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Level of Awareness and Practices on Solid Waste Management Among the Residents of Barangay Turu, Magalang, Pampanga

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Abstract: Environmental degradation remains a critical global concern, necessitating the development of environmental awareness and sustainable waste management practices at the household and community levels. This study aimed to determine the significant relationship between the level of awareness and solid waste management practices among residents of Turu, Magalang, Pampanga. The study employed a descriptive-correlational research design involving 156 randomly selected residents and key informants. Data was collected using an adopted standardized survey instrument designed to assess respondents' awareness and practices related to solid waste management. The gathered data was analyzed using descriptive method. Findings revealed that both residents and key informants demonstrated a high level of awareness regarding solid waste management, with general mean scores of 3.43 and 3.78, respectively. Results indicate that respondents possess adequate knowledge and awareness of their responsibilities in minimizing household solid waste generation and understanding the environmental impacts associated with improper waste disposal. In terms of practices, respondents and key informants reported that solid waste management activities were "always practiced," obtaining mean scores of 3.52 and 3.64, respectively. Overall, the study emphasizes the importance of strengthening environmental awareness programs to further enhance sustainable solid waste management practices within the community.

Keywords: Solid Waste Management; Turu Magalang; Standardized Survey; Environment.

INTRODUCTION

Solid waste management remains a critical environmental concern that society must address effectively. Various factors influence the efficiency of waste management systems within a community, with human activities serving as one of the primary contributors. Human behavior and practices significantly affect waste management outcomes, whether through proper waste segregation, disposal, and recycling practices or through improper waste handling that leads to environmental degradation and public health risks. Vivar et al. (2015) stated that Solid Waste Management (SWM) plays a big role on the preservation of both life and nature. One of the major environmental challenges in modern society, particularly in highly urbanized areas, is the effective management of solid waste generated by residential, commercial, and industrial activities.

Rapid urbanization, population growth, and increasing consumption patterns have significantly contributed to the escalation of waste generation, placing substantial pressure on existing waste management systems. In response to this growing concern, the Philippine government enacted Republic Act No. 9003, also known as the Ecological Solid Waste Management Act of 2000. According to Del Rosario (2023), the law was established to provide local government units (LGUs) with a comprehensive framework and systematic approach for addressing the country's persistent problems in waste collection, segregation, disposal, and environmental sustainability. Despite the implementation of this legislation, ineffective waste segregation practices, limited public compliance, inadequate disposal facilities, and inconsistent policy enforcement continue to hinder efficient solid waste management, making it an ongoing environmental and public health concern in many urban communities. Further,

in developing countries, including the Philippines, inadequate solid waste management remains a major concern. Identifying community issues and their willingness to participate in improving waste management is essential for designing effective interventions, such as barangay-level communication programs (Mendoza et al. 2022). In the study of Hayudini et al. (2022), the majority of residents in the study area consistently practice proper waste disposal. This finding can be related to real-world observations in communities such as Turu, Magalang, where residents are likewise seen to observe waste disposal practices. However, this suggests that knowledge and awareness on proper waste segregation should be further assessed and measure.

Hence, this study aims to assess the level of awareness and practices on solid waste management among the residents of Barangay Turu Magalang, Pampanga. Specifically, the objectives were:

1. To assess the level of awareness of respondents regarding solid waste management principles, policies, and environmental practices.
2. To evaluate the existing practices of respondents in relation to solid waste management, including waste segregation, disposal, recycling, and waste reduction activities.

MATERIALS AND METHODS

Study Location

This study was conducted in Barangay Turu, which is composed of six (6) puroks. The said barangay is located in the municipality of Magalang, Province of Pampanga, Philippines.

