

# Assessing the Impact of Local Government Policies on Community-Based Solid Waste Management Initiative: A Phenomenological Inquiry

Lindsey C. Espino., Jillian Isabel T. Sinangote., Graceziel M. Sun., Francine Toni B. Caraso

College of Arts and Sciences Education, University of Mindanao, Davao City, Davao Del Sur,  
Philippines

DOI: <https://dx.doi.org/10.47772/IJRISS.2025.909000433>

Received: 24 September 2025; Accepted: 30 September 2025; Published: 14 October 2025

## ABSTRACT

The phenomenological inquiry investigated the impact of local government policies on community-based solid waste management initiatives. It was conducted to assess policy formulation and community action in response to the waste management crisis Davao City is currently facing. Corresponding to this, seven participants were purposively selected for this study from the Local Environment Unit in Davao City, a non-governmental environmental group, a waste management company, and residents aged 18 years and above who were involved in solid waste management practices. Moreover, participants were given informed consent to ensure confidentiality and secure their rights to participate or withdraw from the study. The researchers utilized an in-depth Interview (IDI) to formulate interview guide questions and gather meaningful insights from the participants. Afterwards, the collected data undergoes the process of transcription and is then thematically analyzed. The results of data analysis exhibited the following themes: infrastructure challenges, financial and economic constraints, challenges in garbage management, poor policy implementation, logistical and collection issues, public awareness and participation, policy and governance in solid waste management, sustainable waste management practices, community engagement and participation, and infrastructure and technology in waste management. This study found that the policy is impartial, but there is a lack of enforcement workforce and effort, challenges in maintaining sanitary landfills, a lack of cooperation from barangays, and inadequate segregation at source, as identified by the participants as the key experiences and critical observations on solid waste management in Davao City. Hence, they inferred essential policies to change, system reformation, and strategies to overcome challenges, which include the establishment of deputized enforcers in barangay, scheduled collection of garbage, cooperation of barangay on segregation, collaboration with waste management companies and other recycling facilities or Public and Private Partnership (PPP), and sense of responsibility and accountability should be grappled by the residents. In conclusion, the participants' postulations indicated that local government policies on community-based solid waste management in Davao City remain inadequate and outdated, emphasizing the need for enforcement and policy amendments. Ultimately, an in-depth investigation into the participants' lived experiences on solid waste management was successful. It is recommended that the government assess the solid waste management policy and consider strict implementation, enforcement, and barangay compliance. Lastly, technically specialized and practically effective strategies must be introduced and implemented to address Davao City's waste management crisis.

**Keywords:** solid waste management strategy, community-based waste management, Davao City UN SDG Integration: #12 – Responsible Consumption and Production.

## INTRODUCTION

Solid Waste Management has long been a struggle, even in ancient times, and has become more challenging today due to the rapid population increase. In this generation, it is not just an environmental challenge for any local community. However, a global crisis continuously contributes to various disasters and climate change. Aside from this, despite the existence of environmental policies, there are still loopholes that need to be addressed, particularly in terms of enforcement. As these issues persist, a well-established system and

measures should be taken to uphold the integrity of environmental policies and protect and preserve the environment for future generations. Hence, this urgency calls the global community to act, as solid waste mismanagement has social, environmental, and health consequences. To start with, Jiachuan Wu referenced the United Nations' World Prospect report, which predicts that the global population will increase from 8.2 billion to 10.3 billion over the next 50 to 60 years (UN Environment Programme, 2024). In relation to the massive population growth, consumption patterns are also expected to increase. Consumption patterns explain how people manage their daily purchases and the disposition of goods, according to Allie Decker (2024). As consumption patterns increase, so does waste production, which will engulf landfill capacity and challenge waste management systems.

According to the United Nations Environment Programme (2024), the rising volume of waste overwhelmed existing recycling and disposal systems in cities worldwide, which struggle to cope with it. In consequence, public health and environmental health risks became severe. Aside from this, biodegradable waste, which is also recyclable, poses a potential danger. According to Stephanie Safdie (2024), just like any other biodegradable substance, food waste generates methane emissions when rotten and contributes 6% of the world's total emissions. On the contrary, a study by Bukola Margaret Popoola (2022) found that biodegradable waste is sound and can be recycled or reused. They further emphasized the importance of bio-waste recycling in protecting the environment and mitigating climate change. Despite being a first-world country with advanced infrastructure, the United States struggles with waste management. Bruna Alves (2024) notes that consumerism and a "throwaway culture" have exacerbated waste generation in the United States. It highlights the complexities of managing waste, a challenge that every country, regardless of its level of development, continues to struggle with. If it is difficult for developed countries to resolve environmental issues, such as solid waste management, how much more challenging would these issues be for underdeveloped and developing countries?

In Southeast Asia, the Philippines ranks among the top producers of waste and is a significant contributor to ocean plastic pollution (Manas, 2023). The country's "sachet economy," exemplified by the widespread use of small, single-use packaging, has contributed to plastic consumption at unsustainable levels. Furthermore, corporations and businesses took this economic strategy for granted due to its high market demand. Large corporations such as Coca-Cola, Nestlé, and Universal Robina have been identified as major contributors to this problem (Guevarra, 2022). Plastic-producing companies have often promoted recycling plastic as a solution to the waste crisis. However, this narrative allows corporations to continue producing large amounts of plastic while ensuring a consistent supply for incineration. By burning plastic to generate energy, producers can sustain and even increase their profits, leading to a significant increase in municipal waste. A comprehensive analysis of data sourced from the DENR's Environmental Management Bureau (EMB), the National Solid Waste Management Commission (NSWMC), and various documents of local government units (LGUs) exposes a series of critical gaps in the enforcement of policies designed to reduce waste generation and effectively manage landfill capacity (Mantaring, 2024). Hence, aside from plastic, one of the major concerns is that mixed waste is still being dumped in landfills, which highlights the lack of segregation at the source.

Davao City, one of the largest urban cities in the Philippines, is facing a waste management crisis as its landfill capacity is being overwhelmed by limited recycling facilities and inadequate technologies to handle the volume of waste (BusinessWorld Online, 2023). Improper waste segregation by residents has further contaminated recyclable materials, reducing the effectiveness of recycling initiatives. Reports reveal that the City generates 300 tons of biodegradable waste (Escovilla, 2024), as reported in an article published by Ralph Lawrence G. Llemit of SunStar in 2021, Engr. Marivic Reyes, Head of CENRO, admitted that Dabawenyos still do not practice proper waste segregation despite the Republic Act 9003 mandate. Local officials, including Tek Ocampo, Chair of the Committee on Environmental and Natural Resources, have expressed concerns over the escalating waste problem and the struggle to secure additional landfill space (Patumbon, 2024).

Furthermore, Reyes stated that Davao's sanitary landfill was estimated to last only until 2023 (Mendoza, 2022). In response, the Davao City government approved a Waste-to-Energy (WTE) project in 2023, costing over 5 billion pesos, proposed by Nippon Steel & Sumikin Engineering Co., Ltd. The project aimed to address the City's garbage problem. However, it sparked significant controversy, with 71 environmental groups opposing it due to its perceived conflict with legal bans on incineration under the Clean Air Act and the Solid Waste

Management Act (Interfacing Development Interventions for Sustainability, 2023). Despite these objections, the project received unanimous approval from the city council and national leadership. However, as of 2024, Mayor Sebastian Duterte noted that the WTE and Davao Bus Projects had stalled due to the national government's failure to release its counterpart funding (Lacorte, 2024). Correspondingly, the City continues to face challenges in optimizing and enforcing Republic Act 9003, the Ecological Solid Waste Management Program, which highlights the importance of waste segregation.

The findings of this study may serve as a valuable tool for policymakers, community leaders, and environmental practitioners seeking to develop more resilient and sustainable waste management systems in the City of Davao. Moreover, this study can assess and offer practical recommendations for local governments to better support and integrate community-based initiatives into broader solid waste management strategies, thereby bridging the gap between policy formulation and community action. Specifically, this research study aimed to answer the following research questions: (a) What are the primary challenges encountered in the implementation of solid waste management policy, and (b) What recommendations can be generated to enhance the implementation of solid waste management efforts?

Correspondingly, sustainable solid waste management aligns with the United Nations Sustainable Development Goal (SDG) 12, which emphasizes "Responsible Consumption and Production." This goal aims to reduce waste generation, promote recycling of materials, and adopt sustainable practices (United Nations, 2024). Community-based initiatives have become pivotal in addressing these challenges, empowering individuals to take responsibility for managing their waste. According to Nuru Lama (2024), modernizing waste collection systems reduces the volume of recyclable and reusable materials sent to landfills, creating economic opportunities for municipalities and waste management companies. Community-based initiatives, engagement, policy enforcement, effectiveness, and waste segregation at source in Davao City remain underexplored. Additionally, only a few studies existed on integrating informal waste collection into formal systems. Ultimately, addressing these gaps is crucial for developing inclusive and impactful solutions to the growing waste management crisis, not just in Davao City but also to the global community. Lastly, this study responds to the urgent solid waste management crisis in Davao City.

This study aims to support the Davao City Government, notably the City Environment and Natural Resources Office (CENRO), in developing practical Solid Waste Management policies and refining their strategies to promote effective waste management and increase community engagement and collaboration. In line with this, the experiences of Landfill Staff and Garbage Collectors are significant in sharing on-the-ground struggles and highlighting areas for improvement in waste management systems. Furthermore, it will also benefit waste management companies, as it sheds light on how local policies impact their operations, guiding them to better align with government regulations and community expectations regarding collaboration. For residents, this study will provide insight into how active community engagement, initiative, and source segregation are vital in addressing the solid waste management crisis. Ultimately, this study serves as a foundation for future research, paving the way for further exploration of how governance and community-based initiatives can collaborate to address the evolving challenges of waste management and policy implementation, and identify strengths and areas requiring improvement.

This study utilized the following theories: José María Luis Mora's Theory of Modernization, Utilitarianism by Jeremy Bentham, Decision-Making Theory by Herbert Simon, and the Theory of Consociation by Johannes Althusius. Integrating several key theories can offer valuable insights to improve the Solid Waste Management policy in Davao City.

José María Luis Mora's Theory of Modernization in the 18th Century, as a Mexican liberal, suggests that a society must progress and evolve; otherwise, it will stagnate and ultimately die. His theory highlights the importance of mitigation, adaptation, and innovation (Dorling Kindersley, 2018). His assertion that "an educated and wise government recognizes the developmental needs of its society" stresses the importance of the government's innovative action in addressing the issues its constituents face. In crafting public policies, Jeremy Bentham's Theory of Utilitarianism (1776) states that a new law can be justified if it does more good than harm. Through the lens of utilitarianism, the success of these policies can be measured by the 'greatest good for the greatest number of people'. This perspective acknowledges that policies may not benefit everyone

equally but emphasizes evaluating them based on their overall contribution to societal well-being. Penultimately, Herbert Simon's Decision-Making Theory further underscores the need for realistic and achievable policy decisions, advocating for practical solutions that meet the community's immediate needs rather than pursuing unattainable ideals (Simon, 1947). This theory also emphasizes the importance of providing timely, practical, and achievable solutions to prevent the compounding of problems. Lastly, Johannes Althusius' Theory of Consociation stresses that power and authority should be a bottom-up approach – sovereignty belongs to the people (Althusius, 1995). This theory will guide and bridge the gap between policy formulation and community action, offering practical recommendations and attainable strategies.

