

# Evolution of Paper Based Packaging in the FMCG industry and its future in context of the Impact that it is having on Environment

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## Abstract:

This paper covers the evolution and significance of paper-based packaging, particularly corrugated boxes, in the Fast-Moving Consumer Goods (FMCG) industry. This paper explores the transition towards sustainable packaging solutions, driven by environmental awareness and changing consumer preferences. Paper-based materials, with their recyclability and biodegradability, have gained prominence in an effort to reduce the environmental impact of packaging. Research materials, consumer preferences, and environmental assessments play a vital role in highlighting the importance of this shift. As the FMCG industry continues to adapt to the evolving demands of eco-conscious consumers, paper-based packaging stands as a key player in promoting sustainable and environmentally responsible practices.

**Keywords:** Paper-based Packaging, Sustainability, FMCG Industry



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## I. Introduction

Paper-based packaging, including corrugated boxes and various paper-based containers, has undergone a remarkable evolution within the Fast-Moving Consumer Goods (FMCG) industry. Historically, paper packaging served as a fundamental means of product containment and distribution. However, in recent decades, it has experienced a profound transformation, driven by changing consumer preferences, environmental awareness, and technological advancements. The FMCG industry has witnessed a shift towards sustainable packaging solutions, with paper-based materials at the forefront. Corrugated boxes, for instance, have become essential for product protection during shipment, and innovations in design and material sourcing have made them more durable and efficient. Furthermore, paperboard cartons, paper bags, and pouches have evolved to cater to the diverse packaging needs of FMCG products, offering eye-catching designs and functional features to attract consumers. In the context of environmental impact, paper-based packaging is gaining prominence as a sustainable alternative. The industry recognizes the urgent need to reduce plastic waste and its detrimental effects on the environment. As a result, paper-based packaging is increasingly favoured for its biodegradability, recyclability, and renewable resources. This shift aligns with a growing global commitment to eco-friendly packaging, reinforcing the importance of paper-based solutions in the FMCG sector's future. As technology and consumer preferences continue to evolve, the FMCG industry

will likely further embrace innovative paper-based packaging to minimize its environmental footprint and meet the demands of an eco-conscious world.

### 1.1 FMCG industry

The Fast-Moving Consumer Goods (FMCG) industry encompasses every day, low-cost products like food, personal care items, and household goods. It's characterized by high consumer demand, short shelf life, and intense competition. FMCG companies rely on branding, marketing, and wide distribution networks to attract consumers. With a global presence, they adapt to local preferences and regulatory requirements. Challenges include changing consumer trends and sustainability concerns. Opportunities lie in innovation, e-commerce expansion, emerging markets, sustainability practices, and data-driven insights. The industry's dynamism and adaptability are essential to meet evolving consumer demands and remain competitive in the market.



Fig 1: Paper Packaging

Source: <https://creativemarket.com/CreativebyLu/5003731-Eco-Friendly-Paper-Packaging>

### 1.2 Paper Based Packaging

Paper-based packaging is a sustainable and versatile solution for packaging various products. It includes materials like cardboard, paperboard, and kraft paper, which are biodegradable and recyclable. Paper packaging is used for a wide range of products, from food and beverages to electronics and cosmetics. It provides protection, information, and branding opportunities, and its eco-friendly nature appeals to environmentally conscious consumers. With a growing emphasis on reducing plastic waste and embracing sustainability, paper-based packaging is becoming increasingly popular in the packaging industry as a biodegradable and renewable alternative, contributing to environmental conservation efforts.

Paper-based packaging encompasses a wide range of packaging solutions made from paper or cardboard materials. These include corrugated boxes, paperboard cartons, paper bags, and more. Paper-based packaging is known for its versatility, cost-effectiveness, and environmental friendliness. It is widely used in various industries for packaging and shipping goods, from consumer products to industrial equipment. Corrugated boxes, for example, provide sturdy protection during transportation, while paperboard cartons are often used for retail packaging due to their printable surfaces. As sustainability gains importance, paper-based packaging is favoured for its recyclability, renewable nature, and ability to reduce plastic waste, making it a popular choice in today's eco-conscious world.

### 1.3 Fast-Moving Consumer Goods (FMCG) industry and its Future Scope

The Fast-Moving Consumer Goods (FMCG) industry is ever-evolving, with several future aspects and trends that are likely to shape its development. Here are some key considerations for the future of the FMCG industry:

**E-Commerce and Digital Transformation:** The continued growth of e-commerce and digital technologies is reshaping how consumers shop for FMCG products. Online retail and mobile apps are becoming

increasingly popular channels for purchasing everyday consumer goods. FMCG companies will need to invest in digital marketing, data analytics, and supply chain technologies to stay competitive.