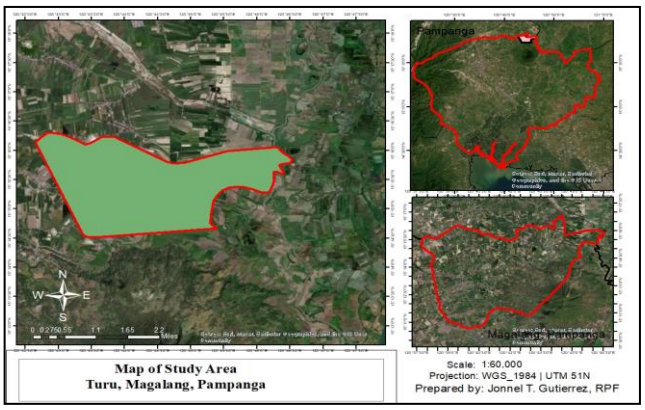

Figure 1. Location Map of the Study Area

Research Design

The study employed a descriptive research design to examine the relationship between the residents' level of awareness and their solid waste management practices within the research locale.

Data Collection

Data were collected through a structured survey questionnaire adapted from the study conducted by Bautista (2019). The instrument consisted of items designed to assess the respondents' awareness of solid waste management policies and their actual waste management practices.

A total of one hundred fifty-six (156) household heads were invited to participate in the study and answer the survey questionnaire. The respondents were selected using simple random sampling to ensure equal representation within the research locale. In addition, five (5) barangay officials were invited to serve as key informants for the study in order to provide supplementary insights regarding the implementation and management of solid waste practices within the barangay.

Data Analysis

The gathered data were analyzed using descriptive statistical tools, including frequency distribution, percentage, mean, and standard deviation, to summarize and interpret the responses of the participants.

To interpret the respondents' level of awareness regarding solid waste management, the scale presented in Table 1 was utilized. Furthermore, the interpretation of data concerning the respondents' solid waste management practices was based on the criteria presented in Table 2.

Table 1. Interpretation for level of awareness

Numerical value	Interpretation
5.00 – 4.20	Very Highly Aware
4.19 – 3.40	Highly Aware
3.39 – 2.60	Aware
2.59 – 1.8	Not Aware
1.8-1.00	Very Unaware

Table 2. Interpretation for the practices of the respondents

Numerical value	Interpretation
5.00 – 4.20	Always
4.19 – 3.40	Often
3.39 – 2.60	Sometimes
2.59 – 1.8	Rarely
1.8-1.00	Never

RESULTS AND DISCUSSION

Level of Awareness of the residents to Solid Waste Management

As presented in the table below, the highest computed mean score was 3.83 for the indicator, "*The role of citizens in practicing Solid Waste Management (SWM)*," which was interpreted as "*Highly Aware*." This finding indicates that the residents of Turu, Magalang possess a strong understanding of their responsibilities in implementing proper solid waste management practices for environmental protection and preservation.

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Conversely, the indicator with the lowest mean score of 2.76 was "*The penal provisions concerning the collection of non-segregated waste, squatting in open dumps and landfills, and the open dumping or burying of biodegradable and non-biodegradable materials in flood-prone areas,"* which was interpreted as "*Aware*." Although this item obtained the lowest mean among the indicators, the result still suggests that the majority of the residents of Turu, Magalang have a basic awareness of the legal penalties and prohibited acts related to improper waste disposal practices under solid waste management regulations.

The findings of the present study are consistent with the results reported by Zaman (2024), who found that rural citizens in Bangladesh actively participate in solid waste management activities, indicating a high level of awareness regarding their responsibilities in maintaining environmental sanitation and sustainability. This similarity suggests that community participation plays a significant role in strengthening public awareness and compliance with solid waste management practices.

Furthermore, the findings also support the study conducted by Galarpe and Heyasa (2017), which revealed that respondents demonstrated active involvement in solid waste management initiatives. Their study emphasized that community engagement and participation contribute positively to the successful implementation of waste management programs and environmental conservation efforts.

