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Food Waste in Manila: Identifying Barriers and Developing Sustainable Waste Management Solutions

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ABSTRACT

Food waste remains a critical global issue. In Manila, public markets are key contributors to this problem, yet market vendors often lack the resources, knowledge, and institutional support. This study explored their lived experiences regarding food waste and identified sustainable, community-based solutions. A qualitative phenomenological approach was used with semi-structured, face-to-face interviews conducted with ten purposively selected fruit and vegetable vendors. Findings revealed that vendors' food waste management practices were influenced by age, years of experience, and type of business. While some vendors applied basic strategies such as reducing stocks, adjusting prices, repurposing leftovers, and using ice for preservation, many faced barriers like lack of cold storage, absence of waste segregation systems, and limited training. Government support and infrastructure were found to be inconsistent or unavailable. Despite these challenges, vendors expressed a strong willingness to improve their practices if they were given appropriate support, education, and tools. The study highlights the need for improved collaboration between market vendors, local government units (LGUs), NGOs, and waste management agencies. Overall, this study emphasizes the importance of localized, participatory strategies to empower vendors as active agents in reducing food waste to contribute meaningfully to more sustainable food systems in urban environments.

RESUMO

O desperdício de alimentos continua sendo uma questão global crítica. Em Manila, os mercados públicos contribuem significativamente para esse problema; no entanto, os comerciantes frequentemente carecem de recursos, conhecimento e apoio institucional. Este estudo explorou as experiências desses comerciantes em relação ao desperdício de alimentos e identificou soluções sustentáveis de base comunitária. Utilizou-se uma abordagem fenomenológica qualitativa, com entrevistas presenciais semiestruturadas realizadas com dez vendedores de frutas e hortaliças selecionados intencionalmente. Os resultados revelaram que as práticas de gestão de resíduos alimentares dos comerciantes eram influenciadas pela idade, pelo tempo de experiência e pelo tipo de negócio. Embora alguns comerciantes adotassem estratégias básicas — como reduzir estoques, ajustar preços, reaproveitar sobras e utilizar gelo para conservação —, muitos enfrentavam barreiras como a falta de instalações de refrigeração, a ausência de sistemas de separação de resíduos e o treinamento limitado. Constatou-se que o apoio governamental e a infraestrutura eram inconsistentes ou inexistentes. Apesar desses desafios, os comerciantes demonstraram grande disposição para aprimorar suas práticas, caso recebessem o apoio, a capacitação e as ferramentas adequadas. O estudo destaca a necessidade de uma colaboração mais efetiva entre comerciantes, governos locais, ONGs e órgãos de gestão de resíduos. De modo geral, a pesquisa ressalta a importância de estratégias locais e participativas para capacitar os comerciantes como agentes ativos na redução do desperdício de alimentos, contribuindo de forma significativa para sistemas alimentares mais sustentáveis em ambientes urbanos.

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Introduction

Food waste is a pervasive global issue with profound environmental, economic, and social implications. Over 30% of the food produced worldwide—equivalent to 1.3 billion tons annually—is lost or wasted, contributing to more than $1 trillion in economic losses each year (Safdie, 2024). This waste occurs at multiple stages of the food supply chain, from production and transportation to retail and consumer consumption. The United Nations (2021) highlights that 13.2% of food is lost before reaching consumers, while an additional 19% is wasted at the consumer level, including in households, restaurants, and retail outlets. When food waste decomposes in landfills, it releases methane, a potent greenhouse gas that accelerates climate change (Goodwin, 2022; Lewis, 2022). Despite the vast quantities of food wasted, nearly 2 billion people continue to face food insecurity, with the discarded food being sufficient to nourish those in need (Rogin & Wilde, 2024).

The environmental toll of food waste is especially alarming. Methane emissions from decomposing food in landfills account for approximately 8-10% of human-induced greenhouse gas emissions globally (UNEP, 2022). Furthermore, agricultural practices—often the primary drivers of food production—are responsible for the endangerment of over 24,000 species, which are at risk of extinction due to habitat loss and biodiversity decline (UNEP, 2022).