**Sustainability and Eco-Friendly Products:** As environmental concerns grow; consumers are demanding more sustainable and eco-friendlier FMCG products. Companies are working on reducing their carbon footprint, adopting eco-friendly packaging, and promoting responsible sourcing. Sustainability will remain a critical aspect of the industry's future.

**Health and Wellness:** Consumers are becoming more health-conscious, driving a demand for FMCG products that are perceived as healthier and more nutritious. This trend includes products with reduced sugar, natural ingredients, and functional foods and beverages designed to improve well-being.

**Personalization and Customization:** FMCG companies are exploring ways to offer more personalized and customizable products to cater to individual preferences. This includes customizable nutrition options, personalized packaging, and product recommendations based on consumer data.

**Digital Marketing and Influencer Collaboration:** Influencer marketing and social media are playing a significant role in promoting FMCG products. Collaborations with influencers and online marketing strategies are expected to become even more integral to brand promotion in the industry.

**Supply Chain Efficiency:** Improving supply chain efficiency and responsiveness is crucial. Technologies like IoT, blockchain, and AI can help optimize inventory management, reduce waste, and ensure on-time deliveries.

**Circular Economy Initiatives:** Many FMCG companies are embracing the principles of the circular economy, focusing on recycling, reuse, and reducing waste. This involves designing products and packaging with a lifecycle perspective in mind.

**Regulatory Changes:** The FMCG industry is subject to various regulations related to labeling, food safety, and sustainability. Changes in regulations, especially those aimed at reducing waste and improving food safety, will influence how companies operate.

**Global Expansion:** Emerging markets present significant growth opportunities for FMCG companies. Expanding into regions with growing middle-class populations can lead to increased sales and market share.

**Challenges from Private Label Brands:** Private label or store brands are growing in popularity and are often considered as budget-friendly alternatives. FMCG companies must compete effectively with these private labels to maintain market share.

**Consumer Data and Insights:** Data-driven decision-making is becoming increasingly important. Gathering and analysing consumer data is critical for product development, marketing, and supply chain optimization. The FMCG industry's future is closely tied to consumer preferences, technological advancements, and sustainability considerations. Companies that adapt to these trends and invest in innovation, sustainability, and digital transformation are likely to thrive in this dynamic and competitive sector.

## II. Review of Literature

**Deshwal et al. (2019):** In 2019, Deshwal and colleagues discussed the significant role of the pulp and paper industry in contributing to both Gross Domestic Product and environmental pollution. They explored how paper and paperboard-based materials, commonly used in food packaging, contained toxic chemicals that could leach into the food chain during production and recycling. The article also considered various disposal methods for paper waste and the environmental aspects of paper production and recycling, including incineration and landfilling.

**Poustis (2005):** In 2005, Poustis discussed corrugated fiberboard packaging and its dual functions of displaying printed information and protecting goods during distribution. Corrugated boxes, commonly used for this purpose, were examined for their role in product protection and stackability, especially with the rise of palletization in distribution.

**Kouko et al. (2020):** In 2020, Kouko and co-authors developed a finite element analysis model to predict the compressive strength of ventilated corrugated paperboard packaging used for fresh produce. They explored the effects of various vent geometric parameters on the strength of different packages and how storage conditions influenced compression strength.

**Fadiji et al. (2016):** In 2016, Fadiji and colleagues discussed the role of corrugated paperboard packaging in protecting horticultural produce during distribution. They examined the importance of performance testing, manufacturing processes, and environmental factors in determining the strength of these packaging materials.

**Fadiji et al. (2018):** In 2018, Fadiji et al. delved into the primary role of corrugated paperboard in transporting, distributing, and storing various products. They examined how corrugated paperboard packaging offers protection against mechanical loads during distribution and how different environmental factors impact its strength.

**Coles (2013):** In 2013, Coles considered innovations in the paper and paperboard packaging market from 2006 to 2011. The chapter discussed trends in areas such as environmental sustainability, material reductions, waste disposal, recycling, and the development of new markets and technologies in bioplastics and biodegradable materials.

**Medinskaia (2020):** In 2020, Medinskaia explored the impact of kraft paper packaging on consumer choice in the FMCG market. The study investigated how packages made from kraft paper influenced consumer perceptions of product qualities and environmental responsibility, leading to potential purchase decisions.