Table 3. The Awareness of the residents of Turu, Magalang to Solid Waste Management

Responses	Mean	SD	Interpretation
1.Policies and Guidelines of Solid Waste Management	3.60	0.88	Highly Aware
2.Implementation of Republic Act. 9003	2.96	0.91	Aware
2a. Penal provision of Littering, throwing, dumping of waste in public places.	2.87	1.08	Aware
2b. Penal provision of permitting the collection of non-segregate waste, squatting in open dumps and landfills, and open dumping burying of biodegradable and non-biodegradable materials in flood prone area	2.76	1.02	Aware
3.Importance and benefits of Solid Waste Management to the environment.	3.56	0.84	Highly Aware
3a. Importance and Benefits of Solid Waste Management the canals do not become clogged and do not Flood	3.54	0.84	Highly aware
3b. Importance and Benefits of Solid Waste Management can prevent Dengue due to the cleanliness of the environment.	3.63	0.81	Highly Aware
4.Implementation of Solid Waste Management	3.46	0.86	Highly Aware
4a. Someone Collects garbage	3.25	0.92	Aware
4b. Someone Cleaning the canals	3.47	0.85	Highly Aware
5.Purpose of the Management of Solid Waste Management	3.61	0.85	Highly Aware
5a. Effects of waste materials on Human Health and The Environment	3.30	0.83	Aware
5b. Reduced polluted air, reduced insect pollutants such as mosquitoes, flies, cockroaches etc.	3.65	0.91	Highly Aware
6.Importance of Waste Minimization	3.48	0.95	Highly Aware
7. Proper Discipline of Solid Waste Management	3.56	0.84	Highly Aware
8. Role as a citizen on practicing Solid Waste Management	3.83	0.79	Highly Aware
Grand Mean	**3.43**		Highly Aware

Level of Awareness of the Key Informants to Solid Waste Management

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As presented in Table 4, the indicators "*Implementation of Solid Waste Management (SWM)*" and "*Purpose of Solid Waste Management*" obtained the highest mean score of 4.20 with a standard deviation of 0.98, while the indicator "*Someone Cleaning the Canals*" also recorded a mean score of 4.20 with a standard deviation of 0.75. These indicators were interpreted as "*Very Highly Aware*," suggesting that the respondents possess a strong understanding of the implementation and objectives of solid waste management, as well as the importance of maintaining clean waterways and drainage systems within the community.

On the other hand, the indicator "*Penal Provision on Littering, Throwing, and Dumping of Waste in Public Places*" obtained the lowest mean score of 3.20, which was interpreted as "*Aware*." This result indicates that although the respondents demonstrate awareness regarding penalties associated with improper waste disposal in public areas, their level of awareness on this particular aspect is comparatively lower than the other indicators presented in the study.

The findings of the present study are consistent with the results reported by Abangan (2026), which revealed that compliance with solid waste management practices was generally high among barangay officials, garbage collectors, and household members. This similarity suggests that active community participation and institutional support contribute significantly to the effective implementation of solid waste management programs at the barangay level. Moreover, this result is supported by the findings of Mendoza et al. (2022), which stated that both residents and officials rated the management as very effective in terms of planning and control, waste management campaigns, waste collection, and waste disposal. Furthermore, the study of Carmen (2026) reported that awareness was relatively low regarding provisions on the handling of non-segregated waste and the mixing of recyclables with other types of waste, indicating the need for targeted educational efforts in these areas. Their results emphasize the importance of awareness in promoting environmentally responsible behavior and suggest that interventions aimed at improving knowledge of specific legal provisions may enhance compliance and participation in sustainable solid waste management initiatives.

Table 4. Level of Awareness of the Key informant to Solid Waste Management

Responses	Mean	SD	Interpretation
1. Policies and Guidelines of Solid Waste Management	3.80	0.98	Highly Aware
2. Implementation of Republic Act. 9003	3.80	0.98	Highly Aware
2a. Penal provision of Littering, throwing, dumping of waste in public places.	3.20	0.40	Aware
2b. Penal provision of permitting the collection of non-segregate waste, squatting in open dumps and landfills, and open dumping burying of biodegradable and non-biodegradable materials in flood prone area	3.40	0.80	Highly Aware
3. Importance and benefits of Solid Waste Management to the environment.	3.80	0.98	Highly Aware
3a. Importance and Benefits of Solid Waste Management the canals do not become clogged and do not Flood	3.40	0.80	Highly aware
3b. Importance and Benefits of Solid Waste Management can prevent Dengue due to the cleanliness of the environment.	3.80	0.98	Highly Aware
4. Implementation of Solid Waste Management	4.20	0.98	Very Highly Aware
	4.00	0.89	Highly Aware
4b. Someone Cleaning the canals	4.20	0.75	Very Highly Aware
5. Purpose of the Management of Solid Waste Management	4.20	0.98	Very Highly Aware
5a. Effects of waste materials on Human Health and The Environment	3.80	0.98	Highly Aware
5b. Reduced polluted air, reduced insect pollutants such as mosquitoes, flies, cockroaches etc.	3.80	0.98	Highly Aware
6. Importance of Waste Minimization	3.60	0.80	Highly Aware
7. Proper Discipline of Solid Waste Management	3.80	0.98	Highly Aware
8. Role as a citizen on practicing Solid Waste Management	3.60	0.80	Highly Aware
Grand Mean	**3.78**		Highly Aware

