

The Impact of Waste Management Awareness on Effective Waste Management

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ABSTRACT

In the modern era, effective waste management practices have become imperative for sustaining our environment and conserving resources. As global populations continue to grow and consumption patterns evolve, the management of waste has emerged as a critical challenge. Therefore, this study was conducted to analyze the impact of waste management awareness on effective waste management in Batticaloa. This study uses waste management awareness (WMA) as an independent variable and effective waste management (EWM) as the dependent variable. Simple random sampling is used to choose the sample size of 350 individuals in Manmunai North Division, Batticaloa. Univariate analysis, correlation analysis and simple regression analysis were also performed on the obtained data using the SPSS version 25 software. The results indicated that there is a low level of waste management awareness on effective waste management among the respondents. Moreover, there is a weak positive correlation between WMA and EWM and WMA has a significant and positive impact on EWM among the people of the selected respondents in Manmunai North Division, Batticaloa. The findings of the study have various implications for other urban areas in any social context. Setting up recycling and reusing household solid waste can be an effective strategy in Manmunai North Division, Batticaloa.

Keywords: - *Effective Waste Management, Recycle, Reuse, Waste Management Awareness*

1. Introduction

The modern era has witnessed an unprecedented increase in population and urbanization, consequently leading to a surge in waste generation. Effective waste management is no longer a choice but an urgent necessity, requiring a paradigm shift in both public awareness and the strategies employed for waste disposal. This research delves into the significance of enhancing waste management awareness and explores strategies for more effective waste management.

Waste management is a critical issue that transcends geographical boundaries, affecting both developed and developing nations alike. The environmental repercussions of inadequate waste disposal are manifold, encompassing soil contamination, water pollution, and air quality degradation. Moreover, improper waste management poses serious health risks to communities, making it imperative to address this issue comprehensively (Kala & Bolia, 2020). One of the primary challenges in waste management lies in the lack of awareness among the general public. Many individuals remain unaware of the environmental and health consequences associated with improper waste disposal. Therefore, raising awareness is the cornerstone of any effective waste management initiative. Educational campaigns play a pivotal role in informing the public about the importance of responsible waste disposal, and encouraging the adoption of sustainable practices (Ramzan et al., 2019).

Waste management is a great problem in urban areas in Sri Lanka as well as in other countries of the world. Waste generated in urban places creates major problems for environmental pollution such as air pollution, water pollution, and soil pollution. Now a day presently it is not only the urban problem but also the village problems too. Waste management is very critical in the view of public health and sustainable development. The most obvious environmental damage caused by waste is aesthetic. A more serious risk is the transfer of pollution to groundwater and land as well as the pollution of air from improper burning of waste. Many waste activities generate greenhouse

gases like landfills generate methane and refuse fleets are significant sources of carbon dioxide and nitrous oxide (Saja et al., 2021).

The waste management system in Sri Lanka is controlled by the Municipal Council. The Municipal Council has many challenges in waste management due to a lack of resources, rapid population growth, urban migration and some tourism activities. Even though the Municipal Council maintains a good waste management system, the people do not have a proper awareness of the waste management system. Usually, the waste management system is based on waste handling, waste disposing systems, public awareness of waste management and government policy on waste management. Rushed lifestyles leave little time for mindful disposal, leading to indiscriminate dumping and littering. The pressure of urban life can result in neglecting sustainable practices, emphasizing the need for awareness and convenient waste disposal solutions to address the environmental consequences of urban busyness. Based on the above empirical evidence, there is a need to investigate the effective waste management of urban areas in Batticaloa. Also, in the context of Batticaloa, there are lack of studies regarding the impact of WMA on EWM. This shows there is a population gap in the related topic. Therefore, the focus of the research is to analyze waste management awareness in urban areas, specifically concentrating on effective waste management in the Manmunai North Division, Batticaloa.

The specific objectives of this empirical investigation are:

- To identify the levels of waste management awareness and effective waste management.
- To explore the relationship between waste management awareness and effective waste management.
- To investigate the impact of waste management awareness on effective waste management.

