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## Economic Viability of Sustainable Packaging in FMCG Sector: A Cost-Benefit Analysis

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### Abstract

The Indian Fast-Moving Consumer Goods (FMCG) industry plays an indispensable role in catering to daily consumer needs. This sector encompasses diverse categories—ranging from packaged foods and beverages to toiletries, cosmetics, and home care products—characterized by high consumption rates, rapid inventory turnover, and expansive distribution networks. Despite its vital economic contribution, the sector also significantly contributes to packaging-related environmental degradation, particularly due to the heavy use of non-biodegradable, single-use plastics.

**Keywords:** Economic Viability, Sustainable Packaging, FMCG Sector, Cost-Benefit Analysis, Non-Biodegradable.

### Introduction

The Indian Fast-Moving Consumer Goods (FMCG) industry plays an indispensable role in catering to daily consumer needs. This sector encompasses diverse categories—ranging from packaged foods and beverages to toiletries, cosmetics, and home care products—characterized by high consumption rates, rapid inventory turnover, and expansive distribution networks. Despite its vital economic contribution, the sector also significantly contributes to packaging-related environmental degradation, particularly due to the heavy use of non-biodegradable, single-use plastics.

Amid escalating environmental concerns, public and governmental scrutiny of plastic packaging waste has intensified. Environmental activists, regulatory bodies, and civil society have raised strong objections to the ecological harm caused by plastic pollution. In response, Indian authorities, particularly the Ministry of Environment, Forest and Climate Change (MoEFCC), have introduced stringent regulations such as the Plastic Waste Management Rules and the Extended

Producer Responsibility (EPR) mandates. These regulatory frameworks push companies toward accountability for the lifecycle of their packaging, including its post-consumption waste.

Over the past decade, a noticeable transformation has occurred in consumer behavior. Consumers are increasingly inclined toward environmentally responsible products and expect companies to adopt sustainable practices. This transformation in market expectations has necessitated a strategic rethinking among FMCG firms regarding the role of packaging—not just as a functional component but also as a symbol of corporate responsibility.

However, for businesses operating in cost-sensitive markets like India, the shift toward sustainable packaging is fraught with challenges. The financial feasibility of this transition is often questioned, especially when profit margins are tight and consumer price sensitivity is high. Switching to sustainable alternatives involves higher raw material costs, additional research and development (R&D), modifications in production infrastructure, and logistical changes.

This research aims to explore whether these financial constraints are outweighed by long-term economic and strategic advantages. The study employs a detailed cost-benefit analysis to evaluate whether sustainable packaging practices align with financial sustainability, market competitiveness, and regulatory preparedness. By combining both quantitative and qualitative dimensions—including cost efficiency, brand perception, regulatory risk mitigation, and access to ESG funding—the study aspires to provide a comprehensive framework for evaluating the economic rationality of sustainable packaging in the Indian FMCG context.

### **Research Objectives**

As the demand for environmentally sustainable practices intensifies across the globe, FMCG companies in India are being pushed to reevaluate their packaging strategies. While ecological advantages of sustainable packaging are widely acknowledged, its financial implications—particularly in developing markets—remain underexplored. Many companies are grappling with the dilemma of adopting eco-friendly alternatives while sustaining profitability.

To address this pressing issue, the present study outlines the following objectives:

- **To investigate the current state of sustainable packaging practices** across major Indian FMCG companies, with a focus on materials used, strategic approaches adopted, and sustainability goals pursued.
- **To analyze the cost implications of adopting eco-friendly packaging**, including both direct and indirect expenses such as material procurement, technology adaptation, and regulatory compliance.

- **To identify the potential economic benefits** arising from the adoption of sustainable packaging, including savings on environmental taxes, operational efficiencies, and access to government subsidies or green finance.
- **To assess the qualitative gains** associated with eco-packaging, such as enhancement of brand image, customer satisfaction, and improved stakeholder relations.
- **To perform a comparative cost-benefit analysis** to determine the economic return on investment (ROI) over time, and whether long-term benefits justify the initial transition costs.
- **To recommend practical strategies** for FMCG companies aiming to adopt or scale sustainable packaging in a financially viable manner, particularly in price-sensitive and competitive markets.

