Case Study on Sustainable Waste Management of FMCG Market returns

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Abstract

Aims: The study aims to analyze sustainable waste management strategies for market return products in the Fast-Moving Consumer Goods (FMCG) sector, focusing on their repurposing into alternative fuels and animal feed. It investigates innovative methods to enhance sustainability, operational efficiency, and environmental impact reduction.
Study Design: This research adopts a descriptive qualitative case study design.
Place and Duration of Study: The study was conducted in a major FMCG company in Indonesia over a period of six months, from January to June 2024.
Methodology: Data were collected through in-depth interviews with operational managers and sustainability officers, direct field observations of waste sorting and processing activities, and analysis of company documentation, including Standard Operating Procedures (SOPs) and sustainability reports. The waste management process was evaluated for its efficiency and potential to repurpose market return products into usable resources. Techniques such as barcode-based tracking systems and digital monitoring were also assessed for their impact on improving waste management practices.
Results: The findings highlight that approximately 75% of market return products could be repurposed, with 45% converted into alternative fuels, such as bio-pellets for industrial use, and 30% processed into animal feed. The integration of environmentally friendly technologies improved tracking and operational efficiency by 20%. Challenges identified include regulatory gaps and inconsistent waste handling practices across different regions.
Conclusion: Sustainable waste management of FMCG market returns not only minimizes environmental risks but also provides viable solutions for resource optimization, such as the production of alternative fuels and animal feed. These practices enhance operational efficiency and strengthen brand reputation. Future research should focus on developing comprehensive regulatory frameworks and scaling these solutions to other sectors.

Keywords: *Fast-Moving Consumer Goods, Market Returns, Waste Management, Quality Control, Safe Disposal,Sustainability, Animal Feed Repurposing*

1. INTRODUCTION

Sustainability Strategies in the Fast-Moving Consumer Goods (FMCG) Industry the FMCG industry holds immense potential for advancing renewable energy, particularly through innovative waste management solutions such as transforming sawdust into biofuel pellets. This approach addresses the dependency on fossil fuels while mitigating environmental impact.

Sustainable Strategies for FMCG Efforts to enhance sustainability in FMCG production and distribution include:

1. Eco-Friendly Materials: Shifting from plastics to biodegradable alternatives such as cloth bags, bamboo, and refillable containers.
2. Renewable Energy: Utilizing solar panels, wind power, and biofuels to energize operations and transportation fleets.
3. Sustainable Supply Chain Practices: Enhancing collaboration between suppliers and retailers, optimizing logistics to reduce environmental footprints.
4. Circular Economy: Minimizing waste and encouraging resource reuse through sustainable economic models.
5. Stakeholder Collaboration: Engaging communities, NGOs, and governments to promote responsible resource management, such as water conservation. These initiatives support long-term sustainability and lower environmental impact in FMCG operations. Characteristics of FMCG Products FMCG products, including packaged food, beverages, toiletries, and cosmetics, are defined by their high turnover and affordability. They often have a short shelf life, emphasizing the need for efficient production, distribution, and waste management. Key FMCG producers in Indonesia include Nestle, Unilever, Indofood, Garuda Food, and Ultra Jaya, among others.

Market Return Management Challenges Market return management is critical for maintaining brand reputation and environmental responsibility. Challenges include discrepancies in shipment documentation, improper waste disposal risks, and ensuring that expired products are securely destroyed. Mismanagement of these products can lead to reputational damage if compromised products reach consumers. Proposed Solutions:

1. Implementing a barcode-based calculation system integrated with a web-based monitoring application for real-time, accurate tracking of market returns.
2. Collaborating with third-party waste management companies to process expired goods into raw materials or alternative fuels, such as in the cement industry. Case Study: Waste in the Garment Industry Preliminary observations in household garment production identified waste from overproduction and defects as a significant challenge. Utilizing focused questionnaires and systematic observations can help quantify and address waste management issues.

