

# Sustainable Supply Chain Management in the Indian Automotive Industry: A Case Study of Tata Motors

Ak<mark>sha</mark>t Munjal Student, Sat Paul Mittal School, Ludhiana.

#### Abstract

This research paper examined Tata Motors as a case study of the Indian car industry and its sustainable supply chain management practices. The availability of sustainable materials and technology, as well as the regulatory framework for environmental and social concerns, were emphasised in the industry research as obstacles and possibilities connected with sustainable supply chain management. Tata Motors' history and environmentally responsible policies were highlighted in the case study. These policies included carbon neutrality goals, circular economy efforts, and the minimization of hazardous waste. The potential financial advantages, increased brand reputation, and stakeholder involvement that may result from sustainable supply chain management were examined. Positive results for businesses and the sector as a whole were highlighted as a result of this study's focus on the value of sustainable supply chain management.

# 1. Introduction

The automotive industry in India plays an important role in the economic development of the country while at the same time facing sustainable challenges. Tata Motors is one of India's most well-known vehicle manufacturers. This case study examines how the company handles sustainable supply chain management and analyses sustainable supply chain management in the Indian automotive industry by specifically focusing on Tata Motors. The paper initially analyses the Indian automotive industry, including its challenges and opportunities in regard to sustainable supply chain management. Then, it critically evaluates Tata Motors' sustainable practices, such as procurement, transportation and logistics and its environmental impacts. Finally, it discusses the potential benefits of sustainable supply chain management.

## 2. Industry Analysis

The automobile sector in India has been crucial from its start. In its AMP 2026 analysis, Auto Tech Review predicted that the automobile industry would account for more than 12% of the national GDP by that year (Economictimes.indiatimes.com, 2023). Customers, workers, and business partners exert social and environmental pressures on the worldwide automotive industry. Due to its immense influence on economic, environmental, and social activities worldwide, the automobile sector is crucial to people's ability to go about their daily lives. The automotive industry, perhaps the biggest industrial sector in the world, confronts significant environmental difficulties (Kumar Singh and Modgil, 2023). These include being blamed for worsening air quality, contributing to global warming, and improperly dealing with discarded vehicles.

Certain automobile manufacturers have been compelled by environmental concerns and globalisation policies to adopt new methods of production that embrace sustainability. There is mounting evidence suggesting that elements of the conventional supply chain must be included in efforts to attain sustainable performance. Thus, although the advantages of SSCM practices are widely recognised, the difficulties of implementing and comprehending them remain less so, particularly in developing countries like India (Kumar and Gupta, 2022). The following discussion shows the challenges and opportunities for sustainable supply chain management:

#### 2.1 The Challenges for Sustainable Supply Chain Management

Many factors, from resource availability to regulatory frameworks, pose difficulties for sustainable supply chain management in India's automobile sector. This section discusses the challenges businesses experience when adopting sustainable methods.

Availability of sustainable materials and technologies: Access to environmentally friendly resources and tools is a major obstacle. There is a rising need for eco-friendlier, lower-carbon-emitting materials and technology as the business sector works to lessen its impact on the natural world. These options are restricted in both availability and scalability, though. For instance, electric vehicle (EV) manufacturing now depends on a stable supply of lithium-ion batteries, which depends on rare earth materials (Ghosh *et al.* 2022). Significant obstacles exist in ensuring a constant supply chain of sustainable resources, including procuring and recycling these minerals.

Moreover, supply chain stakeholders, including manufacturers, distributors, and retailers, must work together to implement sustainable practices. However, several suppliers to the Indian automobile industry are on a smaller scale and lack the financial wherewithal to engage in environmentally friendly procedures. This leaves a hole in the execution of green programmes. Thus, it's crucial to provide suppliers with financial backing and other incentives to make the switch to eco-friendly methods (Kumar *et al.* 2020).

