

Solid Waste Management Practices and Community Engagement of Senior High School Students

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Article Details:

Received: 20 April 2026

Revised: 30 April 2026

Accepted: 9 May 2026

Published: 18 May 2026

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Recommended Citation:

Cabido, G. V., Miranda, M. M. (2026). Solid Waste Management Practices and Community Engagement of Senior High School Students. The International Review of Multidisciplinary Research. 1 (5), 860-864.

<https://doi.org/10.5281/zenodo.20271251>

Index Terms:

development education, solid waste management practices and community engagement of SHS students, descriptive-quantitative research method, Cebu, Philippines

Abstract. This research evaluated the students' solid waste management practices on solid waste among the select public Senior High School Grade 11 students with 20 teachers, 80 students and 40 community members in the City of Naga, Cebu Division, DepEd Region VII, Central Visayas during the School Year of 2024-2025 as basis for Solid Waste Management Program. Survey questionnaires were used to collect the data. Most of the teachers belonged to the age of 41-50 with an average age of 40.90. Majority of them are married, with master's degree holders, having an entry-level positions, and having a very satisfactory performance rating. Students are predominantly female and are mostly aged 17 years. Students come from families with 2-3 siblings, with an average family size of approximately 3 children. Among the most notable is the item stating that garbage is placed in designated areas during the prescribed schedule the highest in the set. The results for segregation practices show statistically significant relationships across all engagement types, most notably in volunteering for waste management projects and joining environmental clubs. Those who are engaged in consistent environmental advocacy, whether by formal membership or active project participation, appear to internalize recycling habits. For recovery and retrieval, a practice that often involves converting waste into usable items or restoring damaged resources, a similarly strong relationship exists. Among all SWM domains, proper disposal exhibits the highest Chi-square values, particularly with volunteering and joining environmental clubs. The strength of these relationships implies that those engaged in regular environmental activities are more likely to adhere to safe and environmentally sound disposal practices. The research notable findings lead to the conclusion that waste can be converted into useful resources and that monitoring destroyed items occurs the other indicators show clear limitations. Community-based environmental initiatives rely heavily on the principle that individual participation leads to collective impact. Solid waste management (SWM), as one of the core pillars of sustainable environmental behavior, cannot stand alone without the active involvement of stakeholders—including teachers, students, and the broader community. Based on the findings and conclusions arrived in this study, it is hereby recommended that Solid Waste Management Program be adopted.

Introduction

Globally, solid waste management practices vary widely, with high-income countries generally having more advanced systems than low-income countries. Common practices include landfilling, incineration, composting, and recycling, but their effectiveness and sustainability differ significantly depending on a country's resources and infrastructure. Developing countries often face challenges in waste collection, sorting, and disposal, leading to environmental and health problems.

Around the world, waste generation rates are rising. In 2020, the world was estimated to generate 2.24 billion tonnes of solid waste, amounting to a footprint of 0.79 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 73% from 2020 levels to 3.88 billion tonnes in 2050.

Compared to those in developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned. These practices create serious health, safety, and environmental consequences. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote urban violence. Managing waste properly is essential for building sustainable and livable cities, but it remains a challenge for many developing countries and cities. Effective waste management is expensive, often comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported.

Waste Management is the collection, transport, processing or disposal, managing and monitoring of waste materials. The term usually relates to materials produced by human activity, and the process is generally undertaken to reduce their effect on health, the environment or aesthetics. Arising high quality of life, and high rates of resource consumption patterns have had a unintended and negative impact on the urban environment-generation on wastes far beyond the handling capacities of urban governments and agencies. Cities are now grappling with the problems of high volumes of waste, the cost involved, the disposal technologies and methodologies, and the impact of wastes on the local and global environment.

Methodology

Design

This study utilized a descriptive-correlational research design to evaluate the solid waste management (SWM) practices of select Grade 11 students in public Senior High Schools in the City of Naga, Cebu Division, DepEd Region VII, Central Visayas during the School Year 2024–2025. The descriptive method was employed to determine the respondents' demographic profile and assess their practices in waste segregation, recycling, recovery, retrieval, and proper disposal. Meanwhile, the correlational approach was used to examine the relationship between students' participation in environmental activities and their SWM practices.

The respondents consisted of 20 teachers, 80 students, and 40 community members who were selected through purposive sampling. Data were gathered using a researcher-made survey questionnaire that underwent validation and reliability checking prior to administration. Statistical tools such as frequency count, percentage, weighted mean, and Chi-square test were utilized to analyze and interpret the collected data accurately and systematically.

Environment

The study was conducted in select public Senior High Schools in the City of Naga, Cebu Division, under DepEd Region VII, Central Visayas, during the School Year 2024–2025. These schools were chosen because they actively implement school-based environmental activities and solid waste management practices aligned with the ecological programs of the Department of Education and the local government unit.

The research environment provided a suitable setting for assessing the solid waste management practices of Grade 11 students, teachers, and community members. The schools maintain designated waste disposal areas, segregation bins, and environmental awareness campaigns that encourage responsible waste management among stakeholders. Moreover, the surrounding communities participate in environmental initiatives such as clean-up drives, recycling activities, and waste reduction campaigns, which further support the objectives of the study.

