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Sustainable Packaging in Urban Retail: An Assessment of Retailer Awareness in Batasan Hills, Quezon City

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Abstract

High urban consumption patterns continue to generate critical levels of packaging waste, positioning small-scale retailers as vital drivers for local environmental sustainability. This study assessed the level of awareness regarding sustainable packaging and identified the operational barriers to implementation among urban retailers in Barangay Batasan Hills, Quezon City, Philippines. Utilizing a quantitative descriptive research design, data were gathered through purposive sampling from 40 community retailers, predominantly consisting of sari-sari store owners (45%) and mini grocery operators (25%). Data collection employed a structured four-point Likert scale survey evaluating four primary dimensions of awareness alongside perceived structural constraints. The descriptive analysis revealed that while retailers possess a remarkably high environmental consciousness demonstrating a "Strongly Aware" posture toward the environmental impacts of plastic waste (weighted mean = 3.35) their practical application knowledge remains a critical vulnerability. Retailers registered a moderate level of awareness regarding basic sustainable packaging concepts (mean = 3.03) and local policy initiatives (mean = 2.76), but scored lowest on the practical implementation dimension (mean = 2.58), highlighted by a pronounced lack of awareness regarding sustainable material suppliers (mean = 2.40). Financial constraints and market dynamics emerged as the definitive hurdles to behavioral change, with respondents explicitly identifying high premium costs (mean = 3.30) and consumer preference for cheaper alternatives (mean = 3.25) as primary operational barriers. The study concludes that general environmental consciousness does not automatically translate into actual business practices due to restrictive economic pressures and systemic supply gaps. It recommends that Local Government Units shift campaigns toward localized supplier mapping, resource accessibility, and tailored financial incentives for micro-enterprises.

Keywords: Sustainable Packaging, Retailer Awareness, Perceived Barriers, Urban Retail, Responsible Consumption, Micro-Retailers.

1. Introduction

In recent years, environmental sustainability has become a growing concern, particularly in urban communities where high levels of consumption and commercial activity generate substantial amounts of waste. One of the most pressing environmental issues is packaging waste, especially single-use plastics, which continue to accumulate because of their widespread use in everyday transactions (Wandosell et al., 2021). Although packaging serves an important function in protecting, storing, and transporting products, its environmental impact has led to increased attention toward more sustainable alternatives. As concerns about waste and pollution continue to rise, businesses and consumers are being encouraged to adopt packaging solutions that are recyclable, compostable, biodegradable, or made from renewable materials. Advances in packaging technology have led to the development of environmentally friendly options, including plant-based materials and packaging designed to break down naturally after use. Proper management and recycling of packaging waste remain essential in reducing environmental damage and conserving valuable resources (Stories, 2025). In response to growing public awareness of packaging-related environmental issues, many companies have begun promoting sustainable packaging practices as part of their business strategies (Mudgal et al., 2024). Consumer studies also indicate that sustainability increasingly influences purchasing decisions. However, despite this shift in consumer preferences, many businesses still face challenges in transitioning to environmentally friendly packaging due to concerns about cost, practicality, and long-term feasibility.

Sustainable packaging refers to packaging solutions that minimize environmental impact while maintaining their intended function. This may involve the use of recyclable or reusable materials, reducing resource consumption, or designing packaging with a lower ecological footprint. Any type of packaging used for presenting, protecting, transporting, or storing products can be considered sustainable when it is designed with environmental responsibility in mind. According to Dobson (2023), sustainable packaging emphasizes the use of life cycle assessment (LCA) and life cycle inventory (LCI) approaches

to evaluate and reduce environmental impacts throughout a product's life cycle. Similarly, Kawecka (2016) describes sustainable packaging as packaging that balances environmental protection with consumer needs and product performance requirements. The issue is particularly relevant in the Philippines, which remains one of the major contributors to global plastic pollution. It is estimated that the country generates between 2.7 and 5.5 million metric tons of plastic waste annually, a significant portion of which eventually enters the environment (Schachter & Karasik, 2022). Within urban communities such as Barangay Batasan Hills in Quezon City, small retail businesses play a vital role in shaping daily consumption patterns. As direct points of interaction between products and consumers, retailers are in a strategic position to influence the adoption of sustainable packaging practices. However, their decisions are often shaped by practical considerations such as cost, supplier availability, and customer demand, which may limit their ability to shift toward more environmentally friendly alternatives.