#### The regulatory landscape for environmental and social issues:

There are obstacles in the current system of environmental and social regulation. While the Indian government has taken steps towards more sustainable practices, such as implementing pollution limits and providing incentives for the widespread use of electric vehicles, more stringent rules and enforcement measures are needed (Tripathi and Talukder, 2023). The successful achievement of sustainability objectives is hindered by inconsistency in implementation and compliance monitoring. Developing comprehensive and standardised policies that encourage sustainability across the supply chain is a necessary first step in addressing this issue (Ghosh *et al.* 2022).

Supply chain visibility and traceability provide further obstacles. For a supply chain to be managed in a sustainable manner, it must be possible to trace and verify the sources, manufacturing methods, and environmental effects of its constituent parts. This is essential for spotting environmental and social dangers like deforestation or breaches of workers' rights so that they may be addressed. Due to the scale and variety of the automobile sector, implementing traceability systems may be challenging and expensive (Kumar *et al.* 2020).

Furthermore, adopting sustainable practices is hindered by the extensive infrastructural issues confronting the Indian automobile sector. One barrier to the widespread use of electric vehicles is the lack of adequate charging infrastructure. Sustainable supply chain management faces problems from economics. Sustainable projects generally need preliminary expenditures but may pay off in the long run via cost savings and enhanced brand recognition (Agrawal *et al.* 2021). Although the automobile sector works in a highly competitive market, it might be difficult for businesses to commit resources towards sustainability due to their short-term emphasis on profitability. Recognising the long-term benefits of sustainable practices and incorporating them into the entire company plan is essential to overcoming this obstacle.

## 2.2 Opportunities for Sustainable Supply Chain Management

As more and more businesses in India's automotive sector realise the significance of acting responsibly towards the environment, new sustainable supply chain management opportunities are opening up. The potential advantages of sustainable practices will be examined, and this debate will highlight several major prospects and give facts to back up those claims (Krishnan *et al.* 2021).

Adoption of EV (electric vehicle): The shift to electric transport provides a substantial chance for environmentally responsible supply chain management. By 2025, it is predicted that India's EV industry will be worth almost Rs. 50,000 crore. The electric vehicle market in India might be worth as much as \$206 billion by the year 2030 (Ibef.org, 2023). A total of US\$180 billion must be spent on electric car production and charging infrastructure to make this happen. The India Energy Storage Alliance predicted in a paper that the EV market in India will grow at a CAGR of 36% between 2018 and 2026 (Ibef.org, 2023). The market for electric vehicle batteries is also anticipated to grow at a CAGR of 30% over the same time frame (Ibef.org, 2023). A sustainable supply chain that guarantees the availability of renewable energy sources, responsibly sourced components, and effective battery recycling operations is necessary since embracing EVs may decrease greenhouse gas emissions, air pollution, and dependency on fossil fuels (Goswami *et al.* 2020).

**Localisation of the supply chain:** The "Make in India" programme promoted by the Indian government emphasises homegrown goods and independence from imports. This provides a chance to create a sustainable, locally sourced supply chain. Supply chain localisation can potentially lessen the ecological impact of shipping goods across distances. India promised to cut its carbon footprint by 33–35 per cent by developing domestic supply chains for auto parts by 2030 (Niti.gov.in, 2023).

**Circular economic practices:** Waste is reduced, and resource efficiency is increased when circular economy ideas are used in the automotive supply chain. Reducing the need for primary resources and energy use is a major benefit of reusing, remanufacturing, and recycling automobile parts (Krishnan *et al.* 2021). For instance, one of India's leading manufacturers, Maruti Suzuki, has implemented a comprehensive programme to recycle old cars. Maruti Suzuki and Toyota Tsusho Group have collaborated to form MSTI to advance the circular economy and promote the orderly, transparent, and environmentally friendly dismantling of ELVs. Over 24,000 ELVs per year may be scrapped and recycled at the 10,993 sq m facility (Marutisuzuki.com, 2023). The facility, which costs over INR 44 crores to construct, employs cutting-edge machinery to disassemble and recycle ELVs in an orderly manner. All of the machinery utilised here is made in India, keeping Atmanirbhar Bharat's spirit (Marutisuzuki.com, 2023).

