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Philippine Material Recovery Facility Policies: Examining Regulatory Landscapes and Practical Realities

Eduardo Junio Andaya[1], Raymond L. Cruz[2]

[1]Faculty, College of Public Administration and Governance, Pamantasan ng Lungsod ng Valenzuela
[2]Faculty, College of Education, Social Sciences, and Philosophy, Quezon City University, Philippines

ABSTRACT

The growing challenge of solid waste management in the Philippines, exacerbated by rapid urbanization, highlights the crucial role of material recovery facilities (MRFs) as mandated by Republic Act 9003. This study utilized qualitative document analysis to examine the regulatory frameworks and practical contexts surrounding MRF policies at both the national and local levels. The findings revealed that, although a comprehensive legislative framework exists, its implementation is significantly hindered by a notable gap between policy and practice. Key challenges include insufficient funding, a lack of suitable land for MRFs, limited national coverage, and inadequate maintenance. Furthermore, there is a substantial cooperation deficit among stakeholders, along with a lack of public awareness and inconsistent functionality of the facilities, which obstructs adequate waste segregation and MRF utilization. Additionally, data deficiencies and emerging issues regarding gender imbalance within the MRF workforce highlight further areas of concern. Despite these obstacles, the study identifies best practices, such as the centralization and mechanization of MRFs, partnerships with private entities, and innovative uses of these facilities. The recommendations focus on allocating sufficient resources, enhancing public awareness and community engagement, improving operational consistency and data collection, and creating more inclusive policies. Ultimately, bridging the gap between policy intentions and practical outcomes is essential for achieving sustainable waste management in the Philippines.

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I. INTRODUCTION

The increasing amount of municipal solid waste generated worldwide, along with growing concerns about environmental degradation, has placed waste management at the center of environmental policy and research (Rada et al., 2020). In the Association of Southeast Asian Nations (ASEAN), the Philippines faces significant challenges in managing its solid waste. These challenges are compounded by rapid urbanization, industrial growth, and economic development (Gamao & Caelian, 2023). The country's difficulties with solid waste management are an ongoing issue that worsens with population growth (Paz et al., 2020). The passage of Republic Act 9003, also known as the Ecological Solid Waste Management Act of 2000, marked a significant step in addressing these challenges. This legislation emphasizes waste reduction, reuse, recycling, and recovery (Serrona et al., 2014). It highlights the need for proper waste segregation, appropriate disposal methods, and effective waste diversion strategies. The ultimate goal of this act is to achieve a trash-free Philippines through enhanced public participation and awareness (Coracero et al., 2021).

Despite having comprehensive legal frameworks, the practical implementation of effective solid waste management systems, particularly material recovery facilities, is inconsistent across the Philippine archipelago. The challenges of solid waste management are further complicated by the need for good governance, active community engagement, and collaborative efforts among various stakeholders, including government agencies and local communities (Coracero et al., 2021). Many member countries of the United Nations have signed

international treaties aimed at establishing global standards for enforcing environmental regulations. However, most of these efforts primarily focus on promoting environmental compliance. While this is crucial, law enforcement agencies require a better understanding of effective opportunities and concrete actions they can take to detect and prevent waste-related crimes. Many communities are unaware that they may be violating the Ecological Solid Waste Law by engaging in actions considered environmental crimes. Thus, they often do not participate in waste management programs for proper waste disposal (Casiw, 2020). The extent to which city ordinances on solid waste management are implemented in communities has been assessed based on various factors examined by a sample of implementers and residents (Casiw, 2020; Gamao & Caelian, 2023).

This study aims to provide a comprehensive overview of the policy and implementation landscape surrounding material recovery facilities (MRFs) in the Philippines. It highlights the regulatory frameworks, practical realities, challenges, and opportunities for improvement. The global impact of solid waste is increasing at a rate that outpaces urbanization, posing a significant threat to humanity's survival and causing substantial harm to the environment (Casiw, 2020). Local governments bear the primary responsibility for effective solid waste management in the country (Castillo & Otoma, 2013). According to data from the National Solid Waste Management Commission, numerous open dumpsites, controlled dumps, and landfills are scattered throughout the nation (Dataman et al., 2012). Despite existing policies and regulations, the country's waste management system remains a significant challenge. The increasing volume of waste heightens the urgency to develop a sustainable solid waste management strategy, as the decreasing capacity of current disposal sites poses a threat to the environment and health. To address these pressing concerns, this study is guided by the following research questions:

1. What are the existing national and local government policies about material recovery facilities in the Philippines?
2. What key themes, challenges, and best practices are evident in the implementation of MRF policies across different localities in the Philippines?
3. What are the gaps and recommendations for strengthening MRF policies and their implementation in the Philippines?

