

Solid Waste Management Ordinances: Compliance and Challenges

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Abstract

This study examined the level of compliance with solid waste management ordinances and the challenges encountered in their implementation in the Municipality of Trinidad, Bohol. Anchored on Policy Implementation Theory and Compliance Theory, the study analyzed how local solid waste management policies are translated into community practice and how stakeholder behavior affects compliance. A mixed-methods research design was used, combining survey questionnaires and Key Informant Interviews. The respondents included 272 survey participants composed of 6 barangay officials, 12 garbage collectors, and 254 household members, while 5 Local Solid Waste Management Board members served as key informants. Findings showed that compliance with solid waste management ordinances was generally high among barangay officials, garbage collectors, and household members, with overall means of 3.82, 3.80, and 3.59, respectively, all interpreted as fully complied. However, challenges remained, particularly among household members, who reported moderate difficulties related to plastic use, limited ordinance awareness, disposal habits, and accessibility concerns. Compliance levels did not significantly differ among respondent groups, but challenges encountered differed significantly, particularly between barangay officials and household members. The study concludes that Trinidad's solid waste management ordinance implementation is generally effective but requires stronger household-focused education, improved access to waste management facilities, and institutionalized incentive and monitoring mechanisms. The study supports SDG 3, SDG 11, SDG 12, SDG 16, and SDG 17 by promoting healthier communities, sustainable barangays, responsible waste practices, stronger local governance, and stakeholder collaboration. Its sustainability impact lies in strengthening environmental protection, public health, community participation, and policy-based local governance.

Keywords: Barangay Governance, Community Participation, Ecological Solid Waste Management, Household Waste Practices, Local Governance, Policy Implementation, Solid Waste Management, Stakeholder Participation

1. Introduction

Solid waste management remains a critical environmental, public health, and governance concern, especially in local communities where national laws depend heavily on municipal and barangay-level implementation. Although the Philippines has established Republic Act No. 9003, or the Ecological Solid Waste Management Act of 2000, implementation challenges persist due to issues in enforcement, monitoring, awareness, cooperation, resources, and community behavior. This study focuses on the Municipality of Trinidad, Bohol, a recognized locality in ecological solid waste management, to examine the level of compliance with solid waste management ordinances and the challenges encountered by key stakeholders. Anchored on Policy Implementation Theory and Compliance Theory, the study provides a basis for understanding how local ordinances are translated into actual community practices and how stakeholder participation affects policy effectiveness.

Solid waste remains a pressing environmental problem due to population growth, increasing consumption, and inadequate disposal systems. Waste generation is one of the environmental costs of development activities worldwide. Globally, two billion tons of waste are produced annually, and this amount is expected to rise by more than 70% by 2050 compared to 2020 due to increasing consumption in developed countries and similar consumer patterns in developing nations (World Bank, 2018). In the Philippine context, solid waste management remains a major concern despite the enactment of Republic Act No. 9003, which requires Local Government Units (LGUs) to formulate and implement comprehensive waste management plans and achieve waste reduction through community-based strategies. However, local implementation has been affected by inadequate enforcement, weak monitoring, poor public cooperation, and lack of awareness among residents, resulting in low compliance particularly at the barangay level (Dalugdog, 2021; Camarillo & Bellotindos, 2021). In 2023, waste generation in the Philippines reached 60,640 tons per day (Balita, 2024), placing the country among the top five largest solid waste generators every year among Southeast Asian countries (Romero, 2020). The National Solid Waste Management Commission described the country's waste management situation as far from ideal, with persistent institutional, technical, and financial challenges (NSWMC, 2018). In Bohol, ecological solid waste management is also a major concern, with approximately 88,000 kilograms of residual waste generated daily, placing pressure on the province's

ecological landfill facility, which may reach capacity in over 25 years if current practices continue (Chiu, 2023). These conditions show the urgency of strengthening waste management systems to reduce environmental and public health risks.

