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Addressing Plastic Pollution: Research on Sustainable Practices and Strategies in the Consumer Goods Industry Supply Chain

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Abstract

Research Background: The consumer goods industry faces a significant sustainability challenge due to the environmental and social impacts of plastic pollution, particularly from single-use plastics. This essay addresses the current situation and the difficulty in implementing sustainability commitments within the industry. Research Objectives: The essay aims to propose solutions for sustainable supply chain management that balance economic, social, and environmental concerns, and to extend these solutions to other industries. Research Methods: The essay identifies the main sustainability issues, analyzes the problems, and proposes solutions based on the sustainable supply chain concept. Data from literature and expert opinions are synthesized to support the arguments. Conclusion: The essay establishes that the use of innovative packaging design, material optimization, and improved recycling systems are crucial for mitigating plastic pollution. It also emphasizes the importance of stakeholder collaboration and government intervention. The proposed solutions are not only applicable to the consumer goods industry but can be generalized to other sectors, highlighting the need for a unified approach to achieve sustainable development.

Keywords

Sustainable Operations, Supply Chain Management, Plastic Pollution, Consumer Goods Industry, Innovative Packaging, Recycling Systems, Stakeholder Collaboration, Government Intervention, Sustainable Development.

1. Research Background

The greatest sustainability challenge facing the consumer goods industry is the social and environmental impact of plastic pollution caused by plastic products. The widespread use and overconsumption of single-use plastics has become a global challenge, posing a serious threat to marine ecosystems, wildlife and human health (Phelan et al., 2022). The purpose of this essay is to address the current situation in the consumer goods industry and to present and analyze the problem of companies making sustainability commitments that are difficult to implement.

To solve this problem, this study proposes solutions from the perspective of sustainable supply chain by balancing the triple bottom line of economy, society and environment, and extends it to other industries.

2. Main Sustainability Issues

2.1. Problem identification

The use of plastic products has created a serious problem of plastic pollution in the environment. The massive production and non-biodegradable nature of plastic waste poses a major threat to marine ecosystems and wildlife, as well as affecting land and air quality (Beaumont et al., 2019). One of the most critical sustainability challenges in the consumer goods industry today is plastic pollution caused by single-use plastic products and how to actually implement the recycling of plastic packaging that companies have committed to. While many

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major consumer goods companies have pledged to replace all product packaging with more sustainable packaging by 2025 and to reduce the amount of plastic used in the production, distribution and use of their products, most do not have clear, measurable targets or detailed strategic plans to address the plastic pollution crisis (Why corporate leadership on plastic pollution is sorely lacking | Greenbiz, n.d.). "Replacing single-use packaging with reusable packaging" and "recycling plastic products efficiently" are only promises for most companies and have not yet been translated into action. The poor performance of companies indicates that they have not really moved to a recycling model. In short, the consumer goods industry has not addressed the pollution problem in a positive and comprehensive way, making it difficult to solve the plastic pollution crisis.

2.2. Analysis of the problem

Consumer goods industries, such as the beverage, fast food, FMCG, and retail manufacturing industries, are currently facing serious sustainability challenges, primarily due to the pollution caused by their overuse of single-use plastic packaging (Phelan et al., 2022). On the one hand, most companies lack related basic goals, strategy and planning, while at the same time lagging behind in establishing reusable packaging models to replace single-use packaging. This means that companies lack a clear direction and plan for sustainability and are not responding quickly and effectively. On the other hand, the problem has arisen specifically because companies have difficulty balancing the economic, social and environmental benefits of flexible packaging, recycling rates, recycling systems and corporate responsibility (Why Corporate Leadership on Plastic Pollution Is Sorely Lacking | Greenbiz, n.d.). For example, the use of flexible plastic packaging is still growing, but it is hard to recycle; the actual recycling rate of PET plastic is still far from meeting the commitments made by companies to use recycled plastic content in product packaging; the problem with recycling systems is that in the United States, for example, not only do companies have to bear higher recycling costs, but the lack of critical operating funds makes it difficult to maintain normal operations with limited levels of recycling; many companies are unwilling to take on either producer responsibility or to provide funding and solutions to improve recycling systems. As report author Conrad McKerron puts it, "It all comes down to responsibility. Brands will tell us, 'We're not in the waste business.' But we think it's a part of corporate responsibility that needs to happen in the future (Brands Neglect Sustainable Packaging | WARC, n.d.)." All of the above have become major obstacles that currently prevent companies from meeting their sustainability commitments.

3. Solutions

The solution to this problem requires the consumer goods industry to take more proactive and comprehensive measures. The industry needs to develop fundamental targets, strategies and planning (Unnikrishnan et al., 2020). Companies need to increase the use and promotion of reusable packaging, reduce the use of flexible packaging or improve recyclability, and improve recycling systems. At the same time, companies need toensure the real implementation of commitments and initiatives, and monitor transparency and accountability. Strengthening business-to-business and business-to-government cooperation and improving stakeholder participation and communication are key factors in solving sustainability problems. Government, business, NGOs and the public should work together to develop common goals and action plans to promote sustainable development (Norman & MacDonald, 2004).