Despite ongoing environmental campaigns and policy initiatives promoting sustainability, there remains limited localized research on retailers' awareness of sustainable packaging and the extent to which this awareness translates into actual business practices. Understanding this relationship is important because successful environmental initiatives depend not only on policies and regulations but also on the active participation of those directly involved in commercial activities. This study is anchored in the broader principles of sustainable development and the circular economy. Kozik (2020) emphasized that strategies such as reducing packaging weight, increasing the use of recycled materials, and incorporating renewable resources are essential components of sustainable packaging systems. The author also highlighted the importance of complying with environmental regulations and applying life cycle assessment in packaging design. Likewise, Ibrahim et al. (2022) stressed that sustainable packaging should address present needs without compromising the ability of future generations to meet their own. The study is further supported by the Theory of Planned Behavior (TPB) developed by Ajzen (1991), which explains how awareness and behavioral intentions influence actual behavior. According to the theory, behavior is shaped by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control. These factors collectively influence an individual's intention to perform a particular action and whether that intention is ultimately translated into practice. Magwegwee et al. (2024) noted that awareness and positive intentions do not always result in actual behavioral change, particularly when external barriers are present. In the context of this study, retailers in Batasan Hills generally demonstrate positive attitudes toward sustainable packaging, as reflected in their moderate to high level of awareness regarding its environmental benefits. Many recognize the importance of reducing plastic waste and supporting environmentally responsible practices. However, the limited implementation of sustainable packaging among retailers suggests that awareness alone is insufficient to drive behavioral change. Factors such as financial constraints, accessibility of sustainable alternatives, and consumer preferences may influence their ability to adopt these practices, despite their positive perceptions.

This study is also aligned with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12: Responsible Consumption and Production, which promotes resource efficiency, waste reduction, recycling, and environmentally responsible business practices. In addition, it supports SDG 11: Sustainable Cities and Communities, as it focuses on environmental practices within an urban setting and contributes to the development of cleaner and more sustainable communities through responsible waste management and business operations. Given these considerations, this study seeks to assess the level of awareness of retailers regarding sustainable packaging practices in Barangay Batasan Hills, Quezon City. Specifically, it aims to examine retailers' awareness across various dimensions of sustainable packaging and identify the barriers that may affect its implementation. Through this investigation, the study hopes to provide a deeper understanding of how sustainability is perceived and practiced within urban retail environments and to contribute to the development of more effective environmental strategies at the local level.

2. Material and methods

2.1 Research Design

This study used quantitative research design to assess the level of awareness of retailers in Batasan Hills, Quezon City regarding sustainable packaging in terms of sustainable packaging concepts, environmental impact of packaging, policies and initiatives, practical application in retail settings. The main objective is to understand what retailers currently know, believe, and practice when it comes to environmentally responsible packaging options. It also includes the differences in the level of awareness when respondents are grouped according to their profile, as well as the perceived barriers do retailers encounter in relation to sustainable packaging practices. A quantitative design was chosen because the study is focused on understanding a present condition rather than explaining why it happens or testing whether one factor causes another. Respondent characteristics, such as the type of business they operate, the number of years they have been in business, and their educational background, are considered during the analysis. These factors may provide useful context when interpreting differences in awareness among retailers.