The literature emphasizes that effective solid waste management depends not only on the existence of laws and ordinances but also on the capacity of local institutions to implement them. Policy implementation refers to the enforcement of laws, programs, and policies by government officials or authorized individuals to achieve policy goals (Stewart et al., 2007). Implementation also operates within a continuum between local autonomy and central guidance, depending on the nature and complexity of the policy (Pulzl and Treib, 2007). This is important in solid waste management because national policies such as Republic Act No. 9003 require effective localization through municipal ordinances, barangay enforcement, and stakeholder participation. Policy implementation may be affected by policy standards, communication, characteristics of implementing agencies, socio-economic factors, and the attitudes of community members toward the policy (Van Meter and Van Horn, 1975). Policies cannot be fully implemented if the people involved in carrying them out do not comply with the established rules (Brinkerhoff & Brinkerhoff, 2002). Local governments often use solid waste management ordinances to provide sanitation and environmental services to communities (Zerbock, 2003). However, local governments may encounter difficulty in achieving policy objectives due to limited funding, lack of technical expertise, unclear role definitions, weak coordination, and contextual differences across communities (Buenot et al., 2016). These insights show that solid waste management compliance must be studied not only as an environmental issue but also as a governance, behavioral, and institutional concern.

At the global level, rising waste generation reflects the environmental consequences of development and consumption patterns (World Bank, 2018). At the national level, the Philippines continues to experience significant solid waste management concerns despite the legal mandate of Republic Act No. 9003. The continued increase in daily waste generation, combined with institutional, technical, and financial challenges, highlights the need for stronger local implementation and community compliance (Balita, 2024; Romero, 2020; NSWMC, 2018). At the provincial level, Bohol has adopted measures to strengthen ecological waste management. The province was the first in the Philippines to adopt an Integrated Solid Waste Management Approach in 1998 and later approved its 10-Year Integrated Solid Waste Management Plan through Provincial Resolution No. R-2013-143, aligning municipal waste management plans under a unified provincial framework (Bohol PISWMP, 2013-2022, as cited in Barafon, 2013). Within this context, the Municipality of Trinidad has been recognized as a top municipality in best ecological solid waste management practices based on the Monitoring and Evaluation conducted by the Ecological Solid Waste Management Board of Bohol from 2020 to 2023 (Bohol Island News, 2023). This recognition is associated with the municipality's enactment of Municipal Ordinance No. 07 Series of 2012, known as the Comprehensive Ecological Solid Waste Management Ordinance of the Municipality of Trinidad, Bohol, together with supporting measures such as restrictions on plastic bag use and prohibitions on plastic cellophane in commercial establishments.

This study is anchored on Policy Implementation Theory and Compliance Theory. Policy Implementation Theory focuses on the institutional and governmental capacity needed to implement policies effectively (Pressman & Wildavsky, 1973). It explains how national laws such as Republic Act No. 9003 depend on LGU capacity to translate legal provisions into local actions. In the case of Trinidad, Municipal Ordinance No. 07 Series of 2012 operationalizes national solid waste management mandates within the local setting. Its effectiveness depends on the roles performed by barangay officials, garbage collectors, household members, and the Local Solid Waste Management Board. Compliance Theory explains why individuals follow or resist laws and policies. It suggests that individuals are more likely to comply when they perceive governing authorities as legitimate and fair (Tyler, 2006). Mitchell (2007) further explains that laws influence individual behavior when they respond to social needs and encourage adherence to environmental policies. In the Philippine setting, barangay officials and solid waste management boards are responsible for enforcing solid waste ordinances, and the effectiveness of policies such as Republic Act No. 9003 depends on how well they are implemented by local governments (Maskey et al., 2016). Together, these theories provide a holistic basis for examining both the institutional implementation of solid waste management ordinances and the behavioral factors that shape stakeholder compliance.