II. METHODOLOGY

This study employed a qualitative research design, with a primary focus on document analysis for data collection and interpretation (Morgan, 2021). The methodology aimed to systematically review the existing information regarding material recovery facility (MRF) policies in the Philippines, examining both the regulatory frameworks and the practical realities associated with them.

A. Data Source and Collection

The researchers conducted a thorough and systematic search for relevant documents across multiple electronic databases, including Scopus, Google Scholar, and ResearchGate. This search utilized keywords related to policies of material recovery facilities, waste management, environmental regulations, policy implementation, community participation, and local governance in the Philippines.

During this process, relevant government websites and official repositories were thoroughly examined. This included, but was not limited to, the official portals of the Department of Environment and Natural Resources (DENR), the Department of the Interior and Local Government (DILG), the Philippine Institute for Development Studies (PIDS), and the official websites of key local government units (LGUs).

The data collection process involved a comprehensive review of various types of documents. This included national laws, such as the Republic Act 9003 - the Ecological Solid Waste Management Act of 2000 and its Implementing Rules and Regulations, as well as presidential decrees, administrative orders, and local government ordinances. The researchers also examined provincial, city, and municipal solid waste management plans, as well as official government records and reports, including audit reports, assessment reports, performance reviews, policy briefs, and publicly available internal documents. Reports and publications from non-governmental organizations (NGOs) actively engaged in waste management and environmental advocacy in the Philippines were also considered. Additionally, relevant academic journal articles and research papers focused specifically on materials recovery facility (MRF) policies and their implementation were included. The selection of documents was guided by their direct relevance to regulatory provisions, implementation processes, identified challenges, and documented best practices concerning MRFs within the Philippine context.

B. Data Analysis

A qualitative content analysis approach was used to analyze the collected documents. This method involved systematically reading, coding, and categorizing the information extracted from the documents to address the study's research questions directly.

For Research Question 1 (What are the existing national and local government policies regarding material recovery facilities in the Philippines?), the analysis focused on identifying and detailing the key provisions, mandates, responsibilities assigned, and the overall structure of national and local policies related to MRFs as outlined in the official documents.

For Research Question 2 (What key themes, challenges, and best practices are evident in the implementation of MRF policies across different localities in the Philippines?), the analysis involved extracting and grouping recurring themes, specific challenges reported, and documenting exemplary best practices related to MRF establishment, operation, and public compliance. Insights were drawn from both government and NGO perspectives when available.

For Research Question 3 (What are the gaps and recommendations for strengthening MRF policies and their implementation in the Philippines?), the analysis focused on synthesizing insights from the identified policies and their documented implementation realities. This involved identifying inconsistencies, missing components, areas of ambiguity, and emerging recommendations that were directly supported by the textual evidence from all reviewed sources.

III. RESULTS

This chapter presents the comprehensive findings of the study, derived from qualitative document analysis. It includes the presentation, analysis, and interpretation of all the collected data, aimed at addressing the research questions posed in this study. The diverse range of sources selected for this study, including academic journals, official government records, policy documents, and reports from non-governmental organizations (NGOs), provides varied perspectives on material recovery facility (MRF) policies. The discussion is structured to address each research question directly and in a clear manner. It examines the existing regulatory landscape, the practical realities of implementation—including key themes, challenges, and best practices—and identifies critical gaps. Additionally, it formulates actionable recommendations for strengthening MRF policies and their practical implementation across the Philippines.

A. Findings Related to RQ1: Existing National and Local Government Policies on Material Recovery Facilities in the Philippines.