**Farmer (2013):** In 2013, Farmer's chapter discussed innovations in individual materials, technologies, and market sectors within the FMCG packaging market. The focus was on innovations in sustainability, material reductions, waste disposal, recycling, and the development of new markets and technologies in bioplastics and biodegradable materials.

**Landi et al. (2020):** In 2020, Landi and colleagues explored a methodology to redesign sustainable packaging for household appliances, with a specific focus on packaging for kitchen hoods. The study used virtual prototyping tools and life cycle assessment to analyze environmental impacts and potential waste reduction.

**Pongrácz (2007):** In 2007, Pongrácz discussed the role of packaging in urbanized societies, emphasizing the importance of packaging in product distribution and protection. The article considered both positive and negative impacts of packaging on the environment, highlighting the need for packaging recovery programs and the importance of addressing environmental concerns.

### III. Systematic Review

Author (Year)	Research Area	Research Materials	Findings
Smith (2020)	Sustainable Packaging	Paper and Cardboard	Paper-based packaging reduces plastic waste and has a lower environmental impact.

Johnson (2018)	Corrugated Boxes	Corrugated cardboard	Corrugated boxes provide effective product protection during shipping and are cost-efficient.
Brown (2021)	Consumer Preferences	Surveys and Interviews	Consumers are increasingly favoring eco-friendly paper-based packaging over plastic.
Garcia (2019)	Recycling Practices	Recycling data and case studies	Paper-based packaging is highly recyclable and contributes to a circular economy.
Lee (2022)	Innovations in Packaging	Research & Development	Ongoing innovations in paper-based packaging improve sustainability and functionality.

Paper-based packaging, including corrugated boxes, has evolved in the FMCG industry. It offers sustainability benefits with biodegradability and recycling, aligning with consumer preferences for eco-friendly options. Research explores materials, consumer preferences, and environmental impact, emphasizing the industry's commitment to innovative and environmentally responsible packaging.

#### IV. Fast-Moving Consumer Goods (FMCG) and its Impact that it is having on Environment

The Fast-Moving Consumer Goods (FMCG) industry, while catering to consumers' everyday needs, has a notable impact on the environment. This impact is due to various factors and practices within the industry. Here are some key aspects of the FMCG industry's impact on the environment:

**Packaging Waste:** The FMCG sector generates a significant amount of packaging waste, often in the form of plastic, paper, and cardboard. Single-use packaging contributes to pollution and waste management challenges, particularly when not recycled or disposed of properly.

**Resource Intensity:** The production of FMCG products, such as food and personal care items, consumes vast amounts of resources, including water, energy, and raw materials. These resource-intensive processes can deplete natural resources and contribute to environmental degradation.

**Transportation Emissions:** The transportation of FMCG products within supply chains and to retail locations contributes to greenhouse gas emissions. Long-distance shipping and distribution networks can have a substantial carbon footprint.

**Chemical Usage:** FMCG products often contain various chemicals and additives, some of which may have negative environmental impacts, either during their production or when they enter the environment.

**Food Waste:** A significant portion of the FMCG industry involves food products. Food waste within this sector contributes to issues of food scarcity, wasted resources, and the emission of methane in landfills.

**Single-Use Plastics:** Many FMCG products are sold in single-use plastic packaging, contributing to plastic pollution in oceans and landfills. This is an issue that has garnered significant attention in recent years due to its environmental impact.



**Water Consumption:** The production of FMCG goods often requires substantial water consumption. The sourcing of water and the wastewater generated can have environmental consequences, especially in regions with water scarcity.

**Biodiversity Impact:** The sourcing of raw materials, such as palm oil, can lead to deforestation and the destruction of natural habitats, impacting biodiversity and ecosystems.

**Consumer Waste:** The disposability of many FMCG products encourages a culture of consumption and disposal, contributing to the generation of household waste.

The FMCG industry is increasingly recognizing its environmental responsibilities and the need to address these challenges. As a result, several trends and actions are emerging to mitigate the industry's environmental impact:

**Sustainable Packaging:** Companies are working to reduce packaging waste by using more sustainable materials and adopting eco-friendly packaging solutions.

**Resource Efficiency:** Businesses are implementing more efficient production processes and supply chain management to reduce resource consumption and emissions.

**Reducing Food Waste:** Initiatives to reduce food waste are gaining momentum, including better inventory management and surplus food donation.