In the Philippines, particularly in urban centers like the National Capital Region (NCR), food waste management presents distinct challenges. NCR, home to Manila and its densely populated districts, generates over 9.4 million tons of food waste annually, with the hospitality sector, including hotels, restaurants, and catering services, contributing significantly through overproduction and inefficiencies in inventory management (Cos, 2021). A report by the C40 Cities Climate Leadership Group (2023) reveals that over 80% of the total waste in NCR is organic, predominantly composed of food waste. While cities like Marikina and Muntinlupa have taken steps toward food waste recycling through composting and biogas production, many areas still lack the necessary facilities and policies to convert food waste into valuable resources (Cos, 2022).

The hospitality sector in Manila is a significant contributor to food waste, as it often overestimates demand, leading to the disposal of surplus food. Inefficiencies in forecasting, inventory management, and food storage are major drivers of waste in this sector (WWF-Philippines, 2021). Food loss in Manila occurs at various points along the supply chain, from post-harvest losses in agriculture to inefficiencies in food transportation and storage (SEARCA, 2022). In response, several experts have proposed innovative solutions to address the root causes of food waste. Technologies such as waste-to-energy systems, which convert food waste into biogas or electricity, and composting programs, which transform organic waste into valuable soil nutrients, have shown strong potential in reducing waste and supporting sustainability efforts in urban settings (UNEP, 2021).

Redistributing surplus food is another effective strategy for mitigating food waste while simultaneously addressing food insecurity. Several nations have implemented surplus food redistribution programs, successfully redirecting edible food from restaurants, grocery stores, and households to those in need (Sundin et al., 2022).

At the individual level, consumer behavior also plays a crucial role in food waste generation. Factors such as over-purchasing, improper food storage, and a lack of awareness about expiration dates contribute to significant waste at the household level (Goodwin, 2022). Public awareness campaigns that educate consumers on food management, portion control, and proper storage can significantly reduce waste and foster more sustainable consumption habits like the average Filipino wastes approximately 14 grams of rice per day, amounting to millions of pesos worth of rice discarded daily (Manila Bulletin, 2023). This study explores the existing management practices on food waste management and its barriers for possible reduction towards sustainable solutions necessary to produce a resilient food system in the city of Manila.

This study aims to examine food waste management among market vendors in Manila by analyzing how vendors perceive the influence of age, type of business, and years of experience on their waste management practices; identifying the most common strategies they employ to reduce and manage food waste; and investigating the key challenges and barriers that hinder the effective implementation of sustainable food waste management practices in public market settings.

Research Method

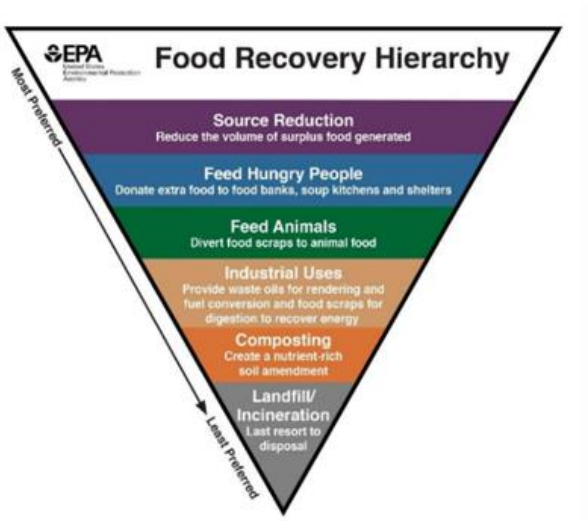
This study employed a qualitative phenomenological research design. It explores the lived perceptions, experiences, and challenges on food waste management encountered by market vendors in Manila (Tenny et al., 2022; Dovetail Editorial Team, 2023) using in-depth semi-structured interviews, purposive sampling in data collection which ensured the inclusion of information-rich cases that could offer valuable insight into existing food handling practices, operational constraints, and adaptive strategies (Ncsc, 2022).