2.2 Locale of the Study

This study was conducted in Barangay Batasan Hills, Quezon City. As one of the largest and most populated barangays in the Philippines, Batasan Hills presents a diverse social and economic environment. The area is home to a large urban poor population, while also containing established residential communities and private subdivisions such as Filinvest Homes and Vista Real. This mix of households creates a unique setting where different consumer needs, lifestyles, and purchasing behaviors exist side by side. Retail activity is a significant part of the local economy in Batasan Hills. Various types of retail establishments operate throughout the barangay, ranging from small sari-sari stores and convenience shops to supermarkets and larger commercial establishments. The presence of these businesses makes the area a suitable location for examining retailer awareness of sustainable packaging practices.

2.3 Respondents of the Study

The respondents of the study consisted of 40 selected retailers operating in Batasan Hills, Quezon City, such as the sari-sari store, mini grocery, convenience store, and specialty shop.

2.4 Sample and Sampling Procedure

This study used purposive sampling technique in selecting respondents. The choice of this approach was guided by the need to focus specifically on individuals who are directly engaged in retail activities within Batasan Hills, Quezon City and are therefore in a position to provide relevant insights regarding packaging practices. Purposive sampling is considered appropriate in this context because not all members of the community are involved in retail operations. By intentionally selecting respondents who own or manage retail businesses—such as sari-sari stores, mini groceries, and similar establishments the study ensures that the data gathered are both meaningful and contextually grounded.

2.5 Research Instrument

The study used a structured survey questionnaire developed by the researcher. The instrument was designed to reflect both conceptual and practical aspects of awareness, recognizing that awareness is not limited to familiarity with terms, but may also involve understanding environmental implications and potential applications in business settings. The questionnaire is divided into four main parts. The first part gathers the profile of respondents, including type of retail business, years of operation, and educational attainment. These variables provide context for interpreting patterns in awareness. The second part focuses on the level of awareness of sustainable packaging practices, which is further organized into four dimensions: (1) awareness of sustainable packaging concepts, (2) awareness of environmental impacts, (3) awareness of policies and initiatives, and (4) awareness of practical application in retail settings. This structure was intentionally developed to avoid a one-dimensional view of awareness and instead capture its different layers. The third part explores perceived barriers, such as cost, accessibility of materials, and availability of information. Although not the central variable of the study, this section was included to provide a more nuanced understanding of how awareness may be shaped or limited by real-world constraints. A four-point Likert scale was used in measuring awareness and perceived barriers, with response options ranging from Strongly Disagree (1) to Strongly Agree (4). The absence of a neutral option was a deliberate choice, encouraging respondents to reflect more carefully on their position rather than defaulting to a midpoint response.

2.6 Data Gathering Procedure

The data collection process was carried out in a manner that sought to balance structure with sensitivity to the respondents' time and context. Prior to data collection, permission was first secured from appropriate local authorities or community representatives, when necessary. The researcher then identified potential respondents based on the established criteria. The questionnaire was administered through face-to-face distribution, allowing the researcher to briefly explain the purpose of the study and clarify any questions from respondents. This approach was particularly important given that some participants may not be familiar with technical terms such as "sustainable packaging." In such cases, the researcher provided simple explanations without leading or influencing the responses. Respondents were given adequate time to answer the questionnaire, and participation was entirely voluntary. They were also assured that their responses would be treated with confidentiality and used solely for academic purposes. After the retrieval of completed questionnaires, the responses were carefully checked for completeness before proceeding to data organization and analysis.

2.7 Data Analysis Techniques

To analyze the data gathered, descriptive statistical tool was employed. The goal was not only to summarize responses but also to present patterns in a way that remains interpretable and meaningful. Frequency and percentage were used to describe the profile of respondents, such as type of business, years of operation, and educational attainment. The weighted mean was used to determine the overall level of awareness of retailers across the different dimensions presented in the questionnaire. Instead of treating all responses equally, the weighted mean accounts for the degree of agreement expressed by respondents using the Likert scale.