**Supplier collaboration and capacity building:** Sustainable practices across the supply chain can only be implemented with the help of suppliers. Tata Motors is just one company that has been working hard to keep its suppliers involved via programmes like the Supplier Sustainability Assessment Programme. The programme evaluates the sustainability results of suppliers and helps them improve their skills. Companies may improve the sustainability of the automotive supply chain by fostering an ethical sourcing culture, decreasing their environmental effect, and working closely with their suppliers (Goswami *et al.* 2020).

## 3. Case Study Analysis of Tata Motors

## 3.1 Company Background

Tata Motors, a division of the Tata Group, is an Indian multinational corporation that produces automobiles. It has been around since 1945 and has its headquarters in the Indian city of Mumbai in Maharashtra. With a more than seventy-five-year history, Tata Motors has become an industry leader in India and beyond. Regarding new technologies and environmentally friendly procedures, Tata Motors has always been one step ahead of the competition in India (Tatamotors.com, 2023). In addition to releasing electric versions of several of its current models, the company has also released a number of fully electric cars, including the Tata Tigor EV and the Tata Nexon EV. The corporation has also invested in battery and charging technology research to facilitate the widespread use of electric cars in India.

The firm has formed strategic alliances and collaborations with multinational automakers to exploit new technologies and broaden its product range (Tatamotors.com, 2023). Tata Motors has played a pivotal role in developing the automobile industry in India for many years due to its dedication to quality, innovation, and sustainability. The firm has positioned itself as a major participant in the global automotive industry by

committing to the research and development of safe and efficient cars, promoting electric mobility, and implementing ethical business practices. As part of its efforts to create a more sustainable future for India, the firm has pledged to support the government's goal of widespread adoption of electric cars by 2030. It delivered the first 10,000 Tigor EVs the government-run Energy Efficiency Services Limited (EESL) ordered in December 2017 (Tatamotors.com, 2023). The company's CSR initiatives focus on improving the quality of the community and SDGs.





## **3.2 Sustainable practices of Tata Motors:**

Tata Motors has played a pivotal role in developing the automobile industry in India for many years due to its dedication to quality, innovation, and sustainability. The firm has positioned itself as a major participant in the global automotive industry by committing to the research and development of safe and efficient cars, the promotion of electric mobility, and the implementation of ethical business practices (Malagihal, 2021). This section mainly analyses the company's procurement, transportation, and logistics practices, as well as their supplier relationships and environmental impact.

**Procurement:** Tata Motors has launched a Sustainable Supply Chain Initiative to help the company reduce its environmental impact in the production phase. The organisation displays its dedication to sustainability throughout the procurement process by shortlisting suppliers based on environmental, social, and governance (ESG) criteria. This strategy helps improve the supply chain's environmental and social performance by ensuring suppliers share Tata Motors' commitment to sustainability (Tatamotors.com, 2023). The role of procurement is crucial since it contributes to the bottom line. Each of its seven factories in India uses raw materials sourced from regional centres in the country's northern, western, and southern regions.



Figure 2: Logistics management of Tata Motors (Source: Tatamotors.com, 2023)

Vendor parks were established in Sanand and Pantnagar to serve as the first nodes in the supply chain at these greenfield sites (Dingra and Padmavathy, 2019). The local economy has grown as a consequence of these measures, which have also encouraged local purchasing, simplified logistics, and cut down on packaging and shipping needs. In FY 2017-18, 57.88% of the materials and services used in its manufacturing plants came from inside the same state as the firm's facilities (Businessworld.in, 2023). In addition to the aforementioned guidelines, the concept of fair competition is also included in the Dealer Code of Conduct.

