Analysis of the Role of Green Logistics and Human Resources in Waste Management in the F&B Industry and Retail Sector in Batam City (Case Study: Indogrosir Batam)

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Abstract. The application of green logistics (GL) and green human capital (GHC) is an important strategy in supporting sustainable waste management, particularly in the food and beverage (F&B) and retail sectors. This study aims to analyze how GL and the role of GHC support the effectiveness of waste management at Indogrosir Batam. The study used a descriptive qualitative approach with interview, observation, and documentation techniques. Information was obtained from four informants selected through snowball sampling, with a research period from October to September 2025. The results showed that GL was implemented in the form of product returns, sorting of goods from the warehouse, and reduction in plastic use, which had an impact on reducing food loss and food waste. The role of human resources is also significant in supporting waste management, although this involvement is still informal and has not been facilitated by training, evaluation indicators, or a coaching system. These findings reveal a gap between theory, which emphasizes the importance of SOPs, performance indicators, and special teams, and practice, which still relies on individual initiative. This study recommends the development of formal SOPs, the establishment of evaluation indicators, the formation of a special waste management team, the improvement of human resource capacity through training, and the strengthening of cooperation with suppliers and collectors so that the implementation of GL and GHC can be more measurable, efficient, and sustainable.

Keywords: Green Logistics; Green Human Capital; Food Loss; Food Waste; Waste Management; F&B Industry

1 Introduction

Global environmental issues, including climate change and increasing amounts of waste, have prompted various industrial sectors to implement sustainable practices. The food and beverage (F&B) and retail sectors are among the main contributors to waste

generation, whether in the form of fresh products, processed foods, or nonbiodegradable disposable packaging. This phenomenon is increasingly crucial because it is directly related to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 12 on responsible consumption and production. At the national level, Indonesia still faces a gap between targets and implementation, particularly in reducing waste generation from the F&B sector [1].

In Indonesia, the problem of food loss and food waste is still very significant. According to the FAO [2], food waste accounts for more than 10% of global energy consumption. During the period 2000–2019, Indonesia experienced food waste of 23– 48 million tons per year, with economic losses of up to IDR 551 trillion, equivalent to 4–5% of the national GDP. At the local level, the city of Batam faces significant waste problems. Data from the Environment Agency [3] shows an increase in food loss and food waste, particularly from the F&B and retail sectors. Indogrosir Batam, as one of the major retailers, produces waste from expired products, unsold food, and single-use packaging. Food loss occurs mostly at the distribution and storage stages due to limited logistics facilities, while food waste is more common at the retail level when products pass their expiration dates.

In the literature, green logistics (GL) is seen as a key strategy to reduce the negative impact of logistics activities on the environment. GL integrates sustainability principles into both forward and reverse logistics [4]. Green logistics practices include energy efficiency, route optimization, product return management, and reduction in the use of disposable materials [5]. . In the context of F&B, green logistics plays an important role in reducing food loss through distribution and storage control, as well as reducing food waste through reverse logistics practices, such as returning expired products or reusing food waste.

In addition to logistics systems, the role of human resources is also crucial. Green human capital (GHC) is defined as the competence, awareness, and skills of human resources in supporting sustainability strategies [6]. A study by Benevene & Buonomo [7] confirms that green human capital can improve company performance through participation in sustainability innovation. In fact, according to Ya Cheng et al. [8] , the contribution of green human capital can increase waste management effectiveness by 20–35% through training, monitoring environmentally friendly behavior, and empowering employees. In the context of Indogrosir Batam, employees actively sort damaged products, arrange returns to suppliers, and reduce plastic use. However, these contributions are still organic because they are not yet supported by SOPs, training, or formal evaluation indicators. The F&B industry itself has unique characteristics that make it highly susceptible to food loss and food waste. Fresh products have a limited shelf life, so errors in logistics handling can directly cause food loss [9]. On the other hand, changes in market demand and limitations in the return system cause high food waste at the retail level [10]. . Therefore, the integration of green logistics and green human capital is key to building an efficient and sustainable waste management system in this sector.

However, the literature also shows a gap between theory and practice. A study by Wibisono [11] found that many companies in Indonesia still implement green logistics

informally without measurable evaluation standards. Wibisono [11] added that the biggest obstacles to the implementation of green logistics are the absence of formal SOPs, human resource training, and unclear environmental performance indicators. A similar situation is seen at Indogrosir Batam, where green logistics practices and the role of human resources do exist, but they are still partial, intuitive, and undocumented.

