sector

This editorial is based on "[Elevating manufacturing to global standards](#)" which was published in The Hindu Business Line on 10/12/2024. The article brings into picture India's ambitious goal to elevate manufacturing's GDP contribution from 15% to 25% through reforms like the Omnibus Technical Regulation, focusing on quality standardization, global competitiveness, and sustainable growth.

For Prelims: [Manufacturing](#), [Make in India](#), [Gati Shakti](#), [Faster Adoption and Manufacturing of Electric Vehicles](#), [India-UAE CEPA](#), [Industry 4.0](#), [National Green Hydrogen Mission](#), [Active Pharmaceutical Ingredients](#), [Emergency Credit Line Guarantee Scheme](#), [World Bank's Logistics Performance Index 2023](#), [Ease of Doing Business rankings](#).

For Mains: Current Status of India's Manufacturing Sector, Reasons Why India's Manufacturing Sector is Lagging Behind Global Standards

India stands at a critical juncture in its [manufacturing](#) journey, with an ambitious vision to elevate the sector's contribution to GDP from **15% to 25% through strategic regulatory reforms**. The introduction of the **Machinery and Electrical Equipment Safety (Omnibus Technical Regulation) Order, 2024** (that sets mandatory safety standards for machinery and electrical equipment in India) **represents** a transformative approach to **standardizing product quality, enhancing global competitiveness, and creating a robust ecosystem for industrial growth**. This strategic intervention signals India's commitment to building a manufacturing sector that is **innovative, sustainable, and globally competitive**.

What is the Current Status of India's Manufacturing Sector?

- **About:** Manufacturing is emerging as a critical pillar of India's economic growth, contributing significantly to GDP and employment.
 - Before the pandemic, the sector contributed **16-17% of India's GDP**, employing **27.3 million workers**.
 - The government envisions increasing this share to **25% by 2025**.
 - By 2030, India aims to add over **US\$ 500 billion annually** to the global economy, reflecting its strategic role in the global supply chain.
- **Sectoral Growth and Performance:** India's manufacturing sector has demonstrated robust growth in recent years, driven by increased output, exports, and domestic demand.
 - The **HSBC Manufacturing PMI** reached a **16-year high of 59.1** in March 2024, indicating strong increases in output, new orders, and job creation.
 - **Manufacturing exports** hit an all-time high of **US\$ 447.46 billion in FY23**, registering a **6.03% growth** over FY22.
- **Investment and Employment Trends:** [FDI inflows in manufacturing](#) reached **US\$ 165.1 billion**, marking a **69% increase** over the past decade.

- Employment in the manufacturing sector has grown steadily, from **5.7 crore in 2017-18** to **6.24 crore in 2019-20**, with further job creation driven by PLI incentives.

What are the Key Growth Drivers of India's Manufacturing Sector?