## METHOD

This section discusses the research design employed in this study, the location where the study was conducted, the research respondents, the sampling method used, the research instrument, the data collection procedures, and the statistical tools utilized in data analysis and the interpretation of the study's results.

### Design and Procedure

For the results to be legitimate and dependable, the study design should be established appropriately (McCombes, 2023). This study employed a qualitative approach and phenomenological inquiry. Theoretically, Qualitative research focuses on delving deeply into phenomena, offering rich and detailed descriptions drawn from non-numeric data (Oranga & Matere, 2023). Relative to this method, it also provides valuable insights into the lived experiences of waste management companies, landfill staff, and garbage collectors, as well as residents, offering a deeper understanding of how these policies shape their daily lives and uncover layers of understanding that go beyond what is immediately apparent. Moreover, the design utilized in this study is Phenomenology. According to Teresita Tanhueco-Tumapon (2024), Phenomenology is intensely focused on understanding how subjective experiences are structured and uncovering the meanings and significance embedded within these structures. For this reason, Phenomenology is an important research design in this study, as it focuses on exploring rare or significant events, offering deep insights into phenomena of scientific interest, which will guide researchers in contributing to and filling meaningful research gaps in this field.

During the data collection and study, the researcher followed the following step-by-step procedure. First, seeking permission to conduct the study. As students from one of the universities in Davao City, we submitted an authorization letter to the Dean of the College of Arts and Sciences to conduct the study among the target participants. After approval, the researchers provided additional authorization letters to several entities, including one of the waste management companies, the barangay in the First District serving residents, the head of a non-governmental environmental group, and the Local Environment Office for garbage collectors and landfill staff. Furthermore, to ensure anonymity and allow participants to withdraw from the study at any time, consent forms were given to each participant to confirm their willingness. Subsequently, the researchers conducted observations and interviews as part of the data collection process, after obtaining all necessary permits. In a study by Lynette Pretorius and Sweta Vijaykumar Patel (2024), the authors argued that when individuals are allowed to select their own pseudonyms, they can express their stories more authentically. This approach will strengthen the bond of trust and cooperation between the participants and the researchers.

Moreover, the qualitative data from the discussions were analyzed using thematic analysis, which involved identifying and coding recurring themes and patterns (Clarke, Virginia, & Braun, Victoria, 2020; Walliman, 2021). Thematic Analysis is a popular method used in the social sciences to analyze emotions, thoughts, descriptive details, opinions, and other forms of qualitative data. It involves identifying and categorizing themes, codes, and subcodes to identify trends and patterns in the data. The researchers generated themes from the data by conducting in-depth interviews with participants, including residents, garbage collectors, landfill staff, and waste management companies. The themes were then categorized into three main themes: assessment of the solid waste management policy, evaluation of sustainable solid waste management practices, and suggestions on optimizing and improving the current environmental policy and community engagement in Davao City. After the interviews, the researchers and the data analyst analyzed the data gathered through a transcription process and interpreted the information provided by the participants.



In this study, transparency was paramount, enabling the free flow of information and fostering public trust. The researchers actively addressed concerns and acknowledged the study's circumstances, ensuring that all aspects of the research were openly disclosed. Obtaining informed consent was crucial in ensuring that participants fully understood the study's entirety, including its funding, potential risks, benefits, and support (Arellano et al., 2023). Before signing consent forms, participants were provided with detailed information and treated as rational decision-makers throughout the process. The researchers respected participants' autonomy, even those who declined to participate, by recognizing their right to make an informed decision about their involvement. According to Kausar Alam (2021), honesty and trust are essential in scientific communication, particularly in research related to solid waste management. The researchers rigorously upheld privacy and confidentiality throughout the study, safeguarding participant information using anonymity and explicit consent. Lastly, commitment to confidentiality must be unwavering, ensuring that participants' data remains protected and secure (Bhandari, 2024).

## Participants

The study participants are from a waste management company, the local environment office, a non-governmental environmental group, and residents of all genders aged 18 years and above who actively participate in solid waste management practices in Davao City. The researchers have selected seven (7) participants from this population and utilized purposive sampling to ensure that participants could provide relevant knowledge and experience in solid waste management. In qualitative research, purposive sampling, also known as judgment or expert sampling, is often used to gather in-depth insights from individuals with specific attributes relevant to the study (Bisht, 2024). This enables researchers to select participants who can offer valuable knowledge, experience, and opinions.

## Materials and Instruments

The researchers conducted interviews with participants via online meetings, using interactive and open-ended questions, as well as a recording device. The researchers utilized online Data Collection, allowing respondents ample time to consider their answers while enabling researchers to probe deeper into their responses. Open-ended questions encourage participants to provide detailed, written or typed answers (Rouder et al., 2021). These questions are designed to draw out personal perspectives, experiences, and stories. They help uncover initial themes or issues to investigate further in the research and serve as a valuable starting point for subsequent interviews or focus groups. The analysis and interpretation of the data took place after it was collected. Additionally, a data analyst was consulted to help interpret the findings. Following this, the researchers shared and examined the insights gained from the interviews during the discussion phase of the study.

## RESULTS AND DISCUSSION

This section presents the results and their discussion. The data results were collected within Davao City. A one-on-one, in-depth online interview was conducted with specifically chosen waste management companies and residents actively participating in solid waste management. Moreover, regarding two interview questions, the seven study participants willingly responded and shared their knowledge about their experiences, challenges, and suggestions for optimizing solid waste management practices and policy.

The researchers suggested that the participants choose their pseudonyms to protect their identities. According to Lynette Pretorius and Sweta Vijaykumar Patel (2024), using pseudonyms is a common practice where participants choose their own pseudonyms. However, participants in this study chose to disclose their identities. For reference, the profile of the participants is as follows: Participants 1 and 2 are Engineers in one of the Local Environment Offices, Participant 3 is a logistics personnel member under a municipal environment authority, Participant 4 is a local businesswoman in Davao City whose company specializes in eco-friendly waste conversion, Participant 5 is a civil society leader serving as the head of a local environmental organization, Participant 6 Civil Engineering student at one of the colleges in Davao City, where he practices solid waste management at the source, lastly, Participant 7 is an owner of Eatery who practices solid waste segregation in one of the barangays in the First District.

The online interview was conducted via phone call and messenger audio call, with a screen recording in one of the barangays in Davao City. The interview was conducted with the approval of the barangay officials, the officer-in-charge of one of the local environment offices in Davao City, and the President of the waste management company. Before the interrogation process began, the researchers introduced themselves and the title of the study, as well as its goal. They asked each participant for their desired pseudonym. Additionally, four male and three female participants are above 18 years of age, residing in Davao City, and actively participate in solid waste management practices. Aside from that, informed consent and the rights of the participants were discussed with them as part of the In-Depth Interview's (IDI) primary objective. After the preliminary conversation, the participants willingly responded to every inquiry asked.

### Challenges encountered in the implementation of the solid waste management policy

The researchers categorized the collected data themes according to the primary challenges faced by residents, the City Environment and Natural Resources Office, and Waste Management Companies in implementing the solid waste management policy in Davao City. These struggles concentrated on six (6) primary themes: Infrastructure challenges, Financial and economic constraints, garbage management challenges, Poor policy implementation, Logistical and collection issues, and Public awareness and participation.

*Infrastructure Challenges.* As predicted by the gathered data, participants were primarily asked about their struggles or challenges in implementing solid waste management policies. The participants reported infrastructure challenges, including the full capacity of landfills, a lack of facilities, and outdated technologies, that they faced in the solid waste management policy in Davao City. Participants detailed their struggles in addressing problems related to solid waste management, as the landfill's capacity is full. Hence, a landfill is a NIMBY, meaning "Not in My Backyard," which refers to the difficulty of finding a new place to build a landfill since most barangays refuse to have one in their vicinity. P1, also known as "Jose," reminisces about his thoughts and expresses his challenges.

*"Then isa ka challenge pud nato is ang area for land filling. Sa pagkakaran, makaingon gyud mi sa atong existing nga sanitary landfill nga puno na gyud ni tungod sa daghang basura nga ilabay kada adlaw. Hundered fifty (150) trucks kada adlaw ang nagahakot og basura nga gilabay sa landfill."* ("Another challenge we face is finding an area for landfilling. We can confirm that our existing sanitary landfill is at full capacity. With the massive amount of waste generated daily—about 150 garbage trucks dumping trash into the landfill every day—it is no surprise that it has reached its limit."). – P1

In addition to the statement above, P4, or "Gabriela," asserted that the landfills' capacity is already full. This corroborates the Philippine Center for Investigative Journalism (PCIJ) analysis of the Environmental Management Bureau's data, which states that among the 18 biggest landfills in the Philippines, Davao City is one of the four biggest landfills that have reached the maximum level (Mantaring, 2024). With this, Davao City under the landfill category belongs to category four, which refers to receiving residual waste of 200 tons and 66 trucks per day in accordance with the DENR Administrative Order No. 10 Series of 2006, Section 4 entitled "Categories of Final Disposal."

*"Iyong landfill natin kasi dito sa Davao puno na...."*

("Our landfill here in Davao is already full...") – P4

*"Since yung sanitary landfill natin is nag-o-operate way back December 2010 and then as of now 'yon pa rin yong landfill na tinataponan natin ng basura, so yung landfill is now already full talaga"* ("Since our sanitary landfill has been in operation since December 2010, it has remained the primary disposal site for our waste. However, its capacity is now full...") – P2

Lamentably, P1, or "Jose," voiced his sentiments that despite the geographical advantage of Davao City, it still struggles to find a place for another landfill. In an article by Rudolph Alama on April 8, 2025, city officials remain concerned despite the expansion of the sanitary landfill from 7 hectares to 9 hectares.

*"Davao City is the biggest city in the Philippines in terms of land area, but unfortunately lisod mangita og*

*Sanitary Landfill kay dili lagi acceptable. So mao nang diha na gyud sa Barangay Carmen ang atong landfill.”* (“No matter how big Davao is—being the largest City in the Philippines in terms of land area—finding a suitable site for a sanitary landfill is still difficult because it is not widely accepted. That is why our landfill remains in Barangay Carmen.”) – P1

Aside from that, participants emphasized the necessity of technology modernization and the lack of equipment in the landfill, which directly affects their operation. In addition, barangays lack sufficient material recovery facilities (MRF) to classify and dispose of garbage properly within their vicinity. They recognized that these challenges hinder the effectiveness of solid waste management, particularly because biodegradable waste and other types of waste, which are not properly segregated at the source, result in their mixing in the sanitary landfill.

