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on

CLIMATE ACTION & GREEN GROWTH: INDIA'S PATH TO SUSTAINABLE DEVELOPMENT

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Abstract

Green Supply Chain Management (GSCM) is a relatively new strategic concept that brings about environmental sustainability in the various operations of the traditional supply chains such as procurement, manufacturing, logistics, distribution and reverse logistics. In response to the increasing environmental regulations, expectations of stakeholders and the problem of climate change, businesses worldwide are incorporating sustainability in their value chains to provide ecological and economic value. To measure the practice of GSCM, a qualitative multiple-case study is conducted on major global and Indian companies, such as Toyota, Patagonia, Walmart, Amazon, Unilever, ITC Limited, Mahindra & Mahindra and Hindustan Unilever. In particular, the research uses secondary data, namely sustainability reports, corporate disclosures and academic literature to determine major drivers of adoption and implementation strategies and performance outcomes in green supply chain. The results indicate that leadership commitment, supplier collaboration, green innovation, inclusion of renewable energy, sustainable sourcing and circular economy practices have been shown to be important determinants of environmental performance besides being cost efficient and competitive. Regardless of the difficulties encountered by the high initial investment requirement and the complexity of the supply chain, the adoption of GSCM has been shown to reduce carbon emissions, waste production, and consumption of resources. The research paper concludes that GSCM is not simply a compliance tool but a strategic necessity of long-term sustainable value creation especially in emergent economies such as India where industrial development and environmental responsibility have to co-exist.

Keywords: *Green Supply Chain Management, Sustainability, Circular Economy, Environmental Performance, Indian Corporations, Supply Chain Strategy.*

1. Introduction

Green Supply Chain Management (GSCM) refer to the strategic approach to integrating environmental issues in the supply chain processes involved in product design, material sourcing, production, transportation, storage, and recovery of the end-of-life. Traditionally, supply chain management was mainly concerned with minimizing costs, efficiency and customer service. The increasing menace of climate change, resource depletion, increased environmental controls and increased stakeholder demands, however, have forced firms to shift their operations towards

environmental sustainability. GSCM is a strategic combination of environmental stewardship and supply chain excellence designed to decrease waste, conserve resources, decrease the quantity of greenhouse gases and the development of closed-loop systems minimizing the environmental impact and improving operational performance. The relevance of GSCM is also especially high in less developed countries such as India that experience rapid industrialization and at the same time have national sustainability goals of net-zero emissions by 2070 and massive adoption of renewable energy sources. In this regard, global and Indian companies are progressively integrating green practices across its supply chain to attain environmental, economic and social goals.

2. Research Methodology

This paper is qualitative in nature as a multiple case-study research study, and incorporates the GSCM practices in the operations of leading corporations. The sample will consist of ten corporations (global and Indian) with established green supply chain programs. Secondary data were gathered through sustainability and annual reports, corporate environmental disclosures, peer-reviewed literature, industry publications, and reliable news sources.

3. Objectives of the Study

To examine GSCM practices in selected global and Indian corporations.

To assess the environmental and operational effects of GSCM adoption.

To determine major drivers and issues in the implementation of green supply chains.

4. Global Case Examples of GSCM Implementation

4.1 Toyota (Automotive Sector)

Toyota has always been known to establish sustainability in its production and supply chain strategies. Toyota is environmentally responsible and this has been demonstrated through the making of hybrid and electric cars, adoption of energy-efficient production plants, the establishment of large waste management programs and supplier assessment of environmental impact. Green procurement policies make sure that suppliers of important goods comply with the environmental rules, and manufacturing methods that are lean reduce the amount of waste and maximize the use of resources. Consequently, Toyota has realised significant lifecycle carbon reduction and operational efficiency.

4.2 Patagonia (Apparel Sector)

Patagonia promotes the principles of a circular economy, as the company uses recycled polyester, organic cotton, and other environmentally friendly materials in all of the supply chain. Its Worn Wear program motivates customers to repair and reuse goods, increasing the lifecycle of products and decreasing textile waste. The transparent nature of Patagonia supply chain and its proactive

environmental advocacy show that sustainability can be adopted as a business value that builds both environmental influence and consumer base.

4.3 Walmart (Retail Sector)

Walmart also promotes sustainability in its broad supplier network by using a total sustainability index and supplier scorecards comprising environmental performance indicators. Walmart is also committed to renewable energy plants, minimization of packaging, and the shift to logistics with lower fuel costs. It has green logistics and supplier engagement strategies that have helped in reducing its operations costs and improving compliance with its supply chain to environmental standards.

4.4 Amazon (E-Commerce Sector)

Amazon has an initiative of achieving carbon-neutral operations by Climate Pledge and taking strategic measures, such as investing in electric delivery vans, renewable energy-driven fulfillment centers, and sustainable packaging solutions. Amazon can serve as an example of how digital innovations can speed up green logistics and minimise the environmental impact of e-commerce supply chains with the help of advanced technologies and route optimization, as well as energy management.