- **Government Initiatives and Policy Reforms:** The government has launched flagship initiatives like "**Make in India**" and "**Gati Shakti**" to boost manufacturing competitiveness and infrastructure.
 - The **Production Linked Incentive (PLI) scheme** covers 14 sectors, expected to generate \$500 billion worth of manufacturing output.
 - Also, the manufacturing industry brought in around **USD 21.34 billion in investment in FY22**, reflecting policy effectiveness.
- **Rising Domestic Demand:** India's growing **middle class, urbanization, and rising disposable incomes** drive demand for automobiles, consumer goods, and electronics, creating a strong domestic market for manufacturing.
 - India's **domestic market for electronics is expected to reach \$400 billion by 2025**, driven by smartphone and appliance sales.
 - The auto sector witnessed significant growth in 2023, **supported by government EV incentives** like the **Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme**.
- **Strategic Trade Agreements and Export Growth:** India's focus on key trade agreements like **CEPA with the UAE** and **negotiations with the EU and UK opens new export markets for manufactured goods**.
 - This is complemented by diversification away from Chinese imports.
 - India's exports rose **6%** to \$447 billion in FY23. The **India-UAE CEPA alone** is projected to increase bilateral trade to **\$100 billion before 2030**.
- **Technological Advancements and Industry 4.0:** Adoption of **automation, IoT, AI, and robotics** is transforming Indian manufacturing into a high-value, technology-driven sector, increasing productivity and reducing costs.
 - **Industry 4.0** is at an inflection point in Indian manufacturing, with **more than two-thirds of Indian manufacturers** embracing the digital transformation by **2025**
 - The government's **Digital India Campaign** complements this by enhancing tech adoption, especially among SMEs.
- **Rising Investments in Green Manufacturing:** Focus on sustainability and clean energy is driving green manufacturing practices in India.
 - The **National Green Hydrogen Mission** and renewable energy projects incentivize industries to adopt environmentally sustainable methods.
 - **India aims to produce 5 million metric tons of green hydrogen annually by 2030. Renewable energy capacity stands at 125 GW (2023)**, supporting manufacturing processes with affordable, green electricity.
- **Resilience in Global Value Chains (GVCs):** India's focus on becoming an alternative to China for global manufacturing companies aligns with **global diversification trends**.
 - Policies like the PLI scheme aim to integrate India into **critical GVCs like electronics and pharmaceuticals**.
 - In April 2021, India, Japan, and Australia launched the **Supply Chain Resilience Initiative (SCRI)** to diversify and strengthen supply chains across the Indo-Pacific region
 - India is the **3rd largest producer of Active Pharmaceutical Ingredients** accounting for an 8% share of the **Global API Industry**, boosting its position in GVCs.
- **Support for MSMEs in Manufacturing:** Micro, Small, and Medium Enterprises (MSMEs) form the backbone of manufacturing and are supported by government measures like the **Emergency Credit Line Guarantee Scheme (ECLGS)** and technology upgradation programs.
 - MSMEs contribute around 30% of India's GDP, over 45% of India's exports. The **ECLGS** has guaranteed **1.19 crore loans worth ₹3.68 lakh crore**, providing critical financial support to these enterprises.
- **Sector-Specific Growth Catalysts:** Key sectors such as **automotive, pharmaceuticals, and textiles** have witnessed targeted growth through reforms, investment incentives, and global partnerships.
 - **India is now the world's largest manufacturer of two-wheelers.** India's textile and apparel exports reached **\$44.4 billion in the fiscal year 2021-22**, supported by

schemes like “**Technical Textiles Mission.**”

- **Renewed Focus on Self-Reliance (Aatmanirbhar Bharat):** The self-reliance campaign promotes domestic production of critical goods like **electronics, defense equipment, and semiconductors**, reducing import dependency and creating local jobs.
 - India unveiled a \$10 billion semiconductor manufacturing incentive plan in 2023, aiming to develop a domestic semiconductor industry.
 - In December 2021, the Centre had announced the production-linked incentive (PLI) scheme to promote setting-up of semiconductor and display fabs, as well as **chip packaging, assembly and testing facilities.**
 - **Defense manufacturing output reached ₹1 lakh crore in FY23**, with exports growing by **334% in 2017-2022.**

Why India's Manufacturing Sector Lags Behind Global Standards?

- **Weak Infrastructure and Logistics Bottlenecks:** India suffers from **poor logistics infrastructure**, which escalates costs and affects competitiveness. Power outages and inadequate transport networks hinder supply chains and production efficiency.
 - **Logistics costs in India account for 14-18% of GDP** compared to **8-10% in developed nations.**
 - Despite the Gati Shakti initiative, India ranked **38th** in the **World Bank's Logistics Performance Index 2023.**
- **Policy Inconsistencies and Bureaucratic Hurdles:** Frequent changes in **trade and taxation policies**, along with burdensome regulatory requirements, create an unstable investment climate. Complex land acquisition laws further delay projects.
 - India ranks **63rd** in the **Ease of Doing Business rankings (2020)** and issues like **contract enforcement (ranked 163rd)** and land acquisition delays still deter investors.
 - Examples include the **delayed POSCO steel plant project in Odisha (later suspended).**
- **Labor Market Challenges:** Lack of implementation of **Four Labour Codes** deter scalability and flexibility for industries. The **informal workforce dominates manufacturing**, leading to inefficiencies and lower productivity.
 - The share of contract workers in India's formal manufacturing workforce has grown from **23.1% in 2002-03 to 40.2% in 2021-22.**
 - For instance, in **October 2024**, over 1,000 workers at Samsung Electronics' home appliances plant in Tamil Nadu **protested for higher wages and union recognition.**
- **Inadequate R&D and Technology Adoption:** India's manufacturing largely depends on **outdated technology due to low R&D investment and lack of innovation.** This restricts value addition and diversification
 - **India's R&D spending is 0.7% of GDP**, much lower than **South Korea (4.8%) or China (2.4%).**
 - For instance, **India's EV ecosystem heavily depends on Chinese imports for lithium-ion batteries**, with **limited local research into alternatives like solid-state batteries or sodium-ion technology.**
- **Import Dependence for Key Inputs** High reliance on imported raw materials and components increases vulnerability to global supply chain disruptions. This impacts self-reliance and raises input costs.
 - **India's trade deficit with China reached \$85 billion in FY 2023-24** due to dependency on critical inputs like semiconductors and electronics. This undermines initiatives like **“Make in India”.**
- **Global Trade Integration Deficiencies:** India's limited participation in global value chains (GVCs) restricts its ability to compete internationally. A protectionist stance on trade policies exacerbates this issue.
 - India's share in global merchandise exports is **1.8% compared to China's 14.7%.**
 - In **2021, India chose not to join RCEP**, potentially losing opportunities to integrate into GVCs.
- **Competition from Emerging Markets:** Countries like **Vietnam and Bangladesh** offer better business environments with lower labor and operational costs, attracting industries shifting away from China.