*“Iyong heavy equipment namin sa ngayon is not functional, so nag-rent lang kami from private company kasi ang heavy equipment is very vital for the operation sa landfill.”* (“Our heavy equipment is currently not functional, so we had to rent from private providers. This heavy equipment is very vital for the operation of the landfill.”) – P2

*“Kulang pud ta og facilities. Naa man gud sa RA 9003 or Ecological Solid Waste Management Act nga ang primary intention is, as much as possible, gamay nalang gyud atong malabay sa landfill.”* (“Facilities are also lacking. According to RA 9003, the Ecological Solid Waste Management Act, the primary goal is to minimize the waste that ends up in landfills.”) – P1

This theme aligns with the Theory of Modernization by José María Luis Mora, emphasizing the importance of technological mitigation, adaptation, and advancement, not to compete with other nations, but to meet the community's need for improved public services. Parallel to this, P4, known as "Gabriela," compared the contribution of advanced technology to the vast dispersion of garbage, particularly in contrast to outdated technologies. The Philippines ranks as the top contributor of pollution in Southeast Asia. This supports Johann Jose Israel Manas' (2023) published article, which states that, aside from being the top waste generator in Southeast Asia, the Philippines also ranks 1 in plastic pollution in the seas.

*“...Without technology it takes 6 months to dissolve while with the use of technology it only last up to 2 to 3 months. Di ba ang laki ng difference?”* (“Biodegradable waste usually takes around six months to decompose, but with the use of technology, it can break down in just two to three months. That is a huge difference, right?”) – P4.

**Financial and Economic Constraints.** Financial and economic constraints exist in sustaining and maintaining the landfill in Davao City. Aside from the maintenance of the sanitary landfill, another cost was for the howling. Constructing a sanitary landfill alone in the Philippines is costly. P2, or "Filinee", highlighted the substantial financial strain resulting from the expensive infrastructure construction in sanitary landfills.

*“Kay ang pag-construct sa sanitary landfill is costly mag-construct ka og new sanitary landfill costs five hundred (500) million.”* (“Constructing a new sanitary landfill is very expensive, costing around 500 million pesos.”) – P2

Furthermore, P1, or "Jose," detailed the City's expenses beyond landfill construction. Daily transportation used for garbage collection is also expensive. This supports the article published by the Philippine Center for Investigative Journalism (2024), in which state auditors from the Commission on Audit (COA) warned that the volume of waste generated if left unattended would cause numerous problems, including increased waste management costs. This aligns with the theory of decision-making by Herbert Simon, which states that decisions should be acted upon rather than delayed, as it may cause a double effect and produce simultaneous problems.

*“Imadyina ra gud, halos one hundred million a year ang gasto, so five hundred million ang atong gigasto anang landfill for five years. Gawas niini, ang cost nato sa howling sa mga trucks, hundred fifty trucks per day, naa sa mga one (1) million a day pud.”* (“Imagine, our 500-million-peso investment in the landfill is spread over five years, meaning we are spending almost 100 million pesos per year just for that. On top of that,

the cost of hauling the waste—considering we have 150 garbage trucks operating daily—reaches around 1 million pesos per day.”) – P1

*Challenge in Garbage Management.* Challenges in garbage management were also one of their primary struggles, as garbage segregation was not implemented at the source, contributing to the overflowing of landfills. Moreover, participants expressed dissatisfaction due to waste mismanagement occurring at the barangay level, where it should have been segregated already. P1, or "Jose," highlighted waste management as a significant challenge in Davao City, generating 750 tons of waste daily, burdening the existing collection and disposal system.

*“Dako kayo ang challenge sa pag-manage sa basura kada adlaw, especially, sa pagkakaran nagkataas sa seven hundred fifty tons per day (750), so imagine, mao na ang kadaghanon sa basura nga atong hakuton unya dal-on sa landfill.”* (“Managing waste every day is a huge challenge, especially now that it has increased to 750 tons per day. Just imagine—that’s the amount of garbage that needs to be collected and transported to the landfill daily.”) – P1

Furthermore, P2, also known as "Andres," highlighted that the landfill restrictions directly influence how waste is collected. Waste cannot be appropriately disposed of when landfills are full, leading to overflow and poor management.

*“So, it means we have our problem in the sanitary landfill, magkaproblema din sa koleksyon. If the landfill cannot accept na iyung mga basura, iyung koleksyon dito sa Davao City hindi rin effective yung pag-collect ng garbage collection sa area.”* (“This means that if we have a problem with the landfill, it will also affect waste collection. If the landfill can no longer accept garbage, then the collection system in Davao City will not be effective.”) – P2

In addition to these, P3, or "Antonio," argues that despite the City's efforts and the presence of waste collection stations, the issue ultimately comes down to the community's own inappropriate segregation.

*“Ang problema nito is yung community dito sa barangay mismo. Naa tay mga collection points, pero dili gihapon segregated.”* (“The issue lies within the community, specifically at the barangay level. We have collection points, but the waste is still not segregated.”) – P3.

*Poor Policy Implementation.* Despite the policy's existence, the implementation remains insufficient and poor, as conveyed by the participants. Although Republic Act 9003 and City Ordinance 0361-10 are still in effect, their enforcement and implementation remain inadequate due to a lack of foundation, specifically the formal system, and the availability of barangays. In line with this theme, P4 and P1 acknowledged the lack of implementation of environmental policies in Davao City. In parallel, this reinforces the investigation results conducted by the Philippine Center for Investigative Journalism (PCIJ) in 2024, which found that, aside from the garbage crisis, policy failure and inadequate enforcement are also significant contributors to the waste management crisis.

*“We actually have laws about this solid waste management, like Republic Act 9003 and Republic Act 9275, pero nagkakaproblema tayo sa implementation.”* (“We actually have laws on solid waste management, such as Republic Act 9003 and Republic Act 9275, but the problem lies in their implementation.”) – P4.

*“So kadtong na-mention nako ganiha, kadtong roles and responsibilities sa mga barangay ang problema kay ang mga barangay officials gyud ang nahibalo sa ilahang obligation sa RA 9003 ug City Ordinance 0361-10 kay sila gyud ang modumala sa biodegradable ug recyclable waste ug paghimo sa segregated collection diha sa ilahang jurisdiction. Ang gap lang kay hangtud karon naa gyuy limitation sa implementation sa mga barangay, ilabina wala silay truck.”* (“As I mentioned earlier, barangays have specific roles and responsibilities under RA 9003 and even our local ordinance 0361-10. They must manage biodegradable and recyclable waste and conduct segregated collection within their jurisdictions. However, the gap lies in the limitations of their implementation—many barangays still lack garbage trucks.”) – P1



Moreover, participants highlighted existing policies, such as the Anti-Littering Ordinance and the collection of tipping fees, to hold residents and private establishments accountable for their actions and to reduce the volume of waste sent to the sanitary landfill. Accordingly, City Ordinance 0361-10 is called "Davao City Ecological Solid Waste Mgt. Ordinance of 2009," Section 48-A entitled "No Contest Provision" indicates the fine amount depending on the repetition of the violation committed (Davao City Government, 2024).

*"Oo, naa tay mga anti-littering ordinansa nga nagmando sa pagpatuman sa maayong pagdumala sa basura, ilabi na ang waste segregation. Kung masakpan nga wala nimo gisunod ang sakto nga pagbulag sa basura, adunay silot nga ipatuman. Sa unang paglapas, magmula ka og lima ka gatos (P500); sa ikaduhang paglapas, usa ka libo (P1,000); ug sa ikatulo, tulo ka libo (P3,000) ug posibleng mapriso sulod sa unom (6) ka buwan hangtod unom (6) ka tuig."* ("Oh yes, we have anti-littering enforcers who are in charge of implementing waste segregation. If you are caught not segregating your waste, you will face penalties. The first offense carries a fine of P500, the second offense P1,000, and the third offense P3,000 plus imprisonment ranging from six months to six years.") – P5

Among other things, the collection of tipping fees has been implemented in accordance with the City Government of Davao's Citizens' Chapter 2024, under the City Environment and Natural Resources Office – External Services, which is the "Issuance of Order of Payment for Special Garbage Collection and Tipping Fees" (Davao City Government, 2024). The CENRO charges P3.00 per kilo for private establishments that accumulate more than three (3) cubic meters. Additionally, these establishments are responsible for garbage collection, as the CENRO will not collect it. On the other hand, if they generate no more than three (3) cubic meters, they will be exempt from paying the tipping fee, which will serve as an incentive for them, according to P2, known as "Andres."

*"Naga-implementar mi og koleksyon sa tipping fee, dili tungod kay ang tuyo mao ang pagpa-income sa siyudad—ikaduhang rason ra na. Ang una niini mao ang pagdasig sa mga establisimento nga mag-segregate sa ilang basura ug aron maminusan ang gidaghanon sa basura nga ilang ilabay sa landfill."* ("Actually, we are implementing a tipping fee, not solely to generate income for the City, that is only number two. Number one purpose is to encourage private establishments to segregate and to minimize the volume of waste they dump on the landfill" – P2

On the other hand, P5, also known as "Josefina," asserted that the strict implementation of the Environmental Compliance Certificate (ECC) would result in many private establishments being sued for non-compliance with certification requirements. This conforms to an article published by the Philippine News Agency last April 30, 2025, entitled "DENR to tighten ECC rules amid Manila Bay findings." The article states that the DENR will strictly implement its guidelines on issuing ECC, also known as Environmental Compliance Certificates, concerning the environmental threats revealed by the Manila Bay Cumulative Impact Assessment (CIA) (Moaje, 2025).

*"Kung istrikto gyud ang pagpatuman sa mga lagda ug giya sa pag-isyu sa ECC, daghan gyud nga mga kompanya ang dili mahatagan og ECC, labi na kung hugot kaayo ang pagmonitor sa pagsunod niini."* ("If the implementation of ECC rules and guidelines were stricter, many companies would not be granted an ECC, especially if the enforcement was rigorous.") – P5

**Logistical and Collection Issues.** Logistical and collection issues arise due to the lack of trucks, Material Recovery Facilities (MRF), the prohibition of food scraps at the garbage site, and the cooperation of the barangay in the implementation, which is hindered by the absence of facilities and the barangay's inability to afford them. As a result, segregation at source became more challenging to resolve, especially regarding biodegradable waste or food scraps. P7, also known as "Teresa," expressed her concern about disposing of food scraps, as it is prohibited, and there is no alternative disposal method aside from the volunteers at piggeries.

*"Ang among problema kay ang mga lamaw dili man pwede ilabay sa basurahan. Maayo gani kay naay manguha diri og lamaw. Sa una, naglibog gyud mi kung asa namo kini ilabay kay wala gyud mi designated nga area para kalabayan, tungod kay bawal man gyud ipalabay ang lamaw sa regular nga basurahan "* ("Our

problem is food waste because we cannot just throw it in the garbage bins. Fortunately, some people collect food waste here. Before, we were really confused about where to dispose of it since there was no designated area, and we were not allowed to throw it in regular trash bins.”) – P7

Furthermore, P3, also known as "Antonio," articulated the same sentiments regarding the struggle of food businesses in disposing of food scraps and provided their insights on how this challenge affected compliance with Republic Act 9003, also known as the solid waste management policy. Likewise, P4, also known as "Gabriela," emphasized the importance of paying attention to biodegradable waste.