Although Trinidad has been recognized for its ecological solid waste management practices, issues remain in some areas, including improper waste segregation, clogged drainage, and continued use of restricted materials. This suggests that a gap still exists between policy mandates and actual community practices. While the municipality is often cited for good practices, there is limited research that closely examines how solid waste management policies are implemented on the ground and how key stakeholders experience compliance and challenges. This study addresses that gap by determining the level of compliance with solid waste management ordinances and identifying the challenges encountered by barangay officials, garbage collectors, household members, and the Local Solid Waste Management Board in the Municipality of Trinidad. By examining both strengths and remaining implementation issues, the study provides a clearer understanding of whether strong local policies lead to consistent community-level compliance. The findings may support the development of practical and community-based waste management programs, strengthen local decision-making, improve stakeholder participation, and provide useful insights for other LGUs seeking to improve their waste management systems.

This study aligns with SDG 3 – Good Health and Well-Being because proper solid waste management reduces environmental sanitation risks and supports healthier communities. It also supports SDG 11 – Sustainable Cities and Communities by examining how local ordinances contribute to cleaner, safer, and more sustainable barangays. The study is also connected to SDG 12 – Responsible Consumption and Production because it addresses waste segregation, composting, recycling, reduced plastic use, and proper disposal practices. Since the study focuses on ordinance implementation, monitoring, enforcement, and stakeholder responsibilities, it also contributes to SDG 16 – Peace, Justice, and Strong Institutions. Moreover, its emphasis on LGUs, barangay officials, garbage collectors, households, and the Local Solid Waste Management Board reflects SDG 17 – Partnerships for the Goals through coordinated local action.

The study is important to multidisciplinary sustainability because solid waste management intersects with environmental protection, public health, governance, community behavior, local policy, and institutional planning. Environmentally, the study contributes to efforts that reduce improper disposal, promote waste segregation, and support ecological waste management. In terms of public health sustainability, the findings may help reduce sanitation-related risks caused by poor waste handling and unmanaged disposal practices. From a governance perspective, the study provides evidence-based insights that may guide LGUs, barangay officials, policy makers, program planners, and the Local Solid Waste Management Board in improving implementation, enforcement, monitoring, and community-based interventions.

The study also contributes to community and institutional sustainability by emphasizing the shared responsibilities of residents, waste collectors, and local authorities. Since residents directly benefit from cleaner and healthier surroundings, the study supports community participation and behavioral transformation. For future researchers, the study adds to the growing literature on solid waste management compliance, policy implementation, and environmental sustainability. Overall, the research is significant because it connects legal compliance, institutional performance, stakeholder participation, and sustainable community development within the local context of Trinidad, Bohol.

2. Material and methods

2.1 Research Design

The study used a mixed-methods research design combining quantitative and qualitative approaches to assess compliance with solid waste management ordinances and the challenges encountered in their implementation across selected barangays in the Municipality of Trinidad, Bohol. This design enabled the study to identify measurable patterns of compliance while also exploring the contextual and institutional factors influencing these patterns (Dawadi, Shrestha, & Giri, 2021). The quantitative component used a survey questionnaire with closed-ended Likert-scale items administered to barangay officials, garbage collectors, and household members. The qualitative component involved semi-structured Key Informant Interviews with members of the Local Solid Waste Management Board to gather deeper insights on policy enforcement, institutional capacity, and community participation. The qualitative findings were used to support and contextualize the quantitative results through triangulation.

2.2 Locale of the Study

The study was conducted in the Municipality of Trinidad, Province of Bohol, Central Visayas, Philippines. Trinidad is a first-class, landlocked municipality bounded by Talibon in the north, Ubay in the east, San Miguel in the south, and Danao in the west. It has a land area of 195.30 square kilometers or 75.41 square miles, representing 4.09% of Bohol's total land area, with an estimated population of approximately 35,000 to 37,000 residents. The municipality is known for natural attractions such as Kawasan Falls and Batongay Cave, as well as agricultural and eco-tourism activities. These socio-economic, cultural, and physical characteristics are relevant because they influence household behavior, waste generation, and solid waste management implementation. Six barangays were included in the study: Banlasan, Hinlayagan Ilaud, Hinlayagan Ilaya, M. Cabiguhan, M. Roxas, and Poblacion. Poblacion represented the urban area and most populated barangay, while the remaining barangays represented rural and geographically distant areas.