2.8 Ethical Considerations

The study observed ethical standards through informed consent, voluntary participation, confidentiality, and secure data handling. Participants' identities were anonymized using codes, and all responses were treated with strict confidentiality. Survey responses were stored securely in encrypted folders and used only for academic and institutional development purposes. These safeguards protected the rights, privacy, and welfare of the participants throughout the research process.

3. Results and Discussion

3.1. Respondents Profile

3.1.1. Distribution of Respondents According to Type of Business

The majority of respondents are sari-sari store owners (45%), followed by mini grocery operators (25%). This distribution suggests that the retail landscape in the area is largely composed of small, community-based businesses. Such a composition is relevant when interpreting awareness levels, as smaller retailers may have more limited access to sustainability-related information and resources. For the distribution of respondents according to their years of operation data show that the largest group of respondents has been operating their businesses for 0–5 years, comprising 13 respondents or 33% of the total sample. This is followed by those with 6–10 years of operation, accounting for 11 respondents or 28%. Meanwhile, 9 respondents (22%) have been in business for 16 years and above, and the smallest group belongs to the 11–15 years category, with 7 respondents or 17%. These findings indicate that the presence of a significant proportion of newer businesses (0–5 years) may have implications for sustainability awareness. Newer retailers may still be in the process of establishing operational routines and supplier networks, which could influence their exposure to sustainable packaging options. On the other hand, more established businesses, particularly those operating for 16 years and above, may have more stable systems but could also be more accustomed to traditional packaging practices, potentially making behavioral change more gradual. The distribution of respondents in terms of their educational attainment show that the largest group of respondents are college graduates, with 16 respondents or 40% of the total sample. This is followed by high school graduates, comprising 11 respondents or 28%, while elementary graduates account for 9 respondents or 22%. The smallest proportion belongs to postgraduate degree holders, with only 4 respondents or 10%. The findings suggest that most of the retailers included in the study have attained at least a secondary to tertiary level of education, with a relatively strong concentration at the college level. This indicates that many respondents may have sufficient formal educational background that could support their understanding of environmental issues, including sustainable packaging practices.

3.2. Level of Awareness

3.2.1. Level of Awareness of Sustainable Packaging

The level of awareness of retailers regarding sustainable packaging concepts across four indicators: familiarity with the concept, understanding of its purpose, awareness of alternatives, and knowledge of recyclability or reusability. Based on the results, the highest weighted mean (3.10) was obtained for familiarity with sustainable packaging, followed closely by understanding its purpose with a mean of 3.05. This suggests that respondents generally recognize the term "sustainable packaging" and have a basic understanding of its intended role in reducing environmental impact. Similarly, knowledge of recyclability and reusability obtained a mean of 3.00, indicating that respondents are moderately aware that packaging materials can be reused or recycled. On the other hand, the lowest mean was recorded for awareness of alternatives with a weighted mean of 2.95, although it is still interpreted as "aware." This slight decrease may imply that while respondents are familiar with the concept in general, their knowledge becomes less specific when it comes to identifying actual eco-friendly packaging options or substitutes for conventional materials. The overall mean of 3.03, interpreted as "Aware," indicates that retailers in Batasan Hills, Quezon City demonstrate a generally positive level of awareness regarding sustainable packaging concepts. However, this awareness appears to be more conceptual rather than deeply detailed or practice-oriented. The findings suggest that while respondents have already been exposed to the idea of sustainable packaging, there is still room to strengthen their understanding—particularly in terms of concrete alternatives that can be applied in real business settings. According to Espineda, et., al (2025), as consumer behavior increasingly prioritizes convenience and aesthetics over sustainability, understanding the barriers to adopting eco-friendly packaging becomes crucial for environmental progress.