Several recent studies show that the application of green logistics in the retail sector is gaining attention. Sadam et al.[5] emphasize the role of product returns in reducing food loss, while Mensah [4] highlights the importance of integrating SOPs and evaluation indicators into GL practices. The study by Cheng et al.[8] also found that the role of human resources is a key factor in the success of green supply chains in the F&B sector. However, most studies still focus on manufacturing or large-scale logistics, so not many have reviewed GL and GHC practices in wholesale retail. This study offers novelty by integrating GL and GHC in the context of wholesale retail and provides practical contributions in the form of SOP and KPI designs that can be directly applied at Indogrosir Batam.

Based on this description, this study aims to analyze the application of green logistics (GL) and green human capital (GHC) in waste management at Indogrosir Batam. Specifically, this study focuses on three main things: (1) describing GL practices in managing food loss, food waste, and inorganic waste; (2) identifying the contribution of GHC in supporting the implementation of GL; and (3) evaluating the gap between existing theory and practice, while offering practical solutions in the form of drafting Standard Operating Procedures (SOP) and establishing Key Performance Indicators (KPI) as institutional instruments to strengthen waste management in the wholesale retail sector.

2 Research Method

This study uses a qualitative method with a descriptive approach to gain an indepth understanding of green logistics practices and the role of green human capital in waste management in the F&B industry in Batam City, particularly at Indogrosir. Research data was obtained through semi-structured interviews, observations, and analysis of internal company documents. The semi-structured interview technique was chosen because it provides flexibility for researchers to explore information more deeply in accordance with the field context. The research was conducted from October 2024 to September 2025 in Batam City. Indogrosir Batam was chosen as the research location because it is one of the largest F&B retailers in the city, with complex logistics and distribution activities and a significant contribution to food and packaging waste generation. A total of four informants were interviewed, consisting of three operational employees and one operational manager. The main criteria for selecting informants were a minimum of six months of employment and direct involvement in logistics, distribution, and waste management activities. The technique for selecting informants used purposive sampling by choosing an operational manager who was considered to have comprehensive knowledge of logistics and waste management practices. Subse-

quently, the initial informant recommended three operational employees who were directly involved in logistics and returns activities, so that the informant selection process also contained elements of snowball sampling.

No	Nama Informan	Jabatan/Posisi	Keterangan Tugas Utama	Kriteria Khusus
1	Yusuf Hasan Fadhillah	Karyawan Operasional	Penanganan logistik dan penyimpanan barang F&B	Masa kerja ≥ 6 bulan, terlibat langsung operasional
2	Adam Oka	Karyawan Operasional	Distribusi produk dan pengelolaan stok makanan	Masa kerja ≥ 6 bulan, terlibat langsung operasional
3	Muhammad Gilang	Karyawan Operasional	Penanganan limbah dan produk rusak/tidak layak	Masa kerja ≥ 6 bulan, terlibat langsung operasional
4	Pak Noel	Manajer Operasional	Pengawasan logistik dan kebijakan pengelolaan limbah	Pengambil keputusan dan memiliki perspektif manajerial

Data analysis was conducted using Miles and Huberman's interactive model, which included data reduction, data presentation, and conclusion drawing. The reduction process was carried out by selecting, simplifying, and grouping data from interviews, observations, and documentation. The data was then presented in the form of a systematic descriptive narrative according to the research theme, and the final stage was drawing conclusions through the interpretation of patterns, relationships, and meanings from the collected data. The validity of the data in this study was strengthened by method triangulation and source triangulation. Method triangulation was carried out by combining semi-structured interviews, field observations, and internal document analysis. In this study, triangulation was carried out in terms of both methods and sources. The interview process began with the operations manager as the main informant because he was considered to have a comprehensive understanding of the procedures for returns, sorting, and waste management. The results of the interview with the manager were then validated through other employees who were also interviewed, namely warehouse employees and cashiers who were directly involved in operational activities.

The validation showed that the manager's statement regarding the mechanism for returning expired products to suppliers was in line with field practices. This was reinforced by the warehouse employees' explanation that damaged or near-expired products were immediately separated in a special area before a decision was made to return or dispose of them. The consistency of information between managers and employees shows that the procedures described are not only formal policies but are also actually implemented at the operational level. Thus, triangulation of sources successfully ensured consistency between managerial policies and actual practices in the field.