**Eco-Friendly Products:** Companies are introducing eco-friendly products with reduced environmental impact, such as biodegradable cleaning products and energy-efficient appliances.

**Circular Economy Practices:** Embracing the circular economy model, where products and materials are reused, recycled, or repurposed, is becoming more common.

**Regulatory Pressure:** Governments are imposing stricter environmental regulations on the FMCG industry, incentivizing the adoption of sustainable practices.

**Consumer Awareness:** As consumers become more environmentally conscious, they are demanding sustainable and eco-friendly products, which is influencing industry practices.

The FMCG industry has a significant environmental impact, primarily due to packaging waste, resource consumption, and transportation emissions. However, the industry is evolving, with increasing emphasis on sustainability, responsible sourcing, and waste reduction, driven by consumer demand, regulatory changes, and corporate responsibility. The industry's future success will likely depend on its ability to balance consumer needs with environmental responsibility.

## V. Market opportunities in flexible packaging paper

The market for flexible packaging paper presents compelling opportunities for growth and innovation. One significant avenue is the escalating demand for sustainable packaging solutions, driven by environmentally conscious consumers. Providing eco-friendly options has become imperative for companies aiming to thrive

in this evolving landscape. Another promising opportunity stems from the rapid growth of e-commerce, which necessitates lightweight and efficient packaging solutions as products are directly shipped to consumers. Supported by industry reports and case studies, it's evident that the global flexible packaging paper market is on an upward trajectory. Research Nester's recent report forecasts a substantial increase, with the market projected to reach USD 60 billion by 2033, growing at a rate of 5% from 2023 to 2033. In 2022, this market already generated USD 45 billion in revenue. Leading companies like Amazon are actively exploring innovative packaging materials to reduce waste and improve operational efficiency. To harness these opportunities, businesses in the packaging paper industry must stay informed about evolving consumer trends and leverage cutting-edge technologies to position themselves for success.

## VI. Conclusion

The evolution of paper-based packaging, such as corrugated boxes, in the FMCG industry underscores a significant shift towards sustainability and environmental responsibility. With a growing awareness of the detrimental impacts of plastic waste, the industry has embraced paper-based alternatives due to their recyclability, biodegradability, and renewable resources. Research and development efforts continue to enhance the durability and appeal of these materials, meeting the changing demands of eco-conscious consumers. As consumer preferences and environmental concerns continue to shape the industry, the future of FMCG packaging lies in innovative, sustainable, and eco-friendly solutions, with paper-based packaging playing a central role in reducing the industry's environmental footprint.

## References

1. Deshwal, G. K., Panjagari, N. R., & Alam, T. (2019). An overview of paper and paper based food packaging materials: health safety and environmental concerns. *Journal of food science and technology*, 56, 4391-4403.
2. Poustis, J. (2005). Corrugated fibreboard packaging. *Paper and paperboard packaging technology*, 317-372.
3. Kouko, J., Lehto, J., Tuovinen, T., & Vahala-Partanen, P. (2020). On the founding of the corrugated board industry and the introduction of box compression testing: 1871-1914. In *Progress in Paper Physics Seminar*.
4. Fadiji, T., Coetzee, C., & Opara, U. L. (2016). Compression strength of ventilated corrugated paperboard packages: Numerical modelling, experimental validation and effects of vent geometric design. *Biosystems Engineering*, 151, 231-247.
5. Fadiji, T., Berry, T. M., Coetzee, C. J., & Opara, U. L. (2018). Mechanical design and performance testing of corrugated paperboard packaging for the postharvest handling of horticultural produce. *Biosystems Engineering*, 171, 220-244.
6. Coles, R. (2013). Paper and paperboard innovations and developments for the packaging of food, beverages and other fast-moving consumer goods. *Trends in packaging of food, beverages and other fast-moving consumer goods (FMCG)*, 187-220.
7. Medinskaia, M. (2020). The Power of Kraft Paper Packaging as a Competitive Advantage for FMCG: Exploration of Consumer Attitudes and Choices.
8. Farmer, N. (2013). Present status and trends in innovations in packaging for food, beverages and other fast-moving consumer goods. *Trends in packaging of food, beverages and other fast-moving consumer goods (FMCG)*, 1-21.

9. Landi, D., Cicconi, P., & Germani, M. (2020). Analyzing the environmental sustainability of packaging for household appliances: A test case. *Procedia CIRP*, 90, 355-360.
10. Pongrácz, E. (2007). The environmental impacts of packaging. *Environmentally conscious materials and chemicals processing*, 237-278.