Sustainable Supply Chain Practices in the FMCG sector

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Abstract- ***This study explores sustainable supply chain practices (SSCPs) in the FMCG sector, focusing on green procurement, ethical sourcing, and eco-friendly packaging. Findings show these practices enhance environmental performance and operational efficiency, especially in multinational firms. Key barriers include high costs and limited supplier cooperation. The research blends theory and industry data, offering practical insights and policy recommendations to support broader adoption of sustainability in FMCG supply chains.***

I. INTRODUCTION

1.1 Background of the Study

The global economy is increasingly prioritizing sustainability due to rising environmental concerns, stakeholder pressure, regulatory compliance, and shifting consumer preferences. The Fast-Moving Consumer Goods (FMCG) sector, known for its high-volume production, extensive packaging, and rapid product turnover, faces mounting scrutiny over its environmental and social impacts. Supply chains within the FMCG sector are vast, complex, and resource-intensive—making them a critical focal point for sustainability initiatives.

Sustainable supply chain management (SSCM) refers to the integration of environmentally and socially responsible practices throughout the life cycle of a product—from raw material sourcing to manufacturing, logistics, retail, and disposal. For FMCG companies, adopting SSCM is not only a matter of ethical obligation but also a business imperative for risk management, cost efficiency, compliance, and brand reputation.

In the FMCG sector, supply chain decisions affect carbon emissions, waste generation, labor rights, resource consumption, and product end-of-life. As such, rethinking traditional supply chain practices through a sustainability lens can lead to long-term competitive advantages and contribute to global sustainability goals.

1.2 Rationale of the Study

Despite global momentum toward sustainability, many FMCG firms continue to struggle with implementing scalable and effective SSCM practices. While large corporations have made progress in reducing emissions and waste, small to mid-sized enterprises often lack the frameworks, tools, or motivation to integrate sustainability into supply chain operations. Furthermore, there exists a gap in understanding which specific practices are most impactful and feasible in real-world FMCG contexts.

This research seeks to investigate:

- What sustainable supply chain practices are being implemented in the FMCG sector?
- What challenges and benefits are associated with their adoption?
- How do these practices contribute to environmental and business performance?

1.3 Problem Statement

Traditional supply chain models in the FMCG sector prioritize cost, speed, and efficiency—often at the expense of environmental and social factors. This short-term optimization leads to:

- Excessive waste generation
- High carbon footprint
- Unethical labor practices
- Unsustainable sourcing of raw materials

There is an urgent need to transition from these linear and exploitative supply chains to circular and responsible systems. However, there is limited academic and industry research that quantifies or compares the outcomes of sustainable practices within the FMCG context, especially in developing markets.

Thus, the central research problem is:
"What is the role and impact of sustainable supply chain practices in enhancing the environmental, economic, and social performance of the FMCG sector?"

1.4 Objectives of the Study

The research aims to achieve the following specific objectives:

- To identify and categorize the sustainable supply chain practices adopted by FMCG companies.
- To evaluate the effectiveness of these practices in improving environmental and operational performance.
- To assess the challenges and barriers to implementing sustainable supply chains in the FMCG sector.
- To provide actionable recommendations for enhancing sustainability across the supply chain.

1.5 Research Questions

1. What sustainable practices are prevalent in FMCG supply chains?
2. How do these practices affect environmental sustainability and business efficiency?
3. What are the key drivers and obstacles in adopting SSCM in the FMCG industry?
4. How can FMCG companies integrate sustainability without compromising competitiveness?

1.6 Scope and Limitations

Scope:
The study focuses on supply chain practices in the FMCG sector, with an emphasis on environmental and social sustainability. It explores procurement, production, logistics, packaging, and distribution, with attention to practices such as green sourcing, circular packaging, ethical labor, and carbon-neutral transportation.

Limitations:
The study may be limited by access to detailed supply chain data due to confidentiality concerns.

- It is largely based on secondary data and select primary inputs, which may not capture all industry variations.
- Regional focus may limit generalizability across global markets.

II. LITERATURE REVIEW

2.1 Introduction

This chapter presents a comprehensive review of academic research, industry reports, and theoretical frameworks related to sustainable supply chain management (SSCM), with a specific focus on the Fast-Moving Consumer Goods (FMCG) sector. It covers the evolution of sustainability in supply chains, key practices adopted globally, theoretical models that explain sustainable transitions, and challenges that FMCG companies face.

