



# DAILY EDITORIAL ANALYSIS

TOPIC

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**GREEN LOGISTICS: REIMAGINING A  
GREEN MOVEMENT OF GOODS**

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## GREEN LOGISTICS: REIMAGINING A GREEN MOVEMENT OF GOODS

### Syllabus: GS3/Energy; Environment

#### Context

- The movement of goods needs to align with **climate goals, circularity, and energy efficiency**, as the **global logistics sector** stands at a transformative crossroads.

#### India's Logistics Landscape

- Logistics Sector Size:** It accounts for **over 14% of India's GDP** and employs **more than 22 million people**.
  - India's logistics market is valued at \$250 billion, growing at 10-12% CAGR (*Ministry of Commerce & Industry, 2024*).
  - It is expected to nearly double to **\$428 billion by 2033**.
- Rail-Based Freight Initiatives:** India is targeting 45% rail freight share by 2030, up from 27% in 2023, through dedicated freight corridors (*Indian Railways, 2024*).
- Electric Vehicle Logistics:** With the FAME II policy, India saw a 400% growth in electric commercial vehicle adoption between 2021-2024 (*NITI Aayog, 2024*).
- Urban Last-Mile Sustainability:** 90% of India's urban logistics emissions come from fossil fuel-based last-mile deliveries.
  - The expansion of micro-fulfillment centers has reduced delivery-related emissions by 30% in select cities (*TERI Report, 2024*).
- Cold Chain & IoT Integration:** India's cold chain logistics sector is expected to grow to \$24 billion by 2027, with 50% of warehouses adopting IoT-enabled efficiency tools (*FICCI Report, 2024*).

#### Global Overview of Logistic Sector

- Carbon Emissions Contribution:** Freight transport accounts for **nearly 8% of GHG emissions**, with road freight contributing 58% of this footprint (*International Energy Agency, 2024*).
- Green Logistics Investments:** Global investments in sustainable logistics solutions are expected to exceed \$1 trillion by 2035 (*World Economic Forum, 2024*).

#### Logistic Sector & Environmental Costs

- According to a report by **Amicus Growth Advisors**, the logistics sector is a **major contributor to Greenhouse Gas (GHG) emissions** and diesel consumption.
  - It accounts for **13.5% of India's GHG emissions**, largely driven by **road transport**.
  - Trucks, while forming just **3% of the vehicles on road**, are responsible for **over one-third of transport-related CO<sub>2</sub> emissions**, and consumes about **40% of the country's diesel**.

#### Green Logistics in India

- It is defined as the **integration of environmental thinking into logistics activities**, supporting both national and global climate goals.
- According to the **Ministry of Commerce and Industry**, green logistics can reduce **India's logistics cost** from the **current 14% of GDP to 8%**, while simultaneously cutting **transport-related emissions by up to 35% by 2030**.
- Additionally, it supports India's commitment to **achieving Net Zero emissions** by 2070 under the **Panchamrit agenda**.

- According to the **Amicus report**, Green logistics is more than just integrating EVs or reducing CO emissions. It requires a **fundamental redesign of logistics operations**, like:
  - Reimagining supply chain design;
  - Embedding sustainability in corporate strategy;
  - Shifting from linear to **circular business models**;

### Key Strategies for Sustainable Logistics

- Cleaner Fuels and Vehicles:** Adopt **EVs** and **LNG-powered trucks** for both short and long-haul freight.
- Modal Shift:** Shift cargo from **road to rail**, leveraging **Dedicated Freight Corridors (DFCs)** to reduce emissions and improve efficiency.
- AI-Driven Planning:** Use **AI-based route and load optimization tools** to reduce fuel consumption and delivery time.
- Green Warehousing:** Develop **sustainable warehouses** powered by **solar energy**, equipped with **efficient lighting** and **water recycling systems**.

Comparative Effectiveness of Green Logistics Technologies			
Technology	Strengths	Limitations	Best Use Cases
<b>EVs</b>	Zero tailpipe emissions, low operating costs	Limited range, charging infrastructure gaps	Urban and short-haul deliveries
<b>Hydrogen Fuel Cell Trucks</b>	Long range, fast refueling	High cost, limited hydrogen availability	Long-haul freight, heavy-duty transport
<b>Autonomous Delivery Systems</b>	Route optimization, reduced labor costs	Regulatory hurdles, high upfront investment	Last-mile delivery, warehouse logistics
<b>AI &amp; Machine Learning</b>	Predictive analytics, route and inventory optimization	Requires quality data and integration	Network-wide logistics planning
<b>IoT Sensors</b>	Real-time tracking, condition monitoring	Data overload, cybersecurity concerns	Cold chain, high-value goods
<b>Blockchain</b>	Transparency, fraud prevention, traceability	Energy-intensive, adoption barriers	Ethical sourcing, customs documentation
<b>Digital Freight Platforms</b>	Paperless trade, faster customs clearance	Requires stakeholder buy-in	Cross-border logistics, port operations
<b>Alternative Fuels (LNG, Biofuels)</b>	Lower emissions than diesel, scalable with existing engines	Still emit CO <sub>2</sub> , supply chain complexity	Maritime and heavy-duty trucking

### Initiatives By India

- National Logistics Policy-2022:** It aims to create a cost-efficient, resilient, and sustainable logistics ecosystem by promoting multimodal transport, digitalization, and automation.
- PM GatiShakti National Master Plan:** It aims to enhance industrial productivity while supporting green logistics and clean energy goals through multi-modal connectivity.
- Unified Logistics Interface Platform (ULIP):** It aims to consolidate **over 30 digital systems** from different ministries for real-time, end-to-end visibility of logistics operations.
- Railway-Based Freight Initiatives:** The government is **shifting coal logistics toward railway-based systems** to minimize air pollution and reduce carbon emissions by approximately 100,000 tonnes per year.
  - India is developing six green freight corridors under PM GatiShakti, prioritizing low-emission trucking and rail-based logistics.

- **Green Logistics in State Policies:** Several states have integrated green logistics into their policies, focusing on eco-friendly logistics parks, smart logistics solutions, and reduced reliance on road transport.
- **Multimodal Logistics Parks (MMLPs):** Developed under the **Bharatmala Pariyojana**, these parks enhance cargo aggregation, reduce handling costs, and promote warehousing efficiency.

#### Way Forward: Logistics as a Catalyst for Viksit Bharat 2047

- A green transformation of the logistics sector is not merely about reducing emissions — it's about **redefining India's development model**. It enables:
  - ♦ **Inclusive growth** through cost-effective, clean transportation
  - ♦ **National competitiveness** in global supply chains
  - ♦ Contribution to India's **climate commitments** and **environmental stewardship**.

Source: TH

#### Mains Practice Question

[Q] How can sustainable logistics redefine global trade while balancing cost-efficiency and consumer demand, affordability, and environmental responsibility?

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