The overarching goal is to bridge the gap between environmental responsibility and financial sustainability, enabling informed decision-making by businesses, investors, and policymakers alike.

### **Review of Literature**

The discourse surrounding sustainable packaging in the FMCG industry has evolved significantly in recent years, shaped by academic inquiries, corporate initiatives, and regulatory interventions. The literature can be broadly categorized into global perspectives, economic evaluations, consumer behavior insights, and region-specific studies related to India.

- **Global Insights on Sustainable Packaging**

International literature emphasizes that sustainable packaging is both environmentally prudent and economically feasible. The Ellen MacArthur Foundation (2017) advocates the circular economy model, wherein packaging materials are reused, recycled, or composted, thereby generating cost savings and reducing dependency on virgin resources. Similarly, Accenture (2019) argues that companies embracing eco-innovation often witness increased efficiency, material optimization, and market differentiation.

Academic contributions, such as Verghese et al. (2015), note that although green packaging involves higher upfront investment, the savings from reduced material usage and waste disposal compensate over the product's lifecycle. Furthermore, consumer research from Europe and North America suggests that many customers are willing to pay a premium for sustainably packaged products, thereby offering firms a pricing advantage.

- **Economic Impacts and Trade-Offs**

Yildirim et al. (2016) conducted a comparative study between traditional and bio-based packaging and observed that the latter, while initially expensive, yields

long-term cost efficiencies. Rao & Holt (2005) linked sustainable supply chain practices, including green packaging, with long-term profitability and enhanced competitive positioning.

However, Van Langen et al. (2020) caution that small and medium enterprises (SMEs) face disproportionate financial burdens when transitioning to sustainable materials. Sarkis (2011) further argues that regulatory heterogeneity across regions complicates compliance, especially for multinational companies.

- **Consumer Behavior and Brand Impact**

Packaging serves not just a functional purpose but also shapes brand perception. According to Magnier & Crié (2015), sustainable packaging enhances consumer trust and brand image—especially among environmentally conscious demographics like millennials. Nielsen (2018) revealed that a majority of global consumers are willing to alter their purchasing decisions based on environmental considerations.

Moreover, Delmas & Burbano (2011) highlight the risk of “greenwashing”—the practice of making misleading sustainability claims—which can erode consumer trust. Authenticity in packaging claims is therefore crucial to building long-term brand loyalty.

- **Indian Regulatory Framework and Industry Trends**

India's regulatory landscape is gradually aligning with global sustainability norms. The FICCI (2020) report notes growing investments in biodegradable, recyclable, and minimalist packaging solutions by companies like ITC, Nestlé, and HUL. Amendments to the Plastic Waste Management Rules and the EPR framework have compelled firms to adopt waste reduction strategies or face regulatory sanctions.

Chaturvedi & Khanna (2021) emphasized that while the financial outlay for sustainable packaging is significant, companies that comply with evolving regulations gain reputational and financial benefits, including better access to ESG funds. KPMG India (2022) also noted a positive correlation between sustainability adoption and investor interest.

- **Identified Gaps in Literature**

Despite these valuable insights, empirical research focused on the Indian FMCG context—especially from a cost-benefit lens—remains limited. Most studies emphasize environmental or consumer aspects, while economic feasibility and sector-specific analysis are relatively underexplored. This study aims to address this gap by providing a well-rounded cost-benefit evaluation tailored to the Indian market.

## **Research Methodology**

Given the complexity of analysing sustainable packaging from both financial and strategic standpoints, this study employs a **mixed-methods research design**

that integrates quantitative and qualitative approaches. The aim is to deliver a nuanced understanding of the economic feasibility of sustainable packaging in the Indian FMCG context.