Conclusion The FMCG industry can play a pivotal role in advancing sustainability through innovative waste management, eco-friendly practices, and renewable energy adoption. Efficient market return management and collaboration with stakeholders ensure reduced environmental impact and strengthened brand reputation. This approach not only aligns with global sustainability goals but also sets a benchmark for other industries to follow. This study underscores the need for an integrated approach to manage market returns and production waste, highlighting the importance of technology and collaboration in achieving sustainability objectives.

Product Innovation According to Kotler and Keller (2009), innovation encompasses new products, services, ideas, and perceptions. Innovation is defined as any product or service that consumers perceive as novel. In simpler terms, innovation can be seen as a breakthrough related to the creation of new products. However, Kotler also emphasizes that innovation extends beyond the development of new products or services. It includes new business ideas and processes, serving as a critical mechanism for companies to adapt to dynamic environments. Businesses are therefore encouraged to generate fresh ideas and innovative products while delivering exceptional service to customers.

Innovation is increasingly vital not only for ensuring business sustainability but also for gaining a competitive edge. Setiadi (2010) identifies five key characteristics of innovation:

1. Relative Advantage: The primary question to assess a product's potential success is whether it offers a significantly greater advantage than the product it replaces.
2. Compatibility: This refers to how well a product aligns with existing values and the past experiences of potential users, significantly influencing the acceptance of new products.
3. Complexity: The perceived difficulty in understanding and using an innovation affects its adoption. The more complex a product, the harder it is to gain user acceptance.
4. Trialability: The degree to which an innovation can be tested or tried before full commitment. Products that allow consumers to experiment in real conditions are generally adopted more quickly. To accelerate adoption, the product must demonstrate its advantages.
5. Observability: The extent to which the benefits or results of using an innovation are visible to others. Innovations with easily observable results are more likely to be adopted, as visibility and ease of communication help showcase their effectiveness to peers and communities. In summary, successful innovation involves creating products or ideas that provide clear benefits, align with user values, are easy to adopt, and offer tangible advantages that can be demonstrated and observed. These factors collectively determine the speed and likelihood of adoption by consumers.

2. Material and Methods

This study uses a qualitative descriptive method by seeking data on how to manage fast-moving consumer goods waste. Qualitative research is used to understand social phenomena that occur from the perspective of participants. Participants are people who are interviewed, observed and asked to provide opinions, data, thoughts and perceptions. Respondents in this study were the operational managers of PT. Karya Kita Jaya in Purwakarta city, Cinangka village. The initial observation step was to find out what was managed by the waste company, and the uses of the waste that had been managed. Then, data was taken at will to make it easier for researchers and to select respondents randomly. This study took a sample of 6 respondents. These respondents were interviewed with several questions and then the results of the interviews were recorded, documented, and analyzed. Furthermore, the answers between respondents were compared to reach conclusions regarding the processing of industrial waste that had been carried out.

Theoretical Framework, Basic Thinking and Research Hypothesis are as follows:

Theoretical Framework works In this final research assignment, the following theoretical framework can be put forward:

1. Fast Moving Cunsomer Goods (FMCG) products;
2. FMCG Product Producing Companies
3. Destruction Process as a basis for maintaining the Brand Image of FMCG Companies;

Meta data

Interviews or interviews are one form of interpersonal communication which is a form of direct communication without the intermediary of individual media, in this case the role of speaker and listener is done alternately, and often these roles are combined. Interviews are a dyadic communication process with serious intent and purpose, designed for the exchange of

behavior and involving a question and answer process. What is meant by the process in this case is the occurrence of a dynamic process alternately with several variables involved where the degree of the system/structure is not too certain
(flexible). While what is meant by dyadic is an interview or interview is an interaction between two parties (individual to individual) no more than two parties, namely the interviewer and the interviewe.

Research Approach This study employs a qualitative approach using a case study method to analyze and understand the operational implementation of waste management in the Fast-Moving Consumer Goods (FMCG) industry. The case study method was chosen to provide in-depth insights into the strategies, processes, and challenges companies face in managing product waste. Research Design The research focuses on analyzing operational processes within a specific FMCG company.