3.1. Concept of sustainable supply chain

Sustainable supply chain introduces environmental factors based on traditional supply chain, which has not only economic benefits but also environmental benefits, aiming to produce the most environmentally friendly products with the least amount of energy and the greenest

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materials. Sustainable supply chain management covers the entire life cycle of a product from product design, raw material sourcing, manufacturing, transportation, and recycling and disposal (Carter & Liane Easton, 2011).

3.2. Problem solving through sustainable supply chain management

3.2.1. Reducing Plastic Use in Manufacturing

For the consumer goods industry, it is key for suppliers and manufacturers therein to reduce plastic use in the green manufacturing segment (Phelan et al., 2022). While the use of plastic is sometimes unavoidable, industry can reduce the amount of plastic in packaging by promoting innovative packaging design and optimizing material choices. Companies that can afford to do so are encouraged to phase out non-recyclable flexible plastic packaging and instead develop materials and products that can be used as alternatives to plastic products, such as biodegradable materials or materials that can be recycled and reused (Markus & Ramani, 2021). Additionally, during the product design and packaging process, companies should consider life cycle analysis and environmental impact assessment to extend product life, such as introducing reusable containers and packaging. Or promote the principles of plastic-free packaging and packaging simplification to further reduce plastic use. The principle of design is to minimize the environmental impact of products and their packaging throughout their life cycle while maintaining product performance and cost-effectiveness.

3.2.2. Economic, Environmental, and Social Impact Balancing

To achieve this goal, companies must consider how to balance the economic, environmental and social impacts of innovative packaging design and optimized material selection. First, companies can consider the costs and benefits of innovative packaging design and optimized material selection. Costs are: procurement costs for new packaging and materials, production costs, transportation costs, disposal costs and external costs related to the environment and society. The benefits come in the form of sustainable packaging that companies can use to attract consumers, increase market share for their products, and realize long-term financial gains. Companies should consider environmental issues early in their strategic planning to better anticipate future changes in laws and regulations, assess their risks in advance, and maintain their reputations. Business benefits also include: improved resource efficiency, product differentiation, reduced environmental impact from production to disposal, product innovation, and subsequent promotion of their sustainable products through green marketing. Through this cost-benefit analysis, companies can understand which innovative design and optimization choices are economically viable and can help them achieve long-term profitability.

3.2.3. Collaborations and Partnerships for Sustainable Operations

Moreover, companies can establish collaborations and partnerships with suppliers, recycling organizations, NGOs, which can help companies share risks and costs, and gain technical support and expertise for more sustainable supply chains and operations. Companies can also provide education and training to increase awareness and understanding of sustainability among employees and stakeholders. This can lead to better employee understanding and support for innovative packaging design and optimized material choices, as well as related environmental and social goals. Companies must be prepared to make improvements and innovations over time. Such continuous improvement and innovation can help reduce costs, increase efficiency and minimize negative environmental impacts.

3.2.4. Retailer's Role in Green Procurement

Retailers, as the core enterprises of the supply chain, should set appropriate green procurement standards, establish appropriate supplier lists, strengthen cooperation among supply chain members, realize the sharing of supply chain management experience, and give full play to the positive effects of green process technologies. At the same time, it is also necessary to

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strengthen the cooperation among supply chain members, make full use of their respective comparative advantages, establish an effective communication system, realize the effective control of logistics, capital flow and information flow, and improve the overall operational efficiency of the supply chain.

3.2.5. Recycling and Reuse Strategies

In addition, for plastic packaging that is produced or unavoidable, its environmental impact needs to be reduced through recycling and reuse by recyclers, which means the reverse logistics chain (Markley & Davis, 2007). It is estimated that 20% of the world's plastic packaging could be saved through reuse, with cost savings of approximately $900 million for these materials (The New Plastics Economy: Catalysing Action, n.d.). Therefore, manufacturers should actively form strategic alliances with suppliers and distributors to work together to recycle used packaging, saving production costs and gaining business benefits, as well as reducing environmental damage and gaining environmental benefits. Both companies and governments can work with recycling partnership organizations to invest in and support the development of recycling systems and improve the viability and sustainability of recycling systems. It is even more important for industry-leading companies to actively embrace producer responsibility by contributing a portion of their corporate revenues to fund infrastructure improvements needed to increase recycling rates and innovative solutions for recycling (Maloni & Brown, 2006).