2.3 Respondents of the Study

The respondents consisted of barangay officials, garbage collectors, household members, and members of the Local Solid Waste Management Board in selected barangays of Trinidad, Bohol. Barangay officials included the barangay captain or designated kagawad responsible for solid waste management. Garbage collectors referred to individuals assigned to waste collection, segregation, and disposal at the municipal or barangay level. Household members referred to household heads or adult members aged 18 years and above who were knowledgeable about household waste management practices. Local Solid Waste Management Board members served as key informants who provided institutional insights into policy design, monitoring, enforcement, and implementation challenges.

2.4 Sample and Sampling Procedure

Household respondents were selected through simple random sampling to give each household an equal chance of inclusion, while purposive sampling was used for barangay officials, garbage collectors, and Local Solid Waste

Management Board members because of their direct roles and specialized knowledge in solid waste management. The household sample consisted of 254 respondents proportionally distributed across the six barangays, with approximately 42 to 43 respondents per barangay. In addition, one barangay official and two waste collectors were included from each barangay, resulting in six barangay officials and twelve waste collectors. Five Local Solid Waste Management Board members were purposively selected for the Key Informant Interviews. Household respondents were required to be at least 18 years old and to have lived in the barangay for at least one year, while transient residents and minors were excluded. For key informants, those with less than six months of tenure or roles unrelated to solid waste management planning and enforcement were excluded.

2.5 Research Instrument

The study used both quantitative and qualitative instruments. For the quantitative component, a self-made questionnaire served as the primary data collection tool. It was based on Municipal Ordinance No. 07 Series of 2012, known as the Comprehensive Ecological Solid Waste Management Ordinance of the Municipality of Trinidad, Bohol, which is aligned with Republic Act 9003 or the Ecological Solid Waste Management Act of 2000. The instrument was validated by experts and pilot-tested to ensure reliability and clarity. The questionnaire gathered information on the participants' role and barangay, measured the level of compliance with ordinance provisions such as waste segregation, composting, collection schedules, enforcement, and establishment of Material Recovery Facilities, and assessed challenges encountered in complying with solid waste management ordinances. Compliance was measured using a four-point scale ranging from fully complied to not complied, while challenges were measured using a four-point scale ranging from very highly experienced to not experienced. The questionnaire was written in simple and clear language and translated into the respondents' own dialect for better understanding. For the qualitative component, a semi-structured Key Informant Interview guide was used to explore institutional roles, enforcement mechanisms, implementation challenges, and strategies for improving compliance. Relevant municipal documents, including solid waste management plans, compliance reports, monitoring records, and records of recognition or awards, were also reviewed.

2.6 Data Gathering Procedure

The data gathering procedure was conducted systematically and ethically. Before data collection, the researcher secured approval from the research adviser and the HNU Ethics Review Board and obtained permits from the Municipal Mayor and Barangay Captains. Participants were informed about the objectives of the study, their role in the research, and their rights, including anonymity, confidentiality, and voluntary participation. Informed consent was obtained before data collection. Survey questionnaires were personally administered to selected respondents, and clarification was provided when needed. Each respondent spent approximately 15 to 20 minutes completing the questionnaire. Completed responses were organized and checked to remove incomplete or inconsistent entries. For the qualitative phase, Key Informant Interviews were conducted with selected Local Solid Waste Management Board members. The interviews were recorded and transcribed with the participants' consent. Data collection was completed over a one-month period to ensure timeliness, completeness, and relevance of the gathered data.

2.7 Data Analysis Techniques

Quantitative data were analyzed using SPSS. Frequency distribution and percentage were used to describe respondent profiles, while weighted mean was used to determine the perceived level of compliance with solid waste management ordinances and the severity of challenges encountered. Compliance ratings were interpreted as fully complied, mostly complied, partially complied, or not complied, while challenge ratings were interpreted as very highly experienced, highly experienced, moderately experienced, or not experienced. Analysis of Variance was used to determine significant differences in compliance and challenges across respondent groups at the 0.05 level of significance, with Tukey's Test used for post hoc analysis. Qualitative data from the Key Informant Interviews were analyzed using thematic analysis, which involved coding, categorizing, and identifying emerging themes related to policy implementation, enforcement, and challenges. The qualitative findings were used to explain and support the quantitative results through triangulation.

