

UNLOCKING POTENTIAL FOR GREEN LOGISTICS IN INDIA

Dr. Neelakshi Arora

Assistant Professor, Department of Commerce
The Bhopal School of Social Sciences, Bhopal, India
Email: Neelakshi.jaidka@gmail.com

Ms. Nikhita Ahuja

Student, Department of Commerce
The Bhopal School of Social Sciences, Bhopal, India

ABSTRACT

Green logistics is an essential approach to mitigating the environmental impact of logistics operations by integrating sustainable and eco-friendly practices. Unlike traditional logistics, which often result in excessive energy consumption and carbon emissions, green logistics prioritizes sustainability through the use of advanced technologies such as artificial intelligence, machine learning, and advanced analytics. These technologies help optimize supply chain operations, reduce fuel consumption, and enhance resource efficiency. India's logistics sector contributes approximately 13-14% to the nation's GDP but faces significant environmental challenges, including high carbon emissions, inefficient infrastructure, and resource depletion. Despite these challenges, adopting green logistics practices, such as using electric vehicles, renewable energy sources, and optimized transportation networks, offers numerous benefits. Studies indicate that sustainable logistics can reduce carbon dioxide emissions by 10% and cut logistics costs by 10-15%, providing economic and environmental advantages. The study explores the advantages, challenges, and future prospects of green logistics in India. While the high initial investment and infrastructure limitations pose challenges, the implementation of sustainable logistics strategies can drive operational efficiency and regulatory compliance while enhancing corporate social responsibility. Government initiatives, such as the Green Ports Initiative, the Sagarmala Project, and the National Logistics Policy, further promote sustainable logistics practices.

Keywords: green logistics, Sustainable logistics, India, companies under green logistics.

“How do you green the supply chain is a challenge. The easier part is to do what we do; the difficult part is to get all your clients to long process will take time.”

-Jamshyd Godrej, Managing director of Godrej & Boyce (Jamshyd,n.d.)

According to Jamshyd Godrej, creating an ecologically environmental supply chain is a tricky mission. The true trouble, he says, is in understanding all the businesses and collaborators in the supply chain, are ready to embrace these principles. Further, it will take time and effort to complete this shift, which is a long-term process.

OVERVIEW

By employing one or more ecologically friendly and sustainable logistics techniques, green logistics aims to reduce the negative environmental effects of logistics. Green logistics is any business approach that lessens the impact of the logistics network and delivery on the environment. Green logistics is the provision of logistical services without causing environmental damage. Sustainable or green logistics methods preserve a healthy profit margin without sacrificing environmental well-being. With the use of powerful technologies like advanced analytics, machine learning, and artificial intelligence, industries are attempting to quickly embrace and understand sustainable logistics management.

Eco-friendly practices and sustainability are not taken into consideration in traditional logistics. Their services result in excessive energy use, trash production, and a significant carbon imprint. Green logistics is more than just a catchphrase these days; it's a crucial idea to protect the environment. Throughout the logistics process, they want to reduce carbon footprints and engage in sustainable activities. Using environmentally friendly raw materials and recyclables, using clean or renewable energy, optimizing distribution networks, cross-docking for supply management, reducing the number of vehicles and kilometers driven, using trucks that are fully loaded, optimizing routes, and recycling returned or end-of-life goods are all examples of green logistics.

India's logistics sector, which accounts for 13–14% of the country's GDP, is an essential part of its economic infrastructure (Transforming India's Logistics | IBEF, n.d.). Notwithstanding its significance, the industry confronts serious environmental problems, including as resource depletion, energy inefficiencies, and excessive carbon emissions. In order to maintain long-term economic and environmental health, India must align its logistics operations with green principles as the emphasis on sustainability grows globally. Optimizing the same can assist save expenses by 10–15% and carbon dioxide emissions by 10%, which would benefit

companies, their clients, and society at large (Green Logistics in India, n.d.). A sophisticated system of highways, railroads, ports, and airports defines India's logistics industry. An essential component of the Indian economy is the logistics industry. India needs sustainable infrastructure in addition to infrastructure. Making this shift requires a clear framework that focuses on project finance and integrates social and environmental considerations at every stage of the project lifecycle. India's prosperity depends on sustainable infrastructure, and investments in renewable energy projects are essential to reducing the nation's carbon footprint and promoting a more ecologically friendly energy mix.(IBEF, n.d.; Sustainable Infrastructure in India). The topic of sustainable logistics is explored in this study. The benefits, drawbacks, difficulties, and prospects of green logistics are covered in the study. The paper goes on to explore case studies of environmentally conscious logistics firms. The study also examines a number of government initiatives aimed at promoting constructive change. The study concludes by discussing how green logistics can revolutionize Indian business, how to implement green logistics in India, and how it may be the way of the future for distribution networks and supply chain operations.