A case study design was selected for its ability to:

• Explain the specific context of waste management practices.
• Explore the connection between theoretical frameworks and real-world applications.
• Investigate on-ground practices in detail.

The study design includes:

• Unit of Analysis: The product waste management process within an FMCG company.
• Research Focus: Operational efficiency, technology adoption, and sustainability impacts.

Data Collection Multiple data collection methods were employed to ensure comprehensive and reliable findings:

1. In-depth Interviews:
    - Conducted with operational managers, sustainability officers, and employees directly involved in waste management processes.
    - Objective: To understand the implementation of strategies, operational challenges, and employee perceptions of the system.
2. Field Observations:
    - On-site observations of activities such as waste collection, sorting, and recycling.
    - Objective: To document processes and identify inefficiencies.
3. Documentation Analysis:
    - Examination of internal documents, including sustainability reports, Standard Operating Procedures (SOPs), and operational data.
    - Objective: To gather quantitative and qualitative data supporting the analysis.
4. Secondary Data:
    - Utilized industry reports, academic journals, and relevant articles to provide context and additional insights.
5. Validity and Reliability To ensure the study's validity and reliability, the following measures were adopted:
    - Methodological Triangulation: Combining interviews, observations, and documentation for a holistic perspective.

- Member Checking: Allowing respondents to review and validate preliminary findings.
- Audit Trail: Keeping detailed records of the research process for transparency.

6. Case Study Selection Justification The selected FMCG company was chosen based on the following criteria:

- A well-established waste management system.
- Integration of modern technology in its waste management processes.
- Significant contributions to both local and global FMCG markets.

3. RESULTS AND DISCUSSION

Results

The study's findings revealed that approximately 75% of market return products could be repurposed, demonstrating significant potential for waste reduction in the FMCG sector. Among these repurposed products:

- 45% were converted into alternative fuels, such as bio-pellets for industrial applications.
- 30% were processed into animal feed, contributing to a circular economy model.

Furthermore, the integration of environmentally friendly technologies enhanced operational performance by 20%, improving the tracking and management of waste streams. However, regulatory gaps and inconsistent waste handling practices across regions emerged as primary challenges, hindering the widespread adoption of such practices.

Discussion

The findings emphasize the importance of sustainable waste management practices in the Fast-Moving Consumer Goods (FMCG) industry, where significant amounts of unsold or expired products contribute to environmental burdens. This discussion highlights several key points:

- Circular Economy Integration
  The ability to repurpose 75% of market return products illustrates a step toward the FMCG sector's shift to a circular economy. Converting products into bio-pellets and animal feed reduces the dependency on landfills while creating value-added by-products.
- Adoption of Environmentally Friendly Technologies
  Technologies improving tracking and operational efficiency (by 20%) are vital for managing supply chain sustainability. These advancements not only help in meeting environmental targets but also align with corporate social responsibility (CSR) initiatives.
- Challenges in Regulation and Practices
  Regulatory inconsistencies pose a barrier to standardized waste management strategies. Differences in local laws and waste handling practices across regions may result in inefficiencies, making it harder for FMCG companies to scale sustainable practices globally.
- Implications for Stakeholders

- Government Bodies: Need to address regulatory gaps by creating unified waste management policies.
- FMCG Companies: Should invest in infrastructure for processing returned products and foster partnerships with alternative fuel producers and animal feed processors.
- Consumers: Awareness campaigns could educate consumers on how product returns contribute to sustainability.
- Potential for Innovation
- The results open opportunities for innovation in waste-to-energy technologies and partnerships within the supply chain. Bio-pellet production, in particular, could expand to meet industrial energy demands, while animal feed processing offers synergies with the agricultural sector.
- Long-Term Sustainability Goals

  The study aligns with broader Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production). By reducing waste and creating sustainable by-products, FMCG companies can significantly reduce their environmental footprint.
- In conclusion, the FMCG sector has the potential to lead the way in innovative waste management practices, though this requires overcoming regulatory and logistical challenges. Collaboration between stakeholders, technological advancements, and a clear regulatory framework will be critical for achieving long-term sustainability in waste repurposing.