A total of ten market vendors were selected from various locations across Manila and data were analyzed through thematic analysis, following the framework outlined by Perenara-Wilkinson (2025) to provide a systematic process for identifying, organizing, and interpreting patterns and themes across the interview transcripts. Through iterative coding and theme refinement, both explicit content and underlying meanings were extracted to understand the factors shaping food waste behavior among vendors. Ethical considerations were meticulously observed throughout the study. Informed consent was obtained from all participants, who were briefed on the study's objectives, their right to withdraw at any time, and the measures taken to protect their confidentiality.

This study is grounded in the Food Recovery Hierarchy developed by the U.S. Environmental Protection Agency (EPA, 2021), which serves as the conceptual lens for analyzing food waste management practices. The hierarchy presents a tiered approach to reducing food waste, ranking actions from the most to least preferred based on their environmental, social, and economic benefits. At the top is source reduction, followed by redistribution for human consumption, animal feed, industrial uses, composting, and disposal as a last resort.

Figure 1.

Theoretical Framework



Results and Discussion

There are ten market vendors from various public markets in Manila who participated in this study using purposive sampling. The data is based on their actual encounters with food handling and sales, to share meaningful insights in this study.

Table 1.

Participants

Participant	Age	Type of Stall	Years in Operation
P1	35	Fruit stall	12 years
P2	61	Fruit stall	10 years
P3	61	Vegetable stall	40 years
P4	66	Vegetable stall	52 years
P5	38	Fruit and vegetable stall	18 years
P6	26	Vegetable stall	14 years
P7	30	Fruit stall	18 years
P8	50	Fruit stall	25 years
P9	43	Vegetable stall	35 years
P10	55	Vegetable stall	30 years

The demographic diversity of the participants—in terms of age, type of stall, and years of experience—provides a well-rounded foundation for understanding the operational and contextual factors influencing food waste management in Manila's public markets.

Food Waste Management Strategies Based on Vendor Characteristics

Table 2.

Influence of Age, Type of Business, and Years of Experience on Food Waste Management

Theme	Quotations
Age as Advantage	P1 - "Mas okay kase mas malawak na karanasan, mas matagal mas sanay ka na." *(It's better because the experience is broader; the longer you've been doing it, the more accustomed you are.)* P6 - "Mas madami ng alam at karanasan sa pagtitinda." *(We know more and have experience in selling.)* P8 - "Matagal-tagal na rin akong nagtitinda kaya kabisado ko na kung paano alagaan ang paninda para hindi masayang." *(I've been selling for a long time, so I know how to take care of the goods to avoid waste.)* P9 – "35 years na akong nagtitinda kaya alam ko na kung paano maiwasan ang pagkasayang ng paninda." *(I've been selling for 35 years, so I know how to avoid spoilage.)*
Type of Business	P2 - "Sa prutas mas mabilis, pero mas mabilis din masira. Sa gulay may nabubulok pero may tumatagal gaya ng luya." *(Fruits spoil faster; some vegetables like ginger last longer.)* P5 - "Depende sa paninda kung mabilis mabulok, doon kami mas nag-iingat." *(We are more cautious with items that spoil quickly.)*
Experience Matters	P3 - "Sanay na, alam na paano i-handle ang paninda. Tansyado na." *(We're used to it and know how to handle the goods—already estimated.)* P4 - "Dati nasasayang pa, ngayon controlled na." *(Before, there was waste; now, it's controlled.)* P7 - "Sa tagal, alam mo na kung ano lang ang kailangang bilhin." *(With time, you know exactly what to buy.)* P10 – "Kapag matagal ka na, alam mo na kung kailan dumarami ang customer at kailan mahina. Kaya naa-adjust mo na ang dami ng paninda." *(With experience, you know peak times and adjust the stock accordingly.)*

The analysis revealed that vendors' food waste management practices are significantly shaped by their age, type of business, and years of experience. As shown in Table 2, many

participants acknowledged that age and length of experience provide critical advantages in managing food spoilage. P9, who had been in the trade for 35 years, emphasized the role of experience in anticipating spoilage and maintaining product quality. P8 and P6 echoed similar sentiments, noting that long exposure to selling activities led to mastery of preservation techniques and customer behavior patterns.