The establishment and operation of material recovery facilities (MRFs) in the Philippines are primarily mandated by national and local government policies. Nationally, Republic Act 9003 (Ecological Solid Waste Management Act of 2000) mandated that each barangay or barangay cluster shall have suitable space for a materials recovery facility (MRF) designed to receive, sort, and process compostable and recyclable materials (Corecero, Gallego, Frago, & Gonzales, 2021). This national directive led to a significant increase in MRFs, growing from 6,957 servicing 7,938 barangays in 2010 to 13,612 MRFs servicing 13,612 barangays by 2018 (Department of Environment and Natural Resources, 2018). This expansion has been noted to help in decreasing littering problems in the country (Corecero, Gallego, Frago, & Gonzales, 2021).

At the local government level, different ordinances support and expand upon the national mandate:

Pasig City Ordinance No. 1, Series of 2018, known as the Ecological Solid Waste Management Code, specifies in Chapter V, Section 10, that a material recovery facility (MRF) must be established in every barangay or cluster of barangays. This facility should be located on land owned or leased by the City or Barangay, or on any suitable open space as determined by the City or Barangay's solid waste management board. Furthermore, Chapter VII, Section 14 of the same ordinance mandates that all malls, commercial complexes, condominiums, buildings, motels, hotels, hospitals, townhouses, subdivisions, and villages are required to establish their own material recovery facility. These facilities must receive accreditation from the Pasig City Solid Waste Management Office.

Alaminos City Ordinance No. (2016).-16, known as the Zero Waste Ordinance, states in Article VII, Section 17 that a material recovery facility must be established in every barangay or clusters of barangays. This facility should be located on barangay-owned land, leased property, or any suitable open space as determined by the barangay council. Additionally, Section 18 of this ordinance outlines the guidelines for establishing these material recovery facilities.

Quezon City Ordinance No. SP-1483, S-2005, also known as the Ecological Solid Waste Management Ordinance, requires residents and businesses to segregate spent fluorescent light bulbs from regular solid waste for collection and disposal. The ordinance states explicitly that "selected MRFs (Materials Recovery Facilities) are designated as disposal sites for busted bulbs from households." This policy emphasizes the importance of MRFs in the proper disposal of hazardous waste.

Municipal Ordinance No. 006, Series of 2023 (Integrated Zoning Ordinance of Pura, Tarlac) offers incentives for developments that implement a

"Private Materials Recovery Facility (MRF)" on-site as part of their waste management strategies, thereby qualifying for zoning incentives. This MRF must include receptacles for various types of waste, including compostable materials, recyclables (such as plastics, metals, glass, and paper), residual waste, hazardous waste, and special waste. Additionally, the ordinance requires that information regarding the capacity of these receptacles be provided.

Municipal Ordinance No. 06, Series of 2020, known as the Ecological Solid Waste Management Code of 2020 for Balaoan, La Union, states in Section 17 that "there shall be a material recovery facility (MRF) established in every barangay." The Code further specifies that the design of the MRF building, layout, and equipment must facilitate "efficient and safe processing, movement, and storage of materials." Additionally, it must allow for "safe external access and accommodate internal flow."

Municipal Ordinance No. 2019-19 (Mandatory Waste Segregation/Sorting at Source of Palanan, Isabela) states in Section 5 that "Every barangay shall establish a material recovery facility (MRF) designed to efficiently receive, sort, process, and store compostable and recyclable materials in an environmentally sound manner." This ordinance emphasizes the importance of proper waste segregation and the responsible management of materials in the Municipality of Palanan, Isabela.

B. Findings Related to RQ2: Key Themes, Challenges, and Best Practices in the Implementation of MRF Policies Across Different Localities in the Philippines

The implementation of MRF policies in the Philippines highlights recurring themes, significant challenges, and emerging best practices across various localities.

Key Themes:

A common theme is the adoption of a "Zero Waste Philosophy," which signifies a commitment to minimizing waste sent to disposal facilities. This approach includes prevention, reduction, recycling, reuse, and composting, as outlined in Ordinance No. 2016-16 of Alaminos City. This philosophy also aligns with local waste reduction initiatives, such as Batangas City's proactive efforts to tackle waste issues, particularly plastic pollution, at the city level (Marcial et al., 2016).