However, some internal data, such as monthly return reports, detailed food waste figures, and plastic monitoring records, cannot be presented in full due to their confidential nature and company privacy concerns. This data was still used in the analysis process as verification material to strengthen the results of interviews and observations, but was only presented in the form of general descriptions, such as an average return volume of 30-50 cartons per month. Thus, this study respects the confidentiality of company data while maintaining the credibility, validity, and legitimacy of the research results through the application of triangulation.

3 Results and Discussion

3.1 The Role of Green Logistics in Waste Management

The application of green logistics (GL) at Indogrosir Batam as part of the F&B and Retail industry is reflected through the mechanism of returning unsellable products, sorting waste from the warehouse, and reducing the use of plastic. The practice of returns is a major activity in controlling expired products. The storage manager informant confirmed that: “If the goods are expired, we usually return them to the supplier.” (I-1) This statement indicates that Indogrosir has implemented a reverse logistics mechanism, which is to divert products that no longer have any sale value so that they do not become waste.

Aspek	Sebelum Ada Mekanisme Retur	Sesudah Ada Mekanisme Retur
Penanganan produk expired	Langsung menjadi limbah	Dikembalikan ke supplier
Volume food loss	Tinggi, terutama produk segar & beku	Berkurang signifikan
Rata-rata produk retur	60-70 karton/bulan	30–50 karton/bulan
Efisiensi pengelolaan limbah	Rendah	Lebih terukur & terdokumentasi

Before the formal return mechanism was in place, expired products in Indogrosir's warehouse could reach around 60-70 cartons per month. After the implementation of a routine return system to suppliers, this figure decreased to an average of 30-50 cartons per month. This decrease provides empirical evidence that the application of green logistics can significantly reduce food loss and food waste. This finding is in line with warehouse observations showing a reduction in the accumulation of expired products compared to previous conditions. The recorded return volume reached 30-50 cartons per month, most of which came from fresh and frozen products. This is important because fresh products have a short shelf life and contribute the most to food loss if not handled immediately.

In addition to returns, employees also sort goods at the receiving stage. A warehouse employee said: "If goods are damaged or dented, we immediately separate them so they don't get mixed up with other stock." (I-2) This sorting practice has proven effective in

preventing damaged products from mixing with stock that is still saleable. Field observations show that sorting is done manually by separating physically defective products to a special area before deciding whether to return or discard them. Indogrosir also strives to reduce the use of plastic as a measure to reduce inorganic waste. A cashier said: "We usually ask buyers if they have brought their own bags. If not, the plastic we give them is recycled." (I-3)

These findings are consistent with literature emphasizing the importance of green logistics in controlling food loss through forward logistics and food waste through reverse logistics [4]. Brilliana et al. [12] emphasize that returns are a core part of reverse logistics, while Sadam et al. [5] emphasize that the implementation of green logistics should ideally be supported by SOPs and evaluation indicators. In the case of Indogrosir, green logistics practices are indeed in place, but they are still informal and depend on employee initiatives. Indogrosir Batam's practices are in line with the circular economy concept, whereby products that are unfit for consumption do not immediately become waste, but are returned to suppliers to be reprocessed or reused. If Indogrosir is able to expand its cooperation with collection partners and the processing industry in the future, the reverse logistics chain will become stronger and contribute to reducing regional waste.

3.2 Peran Sumber Daya Manusia (*Green Human Capital)*

In addition to the logistics system, green human capital (GHC) plays an important role in supporting waste management at Indogrosir. Employees are involved in product sorting, returns, and reducing plastic use, although there is no formal training or officially assigned team. An operational warehouse employee stated: "We immediately sort any damaged or near-expiry items. If possible, the products are returned to the supplier; if not, they are separated as waste." (I-2)

"Evaluations related to waste are usually discussed informally with managers; there are no formal meetings or forums specifically for that purpose." (I-4)

This quote confirms that HR involvement is real, but it still depends on individual initiative, not the company system. In fact, according to Benevene and Buonomo [7], green human capital (GHC) includes structured environmental knowledge, attitudes, and skills that support organizational sustainability. Cheng et al. [8] even emphasize that training can increase waste management effectiveness by up to 35%. The facts at Indogrosir show that green human capital is formed organically, but its contribution is not yet optimal because it is not supported by training, performance indicators, or formal coaching as recommended by Heryana et al. [6].