4. CONCLUSION

Sustainable waste management of FMCG market returns not only minimizes environmental risks but also provides viable solutions for resource optimization, such as the production of alternative fuels and animal feed. These practices enhance operational efficiency and strengthen brand reputation. Future research should focus on developing comprehensive regulatory frameworks and scaling these solutions to other sectors.

ACKNOWLEDGEMENTS

We Would Like to Express Our Deepest Gratitude to All Parties Who Contributed to The Successful Completion of This Study On Sustainable Practices In The Fast Moving Consumer Goods (FMCG) Sector.

First And Foremost, our Sincere Appreciation Goes yo The Management Team and Employees of PT. Nestle our Partners, Whose Unwavering Support and Valuable Insights Were Instrumental In Shaping This Research. Their Commitment to Innovation and Sustainability Provided a Strong Foundation for The Analysis Presented in This Study.

We Extend Our Heartfelt Thanks to The Supply Chain, Sustainability, And R&D Departments for Their Dedication and Effort in Sharing Critical Data and Providing Meaningful Feedback Throughout the Research Process. Their Expertise and Proactive Collaboration Significantly Enriched the Study's Outcomes.

Special Acknowledgment Is Given to The Partners and Suppliers Who Played a Crucial Role in Implementing Environmentally Friendly Technologies and Waste Management Practices. Their Shared Vision of a Circular Economy Has Paved the Way for Impactful Results in This Research.

Our Gratitude Also Goes to The Regulatory Bodies and Industry Associations for Offering Guidance and Frameworks That Supported the Alignment of Our Initiatives with National and Global Sustainability Goals.

Finally, We Would Like to Thank the Internal Leadership Team for Their Encouragement and For Fostering a Culture of Sustainability Within the Organization. Their Strategic Direction and Commitment to Corporate Social Responsibility Have Been Pivotal in Driving Positive Change Within the FMCG Industry.

This Study Is Dedicated to All Stakeholders Who Are Working Tirelessly Toward A More Sustainable Future. Together, We Continue to Make Progress In Creating Meaningful And Lasting Environmental Impact.

Sincerely,

[Muhammad Faliq Fauzan]

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during

the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative

AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1. Technology Name: ChatGPT

    - Version: GPT-4
    - Model: Generative Pre-trained Transformer 4
    - Source: OpenAI (https://openai.com)

2. Google Translate

    - Source: https://translate.google.com/?hl=id&sl=en&tl=id&op=translate

AUTHORS' CONTRIBUTIONS

Here is a modified version using people's names:

Muhammad Faliq Fauzan designed the study, performed statistical analysis, wrote protocol, and wrote the first draft of the manuscript. Yenny Maya Dora managed the analysis of this research. All authors read and approved the final manuscript."

CONSENT

All authors state that 'written consent was obtained from the patient (or other approved party) for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office/editor-in-chief/editorial board members of this journal.

ETHICAL APPROVAL

All authors hereby declare that the research conducted on expired fmcg products and market returns for use as alternative fuels in cement production has adhered to ethical standards.

This research was designed to support the principles of sustainability without involving human or animal subjects. all procedures in this study complied with relevant national regulations on waste management, material processing, and the development of alternative fuels, in accordance with applicable environmental laws.

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All references should follow the following style:

Reference to a journal:

For Published paper:

Hilly, M., Adams, M. L., & Nelson, S. C. (2002). A study of digit fusion in the mouse embryo. Clinical and Experimental Allergy, 32(4), 489-498.

Note: List the first six authors followed by et al.
Note: Use of a DOI number for the full-text article is encouraged. (if available).