The theme of decentralized implementation with barangay involvement is prominent, as seen in the Batangas City ordinance, which relies on barangay Materials Recovery Facilities (MRFs) for the collection of segregated plastics and Styrofoam (Marcial et al., 2016). The requirement for MRFs at both barangay and cluster levels, as well as in larger private establishments, reflects a strategy aimed at localized waste processing and resource recovery, as outlined in Pasig City's Ordinance No. 1, Series of 2018. This decentralized approach emphasizes the primary responsibility assigned to barangays for waste segregation and collection. This mandate is further reinforced by the Balaoan, La Union Code, which requires the establishment of MRFs in every barangay (Municipal Ordinance No. 06 S. 2020: "The Ecological Solid Waste Management Code of 2020 of the Municipality of Balaoan, La Union").

Resource recovery and diversion from landfills are key objectives in Quezon City's efforts. The city is committed to diverting waste from landfills and converting it into valuable resources, including energy. This effort is monitored through the tracking of waste reduction percentages via material recovery facilities (MRFs), biogas projects, and waste-to-energy initiatives (Environmental Management Program of Quezon City, 2018).

The importance of community support is emphasized in Lugait, Misamis Oriental, where a high level of community appreciation for Materials Recovery Facility (MRF) workers indicates strong local buy-in (Trinidad & Vedra, 2025). Additionally, community knowledge, perceptions, and attitudes are essential themes in this context (Trinidad & Vedra, 2025).

An emerging theme highlights the gender dynamics within the MRF workforce, particularly emphasizing the predominance of females, who constitute 61.54% of personnel in certain facilities (Trinidad & Vedra, 2025).

The innovative application of Materials Recovery Facilities (MRFs) for urban gardening in Barangay Balangkas, Valenzuela City, fosters the creation of green spaces, enhances air and land quality, supports biodiversity, and promotes food security. Additionally, by converting biodegradable waste into organic fertilizer, this initiative significantly reduces the burden on landfills and promotes local agriculture and gardening efforts (Equator Prize, 2024).

Challenges:

Lack of Knowledge and Awareness: Respondents in Bacnotan demonstrated a limited understanding of the collection and transportation of solid wastes, indicating a lack of knowledge regarding the use of material recovery facilities (MRFs) (Badua, 2022). In Batangas City, very few homeowners practice waste segregation or bring their waste products to the designated barangay material recovery facilities (Marcial et al., 2016). There is a clear need for

increased education and awareness about MRFs and recycling initiatives within the community. This should focus on specific locations, contamination issues, and the proper preparation of recyclables (Trinidad & Vedra, 2025).

Weak National Law Implementation and Low Local Government Unit (LGU) Compliance: Despite the enactment of Republic Act (RA) 9003, the law has been poorly implemented for 20 years, particularly in areas such as waste segregation, materials recovery facilities (MRFs), and sanitary landfills (Badua, 2022). As of 2018, only 37% of all cities, municipalities, and provincial local government units (LGUs) were compliant with all aspects of RA 9003 (NEDA, 2018).

Insufficient Coverage and Capacity of MRFs: In Metro Manila, only 334 out of 1,710 barangays—approximately 20 percent—have their own material recovery facilities (MRFs) (World Bank, 2022). Nationally, as of 2018, only 30.92% of barangays had MRFs, a figure that falls significantly short of the 2016 targets of 67.39% and 77.10% (NEDA, 2018). Additionally, the capacity of these MRFs is "not clearly defined," and there are "many gaps and inconsistencies in the data" concerning MRF operations, which makes it challenging to draw definitive conclusions (Trinidad & Vedra, 2025).

Lack of Space for Materials Recovery Facilities (MRFs): For example, the Malabon Local Government Unit (LGU) built a Materials Recovery Facility (MRF) in 2015, but it was one of only three barangay-operated MRFs in the area (Community Participation in Solid Waste Management - The Waste Warrior of Barangay Potrero, Malabon, 2020). Similarly, some barangays in Minalin, Pampanga, report a "need for a location to establish their own MRF," despite the mandate that each barangay or cluster should have an MRF (Dela Cruz et al., 2023).

Lack of Maintenance and Functionality: Barangay Potrero in Malabon, despite initial efforts, unfortunately, has been unable to maintain its Materials Recovery Facility (MRF) established in 2015 (Community Participation in Solid Waste Management - The Waste Warrior of Barangay Potrero, Malabon, 2020). In Minalin, Pampanga, the functionality of MRFs is also an issue, as existing facilities do not include a composting area in each barangay (Dela Cruz et al., 2023). Additionally, some barangays are not utilizing the MRF because waste segregation occurs at the source, which undermines the purpose of the MRF at the barangay level (Dela Cruz et al., 2023).