- Bangladesh is a garment sector powerhouse, having seen exports surge by **92% to \$47 billion in 2023** (though **currently declining due to political unrest, India still lags in fully tapping the potential.**)
- **Digital and Skill Gaps:** The lack of **digital infrastructure and skilled manpower restricts adoption of advanced manufacturing techniques.** Training programs remain insufficient to meet industry needs.
 - The [India Skills Report 2023](#) revealed **only 48.7% of India's workforce was employable.** Meanwhile, India's rank in the Global Innovation Index improved to **40th in 2023**, but tech adoption in SMEs remains low.
- **Fragmented MSME Sector:** India's manufacturing is dominated by micro, small and medium enterprises (MSMEs) that **lack access to credit, technology, and export markets, limiting their growth potential.**
 - Among the 64 million MSMEs in the country, **only 14% have access to credit.** Initiatives like the Emergency Credit Line Guarantee Scheme have only partially addressed this issue.

What Measures to Raise India's Manufacturing Sector to Global Standards?

- **Enhance Infrastructure and Reduce Logistics Costs:** Investments in **multi-modal transport systems, port connectivity, and dedicated freight corridors** should be accelerated under the Gati Shakti initiative.
 - Improved infrastructure can reduce transportation costs and enhance supply chain efficiency, enabling global competitiveness.
 - Strengthen the **Eastern and Western Dedicated Freight Corridors** to reduce freight costs by up to **25%**. Expand port capacity and automation at major ports, such as the **recently modernized JNPT terminal.**
 - Establish **"Component Manufacturing Clusters"** in major industrial regions to enhance local sourcing.
- **Simplify Regulatory Frameworks:** Streamlining **labor laws, land acquisition processes, and environmental clearances** can reduce compliance costs and attract foreign direct investment (FDI).
 - A **unified single-window clearance system** for manufacturing projects should be implemented.
 - Digitize the entire approval process for MSMEs to foster ease of doing business at the grassroots level.
- **Promote Research and Development (R&D):** Increase public and private sector investments in R&D and **incentivize innovation through tax breaks and subsidies.**
 - Collaborative R&D ecosystems between industry and academia should be developed learning from **Tesla's Gigafactories.**
 - Introduce a **"Manufacturing Innovation Fund"** to finance R&D in emerging areas like **advanced materials, AI-driven production, and semiconductors.**
- **Boost Technology Adoption and Industry 4.0:** Promote widespread adoption of automation, robotics, IoT, and AI in manufacturing processes to **improve productivity and quality.**
 - Subsidized technology adoption schemes for MSMEs can democratize access to advanced tools
 - Expand the scope of the **PLI scheme to include incentives for firms adopting Industry 4.0 practices.** For instance, **tax credits for manufacturers** investing in IoT-enabled machines can be introduced.
- **Integrate into Global Value Chains (GVCs):** Negotiate trade agreements to align India's manufacturing with global supply chains in **electronics, textiles, and pharmaceuticals.** Strengthening export-oriented infrastructure, such as **SEZs, can further facilitate this integration.**
 - **Establish export processing zones** near ports with tax exemptions and quick approvals.
 - Leverage the **India-UAE CEPA** to expand the footprint of Indian goods in the **Middle East and Africa.**
 - Develop robust strategies to reduce vulnerability to global crises such as supply chain disruptions, pandemics, or geopolitical tensions.
 - Establish a **"Critical Input Reserve"** for sectors like **semiconductors and rare earth metals.**