*“It should be biodegradable waste...”* – P4.

*“ Ang problema, ang ubang mga negosyo, ilabi na ang mga restaurant, maglisod gyud og sunod sa mga regulasyon tungod kay daghan sila’g lamaw. Lisod para kanila kung unsaon pag-dispose niini. Mao ni ang usa sa mga hagit nga giatubang sa mga business entities, labi na gayud sa sektor sa pagkaon o restaurant.”* (“However, some businesses, particularly restaurants, struggle to comply because they generate a lot of food waste or 'lamaw.' They find it difficult to properly dispose of this waste, which is one of the major challenges faced by business entities, especially in the restaurant industry.”) – P3

Another point to consider is that P1, or “Jose,” questioned the policy of the law and expressed dissatisfaction with its financial inclusivity. According to Republic Act 9003 or known as "Ecological Solid Waste Management Act of 2000," Section 10, Paragraph 1 states that "Segregation and collection of solid waste shall be conducted at the barangay level specifically for biodegradable, compostable and reusable wastes: Provided, That the collection of non-recyclable materials and special wastes shall be the responsibility of the municipality or city" (Official Gazette, 2025). Additionally, Section 32 of Republic Act 9003 states that the barangay shall establish and allocate land solely for the Material Recovery Facility, which the Sanggunian shall determine.

*“Ambot giunsa ni pag-draft nga balaod nga murag wala man gyud giisip ang kahimtang sa tanang barangay. Dili tanan barangay adunay kapasidad—uban gani walay kaugalingong barangay hall, samot na ang pagpatukod og MRF o composting facility. Sama aning mga barangay sa downtown area, uban nag-abang ra og barangay hall, busa klaro gyud nga limitado ang ilang kapasidad sa pagdumala sa solid waste sa ilang barangay.”* (“It’s unclear to me how the law was crafted when not all barangays even have the capacity to implement it. Some don’t even have their own barangay hall, let alone an MRF or composting facility. In downtown areas, some barangays are just renting office space, so managing solid waste at the barangay level becomes impossible. That’s why the responsibility often falls back on the city.”) – P1

Unfortunately, despite the mandate of Republic Act 9003, Section 32 entitled "Establishment of LGU Materials Recovery Facility," not all barangays have the capability to afford Material Recovery Facilities (MRF) such as recycling, composting, and biodegradable composting, as stated by P1. In line with this, P3, also known as "Antonio," shared his insights and thoughts on the difficulty of garbage segregation in barangays as a Dispatcher.

*“Ang pinakadako nga hagit mao ang garbage segregation, kay sa barangay mismo, wala sila nagbuhat og segregation. Lisod kaayo ipatuman ang programa kung walay kooperasyon gikan sa barangay sa pag-implementar sa segregation. Mao gyud na ang labing lisod nga hagit nga among giatubang.”* (“The biggest challenge is garbage segregation because, at the barangay level, they do not practice segregation. It is difficult to implement if there is no cooperation from the barangay in enforcing segregation, and that is the most difficult challenge.”) – P3

In parallel with this, P5 or “Josefina,” conveyed her observations on the segregation process, especially during the scheduled collection of trucks. Hence, the significance of these facilities intensified, as they will enable the barangay to have proper placement for garbage segregation according to classification, making source segregation no longer impossible.

*“Mao bitawng moingon ang uban nga murag walay pulos ang among pag-segregate kay pag-abot sa garbage truck, ilaha man gihapon idam-ok tanan. Kita, nagsunod ta sa polisiya, apan pag-abot sa truck operators, sila mismo ang dili mosunod. Mao na ang usa sa akong nakita nga problema.”* (That's why some people say that even if we segregate our waste, it all just ends up mixed together when collected by the truck. We follow the policy, but when the garbage trucks come, they don't follow it properly. That's one of the issues I've observed.) – P5

*Public Awareness and Participation.* Participants expressed concerns about the lack of public awareness and participation, citing the issuance of massive citation tickets, anti-littering violations, and the observation of people throwing garbage everywhere. This suggests that there are still individuals who are unaware of the policy and are unwilling to comply with it. Similarly, P1, also known as "Jose," and P3, referred to as "Antonio," contended that the numerous habitual offenders in Davao City indicate the residents' awareness level.

*“Sa miaging tuig, ang atong na-record nga mga naisyuhan og citation ticket miabot og kapin upat ka libo, halos lima ka libo ka indibidwal ang atong naisyuhan. Daghan sa ilaha ang wala mag-settle sa ilang mga paglapas, hinungdan nga atong gi-file ang kaso batok kanila sa korte. Ingon ana kadaghan ang atong nadakpan.”* (“As of last year, we issued citation tickets to over 4,000 individuals, almost reaching 5,000. For those who did not settle their violations, we had to file cases in court.”) – P1

*“Daghan na kita’g na-apprehend—halos pito ka gatus (700) ka tawo ang napasakaan og kaso, ug tulo (3) na ang atong napriso niini.”* (“So far, we have already apprehended almost 700 individuals who have been charged, and three of them have already been imprisoned.”) – P3.

In addition, discipline and a sense of responsibility remained a significant source of challenge when it comes to strengthening solid waste management practices. This situation depicts the gravity of waste mismanagement efforts at the source, making it more complicated than ever. Johannes Althusius's theory of consociation emphasizes the importance of segregation at its source; therefore, it should begin at the fundamental unit of society, namely, the household. Otherwise, there will be gaps within the policy implementation and community action.

*“Ang segregation usa na gyud ka mas taas nga lebel sa disiplina, kay kinahanglan buhaton kini sa dili pa nimo ilabay ang basura. Bisan pa man og kini ang pinakasimple ug basic nga pamaagi, problema gihapon nato hangtod karon ang pataka lang og labay sa basura.”* (Segregation requires a higher level of discipline because before you even dispose of your waste, you need to separate it properly. It is actually a basic practice, yet improper waste disposal remains a major problem.) – P1

*“Pero sa atoa nga henerasyon karon murag lisod ug dili pud siya ingon ana kadali moingon ka sa mga tawo nga ‘uy, kinahanglan ka mag segregate ...’ dako gyud nga responsibilidad ang disiplina sa tawo.”* (“But in our generation now, it seems difficult and it's not that easy to just tell people, ‘Hey, you need to segregate, you need to do this and that’... discipline is really a big responsibility for a person.”) – P3

Ergo, P1, or "Jose," expressed dissatisfaction with individual mismanagement practices, as they significantly contribute to flooding and other disasters. Jeremy Bentham's Theory of Utilitarianism explains that an act can be considered morally right if it produces pleasure for the majority. In this case, the negligence of individuals in improperly disposing of their garbage, which contributes to flooding, is morally wrong.

*“Everytime nga mag-ukab ta og mga kanal, manhole, daghan kaayog basura na nabara didto which is mao nay cause sa pagbaha. Balik ra gihapon sa atoa ang problema.”* (“Every time we open drainage canals and manholes, we find a lot of garbage stuck inside, which causes flooding. The problem keeps coming back to us.”) – P1

In response to the waste crisis Davao City is facing, the Davao City local government intends to build a P2.5 billion waste-to-energy (WTE) facility on a 10-hectare plot of land in Biao Escuela, Tugbok District, with the help of a Japanese Loan. This is according to Geela Garcia (2023) in her article entitled "Waste-to-energy project in Davao City to fuel climate change, groups warn", highlighting the harsh realities of the waste crisis

in the City. Comparably, in the broader Philippine context, many local government units continue to use open dumpsites due to a lack of financial funds, as entirely constructed sanitary landfills are frequently unaffordable. Parallel to this is the Theory of Decision-Making by Herbert Simon. Due to the impracticality of policy, issues such as waste reduction and source segregation have been compounding daily, resulting in a waste management crisis. Moreover, the waste management crisis affected not only one individual or institution but the whole community. Jeremy Bentham's Theory of Utilitarianism explains that a policy is evaluated based on the number of pleasures it can create. However, most participants expressed dissatisfaction with the policy and its implementation. Ultimately, the Theory of Consociation by Johannes Althusius posits that to create a sufficient policy, it must address the real issues faced by the community. Lastly, José María Luis Mora's Theory of Modernization reflects the opposite reality of infrastructure scarcity and antiquated technology. This theory emphasizes the importance of the government improvising, innovating, and updating resources in response to societal needs.

### Recommendations that can be generated to enhance the implementation of solid waste management efforts

Despite the aforementioned struggles and challenges in addressing solid waste management, the City Environment and Natural Resources Office, waste management companies, and residents have employed various strategies to overcome the waste management crisis. These recommendations and suggestions were assembled into four (4) primary themes: Policy and governance in solid waste management, Sustainable waste management practices, Community engagement and participation, and Infrastructure and technology in waste management.

*Policy and Governance in Solid Waste Management.* The action point should be the barangay's cooperation in implementing solid waste management with strict enforcement. It suggests that barangays can create deputized enforcers to reprimand or apprehend violators. They also recommended policy reformation to promote inclusivity across all barangays, regardless of resources, thereby establishing a more comprehensive policy and governance framework for solid waste management in Davao City. P1, or "Jose," suggested implementing a formal system to manage solid waste effectively.

*"Dapat kumpleto ang Sistema. Dapat man gud naa gyud tanan sistema sa dili pa maimplement gyud ang segregation."* ("The system needs to be complete. Before segregation can be fully implemented, all necessary systems must be in place.") – P1.

This theme aligns with Herbert Simon's Theory of Decision-Making, as it suggests that practical and achievable solutions must be decided upon promptly to prevent the issue from compounding. If the system cannot manage the emerging issue, this will lead to a waste management crisis. It implies that the law should evolve with the changing times, and the system must adapt to address and mitigate modern issues and problems. Additionally, P5 or "Josefina," suggested improving Solid Waste Management efforts in Davao City. She recommended a change to the system or strategies.

*"Nakigstorya na ko kaniadto kang Engineer Madrazo, kadtong kanhi hepe sa CENRO nga siya mismo nakasinati sa pagkolekta og basura sa Australia. Pareho ra mi og panghunahuna bahin niini, nga murag angay nga buhaton sab sa siyudad ang maong sistema aron ang uban makapahimo niini og panginabuhian ug mahimo pa kuni nga pagkakitaan, o kaha usbon gyud ang sistema."* ("I already talked to Engineer Madrazo, the former head of CENRO, who also had experience with waste collection in Australia. We shared the same thoughts about it—that the City should implement a system where waste management can be more efficient. Some types of waste could even be turned into a source of income, or the system itself could be improved.") – P5

Moreover, P3, also known as "Antonio," emphasized the importance of cooperation and compliance of every barangay. Local government units, such as barangays, play an essential role in enforcing strict regulations within their jurisdiction, and waste segregation is their responsibility as mandated by Republic Act 9003, Section 10. The Theory of Consociation by Johannes Althusius supports the idea that waste segregation should



be a bottom-up approach, emphasizing the importance of cooperation between the people and the government, which bridges policy formulation and community action.