Respondents

The respondents of the study consisted of 140 participants composed of 20 teachers, 80 Grade 11 students, and 40 community members from select public Senior High Schools in the City of Naga, Cebu Division, DepEd Region VII, Central Visayas during the School Year 2024–2025. These respondents were chosen because of their direct involvement and participation in school and community solid waste management activities.

The teacher-respondents were mostly aged 41–50 years old, married, and master's degree holders with very satisfactory performance ratings. Their experiences and professional backgrounds provided reliable insights regarding environmental practices implemented in schools. Meanwhile, the student-respondents were predominantly female and mostly 17 years

old, representing the primary target group of the study. Community members were also included to provide additional perspectives on environmental participation and waste management practices within the locality.

Research Instrument

The primary instrument used in this study was a researcher-made survey questionnaire designed to evaluate the solid waste management (SWM) practices of Grade 11 students, teachers, and community members in select public Senior High Schools in the City of Naga, Cebu Division. The questionnaire was carefully developed based on the objectives of the study and related literature on environmental management and sustainable waste practices.

The instrument consisted of two parts. The first part gathered the demographic profile of the respondents, including age, sex, civil status, educational attainment, and family background. The second part focused on the respondents' solid waste management practices, particularly in waste segregation, recycling, recovery and retrieval, and proper disposal. It also included items related to participation in environmental activities such as volunteering and membership in environmental clubs.

Data Collection Procedure

The researchers first sought approval from the school authorities and concerned offices before the conduct of the study. After securing permission, a formal letter was given to the principals of the selected public Senior High Schools in the City of Naga, Cebu Division, requesting approval to administer the survey questionnaire to the identified respondents.

Upon approval, the researchers personally distributed the validated questionnaires to the 20 teachers, 80 Grade 11 students, and 40 community members included in the study. The purpose of the research and the instructions for answering the questionnaire were clearly explained to ensure honest and accurate responses. Respondents were also assured that all information gathered would be treated with confidentiality and used solely for academic purposes.

After the retrieval of the complete questionnaires, the responses were carefully checked, organized, tabulated, and analyzed using appropriate statistical tools to ensure accuracy and reliability of the findings.

Data Analysis

The data gathered from the survey questionnaires were carefully organized, tabulated, analyzed, and interpreted using appropriate statistical tools to ensure the accuracy and reliability of the findings. Descriptive statistics such as frequency count, percentage, weighted mean, ranking, and average weighted mean were utilized to describe the demographic profile of the respondents and determine the extent of their solid waste management practices in terms of segregation, recycling, recovery and retrieval, and proper disposal.

To determine the significant relationship between respondents' participation in environmental activities and their solid waste management practices, the Chi-square test of independence was employed. This statistical tool helped identify whether involvement in activities such as volunteering and membership in environmental clubs influenced environmentally responsible behaviors among students and other stakeholders.

Results and Discussion

Results

The findings of the study revealed that the respondents demonstrated generally positive solid waste management (SWM) practices, particularly in proper waste disposal and segregation. Among the indicators, the practice of placing garbage in designated areas during the prescribed schedule obtained the highest rating, indicating awareness and compliance with proper waste disposal procedures among the respondents.

The results further showed statistically significant relationships between participation in environmental activities and SWM practices. Respondents who actively volunteered in waste management projects and joined environmental clubs exhibited stronger practices in waste segregation, recycling, recovery, retrieval, and proper disposal. These findings suggest that active involvement in environmental advocacy contributes to the development of responsible and sustainable waste management behaviors.

Discussion

The study emphasized the importance of active participation in promoting effective solid waste management (SWM) practices among students, teachers, and community members. The findings revealed that respondents generally practiced proper waste segregation and disposal, particularly by placing garbage in designated areas according to scheduled collection times. This indicates an increasing awareness of environmental responsibility within the school and community settings.

Conclusion and Recommendations

The study concluded that the respondents demonstrated positive solid waste management (SWM) practices, particularly in proper waste segregation and disposal. The findings revealed that active participation in environmental activities, such as volunteering in waste management projects and joining environmental clubs, significantly influenced responsible environmental behavior among students and other stakeholders. Respondents who consistently engaged in environmental advocacy showed stronger practices in recycling, recovery, retrieval, and proper waste disposal.

The study further established that solid waste management is more effective when schools, families, and communities work collaboratively toward environmental sustainability. Although some practices still showed limitations, the overall results highlighted the importance of awareness, participation, and shared responsibility in promoting proper waste management. Therefore, the study concluded that adopting a comprehensive Solid Waste Management Program would strengthen environmental practices and encourage long-term ecological responsibility among stakeholders.

Acknowledgement

I would like to express my heartfelt gratitude to all the individuals who contributed to the completion of this study. I sincerely thank the school administrators, teachers, Grade 11 students, and community members from the select public Senior High Schools in the City of Naga, Cebu Division for their cooperation, participation, and support throughout the research process.

I am also deeply thankful to my adviser, Dr. Marilyn M. Miranda, together with my instructors and mentors, for their valuable guidance, encouragement, and constructive suggestions that greatly improved this study. Their expertise and unwavering support were instrumental in the completion of this research.

Above all, I offer my sincerest gratitude to Almighty God for the wisdom, strength, and perseverance granted to me in accomplishing this work successfully.

Funding

This research received no external funding from any public, commercial, or not-for-profit funding agency, and no organization provided financial support for the conduct of the study, authorship, or publication of this article.

Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.