- **Develop Sector-Specific Strategies:** Focus on **high-potential sectors like electronics, automobiles, pharmaceuticals,** and defense manufacturing.
 - Introduce targeted incentives for high-value manufacturing and product diversification in these areas.
 - Scale up the **Semiconductor Mission** with **partnerships like the one with Foxconn** to develop a robust semiconductor ecosystem.
 - Expand the **FAME-II scheme to include incentives for EV battery manufacturing.**
 - Expand initiatives like the **Mega Food Parks Scheme** and **Textile Clusters.**
- **Strengthen MSMEs with Technology and Credit Access:** Facilitate affordable financing and modern technology adoption for MSMEs, which form the backbone of Indian manufacturing.
 - **E-commerce platforms** should also be leveraged to connect MSMEs with global markets.
- **Focus on Skill Development:** Upskilling and reskilling programs should align with the requirements of **advanced manufacturing technologies** and global production standards following Ireland's industrial upskilling initiatives.
 - Programs like **Pradhan Mantri Kaushal Vikas Yojana** should **integrate specialized training modules.**
 - Establish **Centers of Excellence (CoEs)** in collaboration with global tech companies for specialized training.
- **Encourage Green-Sustainable-Circular Manufacturing:** Adopt green practices to **align Indian manufacturing with global environmental standards.** Incentivize industries to transition to renewable energy and reduce carbon footprints.
 - Expand the **National Hydrogen Mission to decarbonize energy-intensive industries** like steel and cement. Expedite **green bonds** for financing sustainable manufacturing practices.
 - Mandate Extended Producer Responsibility (EPR) frameworks in sectors like electronics and automobiles.
- **Leverage Digital Transformation:** Adopt digital tools like **blockchain for supply chain management and big data analytics to predict market trends.** Promote digital platforms for efficient coordination between stakeholders.
 - Expand Digital India initiatives to **digitize manufacturing units, particularly SMEs.** Implement blockchain in high-export sectors like pharmaceuticals to ensure transparency and traceability.
- **Enhance Public-Private Partnerships (PPPs):** Expand the role of private enterprises in **infrastructure, technology, and skill development** by leveraging PPP models.
 - Develop PPPs in **smart manufacturing parks,** similar to Japan's collaborative manufacturing hubs.
 - The **Bengaluru-BIAL ITIR (Information Technology Investment Region)** is a successful PPP model for infrastructure and industrial growth.
- **Boost Quality Standards and Certifications:** Promote adherence to international quality certifications like **ISO and CE,** ensuring Indian products meet global benchmarks.
 - Introduce **sector-specific "Quality Upgradation Missions"** for textiles, automotive, and electronics.
 - For example, subsidies for obtaining CE certifications for exports to the EU could improve product acceptability.
- **Revitalize Traditional and Heritage Industries:** Integrate India's rich artisanal and traditional industries like **handicrafts and ceramics into the mainstream manufacturing** economy by modernizing processes and scaling up.
 - Extend the **"SFURTI Scheme" (Cluster Development for Artisans)** to include tech-enabled handicraft units.
 - Provide **export incentives for modernized Khadi and handloom products** to target global premium markets.

Conclusion

India's manufacturing sector holds immense potential to **drive economic growth, job creation, and global competitiveness.** By addressing critical challenges such as infrastructure gaps, policy inconsistencies, and technological lag, the **sector can align with global standards.** Government initiatives like the **PLI scheme, National Manufacturing Policy, and green manufacturing efforts**

are creating a robust foundation for sustainable growth.

Drishti Mains Question:

Analyze the challenges faced by India's manufacturing sector in meeting global standards. What measures should be taken to enhance its international competitiveness?

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. In the 'Index of Eight Core Industries', which one of the following is given the highest weight? (2015)

- (a) Coal production
- (b) Electricity generation
- (c) Fertilizer production
- (d) Steel production

Ans: (b)

Mains

Q.1 "Industrial growth rate has lagged behind in the overall growth of Gross-Domestic-Product(GDP) in the post-reform period" Give reasons. How far are the recent changes in Industrial Policy capable of increasing the industrial growth rate? (2017)

Q.2 Normally countries shift from agriculture to industry and then later to services, but India shifted directly from agriculture to services. What are the reasons for the huge growth of services vis-a-vis the industry in the country? Can India become a developed country without a strong industrial base? (2014)

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