The role of human resources is crucial because, in daily practice, they are the main actors who determine whether a product is marketable, returnable, or disposable. Without environmental awareness, these decisions can be subjective and inconsistent. Therefore, equipping employees with knowledge about the impact of food loss and food waste on the economy and the environment will motivate them to sort waste properly. Additionally, providing performance-based environmental incentives (e.g., rewards for teams that successfully reduce monthly waste) can strengthen the role of GHC in a tangible way.

3.3 The Impact of Green Logistics and Green Human Capital on Waste Management

The integration of GL and GHC has had a positive impact on F&B waste management at Indogrosir Batam. Regular returns have significantly reduced the volume of food waste, while sorting from the outset has reduced food loss in the warehouse. The identified waste management process includes the stages of receipt, inspection, sorting, return or destruction, and distribution of waste to collectors. The storage manager emphasized that:

“The waste generated is relatively small because most items can be returned to suppliers, so it rarely piles up.” (I-1) However, the effective implementation of GL still faces several obstacles. First, the absence of formal SOPs means that returns and sorting are not carried out consistently by all employees. Second, the lack of evaluation indicators makes it difficult for the company to assess the extent to which waste management has been successful in reducing food loss and food waste. Third, the absence of a dedicated team means that waste management is only an additional part of routine work, so coordination is often not optimal. As expressed by an operational employee:

"There are no specific indicators to assess waste management. So far, it has only been considered part of daily work." (I-4)

This condition is consistent with the literature. Demir and Dincer [9] emphasize that green logistics in the F&B industry is important to reduce economic losses due to waste, while Santoso and Yulina [10] emphasize the need for reverse logistics to control expired products. However, as shown by Wibisono [11], the main obstacles to the implementation of green logistics in Indonesia are the absence of SOPs, weak monitoring, and a lack of performance indicators. The positive impact felt by Indogrosir is actually only on a micro scale, namely the reduction of waste accumulation in warehouses and at cash registers. However, if GL and GHC practices are strengthened, the benefits can extend to a macro scale, such as savings in operational costs due to reduced waste disposal costs, an improved company image in the eyes of consumers, and the potential contribution to achieving SDG 12 (Responsible Consumption and Production) targets.

3.4 The Gap Between Theory and Practice

The literature emphasizes that the implementation of green logistics (GL) and green human capital (GHC) should be carried out systematically through the support of formal SOPs, environmental performance indicators, and training programs and the formation of special teams [4][5][6]. Integrated green logistics enables every logistics activity, both forward and reverse, to run consistently with the principles of sustainability. At the same time, GHC facilitated through continuous coaching can increase employee involvement in waste management. The combination of the two not only reduces environmental impact but also improves supply chain efficiency in the F&B industry. However, research results at Indogrosir Batam show that existing practices are still far from ideal. Return, sorting, and plastic reduction mechanisms are in place, but they are not formalized in the form of SOPs, so their implementation is highly dependent on indi-

vidual awareness. The absence of evaluation indicators also makes it difficult for companies to measure the effectiveness of waste management, both in reducing food loss and food waste. Additionally, the absence of a dedicated team makes waste management an additional task divided among all employees without clear coordination.

This is reinforced by the statement of one informant who said:

"Evaluations related to waste are usually discussed informally with managers; there are no formal meetings or forums specifically for this purpose." (I-4)

This gap shows that the implementation of GL and GHC at Indogrosir is still in its early stages (early adoption). Although there are positive initiatives from employees and management, institutional limitations mean that existing practices are not yet measurable and sustainable. Therefore, institutional strengthening is needed through the development of SOPs, the establishment of performance indicators, and the formation of a special team to ensure that GL and GHC can be optimally implemented in accordance with theoretical and contextual standards for the F&B sector.

