Green Logistics in the Kusido Coffee Packaging Supply Chain: Case Study of Coffee MSMEs in Tlahab Village, Temanggung Regency

Dinalestari Purbawati[1], Nurul Imani Kurniawati[2], Dani Mohammad Ramadhan[3], Gilda Maulina[4*], Sendhang Nurseto[5], Zalfa Salsa Sabila[6], Theresia Yuni Siwi Chrissanti[7]

{dinalestaripurbawati@lecturer.undip.ac.id[1], nurulimanikurniawati@lecturer.undip.ac.id[2], danimr@lecturer.undip.ac.id[3], gildamaulina97@lecturer.undip.ac.id[4], sendhangnurseto@lceturer.undip.ac.id[5], zalfass@alumni.undip.ac.id[6], theresiayunisiswi@students.undip.ac.id[7]}

Department of Business Administration, Faculty of Social and Political Sciences, Universitas Diponegoro, Semarang, Indonesia[1,4,5,6,7], Logistics Management and Administration, Vocational School, Universitas Diponegoro, Indonesia[2], Social Anthropology, Faculty of Humanities, Universitas Diponegoro, Indonesia[3]

Abstract. The lack of sustainable logistics practices is a challenge in packaging coffee MSME products in rural areas such as Tlahab Village, Temanggung. This study analyzes the potential for implementing green logistics in the Kusido Coffee packaging supply chain as part of efforts to support local business sustainability. The method used is descriptive qualitative through observation and interviews. The results show that environmentally friendly practices are still limited, but there is awareness of business actors to switch to a more sustainable system. Support for affordable packaging materials and technical training is needed to increase effectiveness. Multistakeholder collaboration is key in realizing an MSME-based green logistics ecosystem.

Keywords: green logistics, MSMEs, packaging, sustainability, supply chain

1 Introduction

Green logistics is an approach that emphasizes efforts to minimize negative impacts on the environment and social life, so that logistics can run as a sustainable system by maintaining a balance between social, economic, and environmental aspects [1]. The goal of green logistics is to realize harmony between economic, social, and environmental sustainability needs. The green logistics concept prioritizes supply chain optimization through the use of environmentally friendly technology, the application of reverse logistics, and a circular economy approach.

The implementation of green logistics in the MSME sector is not only a step toward sustainability, but also a smart business strategy to reduce operational costs, increase product selling value, and meet the expectations of consumers who are increasingly environmentally conscious. According to BPS-Statistics Indonesia [2], in 2022 national coffee production

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reached 794,800 tons, an increase of 1.1% from the previous year, making coffee Indonesia's main commodity and a great opportunity for MSMEs to grow through product downstreaming and the application of sustainable logistics.

Coffee MSMEs in Tlahab Village, Temanggung Regency are developing with strong local potential. Kusido Coffee is one example of an MSME that has integrated green logistics principles by using more environmentally friendly packaging, such as biodegradable paper-based packaging and reusable plastic, as an effort to reduce negative impacts on the environment. Although this is a good first step, optimization is still needed in supply chain management and reuse of packaging waste so that the environmental impact is truly reduced. This research is important to assess green logistics practices in the Kusido Coffee packaging supply chain and explore the potential for developing other sustainable logistics systems among coffee MSMEs in Tlahab Village.

2 Literature Review

2.1 Green Logistics

Green logistics is a concept in logistics management that not only focuses on cost efficiency, but also prioritizes consideration of the environmental and social impacts of logistics activities, although these aspects are not yet fully reflected in the company's financial statements [3]. Green logistics covers all aspects of logistics such as transportation, warehousing, and inventory related to environmental issues, including greenhouse gas emissions, noise, and the use of scarce resources [4]. This approach emphasizes the importance of integrating sustainability principles into logistics activities to reduce negative environmental impacts while maintaining operational efficiency. Practices in green logistics include using renewable energy, reducing carbon emissions, optimizing distribution routes, and implementing environmentally friendly reverse logistics. The implementation of green logistics not only supports environmental preservation, but also provides economic benefits and enhances the company's reputation. This concept can be implemented in a smaller scope such as MSMEs through simple steps, such as selecting local raw materials, reducing the use of plastic packaging, and utilizing digital technology to improve distribution efficiency.

2.2 Green Supply Chain Management

Green Supply Chain Management is an alternative approach to supply chain efficiency that focuses on sustainability. Green Supply Chain Management (GSCM) is a strategic approach that integrates environmental sustainability principles in all supply chain activities, from product design, raw material procurement, manufacturing processes, assembly, packaging, logistics, to distribution [5]. The implementation of GSCM is expected to reduce logistics inefficiencies and support environmental sustainability. The main objective of GSCM is to minimize negative impacts on the environment such as climate change, pollution, and exploitation of non-renewable resources [6].