2.8 Ethical Considerations

Ethical considerations were observed throughout the conduct of the study because human participants were involved. Participants were given clear information about the objectives, procedures, potential risks, and benefits of the study. Participation was voluntary, and respondents were informed that they could withdraw at any time without penalty. Confidentiality and anonymity were strictly maintained by anonymizing responses and restricting access to data to the researcher and academic adviser. Electronic data were stored in password-protected and encrypted files, while hard copies were kept in a locked cabinet. Audio recordings were deleted after transcription and verification. Special care was given to household members and garbage collectors, who were considered potentially vulnerable groups, by assuring them that their responses would not affect their standing in the community or workplace. No monetary incentives were given to avoid undue influence, although reasonable expenses related to participation were reimbursed when necessary. The study protocol was reviewed and approved by the Holy Name University Ethics Review Board.

3. Results and Discussion

3.1 Respondent Profile

The study involved 272 respondents composed of barangay officials, garbage collectors, and household members. Barangay officials accounted for 6 respondents or 2.2% of the total sample, garbage collectors accounted for 12 respondents or 4.4%, and household members formed the largest group with 254 respondents or 93.4%. This distribution shows that the findings primarily reflect household-level experiences while still incorporating the perspectives of local implementers and frontline waste workers. The strong representation of household members provides a reliable basis for understanding community-level compliance, since households are directly involved in daily waste segregation, disposal, and participation in collection systems. At the same time, the inclusion of barangay officials and garbage collectors allowed the study to compare the views of those who implement, enforce, and operationalize solid waste management ordinances.

3.2 Compliance with Solid Waste Management Ordinances

3.2.1 Compliance among Barangay Officials

Barangay officials obtained an overall mean of 3.82, interpreted as fully complied. The highest-rated areas were proper segregation of solid waste, regular collection of segregated waste, and regular conduct of Information, Education, and Communication campaigns, all with a mean of 4.00. The lowest-rated areas were the common use of reusable baskets made from “nito,” bamboo, or rattan and the imposition of fines or community service on violators, both with a mean of 3.50, although these were still interpreted as fully complied. These results indicate that barangay officials perceive strong compliance in structural and program-based components of solid waste management, particularly segregation, collection scheduling, public education, and facility establishment. This supports the findings of Camarillo and Bellotindos (2021), who emphasized that effective barangay-level solid waste management is linked to functional facilities, organized collection systems, and active community participation. The findings also align with Wilson et al. (2015), who emphasized the importance of strong governance, stakeholder participation, and consistent service delivery. However, the relatively lower ratings on reusable materials and penalties suggest that behavioral practices and strict sanction enforcement still require improvement.

3.2.2 Compliance among Garbage Collectors

Garbage collectors obtained an overall mean of 3.80, interpreted as fully complied. Proper segregation of solid waste received the highest mean of 4.00, showing strong compliance in separating compostable, recyclable, non-recyclable, and special waste. Other indicators, such as the use of eco-bags, enforcement of cleanliness ordinances, and regular waste collection schedules, were also rated highly. The lowest mean was 3.42 for the common use of reusable baskets made from “nito,” bamboo, or rattan when marketing, although this remained within the fully complied range. These findings show that garbage collectors strongly comply with operational responsibilities directly related to waste segregation and collection. This supports Guerrero et al. (2013), who emphasized that waste collectors play an important role in the effectiveness of segregation and collection systems, especially in developing countries. The qualitative findings further suggest that supervision, incentives, and systems such as the garbage sticker system help strengthen their compliance. However, the lower score on reusable materials indicates that formal work-related compliance may not always extend to personal environmental practices.