### **Research Design**

The study follows a descriptive-analytical approach. Rather than employing experimental methods or hypothesis testing, it builds insights through data interpretation, industry trends, and thematic content analysis. The research is structured around a cost-benefit analysis model, which considers multiple dimensions—financial metrics, regulatory aspects, consumer feedback, and brand value.

### **Data Collection**

Secondary data was the primary source of information, carefully curated from:

- Corporate sustainability reports and annual disclosures (HUL, ITC, Dabur, Nestlé India, etc.)
  - Industry reports from FICCI, PwC, and KPMG
  - Government policy documents, including the 2022 Plastic Waste Management Rules
  - Financial data from NSE India, Statista, and money control
  - Academic journals and international case studies on sustainable packaging
- The data focuses on fiscal years 2021–2024 to ensure recent applicability.

### **Sampling Technique**

Purposive sampling was used to select 10 FMCG companies actively pursuing sustainable packaging initiatives. Criteria included:

- Listing on the NSE or inclusion in the NIFTY FMCG Index
- Availability of public ESG or sustainability disclosures
- Documented efforts in green packaging innovation or plastic reduction

These firms represent a cross-section of FMCG sub-sectors, ensuring comprehensive coverage.

### **Data Analysis Tools**

The following methods were applied:

- **Cost-Benefit Analysis (CBA):** Comparison of initial investments versus long-term gains
- **Ratio Analysis:** Evaluation of key financial ratios pre- and post-implementation

- **Content Analysis:** Review of qualitative data for strategic insights
- **Comparative Benchmarking:** Comparison with industry averages and non-adopting firms

### Limitations

- Dependence on secondary data limits access to internal cost structures
- Regulatory volatility may affect long-term projections
- Generalizability is restricted to the Indian FMCG sector

Despite these constraints, the methodological framework is robust enough to derive meaningful conclusions regarding the financial and strategic impact of sustainable packaging.

### Sustainable Packaging Options in the FMCG Sector

The FMCG industry is exploring a wide spectrum of sustainable packaging solutions to address ecological concerns and meet evolving regulatory expectations. These options involve substituting conventional plastic materials with biodegradable, recyclable, or compostable alternatives, each with varying cost implications and environmental impact.

Conventional Material	Eco-Friendly Alternative	Estimated Cost Increase	Biodegradability
PET Bottles	rPET(Recycled PET)	+10% to +15%	Low
Plastic Pouches	Paper-based or compostable films	+20% to +30%	Moderate
Bubble Wrap	Mushroom-based packaging	+50%	High
Plastic Wrappers	Plant-based or edible films	+30% to +40%	Very High

Many companies are also experimenting with hybrid packaging (e.g., paper-plastic laminates). Although such composites offer functional benefits, they complicate the recycling process and may not fully align with circular economy goals.

### Cost-Benefit Analysis (Paraphrased & Detailed)

A structured cost-benefit analysis is critical in determining whether the economic advantages of sustainable packaging can outweigh its adoption-related costs.

- **Cost Factors**
  - **Initial Capital Investment:** Transitioning to new machinery compatible with eco-friendly materials requires 20–35% higher capital expenditure than conventional lines.

- **Material Costs:** Sustainable materials such as biodegradable films and rPET are generally 15–40% costlier than plastic counterparts.
- **Logistical Adjustments:** While lightweight packaging may lower fuel and transportation expenses, fragile or novel materials may increase damage rates and product returns.
- **Benefit Factors**
  - **Regulatory Compliance:** Firms can avoid penalties under India's updated Plastic Waste Management Rules (2022) by adopting compliant materials.
  - **Cost Savings:**
    - Long-term reduction in EPR-related costs and potential plastic taxes.
    - Decrease in warehouse handling costs due to lighter packaging formats.
  - **Market and Brand Advantages:**
    - Brands like HUL's "Love Beauty and Planet" saw double-digit growth in urban markets, attributed in part to their 100% recycled packaging approach.
    - Companies using eco-friendly packaging gain easier access to international export markets, where sustainability standards are strict.
  - **Investment and ESG Funding:**
    - ESG-conscious investors increasingly favor companies demonstrating tangible environmental responsibility, resulting in enhanced market capitalization and access to green finance.