Aspek	**Teori (Literatur)**	**Praktik di Indogrosir Batam**
SOP dan kebijakan	Ada SOP formal, standar operasional terdokumentasi	Tidak ada SOP tertulis, hanya arahan lisan
Indikator evaluasi (KPI)	Ada indikator kinerja untuk efisiensi, lingkungan, dan SDM	Belum ada KPI terkait *green logistics*, evaluasi masih umum
Keterlibatan SDM	Dilatih khusus, dengan pembagian tugas formal	*"Tidak ada tim khusus, semua karyawan terlibat"* (I-1)
Keterlibatan pihak ketiga	Kontrak formal dengan vendor pengelola limbah, monitoring berkala	Kerjasama informal: *"Kita kumpulkan dulu, nanti mereka ambil"* (I-1)
Penggunaan plastik	Substitusi dengan kemasan ramah lingkungan	Pengurangan plastik, konsumen disarankan bawa tas sendiri

Furthermore, this study also confirms that the existence of formal SOPs is crucial to ensure consistency in the practices of returning, sorting, and managing plastics, which have so far depended on employee initiatives. SOPs will serve as standard operating procedures that reduce the risk of inconsistency and facilitate monitoring. At the same time, the application of Key Performance Indicators (KPIs), such as a 20% annual food waste reduction target, a 60% recycling rate, and an 80% reduction in single-use plastic, will make waste management more quantitatively measurable[8] . With SOPs and KPIs in place, GL and GHC practices at Indogrosir are not only operational on a daily basis, but their success can also be evaluated systematically, thereby narrowing the gap between theory and practice. If this gap is not closed immediately, the risks that may arise are increased hidden costs due to food loss, loss of opportunities to utilize economically valuable waste, and a decline in the company's competitiveness in facing future environmental regulatory demands. Conversely, if the company is able to integrate theory into practice, Indogrosir can become a model for the application of green logistics in the Batam retail sector that is not only beneficial to the company internally, but also has a positive impact on the environment and the surrounding community.

4 Conclusion and Recommendations

This study confirms that the implementation of green logistics (GL) and green human capital (GHC) at Indogrosir Batam as part of the F&B industry has a real contribution to waste management. From the GL perspective, the practices of returning expired products, sorting goods at the warehouse, and reducing plastic have proven to be effective in reducing food loss and food waste. 's routine returns of fresh and frozen products prevent the accumulation of food waste, while sorting at the receiving stage maintains stock quality and ensures that damaged products are not mixed with those suitable for sale [12][4]. Efforts to reduce plastic also show awareness of inorganic waste, although they are still limited to encouraging consumers to bring their own shopping bags.

From GHC's perspective, employee involvement in sorting activities, returns, and informal discussions with management indicates a growing organic environmental awareness. This confirms that human resources play an important role in supporting operational sustainability. However, this involvement is not yet fully optimal because there is no formal training, evaluation indicators, or special incentives related to waste management. In fact, the literature emphasizes that GHC facilitated through continuous training and coaching can increase waste management effectiveness by up to 35% [7][8][6].

This finding also reveals a gap between theory and practice. GL theory requires an integrated system, formal SOPs, and clear performance indicators to ensure consistency and sustainability [5][11]. However, practices at Indogrosir Batam are still informal, dependent on individual initiatives, and lack adequate institutional instruments. As a result, the effectiveness of waste management has not been fully measured, although the positive impact of existing practices is already evident. This study has several limitations. First, the number of informants was limited to four people, so the perspectives obtained did not cover all levels of the organization. Second, internal company data such as monthly return reports and plastic monitoring records could not be presented in detail for confidentiality reasons, so the presentation was only in the form of general descriptions. Third, the research focused only on Indogrosir Batam, so the results cannot be generalized to the entire retail sector in Indonesia. In addition, discussions on the impact of Green Logistics (GL) on operational performance, cost efficiency, and the environment are still limited. This study was only able to provide a general overview of the reduction in food loss, food waste, and plastic use, but did not quantitatively measure its contribution to cost savings or carbon emission reductions. Based on these

findings, it is recommended that formal SOPs be developed regarding the flow of returns, sorting, and waste management so that GL practices are more consistent.

STANDAR OPERASIONAL PROSEDUR (SOP)

Ruang Lingkup : Pemeriksaan Produk

Unit/Departemen : Quality Control

Dokumen terkait :

Dibuat Tanggal :

Penanggung Jawab : Entah siapa

Tujuan :

Memastikan Kualitas Produk Sesuai dengan Standar untuk Menjaga Kebersihan dan Menjaga Proses Pengolahan Limbah Lebih Terjaga