2.2 Understanding Sustainable Supply Chain Management (SSCM)

Sustainable supply chain management (SSCM) integrates environmental, social, and economic considerations into supply chain operations. According to Ahi and Searcy (2013), SSCM is the management of material, information, and capital flows as well as cooperation among companies along the supply chain while integrating sustainable goals.

Key elements of SSCM include:

- Environmental sustainability: Reducing carbon emissions, energy usage, and waste.
- Social sustainability: Ensuring labor rights, workplace safety, and ethical sourcing.
- Economic sustainability: Maintaining profitability while minimizing negative environmental/social impacts.

2.3 Characteristics of the FMCG Sector and Its Sustainability Impact

The FMCG industry includes products with short shelf lives and high turnover—such as packaged foods, beverages, toiletries, and cleaning products. Due to:

- Extensive packaging,

- Rapid product cycles,
- Mass production, and
- Globalized logistics,
- FMCG companies have substantial environmental footprints.

Key sustainability issues in FMCG supply chains include:

- Over-reliance on plastic packaging
- Excessive carbon emissions from distribution
- Non-renewable resource usage

Labor exploitation in developing countries (Sodhi & Tang, 2018)

2.4 Sustainable Practices in FMCG Supply Chains

Various sustainable practices have been documented across different stages of FMCG supply chains:

a) Green Procurement:- Sourcing raw materials from certified sustainable farms or vendors.

Example: Unilever's commitment to 100% sustainably sourced agricultural raw materials.

b) Eco-friendly Packaging:- Reducing single-use plastics, using biodegradable/recyclable materials.

Example: Nestlé and P&G investing in reusable packaging systems.

c) Energy-Efficient Manufacturing: Using renewable energy and energy-efficient machinery to reduce carbon footprint.

Example: Hindustan Unilever shifting to solar-powered factories.

d) Reverse Logistics & Circular Economy: Managing product returns, recycling, and repurposing materials.

Example: Coca-Cola's "World Without Waste" initiative aiming to recycle every bottle sold by 2030.

2.5 Theoretical Frameworks Supporting SSCM

Several theories help conceptualize sustainability in supply chains:

a) Triple Bottom Line (TBL) Theory: Proposed by Elkington (1997), TBL encourages firms to focus on three Ps—People, Planet, and Profit—creating value in all three dimensions.

b) Stakeholder Theory: Introduced by Freeman (1984), this theory suggests that organizations should serve the interests of all stakeholders—not just shareholders—including employees, customers, suppliers, and communities.

c) Resource-Based View (RBV): This theory argues that sustainability can be a source of competitive advantage if firms develop unique, valuable, and non-imitable sustainable capabilities (Hart, 1995).

2.6 Challenges in Implementing SSCM in FMCG

Despite the growing awareness and corporate commitments, many FMCG companies face barriers such as:

- High cost of sustainable alternatives (e.g., biodegradable materials)
- Complexity in monitoring Tier-2/Tier-3 suppliers
- Resistance to change within operations or supplier networks
- Consumer price sensitivity
- Lack of supply chain transparency and traceability tools

(Reference: Lee & Rammohan, 2019)

2.7 Empirical Studies and Industry Practices

Deloitte (2021) found that companies with mature SSCM practices had 35% higher supply chain efficiency and 22% lower risk exposure.

Accenture (2020) reported that 62% of global FMCG leaders consider sustainability a key driver of long-term growth.

Unilever and Nestlé have been recognized for embedding sustainability metrics into their procurement scorecards and annual reporting structures.

III. RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research design, data collection methods, sampling procedures, and analytical techniques used in the study. It is aimed at ensuring a systematic and objective approach to investigating the sustainable supply chain practices adopted in the FMCG sector and their effectiveness

in improving environmental, economic, and social performance.

3.2 Research Design

The study adopts a descriptive and exploratory research design. It is quantitative in nature, aiming to gather empirical data from FMCG professionals on the current state, challenges, and impacts of sustainability initiatives within their supply chains.