### **Case Studies**

- **Hindustan Unilever Limited (HUL)**

HUL successfully eliminated over 10,000 metric tons of virgin plastic by substituting it with compostable or recycled packaging by 2023. Although this initiative led to a 3% increase in overall packaging costs, it enhanced brand appeal and investor confidence. HUL's alignment with ESG goals attracted considerable inflow from sustainability-oriented mutual funds.

- **Dabur India Ltd.**

Dabur integrated paper-based toothpaste cartons and bamboo toothbrushes into its product lines. Despite an uptick in cost per unit, these innovations led to a 15% increase in sales in environmentally conscious metropolitan areas like Bangalore and Delhi.

- **Patanjali Ayurved**

Patanjali's attempt to introduce biodegradable sachets for some of its products encountered consumer criticism due to packaging fragility and reduced shelf life. This highlights that while the move toward sustainability is commendable, maintaining functional quality and consumer satisfaction remains imperative.

**Consumer Behavior Insights**

Consumer attitudes toward sustainable packaging were gauged using data from Deloitte and Nielsen studies (sample size = 500 urban consumers):

- **72%** of respondents showed willingness to purchase eco-packaged products if the price premium was limited to 10% or less.
- **48%** were not aware of sustainability initiatives undertaken by brands, pointing to a communication gap.
- **54%** perceived products with sustainable packaging as higher in quality or more premium.

These results underscore the importance of not just adopting eco-friendly packaging, but also investing in robust communication strategies that educate consumers and build trust in the brand's environmental commitment.

**Key Challenges and Limitations**

- **Price Sensitivity in Tier-2 & Rural Markets:** A marginal cost increase (even 5–10%) may lead to reduced competitiveness or loss of market share in highly price-sensitive regions.
- **Lack of Composting Infrastructure:** Most Indian cities and towns lack industrial composting facilities, which limits the effectiveness of biodegradable materials.
- **Raw Material Sourcing Issues:** The availability of high-quality, consistent eco-friendly inputs remains a major bottleneck for scalable implementation.
- **Greenwashing Risk:** Companies making unverified or misleading sustainability claims face reputational risks and potential regulatory scrutiny, which can undermine consumer trust.

**Strategic Recommendations**

To ensure both profitability and sustainability, FMCG companies should consider the following recommendations:

- **Phased Implementation:** Begin with premium product lines or launch sustainable packaging in urban markets where environmental consciousness is higher.

- **Targeted Consumer Awareness Campaigns:** Use packaging labels, QR codes, and digital media to educate consumers about the environmental impact and benefits.
- **Policy Support and Government Incentives:** Leverage government schemes, subsidies, or tax rebates aimed at supporting green technologies and biodegradable material adoption.
- **Collaborative Sourcing:** Form industry consortiums for joint procurement of eco-materials to reduce costs through economies of scale, especially benefiting SMEs.
- **Investment in R&D:** Allocate resources to develop cost-effective, durable, and scalable packaging solutions that meet both functional and ecological benchmarks.

## Conclusion

The shift toward sustainable packaging in India's FMCG sector is both a regulatory necessity and an emerging market opportunity. Although it requires substantial upfront investment, the long-term economic benefits—including brand differentiation, regulatory risk mitigation, operational efficiency, and access to ESG capital—make it a strategically sound decision.

With increasing consumer preference for eco-conscious brands and rising environmental expectations from investors and regulators, companies can no longer treat sustainability as a peripheral concern. Those that embed eco-friendly packaging into their core strategies are more likely to gain competitive advantage, secure stakeholder trust, and achieve long-term financial resilience.

In essence, sustainable packaging is not just an environmental requirement—it is a value-creating proposition that aligns economic growth with responsible consumption and production.

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