ADVANTAGES OF GREEN LOGISTICS

The primary benefit of green logistics is that it will increase businesses' long-term profitability by reducing waste, expenses, and carbon emissions. Even though there is an initial expense involved in achieving the benefits of green logistics, the long-term gains outweigh the disadvantage. Green logistics techniques can reduce a company's logistics expenses by up to 10%, according to a study conducted by the Indian Institute of Management Bangalore.(Saraf and Jose, 2013)Green logistics emphasizes waste reduction and fuel efficiency, two factors that have an effect on a company's bottom line. According to a McKinsey & Co. analysis, companies can increase their operational earnings by up to 60% by implementing zero- and low-waste policies that reduce material waste. (How ESG Adds Value to Businesses, n.d.). Additionally, businesses can improve their corporate social responsibility with the aid of Green Logistics. Businesses are currently examining their environmental impact and attempting to implement green logistics. One of the many benefits that green logistics offers businesses is the ease with which they can comply with regulations. By optimizing transportation—that is, by using sustainable packaging and delivery routes—it lowers total costs and gives businesses a competitive edge. By conducting business in a sustainable way, Green Logistics also contributes to the enhancement of the company's brand image. By reducing carbon footprints, minimizing waste, reducing pollution, conserving the

environment, and embracing green technologies, green logistics benefits not only businesses but also the environment.

DISADVANTAGES OF GREEN LOGISTICS

High upfront costs are one drawback of green logistics, meaning that implementing sustainable practices and technology can be expensive, particularly for small and medium-sized businesses. The supply chain and logistics procedure get more complex with green logistics. Green logistics increases reliance on certain infrastructure. Appropriate training and knowledge are necessary for this.

INDIA AND PROBLEMS OF GREEN LOGISTICS

One of the biggest disadvantages of green logistics in India is fragmented infrastructure. Longer travel durations and more roundabout routes caused inefficiencies and higher carbon emissions as a result of poor road conditions, inadequate warehousing facilities, and a lack of multi-modal connection. The logistics industry in India is dominated by road transportation, which is notorious for its excessive fuel consumption and air pollution. Despite being a more environmentally friendly option, railroads nevertheless only convey a small portion of freight because of operational inefficiency and infrastructure constraints. Diesel-powered trucks are a major source of carbon emissions in the Indian logistics industry. The dilemma is made worse by the dearth of easily accessible and reasonably priced alternative fuels, such as biofuels or electricity. Packaging waste has dramatically increased as a result of the growth in e-commerce. A major environmental problem is the usage of non-biodegradable materials and ineffective waste management systems.

CURRENT CHALLENGES IN INDIAN LOGISTICS

Due mostly to the use of antiquated transportation techniques and diesel-powered trucks, the logistics industry in India is a significant contributor to greenhouse gas emissions. Delays, higher fuel consumption, and higher emissions are caused by our nation's inefficient infrastructure, which includes clogged metropolitan areas, poor road conditions, and inadequate warehousing facilities. Ineffectiveness, waste, and higher operating expenses result from different stakeholders' lack of cooperation and integration. Advanced technologies like IoT, AI, and big data analytics, which can greatly improve supply chain sustainability and efficiency in India, are being adopted slowly.

OPPORTUNITIES FOR SUSTAINABLE LOGISTICS IN INDIA

By implementing electric cars, India can take the lead in sustainable logistics. Additionally, technological innovations such as block chain, artificial intelligence (AI), and advanced analytics have substantial prospects for sustainable logistics. AI-powered route optimization can cut down on wasted kilometers, which lowers pollutants and fuel use. Block chain technology can encourage environmentally friendly practices by improving supply networks' accountability and transparency. A move toward multimodal transportation, or promoting a more balanced combination of land, sea, and air transportation, can greatly increase efficiency and lower emissions. The employment of more environmentally friendly modes, such as railroads and canals, can be encouraged by optimizing freight movement depending on volume and distance.