This design was chosen to:

- Capture descriptive insights into sustainable practices.
- Explore relationships between supply chain strategies and sustainability outcomes.
- Identify trends and patterns relevant to the FMCG industry.

3.3 Population and Sampling

- Population: The target population includes professionals working in the supply chain, procurement, operations, and sustainability departments of FMCG companies (both multinational and domestic) operating in India.
- Sampling Technique: Non-probability convenience sampling was used, selecting respondents based on accessibility and willingness to participate.

This approach is practical for reaching industry professionals in time-constrained environments.

- Sample Size: A total of 120 valid responses were collected through an online structured questionnaire.
- Inclusion Criteria: Employees with at least 2 years of experience in the FMCG supply chain domain.

Individuals in managerial, operational, or sustainability-related roles.

3.4 Data Collection Method

Primary Data: Collected through a structured questionnaire using Google Forms and email distribution.

The questionnaire consisted of closed-ended questions using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Secondary Data: Academic journals, industry reports (e.g., Deloitte, McKinsey), government publications (e.g., FSSAI, Ministry of Environment), and sustainability reports of leading FMCG firms.

Questionnaire Sections:
Demographic Information: Gender, role, years of experience, company size.

- Sustainable Practices: Green procurement, eco-packaging, waste reduction, carbon-neutral logistics.
- Challenges: Barriers in implementing sustainability (cost, knowledge, supplier resistance).
- Outcomes: Environmental performance, cost savings, brand impact.

3.6 Reliability and Validity

Reliability: A Cronbach's Alpha test was conducted on the survey items to check internal consistency. A value of 0.83 indicated strong reliability.
Validity: Content Validity was ensured by consulting supply chain and sustainability experts during questionnaire design.
Pilot Testing was conducted with 10 respondents to refine wording and structure.

3.7 Data Analysis Tools and Techniques

Data was analyzed using Microsoft Excel and SPSS software. The following statistical tools were employed:

- Descriptive Statistics: Mean, percentage, and frequency distribution to summarize data.
- Correlation Analysis: To examine relationships between sustainable practices and performance outcomes.
- Regression Analysis: To measure the impact of specific practices (e.g., green procurement, eco-packaging) on sustainability indicators.
- Cross-tabulation and ANOVA: To understand the variation of sustainability adoption across company types and roles.

3.8 Limitations of the Methodology

- Convenience sampling may introduce bias and limit generalizability.
- The study focuses primarily on Indian FMCG firms, which may not reflect global dynamics.
- Self-reported data can lead to response bias.
- The cross-sectional nature of the study limits its ability to capture long-term effects.

IV. DATA ANALYSIS AND INTERPRETATION

4.1Introduction

This chapter presents the results of the primary data collected through a structured questionnaire administered to professionals working in the FMCG sector. The data has been analyzed using descriptive and inferential statistical techniques to uncover key insights regarding the adoption, effectiveness, and challenges of sustainable supply chain practices (SSCPs) in the industry.

4.2 Demographic Profile of Respondents

The demographic characteristics of the 120 respondents are summarized below:

Category	Options	Percentage (%)
Gender	Male (66), Female (54)	55%, 45%
Age Group	21–30 (35), 31–40 (50), 41+ (35)	29%, 42%, 29%
Work Experience	2–5 years (40), 6–10 years (50), 10+ (30)	33%, 42%, 25%
Job Function	Supply Chain (45), Procurement (30), Sustainability/CSR (25), Operations (20)	—
Organization Type	MNC (60), Domestic (60)	50%, 50%

4.3 Adoption of Sustainable Supply Chain Practices

Respondents rated the extent to which various SSC practices were adopted in their companies on a 5-point Likert scale.

Practice	Mean Score	Interpretation
Green Procurement	4.0	High adoption
Sustainable Packaging	3.8	Moderate to high adoption
Waste Management & Recycling	3.6	Moderate adoption
Carbon-Neutral Logistics	3.4	Moderate adoption
Ethical Sourcing & Labor Compliance	4.1	High adoption
Supplier Sustainability Audits	3.2	Low to moderate adoption

Interpretation:
Green procurement and ethical sourcing practices are more commonly adopted, especially by multinational FMCG firms. However, supplier audits and carbon-neutral logistics are less prevalent due to complexity and cost.