**Transportation and Logistics:** Logistics at Tata Motors are constantly being refined in an effort to save costs and boost productivity. The efficacy and efficiency of the supply chain are significantly impacted by integrated packaging. This relatively novel idea, also known as package logistics, has the potential to improve the environmental friendliness of supply chains. Polypropylene boxes and other reusable packaging options are replacing disposable alternatives (Tatamotors.com, 2023). This is done to lessen the amount of money wasted on packing material for items like bumpers, back walls, dashboards, gas tanks, etc. Steel containers, pallets, trolleys, and plastic bags are utilised to transport heavy components. Steel rack packing is used instead of wood packing, as well.

Consolidation hubs at strategic sites around the country are another step in this direction since they facilitate the timely reception of materials in accordance with production plans (Laljani and Kharecha, n.d.). In order to reduce the need for a large number of trucks and the amount of time spent on material handling, its logistics team devised 'Milk Runs' for locally run transportation. Special containerized vehicles were created to maximise cargo utilisation and reduce the number of trucks entering industrial facilities (Tatamotors.com, 2023).

**Supplier Relationships:** Tata Motors' Sustainable Supply Chain Initiative exemplifies the company's commitment to fostering productive partnerships with suppliers who share its commitment to environmental responsibility. Tata Motors can advance responsible sourcing and guarantee a more sustainable supply chain by working with suppliers and prioritising ESG practices in FY17 (Businessworld.in, 2023). Working together is great for establishing lasting relationships and improving sustainability results.

**Environmental impact:** Tata Motors has shown it cares about the environment by taking many measures to lessen its footprint. The corporation is committed to achieving carbon neutrality and has established goals for reducing carbon emissions per vehicle. The presented information demonstrates a steady decline in carbon emissions per vehicle, which bodes well for their ability to meet their goals. This decline is encouraging since it reflects the company's efforts to boost energy efficiency and cut carbon output (Tatamotors.com, 2023). Tata Motors has an internal carbon price rate of \$14 per metric tonne of CO2 produced in 2019, as reported by the

Carbon Disclosure Project (CDP) (Businessworld.in, 2023). It fell to 0.69 tCO2e per car in FY19 and stayed there in FY20, which is good news for the company's sustainability efforts (Businessworld.in, 2023).

Tata Motors' sustainability policy places heavy emphasis on circularity and recycling. The corporation has promised to include recycle-reuse-recover practices, use recyclable materials in its production processes, and encourage the employment of recycled content at its Jaguar Land Rover division. These efforts have led to significant material savings and reduced carbon emissions, making manufacturing more sustainable and regenerative (Tatamotors.com, 2023). The firm is also aiming to increase the amount of renewable energy produced in-house and acquired from off-site sources, and it is a signatory to RE100, a worldwide programme in which firms pledge to use only renewable power (Businessworld.in, 2023).

In addition, the amount of hazardous waste sent to landfills or incinerators has decreased, as stated by Tata Motors. The company's dedication to responsible waste management and compliance with waste rules is seen in its efforts to recycle hazardous trash. Tata Motors emphasises eco-friendliness in its purchasing policies thanks to its Sustainable Supply Chain Initiative (Tatamotors.com, 2023). The corporation has pledged to reduce carbon emissions per vehicle, increase its use of recyclable materials, and decrease hazardous waste production. Tata Motors' commitment to sustainability is even more evident in the company's emphasis on circularity and the remanufacturing of automobile components. To improve the supply chain's environmental impact, it's important to foster cooperative partnerships with suppliers with the same sustainability commitment. A more indepth assessment of Tata Motors' sustainability initiatives would be possible with additional information on the company's transportation and logistics practices (MATHUR and PATEL, n.d.).

# 4. Potential Benefits of Sustainable Supply Chain Management

There are several ways in which sustainable supply chain management practices might improve Tata Motors' bottom line, public image, and stakeholder involvement.

**Financial Performance:** Sustainable supply chain management may help boost Tata Motors' bottom line. The organisation may save money and make better use of its resources by implementing energy efficiency measures, cutting down on waste, and embracing lean manufacturing practices (Saberi *et al.* 2019). These savings may have a direct and beneficial effect on the company's bottom line. In addition, by taking precautions to lessen environmental and social hazards in the production process, Tata Motors can protect its bottom line from interruptions, fines, and harm to its brand (Kouhizadeh *et al.* 2021).