*“Kinahanglan og cooperation within the barangay so dako og role ang barangay sa atoang waste segregation nga program. Kay from them didto na magsugod ang waste segregation sa ilaha pa lang...”* (“There needs to be cooperation within the barangay because they play a big role in our waste segregation program. Waste segregation should start at their level...”) – P3

Aside from cooperation and compliance of the barangay, the policy should put attention to the availability of the barangay to afford Material Recovery Facilities, as inferred by P1, or "Jose." Nonetheless, waste will end up mixed in the landfill due to inadequate infrastructure within the barangay.

*“Wala may facilities ang barangay so ang nahitabo bisan nag-segregate ka sa household, landfill lang gihapon padulngan. Kana ba mao nay dapat makita nga bag-uhon ang balaod.”* (“The barangay does not have any facilities, so what happens is that even if you segregate, it still ends up in the household landfill. Is that really what should be looked at? The law needs to be changed.”) – P1

In order for the enforcement to be effective, Participant 5 or "Josefina," proposed that there should be police power on garbage collectors since they have expertise in garbage collection on the ground, and they can monitor those who violate the policy. She also advocated for changes in the law to address emerging and new issues.

*“Dapat may police power iyong mga basurero at saka iyong pag monitor. Pag monitor sa kanang gipanglabay sa mga households kana.”* (“The garbage collectors should have police power and the ability to monitor.” Monitoring what is being thrown away by the households.) – P5.

Commensurate with this, barangays can also create deputized enforcers to monitor and reprimand solid waste management policy violators, according to P1, or "Jose." This ensures that individuals and private establishments properly segregate waste, following scheduled collection and disposal locations (Sunstar, 2023).

*“So dili lang ang CENRO ang naay deputized enforcers, sa barangay, nay provision sa balaod na ang barangay magbutang og barangay deputized enforcer na mag-issue og citation ticket sa ilahang territorial jurisdictions kay kabalo man gyu na sila kinsay violator.”* (“So, it is not just the CENRO and the deputized enforcers; in the barangay, there is a provision in the law that allows the barangay to appoint barangay deputized enforcers who can issue citation tickets within their territorial jurisdictions because they really know who the violators are.”) – P1

Similarly, P3, also known as "Antonio," and P7, or "Teresa," imparted the momentousness of "anti-littering forces." Their presence within the community to enforce the law and apprehend or reprimand violators encourages residents to comply with proper waste disposal, creating a sense of accountability in the latter.

*“Dapat naa tay mga anti littering forces na mag-adto sa mga barangay collection points para makita nila dito kung ga-segregate ba o wala. So daghan natag na apprehend nga almost seven hundred ka tawo na ang napasakaan og kaso ug naa na tay napriso ana tulo kabuok.”* (“If we have anti-littering forces who will go to the barangay collection points to see if they are segregating or not, we have already apprehended almost seven hundred people who have been charged, and we have already imprisoned three of them.”) – P3

*“... kung naay gahig ulo ginatagaan man gud nilag aksyon ila yata ng ginapamulta. Ay murag naa sila’y papel na ilang lista tapos pabayaron. Oo, mao ng mahadlok pud ang maglabay na masakpan, makabayad jud.”* (“... if someone is stubborn, they take action and impose fines on them. It seems they have a list on paper, and then they charge you. Yes, that is why they are also afraid of getting caught; they really have to pay.”) – P7

Besides, consistent monitoring and evaluation positively impact enforcing solid waste management policy in their community, as asserted by P6 or "Marcelo." Parallel to this is the mandate of Republic Act 9003 of 2000

Chapter III, Article 1, Section 15, paragraph (b), mandated the "identification of critical solid waste facilities and local government units which will need closer monitoring and/or regulation" and "review and monitor the implementation of local solid waste management plans, according to Article 2, Section 5, paragraph (c).

*"Maganda na mayroong nagmo-monitor ng aming basura dito sa komunidad upang ma-identify at maipatupad kung ano ang tamang paraan ng pagtatapon at kung ano ang hindi dapat itapon."* ("It is good that people are monitoring our waste here in our community so that we can identify and implement what the proper disposal methods are and what should not be disposed of.") – P6

*Sustainable Waste Management Practices.* The participants propose a scheduled collection strategy for active segregation and waste management sustainability to reduce waste volume in the landfill efficiently. It aims to create a more organized and efficient waste management system by focusing on scheduled collection and collection coding for active segregation. Subsequently, through this strategy it can optimize Article 2 or Republic Act 9003, Section 21 that states "The LGUs shall evaluate alternative roles for the public and private sectors in providing collection services, type of collection system, or combination of systems, that best meet their needs: Provided, that segregation of wastes shall primarily be conducted at the source, to include household, institutional, industrial, commercial and agricultural sources: Provided, further, that wastes shall be segregated into the categories provided in Sec. 22 of this Act" (Official Gazette, 2025). P1, or "Jose," the acting head of the division of solid waste management in CENRO, advocated the importance of facilities in every barangay.

*"Kinahanglan gihapon og mga pasilidad nga adunay klaro nga segregated collection ug schedule. Pananglitan, ang biodegradable kay kolektahon matag Martes ug Biyernes, unya ang recyclable matag Miyerkules. Dapat adunay lahi-lahi nga schedule sa pagpanikop. Niana nga paagi, kung ang CENRO mangolekta sa Lunes, residual ug special waste ra gyud ang among iandam para kolektahon."* ("There should still be segregated collection and a proper schedule—like biodegradable waste on Tuesdays and Fridays, recyclables on Wednesdays, and so on. That way, when CENRO collects waste, they only need to focus on residual and special waste, making the system more efficient.") – P1

José Maria Luis Mora's Theory of Modernization corroborates this strategy as it promotes the adaptation of modern collection systems, such as assigning different waste types to specific days rather than the traditional way of collection. Furthermore, the Theory of Modernization of Mora prioritizes the government's initiative to meet societal needs, thereby contributing to smooth public services. Most participants also recommend coding trucks for scheduled garbage collection, as this will optimize Article 3, Section 24 of the Republic Act 9003, known as "Requirements for the Transport of Solid Waste." This part of the policy mandates explicitly that "The use of separate collection schedules and/or separate trucks or haulers shall be required for specific types of wastes..." P5, also known as "Josefina," conforms to this.

*"Lahi gyud sa ubang mga nasud, naka-eksperyensya ko niini—labi na gyud sa Australia. Pananglitan, kada Martes ilang kolektahon ang biodegradable nga basura, unya kada Huwebes ang recyclable. Sa sulod sa usa ka semana, tulo ka beses sila mangolekta ug klaro kaayo ang iskedyul. Kung wala kay ipagawas nga basura, mamonitor dayon ka. Kung sa sunod semana wala gihapon kay ipagawas, pangutan-on ka o silutan. Ang mga toxic o hazardous materials aduna sab silay kaugalingong iskedyul sa pagkolekta."* ("Unlike in other countries—based on my personal experience, especially in Australia—there, waste collection is strictly scheduled. For example, on Tuesdays, they collect biodegradable waste, and on Thursdays, they pick up recyclables. If they collect waste three times a week, it is all scheduled. If you fail to put out your trash, they can monitor that. If you repeatedly miss the collection schedule for biodegradable or recyclable waste, you will be questioned and even penalized. Toxic materials also have a separate collection schedule.") – P5

On the other hand, despite the existing mandate of Article 3, Section 24, P4, also known as "Gabriela," there is a lack of implementation. She emphasized that there is a clear mandate from the law. However, Davao City's waste disposal program lacks a coding system for different types of garbage. Instead, collection is only conducted once or twice a week while encouraging 3Rs (Reduce, Reuse, Recycle). Moreover, her statement emphasizes R.A. 9003's Chapter III, Article 1, Section 17, paragraph (4), mandates the "issuance and enforcement of ordinances to implement a collection system in the barangay effectively."

*"There is existing waste collection system here in the Philippines. Gaya ng scheduled collection, Monday biodegradable, Tuesday non-biodegradable. However, the implementation is the problem..."* ("There are existing waste collection systems here in the Philippines, such as scheduled collections—Mondays for biodegradable waste and Tuesdays for non-biodegradable waste. However, the implementation is the problem") – P4

Along with scheduled collection, P2 or "Andres," asserted that the landfill is only meant for residual and special waste, as mandated by Article 1, Section 10 of Republic Act 9003, which states that non-recyclable materials and specials should be the responsibility of the City. Additionally, P3, known as "Antonio," clarified that there is a limitation on the kinds of garbage it can receive; meat and other biodegradable wastes are among these.

*"So, it means gamay lang gyud didto, ang residual lang gyud ang malabay sa landfill para ma-extend iyang life span."* ("So, it means only a small amount will go there, just the residual waste will be thrown in the landfill to extend its lifespan") – P2

*"Unya kana atong landfill is for purely kuan lang na siya mga disposable kanang walay mga karne, mga biodegradable."* ("Our landfill is purely for disposable items, those without, without things like meat, biodegradable.") – P3

In addition, P5 or "Josefina," proposed the same sentiments as other participants in this study, referring to the reformation of policy when it comes to scheduled collection, since the City's garbage collection happens twice a week only. In a study published by Dela Cruz, Edmund Jr, A., entitled "Davao City Ecological Solid Waste Management Ordinance Series of 2010," he stated that garbage collection in barangays is conducted only twice a week (Dela Cruz, 2024).

*"Actually, dapat naa sa sa policy nga naay certain day like katong giingon namo nga for the week or for the day nga unsay dapat ilabay."* ("Actually, according to the policy, there should be a particular day, like what we mentioned, for the week or for the day when things should be thrown away.") – P5

**Community Engagement and Participation.** Participants suggested community engagement and participation to attain long-term results, fair decision-making, and strengthen bonds and confidence between communities and government agencies. This action promotes public participation in making decisions or outcomes that would eventually influence the effectiveness of policies. According to Allison Hendricks (2023), community engagement can reach a wide variety of viewpoints and ideas. For good measure, collaboration with waste management companies focused on the 3Rs is an effective and convenient strategy for waste reduction, according to P4 or "Gabriela," who is the President of a waste management company in Davao City that focuses on transforming biodegradable waste into biofertilizers.

*"Dapat 'yong mga truck na nagkokolekta ng basura may hinihintuan na waste management facility para yung mga waste na pwede ma recycle, re-use, reduce, re-furnish will be separated."* ("Garbage collection trucks should have designated waste management facilities to separate waste for recycling, reusing, reducing, or refurbishing. This way, only the waste that is impossible to recycle or reuse will go straight to the landfill, reducing the amount of waste that ends up there.") – P4

Expanding on this point, P2 or "Andres," emphasized the benefits residents can get from selling their recyclable materials to junkshops and other waste management companies. Aside from having personal income, these actions contribute to positive waste reduction, and private establishments could be charged free tipping fees due to the reduced volume of waste thrown at the sanitary landfill.