2.3 Circular Economy

Circular economy (CE) can be defined as an economic model that aims for the efficient use of resources through waste minimization, maintaining long-term value, reducing the use of

primary resources, and creating closed cycles for products, product components, and materials, while maintaining environmental protection and providing socioeconomic benefits [7]. This economic model encourages the redesign of production and consumption systems to be more sustainable, with a focus on waste reduction and optimal resource reutilization.

2.4 Previous Studies

The implementation of Green Supply Chain Management (GSCM) in the context of MSMEs is proven to improve economic performance as well as overall organizational performance. Chalarhena and Hendayani [8] shows that if internal green practices are actively implemented, then external green collaboration has a significant relationship with improving the performance of MSMEs in the food industry sector in Wonosobo Regency. Yalviolita and Hendayani [9] also confirmed that the implementation of GSCM has a significant positive influence on the environmental and economic performance of companies, including in the livestock sector. Therefore, GSCM not only plays a role in better environmental management, but also becomes an important factor in improving overall business competitiveness and sustainability.

3 Research Methods

This research was organized using a qualitative descriptive approach. Waruwu [10] explains that a qualitative descriptive approach uses narratives or words to explain and describe the meaning of phenomena, symptoms, and social situations. In this study, the approach was applied to examine the logistical efficiency of the packaging supply chain at Kusido Coffee in Tlahab Village. The research data were categorized as primary and secondary data according to how they were obtained. Primary data was obtained through observations and interviews with MSME players of Kusido Coffee, Tlahab Village as well as documentation of the production process and packaging distribution. Secondary data was obtained through literature studies relevant to the research topic. The data were analyzed through data reduction, data categorization, and data interpretation

4 Results and Discussion

Kusido Coffee MSME players in Tlahab Village, Temanggung Regency, have implemented some of the initial elements of the green logistics concept in the product packaging supply chain. The packaging used is paper-based, both in pure form and coated with aluminum foil on the inside. The aluminum layer serves to keep the quality and aroma of the coffee fresh during storage and distribution. The use of paper materials reflects an effort to find alternatives to plastic, even though the materials are not yet categorized as recyclable or biodegradable. All packaging materials are purchased online through platforms such as Shopee and are still classified as new materials, not recycled.

Kusido Coffee's packaging design was designed independently by the business owner with a minimalist approach and size efficiency in mind. This approach not only serves as a visual identity for the product, but also represents a real step in reducing the use of excess materials and maximizing logistical efficiency. This design efficiency has a positive impact, such as a

reduction in shipping volume and potential savings in distribution costs, which is in line with the principles of green logistics and supports the goals of SDGs Goal 9 (Industry, Innovation and Infrastructure), especially in the aspect of simple sustainable packaging innovation.

The packaging process is still done manually at home by business actors with a production amount of more than 300 packages per week, depending on demand. Although they do not yet use environmentally friendly technology or automation systems, the micro-scale production makes their energy consumption and environmental impact relatively low. This shows that green logistics principles can be gradually applied by MSMEs without having to rely on high technology. This effort is in line with SDGs Goal 8 (Decent Work and Economic Growth) as it supports inclusive and sustainable micro-enterprise-based local economic growth.

Post-consumption waste management is still a major challenge. There is no system for returning packaging from consumers or incentives to support it. On the other hand, internal waste such as damaged or failed packaging has been sorted, but due to limited access to waste treatment facilities such as waste banks, the waste is burned. The practice of burning has the potential to cause air pollution and contradicts green logistics principles that emphasize reducing emissions and managing waste responsibly. This issue is very relevant to SDGs Goal 12 (Responsible Consumption and Production) which demands more sustainable production patterns, including planned and efficient waste management.

Although MSME players are not formally familiar with the term green logistics, there is a basic understanding of the importance of protecting the environment. This awareness includes the view that the use of environmentally friendly packaging can improve product image in the eyes of consumers who are concerned about sustainability issues. Interest in training, mentoring, and access to green packaging alternatives is high, but realization still depends on external support, such as facilitation from the government or related institutions. The need for partnerships and education is in line with efforts to realize inclusive innovation and industrialization, as stated in SDGs Goal 9.

Packaging cost is a crucial consideration in the production process. Environmentally friendly packaging generally has a higher price than conventional packaging, thus adding to the production burden. Nevertheless, businesses realize that quality and visually appealing packaging greatly influences consumer buying interest and product competitiveness. This emphasizes the importance of sustainability as part of a business strategy that is relevant to SDGs Goal 8, which is to encourage sustainable economic growth based on MSMEs.