3.2.2. Level of Awareness of Environmental Impact

The level of awareness of retailers regarding the environmental impact of packaging waste, particularly plastic use and disposal. The indicators cover pollution contribution, community impact, ecosystem effects, and the importance of waste reduction. The results reveal a high level of awareness, with an overall mean of 3.35, interpreted as "Strongly Aware." This suggests that respondents have a well-developed understanding of the environmental consequences associated with packaging waste, particularly plastic materials. Among the indicators, the highest mean was recorded for the importance of reducing waste (3.45), followed closely by the belief that plastic contributes to pollution (3.40) and that improper disposal harms the community (3.35) all interpreted as "Strongly Aware." These results indicate that environmental messages regarding pollution and waste reduction have likely been effectively communicated to the respondents, allowing them to recognize both the broader and local impacts of improper waste management. The lowest mean was obtained for

effects on ecosystems (3.20), although it is still interpreted as "Aware." This slight decline may suggest that while respondents clearly understand visible and immediate effects of pollution (such as community cleanliness and waste accumulation), their awareness becomes somewhat less detailed when it comes to more distant or ecological-level consequences, such as marine biodiversity loss or ecosystem disruption. Although people are becoming increasingly aware of environmental issues, they often prioritize convenience over sustainability, making it more challenging for eco-friendly packaging options to gain popularity (Orzan et., al. (2018). Biodegradable plastics, reusable bags, and recycled paper materials are some of the solutions that have been implemented, although it remains unclear how they will impact the environment. For example, many people utilize reusable bags as if they were single-use bags, which defeats their purpose of being environmentally friendly (Chang, 2020). Sustainability refers to the capacity to maintain ecological balance and meet present needs without compromising the ability of future generations to meet their own. The concept integrates three pillars: environmental protection, social equity, and economic viability, commonly referred to as the "planet, people, and profit" framework (YouMAtter, 2021).

3.2.3. Level of Awareness of Policies and Initiatives

The level of awareness of retailers regarding existing policies and initiatives related to sustainable packaging, including government efforts, local ordinances, environmental campaigns, and the perceived role of businesses in sustainability efforts. Based on the results, the overall mean is 2.76, interpreted as "Aware." This indicates that respondents have a moderate level of awareness regarding institutional and policy-driven efforts promoting sustainable packaging. However, this awareness appears to be less developed compared to their understanding of environmental impacts, suggesting a gap between general environmental consciousness and knowledge of formal sustainability frameworks. Among the indicators, the highest mean was obtained for understanding the role of businesses in sustainability efforts (2.85). This suggests that respondents have a relatively clearer perception that businesses, including their own retail operations, have a part to play in environmental responsibility. This is a positive indication, as it reflects a degree of recognition that sustainability is not solely the responsibility of government institutions but also involves private sector participation. This is followed by awareness of government efforts (2.80) and awareness of environmental campaigns (2.75), both interpreted as "Aware." These results imply that respondents have been exposed to general information about sustainability initiatives, likely through media, community programs, or local information drives. However, the awareness level remains moderate, indicating that such initiatives may not be deeply understood or consistently reinforced among retailers. The lowest mean was recorded for knowledge of local ordinances (2.65), although still interpreted as "Aware." This suggests that awareness of specific, localized regulations is relatively limited compared to broader environmental messages. In practical terms, retailers may be aware that environmental policies exist but may not be fully informed about the exact rules, guidelines, or enforcement mechanisms at the local level.