2. Literature Review

2.1 Effective Waste Management

Effective waste management refers to the systematic and sustainable handling, treatment, and disposal of waste materials to minimize environmental impact, conserve resources, and promote public health and safety. It involves a combination of strategies and practices aimed at reducing the generation of waste, reusing materials whenever possible, recycling valuable resources, and responsibly disposing of remaining waste (Petts, 1994).

Effective waste management also encompasses proper waste segregation, collection, transportation, and treatment, as well as the implementation of regulatory measures, public education campaigns, and innovative technologies to address waste-related challenges. Ultimately, the goal of effective waste management is to achieve a balance between environmental protection, resource conservation, and societal well-being (Halkos & Petrou, 2016).

2.2 Waste Management Awareness

Waste management awareness refers to the level of knowledge, understanding, and consciousness among individuals, communities, and organizations regarding the importance of proper waste management practices and their associated environmental, social, and economic implications. It involves raising awareness about the need to reduce waste generation, promote reuse and recycling, and ensure responsible disposal of waste to minimize environmental pollution, conserve resources, and protect public health (Hasan, 2004).

Waste management awareness efforts may include educational campaigns, outreach programs, workshops, and initiatives aimed at informing and empowering individuals to make informed choices and take action to support sustainable waste management practices. Ultimately, waste management awareness plays a crucial role in fostering behavioral change, promoting environmental stewardship, and achieving collective efforts toward a cleaner and healthier planet (Adekola et al., 2021).

2.3 Relationship between Waste Management Awareness and Effective Waste Management

Waste management awareness is pivotal for fostering responsible individual and community practices. Understanding the environmental impact of waste and the benefits of recycling promotes active participation in waste reduction initiatives. A heightened awareness cultivates a sense of responsibility, encouraging proper waste

sorting and disposal. Consequently, effective waste management is achieved through informed decision-making and conscientious behaviours. Communities with a strong waste management awareness are more likely to adopt sustainable practices, leading to improved waste segregation, recycling rates, and reduced environmental harm. Overall, the relationship between awareness and effective waste management is fundamental for building environmentally conscious societies (Abbas et al., 2020).

Thus, based on the evidence and discussions, the researcher proposes the following hypothesis;

H₃: There is a significant positive relationship between waste management awareness and effective waste management.

3. Methodology

A quantitative research design was adopted in this study. The research area spans the Manmunai North Division, located approximately 9.2km from Batticaloa Town, covering the Northern part of the Batticaloa District. It comprises a total population of 31,357 within an area of about 292.65 Sq.km. A study population for this research identified as the general public who are living in the Manmunai North Division, Batticaloa. The sample size was selected through simple random sampling. The researcher has taken a sample size of 350 respondents for study purposes.

The data collection method is fully dependent on a close-ended questionnaire. To measure study variables, questions were adopted from Twumasi, (2017). The questionnaire consists of Part I, and Part II. Part I is related to personal information and Part II is related to research information. Part I contains employees' gender, age group and educational qualification. The "Five Point Likert Scale" will be used to measure the variables. The scale in research information consists of five boxes ranging from "Strongly Disagree" to "Strongly Agree" and was applied in part II of the questionnaire to identify responses. However, the analysis consists of the response from 330 individuals out of 350 sample size. In this study, Cronbach's Alpha Coefficient (CAC) has been used for analyzing the reliability instrument. To achieve the objectives of the study, this has employed univariate, bivariate, and simple regression analysis to analyze the collected data in SPSS version 25.0.

4. Results and Discussions

4.1 Demographic Profile of the Respondents

The gender distribution of the respondents has been demonstrated, out of the 330 total respondents, 43.9% of the respondents are male and 56.1% of the respondents are female. Age distribution reveals that the percentage of respondents fall under the age groups of below 30, 30-40, 40-50, and above 50 are 23.7%, 41.2%, 24.9% and 10.2% respectively. The educational qualifications of respondents are divided into four categories and according to that, 47.5% of respondents possess Advance Level qualifications, 36.3% possess Bachelor's Degree, 13.5% possess, Master's Degree, and 2.7% possess Doctoral Degree.