Additionally, the type of goods sold influenced the handling and turnover strategies. Those vendors having highly perishable goods like fruits mentioned the need for more careful decisions in their inventory compared to those selling relatively more shelf-stable items like ginger (P2, P5). These results support the study of Fabi et al. (2023), noting that vendor familiarity with product perishability is important to control waste. Ps, P4 and P10 cited their knowledge to estimate stocks and demand which leads to better forecasting. This implies that food waste management is not just an awareness, but an applied skill in the marketplace learned over years.

Prevalent Food Waste Management Practices Among Market Vendors in Manila

Table 3.

Stock Management and Inventory Control

Theme	Quotations
Stock quantity adjustment based on day or demand	P1 - "Minsan hindi bundle, kilo kilo na lang… tuwing weekend, Sabado at Linggo pwede na mag bundle." *(Bundle selling on weekends and by the kilo on weekdays)* P5 - "Tuwing Biyernes at Linggo doon, maraing tao." *(High volume on Fridays and Sundays.)* P6 - "Depende… kapag maulan o hindi." *(Stocking depends on the day and weather.)* P9 - "Saktuhan lang sa isang araw… madaling masira." *(Stock just enough to avoid spoilage due to heat.)*
Control on stock purchase quantity	P2 - "Kinocontrol lang kung gaano karami ang stocks." *(Stocks are kept minimal and controlled.)* P7 - "Depende sa dami ng tinda… papamilihin namin ulit kinabukasan." *(Next day purchases are based on leftovers.)* P10 - "Pag mababa ang presyo dinadamihan ko, kapag mataas kokonti lang." *(Stock depends on price fluctuations.)*
Freshness of stock as a factor in decision	P3 - "Pag matumal konti konti lang, pag mabili dadagdagan." *(Stocking depends on sales speed.)* P4 - "Tig sasampung kilo… tig iisang kilo lang." *(Stock size varies per product.)* P8 - "Araw araw ako kumukuha… kapag dalawang araw o tatlo panis na yan." *(Daily restocking prevents spoilage.)*

As detailed in Table 3, vendors demonstrated strategic stock management based on factors such as day of the week, weather conditions, and past sales. Participants like P1 and P6 adjusted inventory quantities for peak days such as weekends, while P9 maintained a "just

enough" daily strategy to prevent spoilage, particularly during hot weather. These practices highlight the role of environmental and temporal awareness in food waste mitigation.

Stock purchase decisions were also data-informed, relying on previous sales and leftovers (P2, P7). Vendors like P10 adjusted buying volumes based on market prices—indicating not only an awareness of perishability but also a strong grasp of economic efficiency. P8's daily restocking strategy reinforces the idea that maintaining product freshness is critical to avoiding waste. These findings align with Adegbite and Ogunwumi (2022), who emphasized that proper inventory control helps minimize food spoilage and enhances operational efficiency in local markets.

Table 4.

Preservation and Shelf-Life Extension Practices

Theme	Quotations
Use of ice for preservation	P3 - "Ung ibang pwede yelohan nilalagyan ng yelo." *(Items that can be iced are kept cold.)* P4 - "Niyeyelohan tas kinabuksan ititinda na ulit." *(Iced overnight, sold the next day.)* P6 - "Kapag mainit ung panahon... nilalagyan ng yelo." *(Ice is used more during hot weather.)* P8 - "May yelo ung ilalim... di ko kaagad babalatan lahat." *(Avoid peeling during rainy weather to preserve.)* P9 - "Alaga lang sa dilig... nilalagyan ng yelo sa cooler." *(Night watering and cooler use.)*
Maintaining freshness through cleaning and storage	P1 - "Kailangan mong linisan... babasain lagi para maging fresh." *(Leafy greens are cleaned and moistened.)* P5 - "Kapag nawala ung lamig ng mansanas... masisira na sya." *(Proper cooling and storage are essential.)* P7 – "Dapat maayos yung lagayan... nadadamay yung ibang lanzones." *(Proper storage prevents bruising in sensitive fruits.)*
Stock management to prevent spoilage	P2 - "Control lang... kung bibili ng marami maiistock lang." *(Avoid overstocking.)* P6 – "Kapag ganitong gulay... ibabargain para maging pera ulit." *(Quick selling methods for delicate vegetables.)* P10 - "Lahat ng paninda naming madaling masira... sakto lang." *(Exact stock levels to maintain freshness.)*