**Brand Reputation:** Tata Motors' brand reputation as an ethical and environmentally conscious business can benefit from adopting multiple sustainable supply chain practices. Customers are becoming more environmentally concerned in their shopping habits, and the car sector is feeling the heat as a result. Tata Motors can further demonstrate its dedication to lowering carbon emissions, advancing ethical sourcing, and bolstering renewable energy by embedding sustainable practices across the whole supply chain (Cousins *et al.* 2019). Tata Motors can stand out from the competition thanks to its open and proactive attitude to sustainability, which will appeal to consumers who are concerned about the environment.

**Stakeholder Engagement:** Tata Motors' stakeholder involvement may benefit from sustainable supply chain management. Long-term success requires active participation from several groups, including consumers, workers, investors, and communities. Stakeholders' worries about environmental effects, social responsibility, and ethical practices may be addressed thanks to Tata Motors' commitment to sustainability throughout the supply chain (Zimon *et al.* 2020). This kind of interaction has the potential to increase client loyalty, trust, and satisfaction. Top talent that shares Tata Motors' commitment to sustainability may be attracted and kept in the company. Environmental, social, and governance (ESG) aspects are now being taken into account by investors. Tata Motors can improve its connections with its financial stakeholders and attract ESG-focused investors by proving its dedication to sustainable practices (Saberi *et al.* 2019).

## 5. Conclusion

Finally, the Tata Motors case study demonstrated the importance of sustainable supply chain management in the Indian automotive sector. Tata Motors has shown its dedication to sustainability via its actions by meeting

difficulties, seizing opportunities, and enjoying the fruits of its labour. In addition, Tata Motors' sustainable supply chain management strategy benefits from the company's attention to procurement, transportation, and logistics practices, as well as supplier partnerships. Tata Motors has strengthened its ties with its suppliers and enlisted the support of its stakeholders by making sustainability a top priority at every stage of the company's value chain. When it comes to demonstrating the beneficial effects that sustainable supply chain management can have on a company's bottom line and environmental impact, Tata Motors is hard to beat. Based on the overall discussion, Tata Motors' efforts and experiences provided useful insights for other organisations striving to adopt sustainable practices and build a greener, more responsible future as the Indian automotive sector continues its path towards sustainability.

#### References

Agrawal, R., Wankhede, V.A., Kumar, A. and Luthra, S., 2021. Analysing the roadblocks of circular economy adoption in the automobile sector: Reducing waste and environmental perspectives. *Business Strategy and the Environment*, *30*(2), pp.1051-1066.

Businessworld.in. *Pushing For Clean Mobility*. Available at: <u>https://www.businessworld.in/article/Pushing-For-</u> <u>Clean-Mobility/16-12-2020-354247/</u> (Accessed May 8, 2023)

Cousins, P.D., Lawson, B., Petersen, K.J. and Fugate, B., 2019. Investigating green supply chain management practices and performance: The moderating roles of supply chain ecocentricity and traceability. *International Journal of Operations & Production Management*.

Dingra, R. and Padmavathy, G., 2019. Green human resource management–A leap towards sustainability. *International Journal for Advance Research and Development*, 4(1), pp.50-57.

Economictimes.indiatimes.com. *Auto sector may generate \$300 billion revenue by 2026, create 65 million jobs.* Available at: <u>https://economictimes.indiatimes.com/auto-sector-may-generate-300-billion-revenue-by-2026-create-65-million-jobs/articleshow/48775988.cms (Accessed May 8, 2023)</u>

Ghosh, S., Mandal, M.C. and Ray, A., 2022. Strategic sourcing model for green supply chain management: an insight into automobile manufacturing units in India. *Benchmarking: An International Journal*, 29(10), pp.3097-3132.