COMPANIES UNDER GREEN LOGISTICS IN INDIA

The logistics firm SEROS Logistics is situated in Surat. It has started a number of projects to implement logistical techniques that use less energy. Actually, the corporation is dedicated to transporting freight using cleaner fuel through a segment called SEROS Green. A Mumbai-based business called Greenline Logistics provides its clients with green logistics services. The company's fleet of trucks runs on LNG. Using LNG instead of conventional fuel can save carbon emissions by about 30% (Greenline, n.d.). Global logistics behemoth DHL is dedicated to preserving the climate. By 2030, it wants to use electric cars for 60% of long-distance shipments and last-mile deliveries (DHL Home, n.d.). The company Mahindra Logistics is for environmentally friendly transportation services, the organization operates around 1300 electric vehicles. By 2040, it also hopes to achieve carbon neutrality. Solar-powered warehouses and LEED-certified buildings are examples of other green logistics projects. One of the top e-commerce companies in India, Flipkart, has pledged to switch to an entirely electric delivery fleet by 2030, proving the viability and advantages of implementing green logistics techniques. Indian Railways has been making efforts to improve its freight operations in order to make them more environmentally friendly. The program calls for the deployment of electric locomotives and the creation of specialized freight lanes. Electric locomotives are now more energy efficient than diesel ones thanks to this program. Tata Motors has adopted a number of green logistics strategies, such as encouraging the use of alternative fuels and streamlining its supply chain to lessen its carbon footprint. This contributed to trash reduction, energy conservation, and the achievement of sustainable transportation. With an emphasis on cutting carbon emissions and improving transportation,

Godrej & Boyce has incorporated sustainable logistics techniques into their business operations.

GOVERNMENT OF INDIA INITIATIVES

The Green Ports Initiative, which aims to make Indian ports more ecologically friendly, is being promoted by the Indian government, which has acknowledged the significance of sustainable logistics. These include cutting emissions from port operations, managing trash, and using renewable energy sources. The Government of India's Sagarmala initiative was centered on promoting coastal shipping, developing coastal communities, and modernizing ports. In order to lessen the carbon impact of freight transportation, it also seeks to cut down on logistical time and expense. Rural connection is the main goal of the Pradhan Mantri Gram Sadak Yojana (PMGSY), which also integrates sustainable road development methods and green technology.

Additionally, this yojana reduced its environmental effect by using eco-friendly building materials and techniques. In an effort to lessen traffic jams and emissions in metropolitan areas, the Indian government has started a number of urban transportation initiatives, such as promoting public transit and expanding metro rail networks. Sustainable urban mobility solutions are also emphasized by the Smart Cities Mission. By offering real-time tracking of container movement, the Logistics Data Bank (LDB) project seeks to increase the logistics industry's efficiency. By optimizing logistical processes, this effort lowers emissions and fuel usage. Integration of Renewable Energy encourages logistics companies to utilize sustainable energy sources like wind and solar. This issue promotes the installation of solar panels on logistical hubs and warehouses. By moving freight from the road to the rail, the Dedicated Freight Corridor (DFC) project strives to cut fuel consumption and greenhouse gas emissions while also creating specialized freight corridors to increase the efficiency of freight transportation. As an alternative to fossil fuels, the National Policy on Biofuels encourages the development and consumption of biofuels. In order to lower emissions from the transportation sector, this strategy promotes the use of biodiesel and gasoline combined with ethanol. EV use is encouraged by the faster use and Manufacturing of Hybrid and Electric Vehicles (FAME) India Scheme, which may significantly lower emissions from the logistics industry. The Unified Logistics Interface Platform (ULIP) is a digital platform designed to increase efficiency and optimize logistics processes. Indirectly, this can help with green logistics by streamlining routes and cutting down on pointless travel. The Government of India launched the National Electric Mobility Mission Plan (NEMMP) 2020 in 2013 with the