Preservation techniques, such as the use of ice and proper storage, are widespread among vendors. Participants like P3, P6, and P9 reported icing perishable items overnight to maintain quality and delay spoilage. P1 also mentioned selecting unripe produce to stagger ripening times, a technique that prevents synchronized spoilage. Proper handling and storage were also seen as essential. Vendors such as P5 and P7 emphasized careful separation and cooling of delicate fruits, while P1 focused on frequent cleaning and hydration of leafy greens to maintain freshness. Equally important was stock control—an effort to align purchase

volumes with expected daily sales (P2, P10). P6's strategy of quickly discounting vulnerable goods reflects an agile response to minimize losses.

These vendor practices align with findings from the University of the Philippines Los Baños (2022), which observed that more experienced vendors employ precise handling, purchasing, and storage strategies to reduce food waste.

Table 5.

Pricing, Disposal, and Informal Reuse Strategies

Theme	Quotations
Discounting to sell	P1 - "Kapag maganda 70… kapag mabubulok na pa lugi na lang." *(Lower price when spoilage is near.)* P2 - "Pag dating ng hapon binabagsak presyo…" *(Afternoon discounts to maintain freshness.)* P7 - "Imbes na 200 pesos… 100 pesos na lang." *(Prices are slashed sign ificantly.)* P9 - "Minsan mababa na sa puhunan…" *(Even break-even selling is acceptable.)* P10 – "Mas mura na lang kumbaga puhunan na lang…" *(Selling at cost to recover capital.)*
Bargaining and selling at lower prices	P3 - "Binabargain, kahit mura na lang…" *(Bargaining to sell off unsold goods.)* P6 - "Ibabargain na para maging pera ulit." *(Quick sale to regain money.)* P9 - "Minsan may nanghihingi… pinapatuyo yung buto-buto tas tinatanim." *(Spoiled items are reused informally by others.)*
Handling spoiled products by disposal or reuse	P4 - "Kapag nasira tapon na." *(Spoiled goods are discarded.)* P5 - "Kapag di na nabibili… hinihingi nila kesa itapon." *(Some people ask for damaged goods.)* P8 - "Kung sira na itatapon ko na lang… Tinatansya para di masira." *(Avoids spoilage through careful estimation.)* P10 - "Kung pwede pa ibibigay… kung hindi, itatapon." *(Gives away safe items, discards unsafe ones.)*

Vendors often adjust pricing dynamically to dispose of products nearing spoilage. P1, P2, and P7 reported lowering prices significantly—sometimes at or below cost—to ensure turnover and avoid waste. This aligns with the concept of dynamic pricing supported by a 2023 study of Sanders, which found that adjusting prices based on perishability reduced waste by over 21% in grocery settings.

Bargaining was another strategy, particularly for delicate vegetables (P3, P6), while informal reuse was also observed. For instance, P9 noted that some unsold goods were re-used by community members for planting—highlighting an unstructured but notable form of sustainability.

When goods were visibly damaged or potentially unsafe, disposal was the default (P4, P5, P8). Vendors like P10 emphasized the importance of food safety, preferring disposal over

risky giveaways. However, several participants remained open to giving away slightly damaged but still edible produce when requested.

These results demonstrate that economic, ethical, and safety considerations are all at play in vendor decision-making. The strategies used reflect a practical, experience-based understanding of perishability, customer expectations, and profit margins.

Challenges and Barriers Faced by Market Vendors in Managing Food Waste

Table 6.