3.2.4. Level of Awareness of Practical Application

The findings indicate that retailers possess a moderate level of awareness regarding the practical application of sustainable packaging, particularly in terms of alternative packaging materials, implementation within their stores, perceived feasibility, and knowledge of available suppliers. The overall mean score of 2.58, interpreted as "Aware," suggests that respondents have some familiarity with the operational aspects of sustainable packaging. However, this score is lower than their awareness of environmental impacts and general sustainability concepts, indicating that their understanding is stronger at the conceptual level than in actual practice. Among the indicators, awareness of alternative packaging options obtained the highest mean score (2.70), followed by understanding how sustainable packaging can be applied within retail operations (2.65). These results suggest that retailers generally recognize the existence of environmentally friendly packaging alternatives and understand that such options can potentially be integrated into their businesses. Nevertheless, the moderate ratings imply that this awareness remains largely theoretical and has not yet been fully translated into day-to-day business practices. The perceived feasibility of adopting sustainable packaging received a mean score of 2.55, which also falls under the "Aware" category. This finding suggests that while retailers acknowledge the value of sustainable packaging, they remain uncertain about its practicality in small-scale retail settings. Concerns related to cost, product availability, and the adjustments required for implementation may contribute to this hesitation. The lowest mean score was recorded for awareness of suppliers (2.40), which was interpreted as "Less Aware." This is a particularly important finding because it reveals a significant gap in retailers' knowledge of where and how to obtain sustainable packaging materials. Even when retailers understand the environmental benefits of sustainable packaging and express willingness to adopt it, limited access to information about suppliers can prevent them from putting these practices into action. This lack of supply-side awareness appears to be one of the most significant barriers to implementation identified in the study. The findings are consistent with previous studies emphasizing the importance of practical and accessible sustainable packaging solutions. According to Grönman et al. (2013), packaging plays a crucial role not only in protecting products but also in reducing waste and improving resource efficiency throughout the supply chain. Businesses are encouraged to adopt packaging strategies that balance product protection with waste reduction while supporting efficient logistics and transportation processes. Similarly, Verghese et al. (2015) highlighted the importance of sustainable packaging practices in minimizing food waste and reducing environmental impacts across the product lifecycle. The need for sustainable packaging has become increasingly urgent as packaging waste continues to rise worldwide. Tencati et al. (2016) noted that packaging waste typically accounts

for approximately 15% to 20% of municipal solid waste in many countries, with volumes increasing alongside economic growth. Food packaging, in particular, contributes a substantial share of this waste stream compared to other types of packaging (Simms et al., 2020). These findings underscore the importance of improving not only retailers' awareness of sustainable packaging concepts but also their practical knowledge of implementation and access to reliable suppliers. Without these operational resources, awareness alone may have limited impact on actual adoption.

3.3. Perceived Barriers

3.3.1. Perceived Barriers to Sustainable Packaging

The findings on the perceived barriers to adopting sustainable packaging practices show an overall mean score of 3.18, interpreted as "Agree." This indicates that retailers generally recognize the existence of several challenges that hinder the implementation of sustainable packaging within their business operations. The results suggest that these barriers are not limited to a single factor but rather represent a combination of financial, structural, and informational constraints that influence retailers' decisions and ability to adopt environmentally responsible practices.

Among the identified barriers, the statement "cost is too high" received the highest weighted mean of 3.30. This finding indicates that financial considerations are the most significant obstacle faced by retailers. For many small-scale businesses, particularly those operating within local communities, cost remains a primary factor in business decision-making. Although retailers may acknowledge the environmental benefits of sustainable packaging, the higher price of eco-friendly alternatives can make adoption difficult, especially when operating under limited budgets and narrow profit margins. The second highest mean score was recorded for customer preference for cheaper options (3.25). This finding highlights the important role consumers play in influencing retailer behavior. Retailers often adjust their business practices based on customer demand, and when consumers prioritize affordability over environmental sustainability, businesses may be reluctant to switch to more expensive packaging alternatives. This suggests that the successful adoption of sustainable packaging requires not only retailer awareness but also greater consumer support and willingness to embrace environmentally responsible choices. Difficulty finding suppliers received a mean score of 3.10, which was likewise interpreted as "Agree." This points to a structural challenge that limits the accessibility of sustainable packaging materials. Even when retailers are interested in adopting environmentally friendly alternatives, limited supplier networks and difficulties in sourcing suitable materials may prevent implementation. This finding reinforces earlier results of the study, which showed that awareness of sustainable packaging suppliers was relatively low among respondents. The lack of accessible and reliable suppliers appears to be a practical obstacle that directly affects adoption efforts. The indicator "lack of information" obtained the lowest mean score of 3.05, although it still fell within the "Agree" category. While respondents viewed information gaps as a barrier, they considered them somewhat less significant than financial and supply-related concerns. Nevertheless, the result suggests that some retailers still feel they lack sufficient knowledge, guidance, or exposure to sustainable packaging options and best practices. Improving access to information through educational campaigns, training programs, and industry support initiatives may therefore help strengthen retailers' capacity to adopt sustainable packaging. The findings indicate that the adoption of sustainable packaging among retailers is influenced by a complex interaction of economic pressures, consumer preferences, supplier accessibility, and information availability. These results are consistent with the observations of Goel et al. (2025), who noted that multiple barriers continue to impede the widespread adoption of sustainable packaging across the value chain. Their study emphasized that challenges related to cost, market demand, accessibility of sustainable materials, and knowledge limitations often prevent businesses from fully transitioning to environmentally responsible packaging practices. Consequently, addressing these barriers will require coordinated efforts from policymakers, suppliers, businesses, and consumers to create conditions that support the broader adoption of sustainable packaging solutions.