goal of encouraging the use of electric cars (EVs) in order to lessen reliance on fossil fuels and cut carbon emissions. The Government of India's National Logistics Policy seeks to establish a smooth, integrated, economical, and effective logistics network. Given the high cost of logistics in comparison to other developed countries, India has acknowledged the necessity for a national logistics policy. Logistics expenses currently make up 14–18% of GDP, which is far more than the 8% worldwide best practice. In the global market, this puts Indian products at a disadvantage.n.d.; National Logistics Policy 2022. Reduce logistics expenses by 50% and achieve global cost parity by 2030. India will rise to the top 10 on the Logistics Performance Index as a result. (Indian National Logistics Policy, n.d.). NLP seeks to simplify logistics industry rules on a larger scale. It will start a single-window approval procedure for all logistical issues and reduce the number of paperwork stages for shipping service providers. The National Logistics Policy (NLP) aims to increase corporate competitiveness and strengthen the nation's economy. Using the greatest technology and the most knowledgeable personnel, it seeks to establish a seamless, effective, and environmentally responsible logistics network. This network will enhance logistical performance and save expenses. By combining smart technology, environmentally friendly means of transportation, and sustainable urban development methods, the Delhi-Mumbai Industrial Corridor (DMIC) initiative seeks to provide an efficient and sustainable logistical infrastructure.

In general, the Indian government takes a multifaceted approach to green logistics. To make the logistics industry more ecologically friendly, it integrates infrastructure development, legislative initiatives, and the promotion of sustainable technology. Through a number of programs, the Indian government has been aggressively advancing green logistics in an effort to improve sustainability and lessen the negative environmental effects of transportation and logistics.

HOW GREEN LOGISTICS CAN TRANSFORM THE INDIAN BUSINESS.

Green logistics has the potential to revolutionize Indian companies by greatly increasing their sustainability and operational efficiency. Businesses may enhance resource usage, save fuel and energy expenses, and lessen their carbon footprint by implementing eco-friendly practices. Long-term profitability may be raised and significant cost savings can result from the use of green logistics solutions, such as electric cars, efficient transit routes, and renewable energy sources. Adopting green logistics may also improve a business's brand and draw in eco-aware investors and consumers. In addition to bringing companies into line with

worldwide sustainability trends, this change guarantees adherence to changing environmental laws, which promotes innovation and gives them a competitive edge in the market.

Green logistics may therefore promote expansion, adaptability, and a favorable environmental effect, opening the door for a more sustainable future in Indian industry. By drastically increasing operational efficiency, cutting expenses, and promoting sustainability, green logistics has the potential to completely transform Indian companies. Significant cost reductions can result from putting green logistics strategies into effect, such as using electric cars, planning transit routes, and using renewable energy sources. Green logistics, which benefits both the environment and the financial line, has the potential to revolutionize Indian industry. Although there may be some initial costs associated with the shift to green logistics, there are indisputable long-term advantages. It's an opportunity for Indian companies to become more economical, sustainable, and relevant in a global market where environmental responsibility is becoming more and more important.

GREEN LOGISTICS COULD BE THE FUTURE OF SUPPLY CHAIN OPERATIONS AND THE FUTURE OF DISTRIBUTION NETWORK

Green logistics has the potential to influence supply chain operations and distribution networks in the future by promoting cost-effectiveness, sustainability, and efficiency. Businesses may drastically lower their operating expenses and carbon footprint by implementing eco-friendly strategies. For example, the success of firms like Amazon India, which has committed to installing 10,000 electric delivery trucks by 2025, shows that using electric vehicles for last-mile delivery may reduce fuel costs by up to 80%. Similar to this, using renewable energy in distribution centers and warehouses, like the solar-powered warehouses run by Flipkart and other enterprises, may cut greenhouse gas emissions and energy expenses by 20–30%. It is anticipated that India's Dedicated Freight Corridor (DFC) would improve rail transportation efficiency, cutting emissions and logistical expenses by up to 45%. Efficiency and transparency may also be increased by using cutting-edge technologies like block chain and the Internet of Things (IoT) for real-time supply chain tracking and optimization. These technologies can result in less waste, less fuel use, and fewer delays. Businesses who engage in green logistics will probably experience an increase in market share and client loyalty as consumer demand for sustainable products rises. Green logistics is therefore a vital component of supply chain operations and distribution networks

in the future as it not only offers financial advantages but also supports global environmental objectives.