*"Kung mag-segregate sila meaning personal income nila iyang mga recyclable na pwede nila mabaligya ma connect nila directly to junk shop ana and then mo-less pud ang ilang basura."* ("Garbage collection trucks should have designated waste management facilities where waste can be separated for recycling, reusing, reducing, or refurbishing. This way, only the waste that is impossible to recycle or reuse will go straight to the landfill, reducing the amount of waste that ends up there.") – P2

Similarly, if waste management companies agreed to purchase recyclable materials and other waste that aligns with their institutional functions, this would help the City increase its revenue, as outlined in P5, also known as "Josefina." In this method, the city could allocate more of its budget to heavy equipment used in the landfill, which is mentioned to be one of the challenges in the landfill's operation. Aside from that, it will open an opportunity for the City to fund a Material Recovery Facility (MRF) in barangays that cannot afford to build an MRF Composting facility. This subscribes to the Theory of Utilitarianism, as exemplified by Jeremy Bentham's maxim "greatest good for the greatest number of people," because this strategy will generate a positive effect not just to the government but also to the community.

*"If the company moving on, we will buy, that is an additional income to the city, then pwede from that income alone pwede sila magdagdag og facilities para sa facilities for the landfill, if ever. Dili lang unta masudlan og mga vested interest from the politicians or the law-making body nato."* ("If companies commit to buying recyclables, it will also generate extra income for the City. That income could then be used to improve waste management facilities, such as building better landfills if needed. Hopefully, this process would not be influenced by the vested interests of politicians or our lawmakers.") – P5

Moreover, the grander expansion of facilities will not only result in higher revenue but will also generate more job opportunities for the residents. In line with this, P5, or "Josefina," marked the distinction between Public and Private Partnership in contributing to the performance of solid waste management in Davao City.

*"Ang Public and Private Partnership kay nindot gyud na siyang program, kay ang private sector mo-come in as partner. Naghatag pud ni og additional income para sa gobyerno ug sa atong lungsod. So kung naa na, ma-improve na ang mga facilities ug ma-address nato ang mga kinahanglan pa nga ma-improve in terms of pondo para sa solid waste management program."* ("Public and Private Partnership is a great program because the private sector becomes a partner, which also brings additional income to the government and our city. With that, we can improve our facilities and address what needs to be enhanced, especially in terms of funding for the solid waste management program.") – P5

Similarly, P2 or "Jose" shared his knowledge on how non-governmental organizations' programs contribute to the progress of waste management in Davao City.

*"Actually, there are some NGO like katong sa Mintal, JICA, like Mirca, Mintal Resource Collection, which improves the waste management sa isa ka barangay. Kanang nagakolekta og sarili nila nga recyclables. So importante gyud ang collaboration sa city ug mga NGOs. Ang JICA pud naa silay program like sa barangay Bucana, which also, para ma-improve ang waste management and collection sa barangay. So importante gyud kaayo ang collaboration sa NGO."* ("Actually, some NGOs, like in Mintal, JICA, and Mirca (Mintal Resource Collection), help improve waste management in certain barangays by collecting recyclables on their own. Collaboration between the city and NGOs is essential. JICA also has a program in Barangay Bucana to enhance waste management and collection. So, strengthening partnerships with NGOs is crucial.") – P2

Along with that is the proliferation of Article 4, Section 28 of Republic Act 9003 which states that "The National Ecology Center shall assist LGUs in establishing and implementing deposit or reclamation programs in coordination with manufacturers, recyclers and generators to provide separate collection systems or convenient drop-off locations for recyclable materials and particularly for separated toxic components of the waste stream like dry cell batteries and tires to ensure that they are not incinerated or disposed of in a landfill..." Nevertheless, P3 or "Antonio," suggested that the government should allocate more resources to focus on wet markets in Davao City. Aligning with Chapter III of R.A. 9003, Section 17, paragraph (3), which mandates explicitly "Estimated solid waste generation and projection by source, such as residential, market, commercial, industrial, construction/demolition, street waste, agricultural, agro-industrial, institutional, other wastes."

*"Yes, mga markets kay ang mga markets kasagaran diha mga, mga wet, wet ilahang basura so kailangan tutukan ang atong mga markets especially yung mga dagko og market na atoang Agdao Public Market and Bankerohan Public Market and naa tay Calinan Public Market and Toril Public Market so kana dapat tutukan sa gobyerno."* ("Yes, markets generate mostly wet waste, so they need special attention. The government



should focus on major markets such as Agdao Public Market, Bankerohan Public Market, Calinan Public Market, and Toril Public Market.”) – P3

In order to have effective community engagement, active participation from the residents is one of its requisites. Individual participation plays a vital role in waste reduction. P4 or "Gabriela," avowed that individuals should have a strong sense of responsibility in managing their waste, as solid waste management requires communal work.

*“It is impossible to incentivize, basura mo responsibilidad mo hindi basura mo responsibilidad ng iba. I am talking here as a citizen. You have to do it on your own.”* (“It is impossible to rely on incentives— your trash is your responsibility, not someone else’s. I am talking here as a citizen. You have to do it on your own.”) – P4.

Additionally, P1, also known as "Jose," conforms to this statement, as solid waste management is not solely the responsibility of CENRO, but rather the primary responsibility of the people.

*“Ang responsibility lang sa mga tao katong number one mag-segregate lang sa mga basura, at source sa ilang mga balay, household, then ika-duha, dili paglabay sa basura bisan asa, ang ikatulo ang pag minus sa basura.”* (“It is impossible to rely on incentives—your trash is your responsibility, not someone else’s. I am talking here as a citizen; you have to do it on your own.”) – P1

Hence, information, education, and communication should be intensified in the community, as mentioned by P2 or "Andres." Additionally, EIC is also mentioned in Chapter II, Section 8, paragraph (c) of Republic Act 9003 on the "Role of Department," which states that the Department shall "prepare and distribute information, education and communication materials on solid waste management." In an article published by Rudolp Alama on April 8, 2025, Maribel Alberca, Information and Education Campaign Assistant at CENRO, highlighted the importance of Dabawenyos' waste segregation practice, noting that new sanitary landfills have a lifespan of only 5 years. This point was also emphasized by P1, or "Jose."

*“Continue nang pag IEC, cause yun kung meron kasing segregation or minimize yung volume nga ma dispose doon sa sanitary landfill it means na ma expand yung lifespan ng sanitary landfill. So very important din na i educate yung tao ditto about segregation at source.”* (“Continuing the Information, Education, and Communication (IEC) efforts is crucial because proper segregation and waste minimization can significantly extend the lifespan of our sanitary landfill. If we reduce the volume of waste being disposed of at the landfill, it will remain useful for a longer period...”) – P2

Following this perspective, P3 or "Antonio," suggested that discipline and education should start at an early age so that the children will embody it as they grow.

*“Siguro ang pinaka the best diha, sa karon nga panahon, sa bata pa lang tudluan na ang mga bata, kanang mga kinder pa lang ba, 4 or 5 years old, didto palang sila sa ilahang pag-matutu naa na sila’y training. Magdako sila na naa na silay training so dili na lisod na ma implementar ang ing-ana nga balaod kay naa nay disiplina.”* (“Maybe the best approach right now is to start teaching children at an early age, like when they are still in kindergarten, around 4 to 5 years old. From that stage of their development, they should already be receiving training. As they grow up with that kind of training, it will not be hard to implement laws like that because they will already have discipline.”) – P3

**Infrastructure and Technology in Waste Management.** Participants suggested that infrastructure and technology in waste management should be modernized and invested in to solve waste management problems effectively. This theme exists to justify the Theory of Modernization by José María Luis Mora, which states that "an educated and wise government recognizes the developmental needs of its society." The government should consider innovation and modernization of equipment to address the issues faced by its constituents. Some participants stressed technology's importance in fighting the solid waste management crisis in Davao City.

*“They should invest in more technologies.”* – P4.

*"To invest more in saving our environment. They should focus on the environment itself." – P6.*

Aside from that, P2 or "Andres" urges the government to focus resources on the landfill's heavy equipment. In line with this, Section 17 of R.A. 9003, paragraph (k), stated, "The plan shall likewise indicate specific projects, activities, equipment, and technological requirements for which outside sourcing of funds or materials may be necessary to carry out the specific components of the plan. It shall define the specific uses for its resource requirements and indicate its costs. The plan shall likewise indicate how the province, City, or municipality intends to generate the funds for the acquisition of its resource requirements."

*"Like I mentioned earlier, first is the heavy equipment that we will be using in the sanitary landfill. So maybe that kana sya nga particular area na ma focus din, kinahanglan namo og more units of heavy equipment para magamit namo sa operation center sa landfill." ("Like I mentioned earlier, the priority is the heavy equipment needed for the sanitary landfill. It is essential to focus on this area because we require more units of heavy equipment to operate the landfill efficiently.") – P2*

As asserted by Nuru Lama (2024), modernizing waste collection systems not only reduces the volume of recyclable and reusable materials sent to landfills but also creates economic opportunities for municipalities and waste management companies. This theme also supports the theory of decision-making by Herbert Simon, which underlines how working in the government constrains choices, as it is also related to the theme of financial and economic constraints. Moreover, this theory suggests that decision-making is the heart of every organization, which stresses the importance of practicality and reality-based solutions or policy formulation. Aside from that, the Theory of Modernization by José María Luis Mora expounds how innovation can smooth public services, making it highly applicable today in the waste management crisis. Hence, despite the limitations of each individual, radical change should start from the basic unit of society. In line with this, Johannes Althusius' Theory of Consociation asserts that there should be a bottom-up approach in policy formulation – active segregation should be optimized through the establishment of deputized enforcers and a strong sense of responsibility from the residents within the barangay. Lastly, the Theory of Utilitarianism explains that a new policy can be justified as long as it creates the greatest good for the greatest number of people. Given the inadequacy of the existing policy in Davao City, strategies should be implemented, as suggested by the participants, to effect a radical change within the system itself.

## CONCLUSION AND IMPLICATION

This phenomenological inquiry successfully understands the experiences of residents, including local environment staff, landfill staff, garbage collectors, and waste management companies, regarding local government policies on community-based solid waste management initiatives. In response to these policies, it examines the challenges, coping techniques, solutions, and insightful observations made. This study also aimed to close the gap between community activity and policy development in response to Davao City's solid waste management (SWM) crisis. Using a thematic analysis of the seven stakeholders' interviews, the study identified six challenges interfering with Solid Waste Management implementation: Infrastructure challenges, Financial and Economic Constraints, Challenges in Garbage Management, Poor Policy Implementation, Logistical and Collection Issues, and Public Awareness and Participation.

This finding of the study reveals that the implementation of solid waste management policies in Davao City faces several interconnected challenges. Parallel to this is a significant issue that lies within the gap between policy formulation and its actual enforcement and implementation on the ground. While laws like Republic Act 9003 and City Ordinance 0361-10 exist, poor implementation and financial constraints undermine their effectiveness. Given the nature of the waste management crisis, particularly in Davao City, the failure of poor policy implementation continues to be of concern. This weak enforcement results in unmethodical garbage collection, a lack of a well-established waste management system, and low community participation in terms of segregation and waste management practices. Aside from that, infrastructure challenges further complicate the struggle of achieving smooth and efficient solid waste management. Inadequate sanitary landfills, a shortage of Material Recovery Facilities (MRFs) in every barangay, and outdated waste-handling technologies significantly hinder the progress of waste management in Davao City. Moreover, financial constraints significantly burden the local government, having a high operational cost for landfill maintenance and the need

for expensive equipment. Lastly, on top of infrastructure and financial challenges, managing waste itself is not simple. Participants also pointed out that segregation of waste at its source is a problem, with many households and businesses not having the ability to separate the waste properly. This means that waste is not segregated correctly and consequently ends up in landfills.