Limited Cooperation and Traditional Habits: A key issue identified in Batangas City regarding waste management implementation is the lack of cooperation among residents, barangay officials, businesses, and educational institutions. This problem is primarily attributed to traditional waste disposal practices, such as selling recyclables to "magbobote" (collectors) instead of delivering them to materials recovery facilities (MRFs) (Marcial et al., 2016).

The municipality of Minalin faces challenges in implementing its policies due to a lack of budget for solid waste management activities, including the construction of recycling centers, landfill development, and equipment acquisition (Dela Cruz et al., 2023).

Incomplete Waste Recovery ("Recycling Gap"): Recyclables undergo four stages of recovery: source separation, drop-off centers or material recovery facilities (MRFs/MRSs), collection vehicles, and disposal sites. This process reveals that there is "incomplete recovery at each stage," resulting in a significant amount of recyclables still found in collection vehicles and disposal sites (World Bank, 2022).

Critical data on solid waste management, including waste generation, diversion rates, collection coverage, and detailed plastic composition, are often unavailable, outdated, or inconsistently collected at all levels (World Bank, 2022).

Best Practices:

Increasing the number of Materials Recovery Facilities (MRFs) from 6,957 in 2010 to 13,612 in 2018 has contributed to reducing littering issues across 7,938 barangays nationwide (Department of Environment and Natural Resources, 2018).

Centralized and Mechanized Materials Recovery Facilities (MRFs): Metro Manila is home to 13 centralized MRFs, ranging in size from 200 to 1,000 square meters, which process waste from the central areas of local government units (LGUs) and nearby barangays. These facilities primarily focus on composting and are operated by various local government units (LGUs), including Caloocan, Mandaluyong, Marikina, Muntinlupa, Parañaque, Pasay City, and Pasig (World Bank, 2022). Additionally, Pasig City has implemented privately operated mechanized material recovery facilities (MRFs) that can process large volumes of mixed waste, thereby reducing the need for manual sorting (World Bank, 2022).

Partnerships and Alternative Systems: In Malabon City, 21 barangays and 42 homeowners' associations have established arrangements with private junk shops that function as materials recovery systems (MRS). This initiative addresses the shortage of space

in urban areas for constructing material recovery facilities (MRF) (Community Participation in Solid Waste Management - The Waste Warrior of Barangay Potrero, Malabon, 2020). In Quezon City, a material recovery facility has been established with eight stations, which organize and employ waste pickers and junk traders to facilitate further segregation and the purchase of recyclable materials and other saleable goods (Environmental Management Program of Quezon City, 2018).

Quezon City has implemented City Council Ordinance No. SP-1483, S-2005 mandates that all residents and businesses must segregate spent fluorescent light bulbs from regular solid waste collection. Designated Materials Recovery Facilities (MRFs) are being utilized as disposal sites for broken bulbs from households (Environmental Management Program of Quezon City, 2018).

Minalin, Pampanga, has an approved 10-year solid waste management plan, which is a key requirement of the Republic Act (RA) 9003. This plan includes the establishment of a materials recovery facility (MRF) (Dela Cruz et al., 2023).

Community Engagement and Acceptance: The strong support and appreciation from the community for material recovery facility (MRF) workers in Lugait are positive signs of local buy-in (Trinidad & Vedra, 2025). MRFs are actively involved in sorting and processing recyclables, including broken bulbs, plastic bottles, steel, old tires, and batteries, as well as segregating biodegradable and non-biodegradable waste (Trinidad & Vedra, 2025).

Innovative Use of Materials Recovery Facilities (MRFs): In Barangay Balangkas, Valenzuela City, utilizing the MRF facility for urban gardening helps create green spaces, improves air and land quality, supports biodiversity, and promotes food security. By converting biodegradable waste into organic fertilizer, this initiative directly reduces the burden on landfills and promotes local agriculture and gardening (Equator Prize, 2024).

