# Environment & Ecology · GS - III

**Why should Indian manufacturers move beyond low-cost production towards value addition, design-led innovation and technological ownership? Discuss the major challenges and suggest measures to improve global competitiveness.**

| EXAM YEAR | PAPER | SUBJECT |
|---|---|---|
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| MARKS | WORD LIMIT |
|---|---|
| 10 | ~150 words |

## Answer Hint

**Value addition; design-led innovation; R&D investment; intellectual property rights; skilled workforce; manufacturing competitiveness; industrial policy**

## Model Answer

### Introduction

India's manufacturing competitiveness depends not only on production costs but also on productivity, product quality, innovation and control over critical technologies. Greater domestic value addition can strengthen economic resilience and improve India's position in global value chains.

### Importance

**1. Higher economic value:** Processing, branding and advanced manufacturing enable firms to capture a larger share of the final product's value.

**2. Technological self-reliance:** Investment in research and development can reduce dependence on imported technologies and create indigenous intellectual property.

**3. Global competitiveness:** Design-led innovation improves product differentiation, quality and consumer appeal, helping Indian firms enter premium markets.

**4. Employment and exports:** Advanced manufacturing can create skilled jobs, increase export earnings and support domestic supplier networks.

**Challenges**

Low R&D expenditure in many sectors, limited industry-academia collaboration, skill gaps, financing constraints and dependence on imported components can restrict progress.

**Way Forward**

India should strengthen R&D incentives, technology transfer, design education, industry-academia partnerships and intellectual property protection. Targeted industrial policies should encourage domestic component ecosystems, technology adoption and export-oriented innovation.

**Conclusion**

A shift from cost-based competition to innovation-driven manufacturing can improve productivity, technological autonomy and long-term economic growth.

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