4.4 Challenges in Implementing SSC Practices

Respondents were asked to rank key challenges faced during SSCM implementation:

Challenge	% of Respondents Reporting It
High cost of implementation	72%
Lack of supplier cooperation	65%
Limited awareness or training	58%
Regulatory uncertainty	40%
Resistance to change (internal)	46%

Interpretation:
The majority cited cost and supplier resistance as the top barriers, particularly for smaller and domestic

firms. Training and awareness gaps were also significant.

4.5 Correlation Analysis

To explore relationships between SSC practices and sustainability outcomes (environmental and operational), Pearson correlation coefficients were computed:

SSC Practice	Environmental Performance	Operational Efficiency
Green Procurement	0.68	0.55
Sustainable Packaging	0.65	0.58
Ethical Sourcing	0.71	0.60

Interpretation:
Strong positive correlations indicate that sustainable supply chain initiatives contribute significantly to environmental goals and improve efficiency in the long run.

4.6 Regression Analysis

A multiple regression analysis was conducted with Environmental Performance (Y) as the dependent variable and the following as predictors:
X1: Green Procurement
X2: Sustainable Packaging
X3: Carbon-Neutral Logistics
X4: Waste Management

Regression Model Output:
$Y = 0.30X1 + 0.25X2 + 0.22X3 + 0.20X4 + \varepsilon$
$R^2 = 0.64$
F-statistic = 15.9, $p < 0.01$

Interpretation:
The model explains 64% of the variation in environmental performance. Green procurement and sustainable packaging are the most significant predictors. The regression is statistically significant, confirming the value of SSC practices.

4.7 ANOVA: Company Type vs. Adoption of SSCM

To test whether company type (MNC vs. Domestic) influences the level of sustainability adoption:

MNCs: Mean SSCM score = 4.1
Domestic Firms: Mean SSCM score = 3.5
ANOVA F-value = 6.75, $p < 0.01$

Interpretation:
There is a statistically significant difference in SSCM adoption between MNCs and domestic companies, with MNCs having a more mature approach due to global standards and stakeholder pressure.

4.8 Key Findings

High adoption of green procurement and ethical sourcing among FMCG firms, especially MNCs.
Cost and supplier resistance are the top two barriers to SSCM implementation.

Sustainable practices are positively correlated with both environmental and operational performance.

MNCs lead domestic firms in the adoption and integration of SSCM strategies.

There is a need for supplier training and engagement to build collaborative sustainability efforts

V. FINDINGS, SUGGESTIONS, AND CONCLUSION

5.1 Summary of Key Findings

Based on the data analysis and interpretation in Chapter 4, several key insights have emerged regarding the adoption and impact of sustainable supply chain practices (SSCPs) in the FMCG sector:

1. Adoption of Sustainable Practices
- Green procurement and ethical sourcing have the highest levels of adoption, particularly among multinational corporations.
- Practices like sustainable packaging and waste recycling are moderately adopted, while carbon-neutral logistics and supplier sustainability audits

are still underdeveloped, especially in domestic firms.

2. Impact on Performance

- There is a strong positive correlation between SSCPs and environmental and operational performance.
- Practices such as green procurement and sustainable packaging significantly contribute to reducing emissions, improving efficiency, and enhancing brand image.

3. Challenges in Implementation

- The top challenges include:
- High cost of implementation
- Lack of supplier compliance and awareness
- Internal resistance to change

5.2 Suggestions and Recommendations

Based on the findings, the following actionable suggestions are proposed for FMCG companies, policymakers, and supply chain managers:

CONCLUSION

The research concludes that sustainable supply chain practices are not only environmentally necessary but also strategically advantageous for FMCG companies. By adopting SSCM strategies such as green procurement, eco-packaging, and ethical sourcing, organizations can improve operational efficiency, reduce environmental impact, and enhance brand reputation.

However, significant barriers such as cost, limited supplier capability, and internal resistance must be overcome to scale these practices effectively—especially for small and medium-sized enterprises. MNCs lead the way, but the FMCG sector as a whole must accelerate its transition toward sustainability.

This study reinforces the need for collaborative efforts among companies, suppliers, regulators, and consumers to build resilient, responsible, and future-ready supply chains.