C. Findings Related to RQ3: Gaps and Recommendations for Strengthening MRF Policies and Their Implementation in the Philippines

Several significant gaps have been identified in the policies and their implementation in the Philippines, leading to a range of recommendations for strengthening MRF policies and their execution.

Gaps:

The primary issue identified is the lack of cooperation among various stakeholders, including residents, barangay officials, businesses, and educational institutions. This deficiency directly impacts the effectiveness of material recovery facilities (MRFs), as segregated waste must be delivered to them (Marcial et al., 2016).

Inadequate Infrastructure and Personnel: Specific gaps exist, including the "lack of strategic disposal areas for plastic and Styrofoam waste collection" and a "limited number of waste disposal personnel" for material recovery facilities (MRFs) (Marcial et al., 2016). A significant practical barrier in densely populated urban environments is the "scarcity of appropriate space for constructing MRFs." This often leads to a reliance on alternative material recovery system arrangements with junk shops (Community Participation in Solid Waste Management - The Waste Warrior of Barangay Potrero, Malabon, 2020). Despite the mandates of R.A. 9003, many barangays struggle to establish and maintain functional Municipal Recycling Facilities (MRFs) (Trinidad & Vedra, 2025).

Barangays often lack the financial support necessary for effective solid waste management (SWM) programs, including the operation of Materials Recovery Facilities (MRFs) (Marcial et al., 2016). As a result, municipalities struggle with policy implementation due to inadequate budgets allocated for solid waste management (SWM) activities (Dela Cruz et al., 2023).

Lack of Awareness Regarding Laws and Programs: Residents are not sufficiently informed about the Republic Act 9003 and local solid waste management (SWM) ordinances (Dela Cruz et al., 2023). Some barangays lack a proper understanding of the appropriate use of the mandated Barangay Materials Recovery Facility (MRF), resulting in the improper disposal of collected waste at the municipal MRF (Dela Cruz et al., 2023). Additionally, many residents remain poorly informed about collection schedules and the correct usage of MRFs (Badua, 2022).

There is a significant coverage and capacity deficit in waste management, particularly regarding Materials Recovery Facilities (MRFs). Only 20% of barangays currently have these facilities, resulting in limited capacity and efficiency in processing all generated recyclables, which leads to what is known as the "recycling gap" (World Bank, 2022). For example, in 2018, only 57 out of 142 barangays in Quezon City had MRFs. This indicates a considerable shortfall in meeting the requirements set by Republic Act 9003, which mandates that every barangay or cluster must have an MRF (Environmental Management Program of Quezon City, 2018).

Critical solid waste management data, such as waste generation, diversion, collection coverage, and

materials recovery facility inputs and outputs, as well as detailed plastic composition, are often unavailable, outdated, or inconsistently collected across all levels (World Bank, 2022).

The gender imbalance in the workforce, potential bias in job assignments, unclear wage data, and inconsistent views on occupational health and safety show a significant gap in gender equality and the need for gender-responsive workplace policies (Trinidad & Vedra, 2025).

Recommendations:

Strengthening Implementation and Participation: While there is an existing law and framework for addressing waste management issues, effective implementation is crucial. As noted by Corecero, Gallego, Frago, and Gonzales (2021), success can only be achieved if these measures are enforced strictly and adequately. This effort requires not only government action but also active participation from citizens, who must fully engage with and apply the strategies advocated by experts. To facilitate this, it is recommended that regular seminars and training sessions on Solid Waste Management be held for residents in barangays adjacent to DMMMSU (Badua, 2022).

Address budgetary constraints by allocating sufficient funds for solid waste management activities, which include developing infrastructure such as material recovery facilities and recycling centers, as well as purchasing necessary equipment.

Enhance Infrastructure and Capacity: It is recommended that centralized recyclable recovery facilities be established for clusters of barangays or local government units (LGUs) to facilitate efficient waste management. These large-scale facilities should focus on the systematic sorting, cleaning, and baling of dry, source-segregated waste and recyclables collected from Materials Recovery Facilities (MRFs). This approach will ensure that recyclers receive clean, high-quality materials (World Bank, 2022).