3.2.3 Compliance among Household Members

Household members obtained an overall mean of 3.59, also interpreted as fully complied. The highest mean of 3.83 was recorded for the enforcement of “No littering” and cleanliness ordinances in public places. The presence of Material Recovery Facilities and regular collection schedules also received high ratings. However, the use of reusable baskets made from “nito,” bamboo, or rattan received the lowest mean of 2.71, interpreted as mostly complied. These results suggest that households generally comply with ordinances when practices are supported by visible systems, enforcement, and monitoring. However, voluntary sustainability practices, such as the use of reusable materials, remain less consistent due to convenience and routine behavior. This supports Raghu and Rodrigues (2020), who emphasized that household waste practices are strongly shaped by convenience, routine, and daily habits. Similar patterns were noted by Guerrero et al. (2013), Kaza et al. (2018), Wilson et al. (2015), and Worldbank (2018), who emphasized the importance of enforcement, accessible systems, education, and community engagement in improving household participation.

3.3 Challenges Encountered in the Implementation of Solid Waste Management Ordinances

3.3.1 Challenges Experienced by Barangay Officials

Barangay officials reported an overall mean of 1.40, interpreted as not experienced, indicating that they encountered minimal challenges in implementing solid waste management ordinances. The most notable challenge was the continued use of plastic bags due to availability and convenience, with a mean of 2.17, followed by the unwillingness of community members to change disposal habits, with a mean of 1.83. Other concerns related to manpower, funding, coordination, infrastructure, and collection schedules were rated low. These findings suggest that barangay officials experience fewer administrative and structural difficulties, likely because established systems, guidelines, and support mechanisms are

already in place. However, the remaining challenges are largely behavioral, particularly plastic use and resistance to changing disposal habits. This indicates that the main limitation is not the absence of policy but the persistence of community practices that are difficult to modify.

3.3.2 Challenges Experienced by Garbage Collectors

Garbage collectors obtained an overall mean of 1.79, interpreted as moderately experienced. The highest-rated challenges were lack of awareness about municipal ordinances and the absence of a suitable waste disposal or dumpsite, both with a mean of 2.17. Continued plastic bag use had a mean of 2.08, while limited access to Material Recovery Facilities had a mean of 1.83. Weak enforcement, reluctance to change habits, and irregular collection schedules were reported as less serious concerns. These findings indicate that garbage collectors experience moderate operational challenges, particularly those related to infrastructure, disposal access, and knowledge of ordinances. This is consistent with Kubanza (2024), who found that solid waste management challenges are often associated with infrastructure limitations, inefficient collection systems, and resource constraints rather than individual willingness. The result suggests that improving facilities, disposal access, and training may strengthen the role of garbage collectors in ordinance implementation.

3.3.3 Challenges Experienced by Household Members

Household members obtained an overall mean of 2.07, interpreted as moderately experienced. The highest-rated challenge was the continued use of plastic bags due to availability and convenience, with a mean of 2.30. Lack of awareness about municipal ordinances and unwillingness to change disposal habits both obtained a mean of 2.13. The lowest mean was 1.95 for insufficient budget or fund allocation for solid waste management facilities, indicating that households viewed behavioral and informational issues as more pressing than financial constraints. These findings show that household compliance is strongly affected by convenience, habits, awareness, and access to practical information. KII responses supported this by noting that although IEC campaigns have improved awareness, monitoring all households remains difficult. These findings align with existing studies indicating that behavioral and informational barriers significantly affect the SWM practices. Guerrero et al. emphasized that lack of awareness, resistance to behavioral change, and limited access to information are major constraints at the household level, while Kaza et al. (2018) noted that household participation is influenced by convenience, awareness, and accessibility of waste management systems.