To address these challenges, this study suggests a multi-level approach considering that the challenges are interconnected. First, strengthening policy enforcement involves creating a formal system for garbage collection, including scheduled and codified collection. Additionally, establishing a solid waste management committee in every barangay, as mandated by Republic Act 9003, and appointing a deputized enforcer in every barangay for regular monitoring and apprehension of violators. Moreover, Republic Act 9003 and City Ordinance 0361-10 should be reassessed by lawmakers in terms of their on-the-ground effectiveness for future amendments. Aside from that, collaboration between local government units, barangays, and private waste management companies is also recommended to improve resource sharing and waste reduction efforts. Second, increasing the number of Material Recovery Facilities, especially in those barangays that cannot afford to build, investing in modern waste technologies and heavy equipment for landfill operation, establishing proper composting systems in every barangay, especially for food waste or food scraps, and putting attention on wet markets are essential to improve waste processing. Lastly, community engagement can be enhanced by introducing waste segregation practices to children in households or schools. Additionally, awareness campaigns, training programs, and incentivizing proper waste segregation at the household and business levels are vital in suppressing the waste management crisis in Davao City. By integrating formal systems, infrastructure development, financial planning, public and private partnerships, and community engagement, the City can build a more effective and sustainable solid waste management system.

## Implications

Solid Waste Management is known to be the most challenging among the many environmental problems that we are experiencing by far. The findings of this study highlight critical implications for the field of solid waste management in Davao City. Despite the City's urban advancement and reputation as a highly progressive area, its waste management system remains inadequate and poorly enforced, impacting its sustainable growth and development. This study underscored that weak policy enforcement, insufficient infrastructure, and ineffective collection systems contribute significantly to the ongoing waste management crisis. There is no reason for it to be neglected, but it continued to be undervalued, mainly due to weak policy implementation. These flaws not only hinder public health and environmental sustainability but also compromise the City's potential for long-term urban resilience. Parallel to this, the lack of a formal and consistent garbage collection system, low community engagement, and the gap between existing laws and enforcement point to a governance deficit. This flaw hinders attempts to implement proper waste disposal and recycling systems. As a result, improperly disposed waste continues to affect waterways and ecosystems, reinforcing the urgency to prioritize effective and inclusive policy enforcement and infrastructure development in Davao City's solid waste management strategies.

The research findings demanded an increase in policy enforcement in light of these issues. Parallel to this, this study finds that there is a need to establish a formal garbage collection system in Davao City. Local government policymakers should prioritize community needs by examining existing policies and identifying those that fall short. The survey revealed that inconsistent implementation is the primary issue, despite widespread awareness of Republic Act 9003 and City Ordinance 0361-10. This type of situation is often identified as a "governance gap." Furthermore, there are other options besides strict monitoring and penalties. To make sure that policies are in line with community needs, it is equally crucial to promote inclusivity in the policy-making process. On top of that, because of the difficulties, this study may help the local government in creating new policies or revising current ones, particularly those that deal with the problems of poor policy enforcement, inconsistency, and insufficiency of the existing waste management practices. Additionally, this study may also help the local government create strategies for mitigating waste reduction, especially since Davao City is currently experiencing a waste management crisis. Understanding the difficulties and experiences, as well as exploring the suggestions made by the findings, would help future and current solid waste management practices.

## REFERENCES

1. Abubakar, I.R., Maniruzzaman, K.M., Dano, U.L., AlShihri, F.S., AlShammari, M.S., Ahmed, S.M., Al-Gehlani, W.A.G., & Alrawaf, T.I. (2022, October 5). Environmental sustainability impacts of solid waste management practices in the Global South. Multidisciplinary Digital Publishing Institute (MDPI). <https://www.mdpi.com/1660-4601/19/19/12717>
2. Alam, K. (2021, February 23). A systematic qualitative case study: questions, data collection, NVivo analysis, and saturation. Emerald Insight. [https://www.emerald.com/insight/content/doi/10.1108/qrom-09-2019-1825/full/html?fbclid=IwZXh0bgNhZW0CMTAAAR3kGwTnVZuixutqdfPz\\_Fuknu\\_nBC\\_LsTtjeZtGs2eH77sDhzTM3CH6CzJk\\_aem\\_9JzRJ7O\\_IfXqEQVIZ1cOyQ](https://www.emerald.com/insight/content/doi/10.1108/qrom-09-2019-1825/full/html?fbclid=IwZXh0bgNhZW0CMTAAAR3kGwTnVZuixutqdfPz_Fuknu_nBC_LsTtjeZtGs2eH77sDhzTM3CH6CzJk_aem_9JzRJ7O_IfXqEQVIZ1cOyQ)
3. Alama, R. (2025, April 08). Davao City residents must learn to segregate trash to avert a garbage crisis. Philippine Information Agency. <https://pia.gov.ph/davao-city-residents-must-learn-to-segregate-trash-to-avert-garbage-crisis/>
4. Althusius, J. (1995). *Politica*. An abridged translation of politics methodically set forth and illustrated with sacred and profane examples. Online Library of Liberty. <https://oll.libertyfund.org/titles/althusius-politica>
5. Alves, B. (2024, August 28). Average cost to landfill municipal solid waste in the United States in 2022 and 2023, by region. Statista. <https://www.statista.com/statistics/692063/cost-to-landfill-municipal-solid-waste-by-us-region/>
6. Arellano, L., Alcubilla, P., & Leguizamo, L. (2023, Marzo). Ethical considerations in informed consent. Research Gate. [https://www.researchgate.net/publication/372300197\\_Ethical\\_considerations\\_in\\_informed\\_consent](https://www.researchgate.net/publication/372300197_Ethical_considerations_in_informed_consent)
7. Bentham, J. (1776). A fragment on government. Google Books. [https://books.google.com.ph/books?id=epMIAAAAQAAJ&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.com.ph/books?id=epMIAAAAQAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
8. Bhandari, P. (2024, October 1). Ethical considerations in research: Types & examples. Scribbr. [https://www.scribbr.com/methodology/research-ethics/?fbclid=IwZXh0bgNhZW0CMTAAAR03klGKEIL\\_SrTzsfO3OJzUJHYa6qMydRc8C8yjnd9wa1D8dgVZIwV-wCs\\_aem\\_IV5A8Ge4p3365FF0btsUcA](https://www.scribbr.com/methodology/research-ethics/?fbclid=IwZXh0bgNhZW0CMTAAAR03klGKEIL_SrTzsfO3OJzUJHYa6qMydRc8C8yjnd9wa1D8dgVZIwV-wCs_aem_IV5A8Ge4p3365FF0btsUcA)
9. Bisht, R. (2024, January 30). What is purposive sampling? Methods, techniques, and examples. Researcher Life. <https://researcher.life/blog/article/what-is-purposive-sampling-methods-techniques-and-examples/>
10. Bonzo, L. (2023, February 14). Environmentalists slam P5-billion waste-to-energy project in Davao City. Retrieved September 7, 2024, from Rappler. <https://www.rappler.com/philippines/mindanao/environmentalists-statement-waste-to-energy-incineration-project-davao-city/>
11. Braun, V., & Clarke, V. (2020, October 18). Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. Wiley Online Library. <https://doi.org/10.1002/capr.12360>
12. Bukola Margaret Popoola. (2022, November 21). Biodegradable Waste. IntechOpen. <https://www.intechopen.com/chapters/84112>
13. BusinessWorld Online. (2023, December 26). Davao aims for waste-to-energy. BusinessWorld. <https://www.bworldonline.com/the-nation/2023/12/26/565508/davao-aims-for-waste-to-energy/#:~:text=The%20existing%20challenge%20lies%20in,intended%20700%2C000%20to%20800%2C000%20tons.>
14. Chow, D., Murphy, J., & Wu, J. (2024, July 11). Graphics: What the 2024 U.N. World Population Prospects report shows about where humanity is going. Retrieved September 10, 2024, from NBC News. <https://www.nbcnews.com/data-graphics/graphics-2024-united-nations-world-population-prospects-report-data-rcna160017>
15. Davao City Government. (2024, April). City Government of Davao Citizens Chapter 2024. Davao City Government. [https://www.davaocity.gov.ph/wp-content/uploads/2024/04/CITY-GOVERNMENT-OF-DAVAO\\_CC\\_VOLUME-I\\_20240327.pdf](https://www.davaocity.gov.ph/wp-content/uploads/2024/04/CITY-GOVERNMENT-OF-DAVAO_CC_VOLUME-I_20240327.pdf)
16. Davao City Government. (2024, December). City Ordinance 0361-10/Amended 0987-22. Davao City Government. <https://www.davaocity.gov.ph/wp-content/uploads/2024/12/City-Ordinance-0361-10->