Level of Practices of Residents to Solid Waste Management

Table 5 presents the respondents' practices regarding Solid Waste Management (SWM). The indicator "*Practice of Proper Waste Disposal*" obtained the highest mean score of 4.18 with a standard deviation of 0.79, which was interpreted as "*Often*." This finding indicates that the participants frequently practice proper waste disposal

methods, such as avoiding indiscriminate throwing of garbage, properly managing waste materials, and ensuring the appropriate disposal of hazardous, toxic, and special wastes. The result suggests that the respondents demonstrate responsible waste management behaviors that contribute to environmental cleanliness and public sanitation.

The findings are supported by the study of Ivy et al. (2013), which emphasized that the proper implementation of the 3Rs concept—reduce, reuse, and recycle—can contribute significantly to sustainable solid waste management practices. The study further highlighted that effective application of the 3Rs helps minimize the emission of greenhouse gases, which are among the primary contributors to the phenomenon of climate change.

The findings further revealed that the respondents "*sometimes*" practice proper waste reusing, as indicated by the computed mean score of 3.12 with a standard deviation of 1.02. This suggests that the participants occasionally engage in activities involving the reuse of solid waste materials, although such practices are not consistently performed.

Similarly, the indicator for proper recycling obtained a mean score of 3.19 with a standard deviation of 1.05, which was likewise interpreted as "*Sometimes*." This result indicates that the respondents recognize the importance of recycling solid waste materials and demonstrate moderate participation in recycling activities within the community. One of the most commonly practiced recycling-related activities among the respondents is the segregation of biodegradable and non-biodegradable wastes prior to collection.

Moreover, the indicator "*Practice of Proper Segregation*" obtained a mean score of 3.84 with a standard deviation of 0.92, interpreted as "Often." This finding shows that the respondents generally exhibit good solid waste management practices in terms of waste segregation. The frequent separation of biodegradable and non-biodegradable wastes reflects the respondents' awareness of the importance of proper waste classification in promoting effective waste collection and disposal systems. These findings contrast with those of Zerna et al. (2026), whose study found that most residents had a general understanding of proper waste segregation and actively practiced separating biodegradable, non-biodegradable, and recyclable waste. Such practices were reported to enhance cleanliness, improve sanitation, and reduce environmental problems such as clogged drainage systems and flooding.

In connection, Issah et al. (2025) also concluded that while the residents demonstrated good knowledge and affirmative attitudes toward solid waste disposal, their practice ratings remained moderate, indicating a gap between knowledge and actual behavior. This suggests the need for educational interventions that focus on practical waste management skills, particularly among less educated residents, to improve community waste disposal practices. In relation to this, Tuanquin et al. (2025) recommended the improvement of community-based environmental education, the incorporation of interactive environmental learning in schools, and the enhancement of media campaigns to further strengthen sustainable waste management practices in barangays. Their recommendations emphasize the importance of continuous environmental awareness programs in sustaining and further improving proper waste segregation and other solid waste management practices among residents.

Table 5. Level of Practices of residents to Solid Waste Management

Responses	Mean	SD	Interpretation
1. The Practice of Proper Segregation	3.84	0.92	Often
2. The Practices of Proper Reducing	3.52	0.86	Often
3. The Practices of Proper Reusing	3.12	1.02	Sometimes
4. The Practices of Proper Recycling	3.19	1.05	Sometimes
5. The Practices of Proper Disposing	4.18	0.79	Often
Grand Mean	**3.52**		Often

Level of Practices of Key Informant to Solid Waste Management

Table 6 presents the respondents' practices regarding Solid Waste Management (SWM). The indicator "*Practice of Proper Waste Reduction*" obtained the highest mean score of 4.60 with a standard deviation of 0.80, which was interpreted as "*Always*." This finding indicates that the respondents consistently practice waste reduction strategies as part of their daily solid waste management activities. The result suggests that the participants demonstrate a strong commitment to minimizing waste generation within their households and community.