Overall, the findings in this study show that Kusido Coffee has taken the first steps toward implementing green logistics, especially through efficient packaging design and awareness of sustainability. The potential for developing a more environmentally friendly logistics system is still wide open if supported by continuous education, adequate waste management facilities, easy access to sustainable packaging materials, and incentives. The integration of green logistics principles in the context of rural MSMEs requires a gradual approach and is in accordance with local needs. This effort supports the achievement of SDGs Goal 8, 9, and 12 simultaneously, namely through strengthening the local economy, innovation in small industry practices, and increasing responsibility in consumption and production.

5 Conclusions and Recommendations

Kusido Coffee in Tlahab Village has started to apply green logistics principles, especially in terms of packaging material selection and design efficiency. Although still using new materials that cannot be recycled, the choice of using paper as the main material shows concern for the environment. The self-made packaging design also reflects efforts to save storage space and shipping costs.

The packaging process, which is still done manually, does not involve environmentally friendly technology. Packaging waste management is a challenge, considering that there is no system for returning packaging from consumers and limited processing facilities cause internal waste to be burned. Kusido Coffee MSME players show an understanding of the importance of protecting the environment and an interest in developing toward more sustainable business practices.

The implementation of green logistics at Kusido Coffee shows potential that can be developed through a phased approach tailored to the scale of MSMEs. Support in the form of training and technical assistance is needed so that business actors have a deeper understanding of sustainable logistics practices. The availability of environmentally friendly packaging materials at affordable prices is an important factor in encouraging the adoption of more sustainable packaging without burdening production costs. The development of waste management facilities such as waste banks or post-consumption packaging collection systems needs to be pursued to avoid burning practices that have a negative impact on the environment. The role of local governments, MSME support institutions, and business partners is key in creating an ecosystem conducive to the implementation of green logistics. The development of efficient and attractive packaging designs also contributes to improving product competitiveness in the market while strengthening the brand image that cares about sustainability.

References

[1] Lapian, P.J., Palandeng, I.D., Karuntu, M.M.: Pelaksanaan green logistic pada PT PLN (Persero) Area Manado. Jurnal EMBA 12(4), 681-690 (2024).

[2] BPS-Statistics Indonesia: Indonesian Coffee Statistics 2022. BPS-Statistics Indonesia, Jakarta (2023).

[3] Kumar, A.: Green logistics for sustainable development: An analytical review. IOSRD International Journal of Business 1(1), 7-13 (2015).

[4] Pramesti, R.I., Baihaqi, I., Bramanti, G.W.: Membangun Green Supply Chain Management (GSCM) scorecard. Jurnal Teknik ITS 9(2) (2021). https://doi.org/10.12962/j23373539.v9i2.54504

[5] Wang, Z., Wang, Q., Zhang, S., Zhao, X.: Effects of customer and cost drivers on green supply chain management practices and environmental performance. Journal of Cleaner Production 189, 673-682 (2018). https://doi.org/10.1016/j.jclepro.2018.04.071

[6] Heriyanto, H., Noviardy, A.: Kinerja Green Supply Chain Management dilihat dari aspek reverse logistic dan green procurement pada UKM kuliner di Kota Palembang. MBIA 18(1), 65-75 (2019). https://doi.org/10.33557/mbia.v18i1.322

[7] Morseletto, P.: Targets for a circular economy. Resources, Conservation and Recycling 153, 104553 (2020). https://doi.org/10.1016/j.resconrec.2019.104553
[8] Chalarhena, N., Hendayani, R.: Pengaruh green supply chain management terhadap performa ekonomi dan organisasi pada UMKM industri makanan di Wonosobo Jawa Tengah. Fair Value: Jurnal Ilmiah Akuntansi dan Keuangan 5(3), 1696-1713 (2022). https://doi.org/10.32670/fairvalue.v5i3.2420
[9] Yalviolita, C., Hendayani, R.: Pengaruh green supply chain management terhadap kinerja lingkungan dan ekonomi perusahaan pada peternakan ayam di Kabupaten Pesisir Selatan Sumatera Barat. Fair Value: Jurnal Ilmiah Akuntansi dan Keuangan 5(2), 689-699 (2022). https://doi.org/10.32670/fairvalue.v5i2.2325
[10] Waruwu, M.: Pendekatan penelitian pendidikan: Metode penelitian kualitatif, metode penelitian kuantitatif dan metode penelitian kombinasi (mixed method). Jurnal Pendidikan Tambusai 7(1), 2896-2910 (2023). https://doi.org/10.31004/jptam.v7i1.6187