CHALLENGES IN ACHIEVING SUSTAINABILITY IN INDIA

Older train lines, traffic, and poor road condition are just a few of the inefficiencies plaguing India's logistics infrastructure. The adoption of sustainable practices, such the use of alternative fuels and effective routing, is hampered by these shortcomings. In India, the use of green technology, such electric cars (EVs), intelligent logistics systems, and renewable energy sources, is still in its infancy. Significant obstacles to these technologies include high upfront expenditures, ignorance, and a lack of infrastructure.

HOW TO ACHIEVE GREEN LOGISTICS IN INDIA

The logistics industry's carbon footprint can be considerably decreased by implementing innovative solutions for sustainable logistics, such as the use of electric vehicles (EVs), alternative fuels (like hydrogen and biofuels), and energy-efficient modes of transportation. Investing in intelligent transportation networks, automated warehouses, and green construction techniques are examples of smart logistics infrastructure that may improve sustainability and operational efficiency. Supply chain optimization can result from minimizing fuel consumption, emissions, and expenses via the use of tactics such load consolidation, route optimization, and real-time tracking. Resource efficiency and waste reduction may be achieved by promoting recycling, reusing, and refurbishing resources across the supply chain.

CONCLUSION

In India, creating a logistics ecosystem that is really sustainable calls for a multifaceted strategy including cooperation from several players. Sustainability in Indian logistics has enormous promise, but it will take a coordinated effort from all parties involved, including the government, business leaders, and customers. India can make its logistics industry a sustainable model by utilizing green technology, streamlining supply chain processes, and putting appropriate legislative frameworks in place. This shift improves resilience, competitiveness, and economic growth in addition to being in line with international environmental goals. In order to support the green transformation of the logistics industry, more research is required to measure the economic and environmental effects of sustainable logistics practices in India, investigate how digital technologies can improve sustainability,

and create thorough policy recommendations. In the Indian logistics industry, sustainability offers both financial and environmental benefits. India can greatly lessen the environmental effect of its logistics operations while increasing efficiency and competitiveness by adopting green technology, strengthening infrastructure, and passing enabling legislation. To fully realize the promise for a green future in Indian logistics, the public, industry stakeholders, and government must work together.

References:

- *DHL Home - Global Logistics and International Shipping India*. (n.d.). Retrieved July 5, 2024, from <https://www.dhl.com/in-en/home.html>
- *Green Logistics in India – Definition, Growth Drivers & More*. (n.d.). Retrieved July 5, 2024, from <https://www.handover.in/blog/green-logistics-in-india-definition-growth-drivers-more/>
- *How the E in ESG creates business value*. (n.d.). Retrieved July 4, 2024, from <https://www.mckinsey.com/capabilities/sustainability/our-insights/sustainability-blog/how-the-e-in-esg-creates-business-value>
- *INDIA'S GREENLINE PLANS MAJOR EXPANSION WITH 5,000 LNG TRUCKS - Greenline*. (n.d.). Retrieved July 5, 2024, from <https://greenline.in/indias-greenline-plans-major-expansion-with-5000-lng-trucks/>
- *Jamshyd Godrej - How do you actually green the supply...* (n.d.). Retrieved July 5, 2024, from https://www.brainyquote.com/quotes/jamshyd_godrej_739891
- Jose, P. D., & Saraf, S. (2013). *NSE-IIMB 'Corporate Governance' Research Initiative Corporate Sustainability Initiatives Reporting: A study of India's most valuable companies Prepared by Corporate Sustainability Initiatives Reporting: A study of India's most valuable companies*. September, 1–45. https://www.iimb.ernet.in/research/sites/default/files/WP No. 428_0.pdf
- *National Logistics Policy 2022*. (n.d.). Retrieved July 5, 2024, from <https://www.drishtiias.com/daily-updates/daily-news-analysis/national-logistics-policy-2022>
- *National Logistics Policy in India*. (n.d.). Retrieved July 5, 2024, from <https://www.investindia.gov.in/team-india-blogs/national-logistics-policy-india>
- *Sustainable Infrastructure in India: Paving the Way Forward | IBEF*. (n.d.). Retrieved July 5, 2024, from <https://www.ibef.org/blogs/sustainable-infrastructure-india-s-path-to-a-resilient-future>
- *Transforming India's Logistics Sector: Challenges and Opportunities | IBEF*. (n.d.). Retrieved July 5, 2024, from <https://www.ibef.org/research/case-study/transforming-india-s-logistics-sector-challenges-and-opportunities>