Amended-0987-22-FLYER.pdf

17. Decker, A. (2020, November 23). How to predict and analyze your customers' buying patterns. HubSpot. [https://blog.hubspot.com/marketing/buying-patterns?fbclid=IwZXh0bgNhZW0CMTAAAR2utcvh6XRaaIpx6uRn\\_M73FBFu7M0m6UMlqs1\\_STkce2tIJJE09rC7s\\_U\\_aem\\_rTQkHfbvaTO75Ma4kKEAKA](https://blog.hubspot.com/marketing/buying-patterns?fbclid=IwZXh0bgNhZW0CMTAAAR2utcvh6XRaaIpx6uRn_M73FBFu7M0m6UMlqs1_STkce2tIJJE09rC7s_U_aem_rTQkHfbvaTO75Ma4kKEAKA)
18. Dela Cruz, E. J. (2024, February 14). Davao City Ecological Solid Waste Management Ordinance Series of 2010. College Sidekick. <https://www.collegesidekick.com/study-docs/3957131>
19. Department of Environment and Natural Resources. (n.d.). DENR Administrative Order No. 10. Series of 2006. Environment Management Bureau. [https://nswmc.emb.gov.ph/wp-content/uploads/2018/01/DAO-9\\_.pdf.pdf](https://nswmc.emb.gov.ph/wp-content/uploads/2018/01/DAO-9_.pdf.pdf)
20. Development Asia. (2024, February 28). Optimizing municipal waste collection in the Philippines through a smart app. Development Asia: An Initiative of Asian Development Bank. <https://development.asia/case-study/optimizing-municipal-waste-collection-philippines-through-smart-app>
21. Dorling Kindersley. (2018). José María Luis Mora. In D. Kindersley, *The Politics Book: Big Ideas Explained* (p. 161). Great Britain: DK Publishing. <https://www.dk.com/uk/book/9781409364450-the-politics-book/>
22. Eldridge, S. (2024, December 3). Data Analysis. Britannica. <https://www.britannica.com/science/case-study>
23. Escovilla, J. (2024, May 23). ECO-BRICKS: Davao City's community-led solution to address plastic marine pollution. Mindanao Times. <https://mindanaotimes.com.ph/eco-bricks-davao-citys-community-led-solution-to-address-plastic-marine-pollution/#:~:text=A%20monumental%20problem,are%20recyclables%20and%20special%20waste.>
24. Garcia, G. (2022, June 23). Waste-to-energy project in Davao City to fuel climate change, groups warn. Climate Tracker Asia. [https://climatetracker.asia/waste-to-energy-project-in-davao-city-to-fuel-climate-change-groups-warn/?fbclid=IwY2xjawJo8uZleHRuA2FlbQIxMAABHIZLtADH2TPQ89DbXMGC65XYuPfSbUjXK\\_clvuuzSdlPPc7CqvCR0PEmivt\\_aem\\_CYqcKMrVQyzHBWuEl\\_05w](https://climatetracker.asia/waste-to-energy-project-in-davao-city-to-fuel-climate-change-groups-warn/?fbclid=IwY2xjawJo8uZleHRuA2FlbQIxMAABHIZLtADH2TPQ89DbXMGC65XYuPfSbUjXK_clvuuzSdlPPc7CqvCR0PEmivt_aem_CYqcKMrVQyzHBWuEl_05w)
25. Guevarra, S. (2022, July 18). The face of plastic. ATENEO DE MANILA. <https://www.ateneo.edu/news/2022/07/18/face-plastic>
26. Hendricks, A. (2023). Community Engagement: Definitions, Benefits & Examples. Simply Stakeholders. [https://simplystakeholders.com/what-is-community-engagement/?fbclid=IwY2xjawJquZdleHRuA2FlbQIxMAABHo\\_2IFFAm28C2qaP8T\\_m-J9sbfg-eOAbjTCCqrsoCXPtEH4Y1uVKxnaMuA4Z\\_aem\\_oGitvU4ZrWnn8bPhR\\_q7qA](https://simplystakeholders.com/what-is-community-engagement/?fbclid=IwY2xjawJquZdleHRuA2FlbQIxMAABHo_2IFFAm28C2qaP8T_m-J9sbfg-eOAbjTCCqrsoCXPtEH4Y1uVKxnaMuA4Z_aem_oGitvU4ZrWnn8bPhR_q7qA)
27. Interfacing Development Interventions for Sustainability. (2023, February 26). An open letter to the Japanese International Cooperation Agency in the Philippines. Retrieved September 7, 2024, from Interfacing Development Interventions for Sustainability. <https://idisphil.org/an-open-letter-to-thejapanese-international-cooperation-agencyin-the-philippines/>
28. International Monetary Fund. (2020, January 31). Waste woes in the world. Retrieved September 10, 2024, from International Monetary Fund (IMF). <https://www.imf.org/en/Blogs/Articles/2020/01/31/waste-woes-in-the-world>
29. International Trade Administration. (2023, April 27). India solid waste management. International Trade Administration. <https://www.trade.gov/market-intelligence/india-solid-waste-management>
30. Lacorte, G. (2024, August 8). Baste blames politics as the reason Davao projects are put on hold. Read more: <https://newsinfo.inquirer.net/1970834/baste-blames-politics-as-reason-waste-to-energy-facility-davao-bus-project-are-put-on-hold#ixzz8l82yPeHy> Follow us: @inquirerdotnet on Twitter. <https://newsinfo.inquirer.net/1970834/baste-blames-politics-as-reason-waste-to-energy-facility-davao-bus-project-are-put-on-hold>
31. Lama, N. (2024, April 26). The world has a waste problem. Here's how to fix it. International finance corporation: World bank group. <https://www.ifc.org/en/blogs/2024/the-world-has-a-waste-problem>
32. Lynette Pretorius & Sweta Vijaykumar Patel. (2024, November 23). What's in a name? Participants' pseudonym choices as a practice of empowerment and epistemic justice. Taylor and Francis Online. <https://www.tandfonline.com/doi/full/10.1080/1743727X.2024.2432271>
33. Manas, J. J. (2023, October 19). Top 5 waste management challenges in the Philippines and how to solve them. Plastic Bank. <https://plasticbank.com/blog/top-5-waste-management-challenges-in-the->

- philippines-and-how-to-solve-them/
34. Mantaring, J. R. (2024, May 19). Has the Philippines created a garbage problem too big to dig its way out of? Philippine Center for Investigative Journalism (PCIJ). [https://pcij.org/2024/05/19/has-the-philippines-created-a-garbage-problem-too-big-to-dig-its-way-out-of/?fbclid=IwZXh0bgNhZW0CMTAAAR1GI85MuAfVkr7A1PE\\_bNDEj32aZRAAYcNWRfRaEYwvP4q6E-nKBvOhnk\\_aemVIOeUr6Mv10VhK3IdKskvw#:~:text=The%20country%20has%20seen%20s](https://pcij.org/2024/05/19/has-the-philippines-created-a-garbage-problem-too-big-to-dig-its-way-out-of/?fbclid=IwZXh0bgNhZW0CMTAAAR1GI85MuAfVkr7A1PE_bNDEj32aZRAAYcNWRfRaEYwvP4q6E-nKBvOhnk_aemVIOeUr6Mv10VhK3IdKskvw#:~:text=The%20country%20has%20seen%20s)
35. McCombes, S. (2023, June 22). Descriptive Research: Definition, types, methods & examples. Scribbr. <https://www.scribbr.com/methodology/descriptive-research/>
36. Mendoza, I. F. (2022, September 19). Cenro: The landfill in Tugbok can only last until 2023. SunStar. <https://www.sunstar.com.ph/davao/local-news/cenro-landfill-in-tugbok-can-only-last-until-2023>
37. Moaje, M. (2025, April 30). DENR to tighten ECC rules amid Manila Bay findings. Philippine News Agency. <https://www.pna.gov.ph/articles/1249135>
38. Nikolopoulou, K. (2023, June 22). What is purposive sampling? : Definition & Examples. Scribbr. [https://www.scribbr.com/author/kassianin/page/11/?fbclid=IwZXh0bgNhZW0CMTAAAR1GI85MuAfVkr7A1PE\\_bNDEj32aZRAAYcNWRfRaEYwvP4q6E-nKBvOhnk\\_aemVIOeUr6Mv10VhK3IdKskvw#:~:text=In%20other%20words%2C%20units%20are,to%20achieve%20the%20study's%20objectives](https://www.scribbr.com/author/kassianin/page/11/?fbclid=IwZXh0bgNhZW0CMTAAAR1GI85MuAfVkr7A1PE_bNDEj32aZRAAYcNWRfRaEYwvP4q6E-nKBvOhnk_aemVIOeUr6Mv10VhK3IdKskvw#:~:text=In%20other%20words%2C%20units%20are,to%20achieve%20the%20study's%20objectives)
39. Official Gazette. (2025, April 13). Republic Act No. 9003. Official gazette. <https://www.officialgazette.gov.ph/2001/01/26/republic-act-no-9003-s-2001/>
40. Oranga, J., & Matere, A. (2023, December 21). Qualitative Research: Essence, types, and advantages. ResearchGate. [https://www.researchgate.net/publication/376739890\\_Qualitative\\_Research\\_Essence\\_Types\\_and\\_Advantages](https://www.researchgate.net/publication/376739890_Qualitative_Research_Essence_Types_and_Advantages)
41. Patumbon, R. G. (2024, February 16). Councilor mulls Japanese-backed WTE project. SunStar. <https://www.sunstar.com.ph/davao/councilor-mulls-japanese-backed-wte-project>
42. Prior, S., Campbell, S., Greenwood, M., & Shearer, T. (2020, June). Purposive sampling: complex or simple? Research case examples. ResearchGate. [https://www.researchgate.net/publication/342283195\\_Purposive\\_sampling\\_complex\\_or\\_simple\\_Research\\_case\\_examples#:~:text=Purposive%20sampling%20is%20a%20technique,et%20al.%2C%202020\)%20](https://www.researchgate.net/publication/342283195_Purposive_sampling_complex_or_simple_Research_case_examples#:~:text=Purposive%20sampling%20is%20a%20technique,et%20al.%2C%202020)%20)
43. Rouder, J., Saucier, O., Kinder, R., & Jans, M. (2021, August 12). What to do with all those open-ended responses? Data Visualization Techniques for Survey Researchers. Survey Practice. [https://www.surveypractice.org/article/25699-what-to-do-with-all-those-open-ended-responses-data-visualization-techniques-for-survey-researchers?fbclid=IwY2xjawKBjsFleHRuA2FlbQIxMABicmlkETEzaTkzVXpVT1ZuOFZsU21GAR5JOyjRNggj8qS\\_zB4yKt1qUfXfuUFwGIrsznzkDkddO](https://www.surveypractice.org/article/25699-what-to-do-with-all-those-open-ended-responses-data-visualization-techniques-for-survey-researchers?fbclid=IwY2xjawKBjsFleHRuA2FlbQIxMABicmlkETEzaTkzVXpVT1ZuOFZsU21GAR5JOyjRNggj8qS_zB4yKt1qUfXfuUFwGIrsznzkDkddO)
44. Safdie, S. (2024, June 27). Global food waste in 2025. Leaf by Greenly. <https://greenly.earth/en-gb/blog/industries/global-food-waste-in-2022>
45. Simon, H. (1947). Administrative behavior, 4th Edition. Google Books. [https://books.google.com.ph/books?hl=en&lr=&id=\\_obn42iD3mYC&oi=fnd&pg=PA1&dq=info%3AqNzWZzgBeW8J%3A%2F&ots=v0XI7BtmfX&sig=gaj3OHfFdt5T83zMdqgA77-e3vo&redir\\_esc=y#v=onepage&q&f=false](https://books.google.com.ph/books?hl=en&lr=&id=_obn42iD3mYC&oi=fnd&pg=PA1&dq=info%3AqNzWZzgBeW8J%3A%2F&ots=v0XI7BtmfX&sig=gaj3OHfFdt5T83zMdqgA77-e3vo&redir_esc=y#v=onepage&q&f=false)
46. Sunstar. (2023, June 02). Brgys urged to deputize Solid Waste Ordinance enforcers. Sunstar. <https://www.sunstar.com.ph/davao/local-news/brgys-urged-to-deputize-solid-waste-ordinance-enforcers>
47. Tanhueco-Tumapon, T. (2024, February 15). Phenomenological research design. The Manila Times. <https://www.manilatimes.net/2024/02/15/campus-press/phenomenological-research-design/1932633>
48. UN Environment Programme. (2024, February 28). Global waste management outlook 2024. UN Environment Programme. <https://www.unep.org/resources/global-waste-management-outlook-2024>
49. UN Environmental Programme. (2024, February 28). The world must move beyond the waste era and turn rubbish into a resource: UN Report. UN Environmental Programme. <https://www.unep.org/news-and-stories/press-release/world-must-move-beyond-waste-era-and-turn-rubbish-resource-un-report>
50. United Nations. (2024). Ensure sustainable consumption and production patterns. United Nations. <https://sdgs.un.org/goals/goal12>
51. Walliman, N. (2021, December 30). Research methods: The basics. Taylor & Francis Group. <https://doi.org/10.4324/9781003141693>