4.2 Analysis of Reliability

According to the current study, the overall variables reliability analysis of Cronbach's Alpha Coefficient for waste management awareness is 0.783 and effective waste management is 0.873. Overall CAC value for WMA and EWM is above 0.7 and it indicates that the measurement which was used in the current study is acceptable (George & Mallery, 2003). It indicates that the data is reliable and adequate for further analysis.

4.3 Research Objective One

To achieve the study's first objective, the researcher applied Univariate analysis. Under the univariate analysis researcher used descriptive statistics. For this analysis mean values of the variables were taken into consideration to find out the level of waste management awareness and effective waste management.

Table -1: Results of Univariate Analysis

Variables	Mean Values	Decision Attributes
Waste Management Awareness	1.76	Low Level
Effective Waste Management	1.70	Low Level

Source: Survey Data

According to Table 1, variables such as waste management awareness and effective waste management show mean values of 1.76 and 1.70 respectively. It indicates a low level of waste management awareness and effective waste management as they fall between the ranges of $1 \leq X_i \leq 2.5$.

4.3 Research Objective Two

To achieve the study's second objective, the researcher applied Pearson correlation analysis. The Pearson correlation measures the strength of the linear relationship between two variables. It has a value between -1 to 1, with a value of -1 meaning a total negative linear correlation, 0 being no correlation, and + 1 meaning a total positive correlation.

Table -2: Results of Correlation Analysis

Variables	Correlation Coefficient	Sig. Value	Decision Attributes
WMA & EWM	0.154	0.005	Weak Positive

Source: Survey Data

According to Ratner (2009), decision attributes for the above result of Pearson's correlation analysis are $r=0.1$ to 0.29 (weak positive). Table 2 shows that there is a weak positive relationship between waste management awareness and effective waste management.

4.4 Research Objective Three

To achieve the study's third and final objective, the researcher applied a Simple Linear Regression statistical tool to examine the impacts of the independent variable on the dependent variable.

Table -3: Results of Simple Regression Analysis

Variables	R Square	β	Sig.
Waste Management Awareness	0.654	0.134	0.005

Source: Survey Data

The coefficient result in Table 3 indicates that waste management awareness ($\beta=0.134$, $p<0.05$) had a statistically significant and positive impact on effective waste management. Further 65.4% of the variation in EWM is explained by WMA. The remaining 34.6% of the variation is explained by other factors which are not taken into consideration and if WMA is increased by one unit EWM will improve by 0.134 units.

5. Conclusions

The existing level of the independent variable waste management awareness indicated that there is a low level of waste management awareness on waste management among 330 respondents who are living in Manmunai North Division, Batticaloa. The findings from the Pearson correlation technique indicated a weak positive relationship between waste management awareness and effective waste management. The results of the simple regression analysis indicated that there is a significant positive impact of waste management awareness on effective waste management in Manmunai North Division, Batticaloa. These results were supported by previous research also.

Hasan (2004) and Kala and Bolia (2020) found that waste management awareness is key to effective waste management.

In conclusion, the enhancement of waste management awareness and the adoption of effective waste management practices are integral to mitigating the environmental and health challenges posed by escalating waste generation. A multifaceted approach that combines education, infrastructure development, technology integration, and stakeholder collaboration is essential for creating a sustainable and resilient waste management system. The collective efforts of individuals, communities, and organizations are paramount in ensuring a cleaner and healthier future for a nation.

6. Directions for Future Research

Future research should focus on assessing the impact of current government waste management policies and investigating their effectiveness, identifying gaps and proposing improvements; analyzing public awareness and participation; explore innovative technologies for waste handling. The goal is to inform policy changes for more sustainable and effective urban waste management.

However, the current study has only focused on the Manmunai North Division and it's just urbanized in Batticaloa. Therefore, time and other resource limitations restricted this research to a narrow scope that only focused on the Manmunai North Division. The researcher therefore recommends the study to be done on a larger scale to cover more areas beyond Manmunai North Division, Batticaloa.

Future studies should incorporate mediating variables such as environmental attitudes, perceived behavioural controls and social norms and moderating variables such as age, education level and income level can provide a deeper understanding of the mechanisms and conditions under which waste management awareness influences effective waste management practices.

7. References

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