3.4 Differences in Compliance and Challenges among Respondent Groups

3.4.1 Difference in the Level of Compliance

The level of compliance did not significantly differ among barangay officials, garbage collectors, and household members. Barangay officials had the highest mean of 3.82, followed closely by garbage collectors at 3.80, while household members had a mean of 3.59. The computed F-value of 1.999 and p-value of 0.137 indicated that the differences were not statistically significant. This result suggests that solid waste management ordinances are generally understood and followed across stakeholder groups. KII responses supported this finding, with one informant stating that “So far, the barangays in Trinidad are compliant, as evidenced by evaluations where the municipality consistently ranks among the top in SWM practices” (KII-1). Another informant noted that “Barangays are compliant; they have Materials Recovery Facilities (MRFs), practice proper waste segregation, and implement initiatives to ensure that residents bring their waste to designated collection points” (KII-2). However, one participant also observed that “It is difficult to change long-established habits such as using plastics and following old practices; these cannot be easily avoided” (KII-3). This aligns with Wilson et al. (2015) and Guerrero et al. (2013), who emphasized that effective waste management depends on strong governance, clear institutional systems, and collaboration among households, authorities, and waste collectors.

3.4.2 Difference in the Challenges Encountered

The challenges encountered significantly differed among respondent groups. Barangay officials reported the lowest mean of 1.40, garbage collectors obtained a mean of 1.79, and household members recorded the highest mean of 2.07. The computed F-value of 3.824 and p-value of 0.023 showed a statistically significant difference. Further analysis showed that the significant difference existed specifically between barangay officials and household members, with a mean difference of -0.67 and a p-value of 0.042. The differences between barangay officials and garbage collectors, and between garbage collectors and household members, were not statistically significant. These findings indicate that household members experience more difficulty complying with ordinances than barangay officials. Barangay officials have clearer access to information, defined implementation roles, and institutional support, while households face more direct barriers related to awareness, convenience, infrastructure, and daily habits. Garbage collectors occupy a middle position, experiencing operational challenges but fewer household-level behavioral barriers. Overall, the result shows that while compliance is generally uniform, the burden of implementation is not equally experienced across stakeholder groups.

3.5 Qualitative Themes from Key Informant Interviews

3.5.1 Compliance with Solid Waste Management Ordinances

The qualitative findings supported the quantitative results by showing that structured barangay programs, monitoring, incentives, regular collection systems, and functional Material Recovery Facilities contribute to compliance. Key

informants noted that barangays practice segregation, maintain compost pits, bring waste to designated collection points, and participate in evaluation and monitoring systems. These insights confirm that institutional support and structured systems help sustain compliance across barangays. However, the findings also show that personal habits and convenience still influence actual behavior, especially among households. This means that ordinance implementation is effective at the system level, but behavioral reinforcement remains necessary to ensure consistent compliance in everyday household practices.

3.5.2 Challenges in Implementation

The qualitative findings identified behavioral, infrastructural, and enforcement-related challenges. Respondents noted that some residents remain resistant to change, waste generation is higher in more populated barangays, some implementers become active mainly during evaluation periods, and fines and penalties are not always strictly enforced due to personal familiarity with residents. These themes reinforce the quantitative finding that implementation challenges are not mainly caused by the absence of policies but by behavioral habits, uneven enforcement, and accessibility issues. The findings suggest that compliance can be strengthened through continuous education, consistent monitoring, improved infrastructure, and stricter but fair enforcement of ordinances.

3.5.3 Stakeholder Differences

The qualitative results showed that households, barangay officials, and garbage collectors perform different roles in solid waste management. Households are mainly responsible for daily waste practices, barangay officials oversee implementation and monitoring, and garbage collectors manage waste collection and transport. The findings also showed that barangay officials and garbage collectors generally have higher awareness because of their direct involvement, while household awareness varies despite IEC efforts. This explains why compliance levels appear similar across groups, but challenges differ significantly. Households carry much of the daily compliance burden, while barangay officials and garbage collectors operate within more structured roles. Therefore, household-focused support, practical education, and accessible services are necessary to reduce the gap between policy compliance and actual waste management behavior.