Creative Solutions for Space Constraints: To effectively address space constraints for material recovery facilities (MRFs) in urban areas, it is essential to explore and support innovative solutions. This can include forming formal partnerships with private junk shops through a Materials Recovery System (MRS) model or developing multi-level or modular material recovery facilities (MRFs) that are suitable for limited urban spaces (Trinidad & Vedra, 2025). Furthermore, both national and local policies should prioritize and support community-based solid waste management (SWM) and materials recovery facilities (MRFs). This involves actively enabling and formalizing community participation and recognizing community members, especially the urban poor and informal waste workers, as a vital part of the solution (Trinidad & Vedra, 2025; Andaya et al., 2025).

Local Government Units (LGUs) must update their 10-Year Solid Waste Management (SWM) plans using the latest population data and account for an increase in per capita waste generation (World Bank, 2022).

There is a need for greater education and awareness about material recovery facilities and recycling initiatives within the community (Trinidad & Vedra, 2025).

Data Improvement: Address the undefined capacity of MRFs and the numerous gaps and inconsistencies in the data regarding MRF operations to draw more definitive conclusions (Trinidad & Vedra, 2025).

Gender-responsive policies are necessary to address gender imbalance, bias, wage transparency, and occupational health and safety issues for the predominantly female workforce at MRF (Trinidad & Vedra, 2025).

IV. DISCUSSIONS:

The study highlights a clear regulatory framework for material recovery facility (MRF) operations in the Philippines. This framework is based on Republic Act 9003 at the national level and is supported by various local ordinances in cities such as Pasig, Alaminos, and Quezon City. These policies require the establishment of material recovery facilities (MRFs) at the barangay level and provide detailed operational guidelines, demonstrating a comprehensive approach to managing solid waste. The increase in the number of MRFs from 2010 to 2018 further underscores this foundational effort.

A significant gap exists between policy intent and practical implementation. Despite clear mandates, RA 9003 has been "poorly implemented 20 years after its enactment," with only 37% of local government units (LGUs) compliant as of 2018. Key challenges include consistently low Materials Recovery Facility (MRF) coverage, particularly in Metro Manila, where only about 20% of barangays have their facilities. Additionally, there is a widespread "lack of space for MRFs" in urban areas. The operational functionality of these facilities is often problematic; many lack the capability for proper waste decomposition and face issues when adequate segregation at the source is bypassed, undermining the MRF's purpose. Furthermore, there is a significant "cooperation deficit" among residents and stakeholders, along with a lack of awareness about how to use MRFs effectively. Insufficient financial support for

barangays and pervasive data deficiencies further compound these issues.

Despite facing challenges, several positive themes and best practices have emerged. A key strategy is the decentralized implementation model that emphasizes involvement from local barangays. Innovations such as centralized and mechanized materials recovery facilities (MRFs) in Metro Manila, partnerships with private junk shops (Materials Recovery Stations), and targeted waste stream management for specific items like fluorescent bulbs demonstrate practical adaptations. Additionally, the creative use of MRFs for urban gardening highlights their potential beyond just waste processing.

The Philippines has a legislative framework in place for the effective operation of material recovery facilities (MRFs). However, ongoing challenges in practical implementation, resource allocation, and cooperation among stakeholders have resulted in a significant gap between the intended policies and their actual outcomes. These findings underscore the pressing need for targeted interventions and policy enhancements to improve the efficiency and sustainability of MRFs in the country.

V. CONCLUSION

This study highlights a significant gap between the comprehensive policies for material recovery facilities (MRFs) in the Philippines and their practical implementation. Key insights revealed systemic challenges, including inadequate funding and a severe shortage of suitable land for MRFs, which have resulted in low national coverage. Additionally, behavioral issues hinder cooperation and awareness, leading to poor waste segregation that undermines the purpose of MRFs. Operational inconsistencies and critical data deficiencies also obstruct effective monitoring and maintenance. To address this gap, the recommendations emphasize the need for improved resource allocation and infrastructure planning, as well as exploring innovative land-use solutions and centralized facilities. Strengthening community awareness and engagement through targeted training and support for community-based solid waste management (SWM) initiatives is essential.

Furthermore, enhancing operational and monitoring capabilities through standardized guidelines, robust data collection, and updated SWM plans is crucial. Finally, promoting inclusive policy development is necessary to tackle gender-related issues within the MRF workforce. Ultimately, transforming policies into effective practices requires addressing these fundamental systemic and behavioral challenges to achieve sustainable waste management in the Philippines.

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