4. Conclusion & Recommendations

The study concludes that retailers generally have a moderate level of awareness regarding sustainable packaging practices. Awareness is strongest in terms of environmental impact, where respondents demonstrate a clear understanding of issues such as plastic pollution and improper waste disposal. However, awareness becomes less detailed when it comes to policy-related knowledge and, more importantly, the practical application of sustainable packaging in their day-to-day business operations. The results further reveal a noticeable gap between awareness and actual implementation, suggesting that while retailers are informed at a conceptual level, their ability to translate this awareness into practice remains limited due to economic and structural constraints such as cost, supplier availability, and customer preference for cheaper alternatives.

It is recommended that the Local Government Units (LGUs) in Quezon City strengthen their sustainability campaigns by focusing not only on general environmental awareness but also on practical guidance tailored to small retailers. This may include clearer dissemination of local ordinances, accessible information on sustainable packaging suppliers, and practical demonstrations on cost-effective alternatives. Retailers are also encouraged to gradually adopt environmentally friendly packaging options where feasible, even in small steps, to help reduce environmental impact over time. In addition, suppliers and environmental organizations may consider developing more affordable and accessible sustainable packaging solutions,

particularly for micro and small enterprises. Future researchers are encouraged to further explore not only awareness but also actual adoption behaviors and long-term sustainability practices among retailers, ideally using mixed-method approaches for deeper insights.

The study's limitations are the selected retailers in Batasan Hills, Quezon City, which may restrict the generalizability of the findings to other urban or rural settings. The use of a structured questionnaire also limits the depth of responses, as it relies primarily on self-reported data and may not fully capture the complexities of actual business practices. Furthermore, the study focuses mainly on awareness and perceived barriers rather than direct observation of sustainable packaging implementation. These constraints should be considered when interpreting the results, as they may have influenced the scope and depth of the findings.

Compliance with ethical standards

This study was conducted in accordance with institutional ethical standards and research guidelines to ensure integrity, respect for participants, and academic honesty throughout the research process. Participation in the study was entirely voluntary, and respondents were properly informed about the purpose of the research before data collection, ensuring that informed consent was obtained without any form of coercion or undue influence. The confidentiality and anonymity of all respondents were strictly observed, and no personally identifiable information was collected or disclosed at any stage of the study, with all responses being used solely for academic purposes. Ethical approval was secured from the appropriate academic or institutional review body prior to the conduct of the survey, and all procedures were carried out in compliance with approved protocols. The researcher also declares that there are no conflicts of interest that could have influenced the design, analysis, or interpretation of the findings. Proper acknowledgment is given to all authors, institutions, and sources that contributed to the development of this study, and all referenced materials are appropriately cited following academic standards. Furthermore, the researcher affirms full responsibility for the originality of the work, ensuring that no form of plagiarism was committed, and that copyright ownership of the content, excluding cited materials, remains with the researcher in accordance with institutional policies.

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