3.6 Proposed Community-Based Program

3.6.1 SWM Behavioral Transformation and Education Initiative

The findings showed that while residents generally comply with policies, open burning, plastic reliance, and long-established disposal habits remain persistent problems. The proposed SWM Behavioral Transformation and Education Initiative addresses these issues through targeted behavioral intervention, hands-on demonstrations, composting and segregation activities, school-to-home advocacy, and localized media campaigns. This program responds directly to the study's finding that awareness alone is insufficient when habits and convenience continue to shape household behavior. By integrating practical training into barangay assemblies and school-based activities, the program aims to transform solid waste management from a legal obligation into a regular community practice.

3.6.2 SWM Structural Accessibility and Logistical Optimization Program

The findings also showed that households and garbage collectors experience challenges related to facility access, collection constraints, and disposal limitations, particularly in areas outside Poblacion. The proposed SWM Structural Accessibility and Logistical Optimization Program addresses these concerns by establishing barangay-managed satellite collection hubs, using eco-trikes for waste consolidation, and improving infrastructure funding and maintenance. This program directly supports households in remote or underserved areas by improving daily access to disposal points and reducing dependence on limited municipal collection schedules. It also supports garbage collectors by streamlining pickup points and improving collection efficiency. The program strengthens compliance by reducing logistical barriers that discourage proper waste disposal.

3.6.3 Institutionalized SWM Incentive and Monitoring Framework

The findings showed that convenience and habit often compete with legal compliance, while incentives and monitoring help encourage participation. The proposed Institutionalized SWM Incentive and Monitoring Framework formalizes a system of motivation and accountability through SWM Champions, Model SWM Household recognition, Cleanest Purok initiatives, waste-to-resource exchanges, and regular monitoring audits. This framework responds to the need for sustained compliance by combining recognition, practical incentives, and data-based monitoring. It benefits residents, especially low-income households, by turning compliance into a visible and rewarding community practice. It also supports barangay officials by encouraging self-policing within the community and institutionalizing a system that can continue beyond changes in local leadership.

4. Conclusion & Recommendations

The study concludes that the implementation of solid waste management ordinances in the Municipality of Trinidad is generally effective because compliance is high and consistent among barangay officials, garbage collectors, and household

members, supported by structured barangay programs, regular waste collection, Information, Education, and Communication campaigns, monitoring systems, incentives, and functional Material Recovery Facilities. However, long-term sustainability remains affected by behavioral and accessibility-related issues, particularly at the household level, including continued plastic use, convenience-based disposal practices, burning of waste, limited ordinance awareness, inadequate access to facilities, and difficulties in sustaining proper waste management habits. Although compliance levels did not significantly differ across respondent groups, the challenges encountered varied significantly, with household members experiencing greater difficulties than barangay officials, indicating the need to address group-specific conditions in ordinance implementation.

It is recommended that the Municipality of Trinidad strengthen household-focused education and awareness programs by intensifying localized IEC campaigns on practical waste management behaviors, ordinance awareness, proper disposal practices, and reduced use of plastic materials through barangay and purok meetings. The municipality should also improve accessibility to waste management facilities and services by enhancing access to Material Recovery Facilities, designated disposal sites, collection points, and mobile waste collection systems to reduce barriers to compliance. Furthermore, behavior-based incentive and monitoring mechanisms should be institutionalized through clear guidelines, regular evaluation, and standardized systems that encourage consistent compliance across all barangays.

The study was limited to selected barangays in the Municipality of Trinidad, Bohol; therefore, its findings may not be generalized to municipalities with different socio-economic, geographic, or institutional conditions. The results were also based partly on self-reported data, which may be affected by response bias and may not fully represent actual waste management practices. In addition, the findings reflected only the conditions during the period of data collection and did not account for possible changes in compliance, implementation practices, or stakeholder experiences over time.

Compliance with ethical standards

The study was conducted in accordance with institutional ethical standards and was approved by the Holy Name University Ethics Review Board. Participation was voluntary, with informed consent obtained from all respondents, and confidentiality and anonymity were strictly maintained throughout the research process. The authors declare no conflict of interest, acknowledge all contributions to the study, and affirm that copyright ownership and responsibility for the integrity of the work remain with the authors.

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