The findings further revealed that the respondents "*rarely*" practice proper waste reusing, as indicated by the computed mean score of 2.40 with a standard deviation of

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0.80. This suggests that the participants have limited engagement in reusing solid waste materials, indicating that reuse practices are not consistently integrated into their daily waste management activities.

Moreover, the indicator for proper recycling obtained a mean score of 2.80 with a standard deviation of 1.33, interpreted as "*Sometimes*." This result indicates that the respondents moderately practice recycling and recognize the importance of recycling solid waste materials. One of the common recycling-related practices observed among the participants is the segregation of biodegradable and non-biodegradable wastes prior to waste collection.

The aforementioned result is somewhat aligned with the findings of Pineda et al. (2024), which showed that residents did not consistently adhere to the 5Rs principles in their waste disposal practices, indicating a gap between knowledge and actual behavior.

Furthermore, the indicators "Practice of Proper Segregation" and "Practice of Proper Disposal" both obtained a mean score of 4.20 with a standard deviation of 0.98, interpreted as "*Always*." These findings demonstrate that the respondents consistently practice proper waste segregation and disposal as part of their solid waste management activities. The results indicate that the participants avoid indiscriminate disposal of garbage and observe appropriate waste management practices, including the proper handling and disposal of hazardous, toxic, and special wastes. Overall, the findings suggest that the respondents exhibit positive solid waste management behaviors, particularly in terms of waste segregation and proper disposal practices.

The findings of the present study somehow contradict the results reported by Castilla et al. (2024), who found that although respondents were highly aware of proper waste disposal practices, a noticeable gap still existed between their awareness, attitudes, and actual waste management practices. Their study identified the lack of adequate materials, facilities, and resources for waste disposal as one of the primary concerns affecting the effective implementation of proper solid waste management among residents. Also, the study of Mendoza et al. (2022) reported that waste disposal and segregation practices remained inadequate despite existing communication initiatives aimed at improving waste management, highlighting the need for authorities to encourage downtown residents to strictly comply with solid waste management (SWM) policies. In contrast, the present study revealed that the respondents consistently practice proper waste segregation and disposal, suggesting a relatively stronger application of solid waste management practices within the community.

Table 6. Level of Practices of Key Informant to Solid Waste Management

Responses	Mean	SD	Interpretation
1. The Practice of Proper Segregation	4.20	0.98	Always
2. The Practices of Proper Reducing	4.60	0.80	Always
3. The Practices of Proper Reusing	2.40	0.80	Rarely
4. The Practices of Proper Recycling	2.80	1.33	Sometimes
5. The Practices of Proper Disposing	4.20	0.98	Often
Grand Mean	**3.64**		**Often**

CONCLUSION

The findings of the study revealed that the residents of Barangay Turu generally possess adequate knowledge and awareness regarding Solid Waste Management (SWM). The respondents demonstrated high levels of awareness concerning their roles and responsibilities as citizens in practicing SWM, as well as the purposes, policies, and guidelines related to solid waste management.

Moreover, the residents exhibited positive solid waste management practices, particularly in terms of proper waste disposal, segregation, reduction, recycling, and reusing of waste materials. The results indicate that the respondents actively participate in maintaining proper waste management practices within the community, contributing to environmental cleanliness and sustainability. Similarly, the key informants indicated that awareness influenced practices in segregation, reducing, and recycling.

Overall, the study highlights the importance of community participation, environmental awareness, and cooperation between residents and local authorities in achieving effective and sustainable solid waste management practices. Strengthening collaborative efforts and promoting environmental education can further enhance responsible waste management behaviors within the barangay.

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Conflict of Interest

There are no conflicts of interest declared by the authors.

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