3.2.6. Government and Consumer Involvement

Governments and consumers are also stakeholders in green supply chain management. Since conducting green process R&D can hardly bring direct economic benefits to enterprises in the short term, but rather increase their costs, most enterprises will be reluctant to conduct green process R&D. Therefore, the government needs to actively promote the establishment of a circular economy model, formulate and implement effective recycling policies, and support the establishment of corresponding technologies and infrastructure to achieve sustainable recycling of plastic waste (Geissdoerfer et al., 2017). Governments needs to be bridges for stakeholders to communicate and engage to ensure broad consensus and effective implementation of solutions. Governments should also strengthen the management and regulation of plastic products and encourage companies to shift to sustainable packaging and production methods by formulating relevant policies and tax measures. The government can formulate stricter regulations and standards to push relevant enterprises to fulfill their environmental responsibilities; introduce a mandatory producer responsibility system, which requires enterprises to be responsible for the life cycle management of packaging and products through the compulsion of law; and set up appropriate incentive mechanisms to promote the long-term development of green supply chains (Linton et al., 2007). Strengthening consumer education and participation to shape green consumption is also a difficult part of solving the plastic pollution problem. Consumer awareness can be raised through education and publicity campaigns, while the active participation of the government and enterprises is also needed. To improve environmental problems, consumers should also actively focus on choosing products with eco-friendly packaging and sustainable materials when purchasing and using products, and reduce the use of single-use plastic products.

3.3. Extension to other industries

These proposed solutions through sustainable supply chain management are not only applicable to plastic pollution in the consumer goods industry, but can also be generalized to other industries and operational issues. For example, in the food industry, reducing packaging waste and promoting sustainable agriculture and food supply chains can help achieve the Sustainable Development Goals. In the energy industry, promoting clean energy, researching and applying low-carbon and environmentally friendly technologies and materials are also key issues for sustainable supply chains. In the construction industry, promoting green building and

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sustainable building design to reduce energy and resource consumption. Examples of sustainable building practices include the use of renewable materials, improved energy efficiency, and the collection and use of rainwater. Other industries, when faced with other sustainability issues, can similarly address the problem by setting goals, formulating strategies, and taking positive action in the areas of green manufacturing, green consumption, reverse logistics, and green marketing. At the same time, both companies and governments need to foster cooperation and exchange among all relevant industries, improve stakeholder engagement and communication, and work together to promote the development of sustainable supply chains and operations.

4. Conclusion and Recommendations

4.1. Conclusion

Pollution from plastic products is a serious sustainability issue in the consumer goods industry. Companies' efforts to address this issue have been slow. However, through the application of sustainable supply chain, a way can be found to solve this problem. First, companies need to set clear goals and strategies, and work with suppliers, governments, and NGOs to promote the implementation of innovative packaging design and optimal material selection. In addition, companies should take a comprehensive view of the economic, environmental and social impacts and balance the costs and benefits of innovative measures. Governments should formulate relevant policies and regulations to encourage companies to switch to sustainable packaging and production methods and promote the implementation of producer responsibility. At the same time, consumers should be encouraged to develop green consumption concepts and habits. Finally, these solutions are not only applicable to the consumer goods industry, but can also be generalized to other industries and operational issues. In the future, all stakeholders need to work together to strengthen partnerships and promote sustainable development by balancing the triple bottom line to realize a solution to the plastic pollution problem and create a more sustainable world for the future.

4.2. Recommendations

4.2.1. For Companies

To effectively address the sustainability challenge posed by plastic pollution, companies must develop and implement comprehensive sustainability strategies with clear, measurable targets. This includes investing in research and development to innovate sustainable packaging alternatives and strengthen collaboration with suppliers and recyclers to enhance recycling systems. Additionally, companies should prioritize transparency and accountability in their sustainability initiatives, ensuring that their commitments translate into tangible actions and outcomes that reduce environmental impact and promote a circular economy.

4.2.2. For Governments

Governments play a pivotal role in shaping sustainable practices and should enact and enforce regulations that encourage the reduction of plastic waste, the adoption of eco-friendly materials, and the development of comprehensive recycling infrastructure. By providing incentives for innovation and implementing strict standards, governments can drive the transition towards a circular economy and ensure that the consumer goods industry operates within environmentally sustainable boundaries.

4.2.3. For Consumers

Consumers must also take responsibility for their consumption habits by choosing products with minimal plastic packaging, participating in recycling programs, and demanding transparency from brands about their environmental impact. Educating consumers on the

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importance of sustainable choices and the long-term consequences of plastic pollution can empower them to make informed decisions that contribute to a more sustainable future.

4.2.4. For Other Industries

Other industries should follow the lead of the consumer goods sector by adopting sustainable practices and supply chain management techniques. This includes reducing reliance on single-use plastics, investing in sustainable materials, and integrating environmental considerations into product design and lifecycle management. By doing so, all industries can contribute to the global effort to mitigate plastic pollution and support sustainable development goals.

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