Goswami, M., De, A., Habibi, M.K.K. and Daultani, Y., 2020. Examining freight performance of third-party logistics providers within the automotive industry in India: An environmental sustainability perspective. *International Journal of Production Research*, *58*(24), pp.7565-7592.

Ibef.org. *Automobile Industry in India*. Available at: <u>https://www.ibef.org/industry/india-automobiles</u> (Accessed May 8, 2023)

Kouhizadeh, M., Saberi, S. and Sarkis, J., 2021. Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. *International Journal of Production Economics*, 231, p.107831.

Krishnan, S., Gupta, S., Kaliyan, M., Kumar, V. and Garza-Reyes, J.A., 2021. Assessing the key enablers for Industry 4.0 adoption using MICMAC analysis: a case study. *International Journal of Productivity and Performance Management*.

Kumar Singh, R. and Modgil, S., 2023. Assessment of lean supply chain practices in Indian automotive industry. *Global Business Review*, 24(1), pp.68-105.

Kumar, N., Mathiyazhagan, K. and Mathivathanan, D., 2020. Modelling the interrelationship between factors for adoption of sustainable lean manufacturing: a business case from the Indian automobile industry. *International Journal of Sustainable Engineering*, *13*(2), pp.93-107.

Kumar, S. and Gupta, P., 2022, February. Implementation of Cost Management Initiatives through TQM in an Indian Automotive Industry: A case study. In *International Conference on Industrial Engineering and Operations Management*.

Laljani, J.I. and Kharecha, K.H., The Effect of Profitability and Dividend Policy on Sustainability Report Disclosure in Automobile Sector.

Malagihal, S.S., 2021. Strategic Options for Automobile OEMs of Indian Origin to have Sustained Competitive Advantage: A Case of Tata Motors. *International Journal of Global Business and Competitiveness*, *16*(2), pp.139-152.

Marutisuzuki.com. *Maruti Suzuki and Toyota Tsusho Group's Vehicle Scrapping and Recycling unit commences operations in India*. Available at: <u>https://www.marutisuzuki.com/corporate/media/press-releases/2021/november/maruti-suzuki-and-toyota-tsusho-groups-vehicle-scrapping-and-recycling-unit-commences-operations</u> (Accessed May 8, 2023)

MATHUR, V. and PATEL, G., Road to Sustainability: A Consumer Based Analysis of Green Marketing Initiatives of the Indian Automobile Industry. *From the Chief EditorNJs Desk*, p.132.

Niti.gov.in. Status quo analysis of various segments of electric mobility and low carbon passenger roadtransportinIndia.Availableat:<a href="https://www.niti.gov.in/sites/default/files/2021-04/FullReport Status quo analysis of various segments of electric mobility-compressed.pdf">https://www.niti.gov.in/sites/default/files/2021-</a>04/FullReport Status quo analysis of various segments of electric mobility-compressed.pdf(AccessedMay 8, 2023)Image: Complexity of the second segments of electric mobility compressed.pdf

Saberi, S., Kouhizadeh, M., Sarkis, J. and Shen, L., 2019. Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, *57*(7), pp.2117-2135.

Tatamotors.com. *About Tata Motors*. Available at: <u>https://www.tatamotors.com/about-us/</u> (Accessed May 8, 2023)

Tatamotors.com. SHAPPING INDIA'S FUTURE, Sustainable Mobility, Smart Cities. Available at: <u>https://www.tatamotors.com/wp-content/uploads/2018/09/05090438/sustainability-report-2017-18.pdf</u> (Accessed May 8, 2023)

Tripathi, S. and Talukder, B., 2023. Supply chain performance and profitability in Indian automobile industry: Evidence of segmental difference. *Global Business Review*, *24*(2), pp.371-392.

Zimon, D., Tyan, J. and Sroufe, R., 2020. Drivers of sustainable supply chain management: Practices to alignment with un sustainable development goals. *International Journal for Quality Research*, 14(1).

# International Research Journal Research Through Innovation