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1. Proses pemilihan bahan baku dan melakukan pengadaan barang yang memiliki sertfikasi lingkungan dan praktik bisnis berkelanjutan
2. Proritaskan bahan baku dan kemasan yang ramah lingkungan seperti bahan organik dan hasil daur ulang
3. Gunakan moda transportasi yang ramah lingkungan seperti kendaraan listrik dan optimalkan rute pengiriman untuk mengurangi jarak tempuh dan emisi
4. Mengumpulkan limbah dari konsumen melalui proses daur ulang atau pengembalian kemasan.
5. Menyortir limbah berdasarkan jenis untuk memudahkan proses daur ulang dan berkerjasama dengan pihak ketiga untuk pengolahan limbah
6. Ukur dan pantau kinerja green logistics secara berkala menggunakan KPI yang relevan.
7. Identifikasi area yang perlu di tingkatkan dan lakukan tindakan perbaiakn yang diperlukan serta membuat laporan hasil pengukuran dan pemantauan green logistics kepada manajemen dan pihak terkait

The establishment of Key Performance Indicators (KPIs) in waste management at Indogrosir Batam is based on actual operational conditions and the company's ability to implement the principles of Green Logistics (GL) and Green Human Capital (GHC). A target of reducing food waste by 20% per year has been set because the average volume of fresh and frozen product returns reaches 30-50 cartons per month. This figure is realistic to achieve gradually, considering that fresh products have a short shelf life and contribute the most to food loss if not handled immediately. Furthermore, the waste recycling rate target of 60% was chosen considering the limitations of processing facilities and the capacity of local collectors. This figure is considered moderate and can be increased as cooperation with third parties expands. Meanwhile, the target of reducing single-use plastic by 80% was chosen because the company already uses environmentally friendly plastics, but there are still obstacles in consumer behavior as they do not always bring their own shopping bags ( ). Therefore, achieving 100% is considered unrealistic in the short term.

KPI measurement is carried out specifically through available instruments: food waste is calculated from the difference between incoming stock, sold stock, and the number of returns; the recycling rate is calculated from the volume of non-returned waste distributed to collectors; and plastic use is calculated based on the amount of plastic used compared to total transactions. Responsibility for achieving KPIs is divided according to function: the warehouse is responsible for returns and food waste, cashiers are responsible for plastic use, and the waste management team is responsible for the recycling process. Evaluations are conducted monthly for operational monitoring and quarterly for strategic discussions with management.

No	Indikator	Satuan	Target	Formula Perhitungan	Penanggung Jawab
1	Pengurangan Food Waste	%	↓ 20% per tahun	(Total Food Waste ÷ Total Produk Masuk) × 100%	Tim Limbah & Gudang
2	Tingkat Retur Produk Segar & Beku	Karton/bulan	30–50 karton/bulan	Total Produk Diretur ÷ Jumlah Bulan	Supervisor Gudang
3	Tingkat Daur Ulang Limbah	%	≥ 60% per tahun	(Volume Limbah Didaur Ulang ÷ Total Limbah Non-Retur) × 100%	Tim Limbah
4	Pengurangan Penggunaan Plastik	%	↓ 80% per tahun	(Plastik Tahun Sebelumnya – Plastik Tahun Berjalan) ÷ Plastik Tahun Sebelumnya × 100%	Kasir & Supervisor
5	Partisipasi Karyawan dalam Pelatihan	%	≥ 80% karyawan/tahun	(Jumlah Karyawan Mengikuti Pelatihan ÷ Total Karyawan) × 100%	Manajer Operasional

With KPIs in place, the success of GL and GHC implementation can be measured more objectively and transparently. The formation of a special waste management team is also important to strengthen internal coordination. Furthermore, increasing human resource capacity through training can strengthen the role of GHC in a measurable and sustainable manner. Finally, closer cooperation with suppliers and collectors will

streamline the return process and waste utilization, so that Indogrosir's supply chain is more in line with the principles of the circular economy With these steps, the implementation of GL and GHC at Indogrosir Batam is expected to develop from merely informal practices into a more strategic, measurable, and sustainable waste management system.

This study shows that the implementation of green logistics and green human capital at Indogrosir Batam is already underway through return, sorting, and plastic reduction practices, but it does not yet have an institutional basis in the form of SOPs and evaluation indicators. The novelty of this research lies in the integration of GL and GHC in the context of wholesale retail and the proposal to develop formal SOPs and specific KPIs for Indogrosir Batam. Thus, this research not only closes the gap between theory and practice but also provides a tangible contribution in the form of institutional instruments that can strengthen the implementation of green logistics in the retail sector.

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