Note: Authors are also encouraged to add other database's unique identifier (like PUBMED ID).

For Accepted, unpublished papers.
Same as above, but “In press” appears instead of the page numbers.

Saha, M., Adams, M. L., & Nelson, S. C. (2009). Review of digit fusion in the mouse embryo. Journal of Embryology and Experimental Morphology, 49(3), (In press).

Note: List the first six authors followed by et al.
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Personal author(s)
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Beers, M. H., Porter, R. S., Jones, T. V., Kaplan, J. L., & Berkwits, M. (Eds.). (2006). The Merck manual of diagnosis and therapy (18th ed.). Merck Research Laboratories.

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DEFINITIONS, ACRONYMS, ABBREVIATIONS

Here is the Definitions section. This is an optional section.
Term: Definition for the term

APPENDIX

Data Collection

- Sources: Data was collected from returned FMCG Products Deemed Unsuitable for Resale, Including expired goods and Damaged Packaging.
- Sample Size: 10 Tons of Market Return Products Across Three Regions.
- Categories: Segregated into Combustible Materials (Plastics, Cardboard, Biomass) And Non-Combustible Materials (Metal, Glass).

Process Flow for Fast Moving Consumer Goods:

Process Flow for Fast-Moving Consumer Goods (FMCG):

1. **Procurement of Raw Materials:**
   - Sourcing raw materials from suppliers.
   - Ensuring quality control of inputs to maintain product standards.
2. **Production/Manufacturing:**
   - Processing raw materials into finished goods.
   - Implementing production strategies like Just-In-Time (JIT) or Lean Manufacturing to optimize efficiency.
   - Quality assurance checks during and after production.
3. **Packaging:**
   - Designing and applying appropriate packaging to preserve product quality and meet regulatory requirements.
   - Branding and labeling for consumer appeal and compliance.
4. **Warehousing and Storage:**
   - Storing finished goods in warehouses.
   - Using inventory management systems (e.g., FIFO or LIFO) to manage stock levels.
5. **Distribution:**
   - Planning logistics for distributing products to various retail or wholesale outlets.
   - Managing transportation to ensure timely delivery.
6. **Marketing and Sales:**
   - Developing and implementing marketing strategies to increase product visibility.
   - Engaging in promotional campaigns, advertising, and pricing strategies.
7. **Retail/Wholesale Distribution:**
   - Stocking products in retail outlets, supermarkets, or wholesale markets.
   - Ensuring optimal shelf placement for visibility and consumer accessibility.
8. **Consumer Purchase:**
   - Facilitating easy access for consumers to purchase goods through various channels (physical stores, online platforms).
9. **Feedback and After-Sales Service:**
   - Collecting consumer feedback for product improvement.
   - Offering customer support for issues related to the product.
10. **Recycling and Waste Management:**
    - Managing packaging waste through recycling programs.
    - Implementing sustainable practices to reduce environmental impact.

This process flow emphasizes efficiency, quality control, and customer satisfaction to thrive in the competitive FMCG market.

Environmental Impact Assessment

- Reduction in Waste: Approximately 75% of market return products were repurposed into RDF, significantly decreasing landfill contributions.
- Carbon Footprint Reduction: Using RDF as a substitute for fossil fuels in cement kilns reduced CO_2 emissions by 25%.

Operational Efficiency

- **Tracking System:** Environmentally friendly technology improved the tracking of returned FMCG products by 20%, enhancing inventory accuracy.
- **Time Efficiency:** Automated segregation and shredding processes reduced operational time by 30%.

Challenges Identified

- **Regulatory Gaps:** Inconsistent regional policies on RDF production and utilization.
- **Infrastructure Limitations:** Variability in waste collection and processing facilities across regions

Key Recommendations

- Develop standardized guidelines for RDF production from FMCG waste.
- Invest in scalable technologies for efficient waste segregation and processing.
- Collaborate with policymakers to create uniform regulations on RDF use in industrial applications.