Food Products that Get Wasted the Most

Themes	Quotations
Fruits	P1 - "Prutas: saging, manga yan ang mabilis masira." (*Fruits like bananas and mangoes spoil quickly.)* P5 - "Itong orange, unang nasisira 'yung balat kapag mainit 'yung panahon, nangungulubot. Kailangan basain ng malamig na tubig." *(The orange's skin is the first to spoil under hot weather—it shrivels and needs rinsing with cold water.)* P7 - "Lanzones kase most sensitive fruits, bawal malamog, mahangin-hanginan lalo maarawan." *(Lanzones are very sensitive—cannot be bruised, exposed to wind, or direct sunlight.)* P8 - "Pag pinya madalas masira kapag nalamog, maasim na." *(Pineapples spoil easily when bruised, turning sour.)* *P2* - "Depende minsan kase ito natitira (apple), minsan ito naman (orange)." *(Sometimes apples remain unsold, sometimes oranges.)*
Vegetables	P3 - "Kagaya ng mushrooms madaling masira, tsaka 'yung lettuce kapag hindi malamig." *(Mushrooms and lettuce spoil quickly without refrigeration.)* *P4* - "Ayan sili nasisira, 'yung pipino lumalambot." *(Chili peppers spoil and cucumbers turn soft.)* *P6* - "Ganito mga kangkong, sitaw madaling malanta." *(Water spinach and string beans wilt easily.)* *P9* - "Sa ngayon madaling masira sili, 2 days pa lang yan kase mainit, sira na, natutuyo 'yung mga dahon." *(Chili peppers spoil fast in the heat—the leaves dry out in just two days.)* *P10* - "'Yung kamoteng kahoy at langkang gulay." *(Cassava and jackfruit as vegetables spoil too.)*

The data in Table 6 reveals that spoilage is primarily driven by the inherent perishability of specific fruits and vegetables. Fruits like bananas, mangoes, lanzones, oranges, and pineapples are highly sensitive to bruising and temperature fluctuations. Vendors noted that these fruits often spoil due to exposure to heat or improper handling. Similar issues were observed with vegetables like mushrooms, lettuce, chili peppers, cucumbers, and leafy greens which wilt, soften, or rot quickly when unrefrigerated.

These insights underscore a critical issue: the absence of refrigeration and proper storage facilities in most market stalls. Vendors operate under conditions that make it difficult

to preserve freshness, especially in tropical climates like the Philippines. As highlighted by Digamon (2023) and the FAO, such infrastructural inadequacies—paired with limited awareness—significantly contribute to high levels of food waste in fresh produce markets.

Table 7.

Challenges Faced in Reducing Food Waste

Themes	Quotations
Impact of Weather and Temperature	P1 - "...sobra kami naapektuhan sa init ng panahon kase mabilis matuyo ang gulay, manga, saging..." *(We're greatly affected by the heat—vegetables, mangoes, bananas dry out quickly.)* P2 - "...nangungulubot kapag naiinitan, nabubulok agad." *(Fruits wrinkle and rot quickly in heat.)* P7 - "Sobrang apektado kami sa init ng panahon..." *(We're heavily affected by the heat.)* P9 - "...nasasayang yung ibang gulay kase nalalanta." *(Some vegetables go to waste due to wilting from heat.)*
Product Deterioration (Overripe/Overstocking)	P3 - "Kapag nakakabili ako ng malapit na masira." *(Sometimes I buy produce that's close to spoiling.)* P5 - "...kapag nahahalo na sa box 'yung hinog na hinog..." *(Overripe fruits in the box spoil others.)*

As Table 7 illustrates, weather—especially extreme heat—plays a significant role in accelerating spoilage. Additionally, vendors often deal with overripe produce, whether from suppliers or due to overstocking. Without cold storage or reliable sales predictions, these factors contribute to a cycle of wastage. The Cold Chain Innovation Hub (2021) emphasizes the Philippines' insufficient post-harvest cold storage, especially for perishable products, further compounding the issue.

Table 8.