4.5 Unilever (Consumer Goods Sector)

Unilever has incorporated sustainability into its corporate strategy through sustainable sourcing, zero waste manufacturing, plastic reduction initiatives and comprehensive supplier sustainability audits. The initiative by Unilever has delivered quantifiable gains in the area of emission reduction of green house gases, waste reduction and efficiency of resources, which strengthens the correlation between environmental performance and stakeholder trust.

5. Indian Case Examples of Green Supply Chain Management

5.1 ITC Limited (Conglomerate)

ITC has a triple bottom-line strategy that focuses on environmental sustainability (Planet), social empowerment (People), and economic value (Profit). ITC supply chain incorporates the concept of a circular economy via such initiatives as water stewardship, waste recycling, the increase of the energy efficiency, and the Well-being Out of Waste program, which transforms the municipal waste streams into reusable materials. The company records a regular occurrence of carbon positivity, water positivity, and solid-waste recycling positivity, which show that it has a strong environmental performance throughout its supply chain.

5.2 Godrej Consumer Products Limited

Godrej Consumer Products Limited has introduced green supply chain project aimed at energy consumption, using of renewable energy and reduction of greenhouse gas emission. That the

company has achieved significant reductions in particular energy use and an increased number of renewable energy suppliers has shown that those improvements that can take place in the environment do not have to be at the expense of the operational performance.

5.3 Mahindra & Mahindra (Automotive and Mobility)

Mahindra & Mahindra is undertaking some ambitious sustainability targets such as its aim to go net-zero by 2040 and to increase the levels of renewable energy integration in its operations. Sustainable supply chain strategy of the company involves improving sustainability of suppliers, enhancing energy efficiency in the processes and electrification of logistics in its automotive value chain.

5.4 Tata Group Companies (Diversified Conglomerate)

Some companies belonging to the giant Tata Group, including Tata Motors and Tata Consultancy Services, have integrated sustainability in the supply chain management and strategy. The Tata Motors GSCM initiatives involve eco-design implementation, EV technology, and recycled material usage in the manufacturing process in accordance with the country climate commitments. Tata Consultancy Services has demonstrated carbon neutrality in several locations and has invested significantly in renewable energy supplying and green building certifications of its campuses which is a good performance in terms of environmental performance in service oriented supply chains.

5.5 Hindustan Unilever (Unilever India)

Hindustan Unilever, the Indian based subsidiary of Unilever is working towards sustainability by using 100 percent of its plastic packaging material reusable, recyclable or compostable. The supplier engagement activities of the company include plans to reduce emissions in the sourcing of its raw materials and the provision of a lot of assistance to its suppliers to minimize environmental impact.

5.6 Mahindra Logistics and TVS Supply Chain Solutions

Mahindra Logistics has made major advancements into green logistics through the encouragement of electric vehicles, solar-powered establishments, and the streamlining of transport activities in the logistics services. Likewise, TVS Supply Chain Solutions provides sustainability services to aid in waste minimization, supplier audits, and streamlined manufacturing logistics, which demonstrates the role Indian logistics companies play in helping supply chain industries become greener.

5.7 Safexpress and Other Logistics Innovators

Indian logistics companies like Safexpress are also implementing green operational policies such as emissionless vehicles, energy efficiency in the warehousing facilities and greener routing

procedures in an effort to minimize carbon footprints and yet offer service excellence. The services of green logistics providers are becoming more vital in decarbonizing India supply chains in the fast-growing markets.

6. Managerial Implications

This study identifies that sustainability must be implemented strategically as a core operation and not a marginal compliance prerequisite. Managers need to consider environmental standards during the process of supplier selection and assessment, maximize the use of digital technology to optimize green logistics, and develop quantifiable goals related to emissions, waste, and resource efficiency. The effective implementation can be further reinforced through collaboration with the industry associations, government organizations and sustainability rating schemes. Also, continuous investment in employee training, supplier development and monitoring of performance increases the capacity of the organization to meet the GSCM objectives.

8. Conclusion

Green Supply Chain Management has shifted beyond a regulatory requirement to a strategic agenda that helps to promote environmental integrity and business value creation. As case studies of both global and Indian corporations demonstrate, sustainability in supply chain functions can be integrated to yield quantifiable changes in the areas of carbon reduction, waste minimization, resource conservation, and stakeholder value. Indian companies are moving towards the application of GSCM practices that are in line with national sustainability objectives, which underscores the significance of supply chains in solving environmental issues. Although there are still barriers to implementation, the long-term gain of green supply chains such as improved operational performance, improved brand reputation, and compliance with the changing regulatory environments underscores the need to keep adopting and developing the concept. This work can be extended to future studies aiming to measure the environment and financial performance related to GSCM implementation in particular to develop Indian context where the heterogeneity of industries is a challenge and an opportunity towards sustainable supply chain Transformation.

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