Support of the Local Government in Managing Food Waste

Themes	Quotations
Lack of Support	P2, P3, P5, P7 - "Wala naman support." (*There's no support.)* P4 - "Binabayaran naming 'yung pwesto... DSWD may binigay na pampuhunan." *(We pay for stalls... DSWD gave some financial support.)*
Waste Collection Practices	P1 - "Minsan...nagbibigay kami sa kumukuha ng basura kase nakakahiya naman." *(Sometimes we pay collectors ourselves.)* P6, P8 - "...hindi na maseseparate dito sa pwesto." *(Waste can't be segregated at the stalls.)* P9, P10 - "...gabi gabi meron nangongolekta ng basura." *(Garbage is collected every night.)*

Based on Table 8, two main themes emerge regarding local government support for market vendors in managing food waste: lack of institutional support and operational

inefficiencies. Vendors (P2–P5) expressed frustration over minimal government assistance, limited to stall fees, with little direct support for waste management. Some aid from agencies like DSWD was mentioned (P4), but it was not linked to food waste efforts. Vendors also felt neglected by officials.

Operationally, waste collection is inconsistent—often delayed or only conducted at night due to equipment issues (P1, P6, P9, P10). Waste segregation is poorly implemented, with mixed waste being collected (P6, P8). Vendors are largely responsible for cleaning their own areas (P7), and some even pay collectors out-of-pocket (P1), revealing gaps in public services.These findings underscore the need for stronger LGU engagement and reliable systems. Strategies could include better storage access, training in food preservation, and formal support for waste reduction (WWF, 2024).

Table 9.

Barriers to Participation in Waste Segregation Programs

Themes	Quotations
Lack of Awareness or Participation	P1, P2, P3, P4, P6, P8 P9 – "Wala." *(None.)* P5 – "Ang nagsesegregate na lang 'non mga mangangalakal." *(Only scavengers segregate.)*
Limited Implementation and Infrastructure	P7 – "Hindi naman 11agging policy ang pag-segregate." *(Segregation is not policy here.)* P10 – "…kung may lalagyan naman, oo (willing)." *(If there were bins, we'd be willing to segregate.)*

The data in Table 9 reveals a widespread lack of engagement in waste segregation due to inadequate education, enforcement, and infrastructure. Vendors reported that segregation is rarely required or enforced. One participant (P10) expressed willingness to segregate, noting the need for basic tools—such as labeled bins—to make compliance feasible. These observations align with the findings of Dimla (2024), who highlighted how limited awareness and infrastructure hinder proper segregation practices among public market vendors in Zamboanga City. Similarly, Kutey and Takyi (2022) reported that although many vendors in Kumasi, Ghana, were willing to segregate waste for hygiene and environmental protection, the lack of color-coded bins and training made implementation difficult. These studies emphasize that education, infrastructure, and enforcement are essential for effective segregation programs.

Conclusion

The findings of this study underscore a critical yet often overlooked reality: market vendors, while positioned at the heart of urban food systems, remain on the periphery of formal waste management strategies. As revealed through thematic analysis, food waste management

among vendors in Manila's public markets is predominantly informal, experience-driven, and shaped by systemic gaps in institutional support. Vendors rely on intuitive practices such as price reduction, food repurposing, and unsanctioned personal payments to waste collectors—not from negligence, but from necessity. These strategies reflect a determined resilience in the face of limited infrastructure, irregular collection schedules, absent cold storage facilities, and a lack of training or guidance from local government units (LGUs).

Despite these constraints, the study reveals that vendors are not passive participants but potential drivers of change. Many express openness to learning and willingness to participate in organized food waste reduction efforts, such as composting and donation programs—provided these initiatives are accessible, practical, and adapted to their daily routines.

This study reinforces that market are not just points of sale but strategic intervention sites where meaningful environmental, economic, and social transformation can take place. Current gaps in governance and infrastructure not only hinder vendors' capacity to manage waste effectively but also obscure the critical role they could play in achieving urban sustainability goals. Food waste management must no longer be treated as a downstream process but as a systemic issue that begins at the source—with those who handle, sell, and distribute food daily.

Therefore, sustainable food waste management in Manila's markets necessitates a multi-sector, vendor-inclusive approach. By integrating policy reform, infrastructure investment, and community-led education, city stakeholders can transform vendors from reactive participants into empowered stewards of sustainability. Addressing food waste at its origin—through the empowerment of market vendors—is not only vital for reducing landfill burden and improving sanitation but is also key to building a more resilient, equitable, and circular food system. As the findings reveal, the road to sustainability does not begin at the landfill; it begins at the stall.

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