




The Relationship Between Waste Bank Utilization Behaviour & Domestic Waste Volume at the Household Level at Aur Village, Medan Maimun Sub-district

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ABSTRACT

Urban functional areas are currently facing waste and environmental problems due to increasing social and economic activities, urbanisation rates, and urban population growth. One effort to reduce household waste volume is the utilization of a waste bank. This research aims to analyze the relationship between waste bank utilization behaviour and the volume of domestic waste at the household level in Aur Village, Medan Maimun Sub-district in 2024. This type of research is an analytic survey with a cross-sectional design. The sample in this study amounted to 40 people using the total sampling technique. Data analysis method in 2 stages: univariate analysis with frequency counts and bivariate analysis with the chi-square test and Spearman's correlation, with a significance level of $\alpha = 5\%$ (0.05). The results showed that there was a significant relationship between housewives' knowledge ($p = 0.003$) and housewives' attitude ($p = 0.02$) with the behaviour of using the waste bank. There was no significant relationship with a positive pattern between the utilization of waste bank and domestic waste volume ($r = 0.069$) and ($p = 0.673$). This research provides the government with information on the use of waste banks to improve the program's effectiveness in reducing waste in the community. Furthermore, Non-Governmental Organizations can continue to provide education to improve customers' knowledge and attitudes, particularly in the area of waste management.

Keywords: Medan City, Waste Bank, Utilization, Waste Volume

1. Introduction

The issue of waste remains a significant environmental concern globally, with an estimated 2.24 billion tons of waste generated in 2020 (The World Bank, 2022). Improper waste management will inevitably lead to increased waste generation, which is influenced by global population growth. According to the 2023 BPS data, the total population of Indonesia from 2022 until mid-2023 reached 278,696,200 individuals. This population size is associated with an estimated 35.3 million tons of waste generated annually in Indonesia (SIPSN, 2022).

As indicated by KLHK (2022), North Sumatra ranks sixth among Indonesia's provinces in waste production, with an estimated 1.9 million tons generated annually. Additionally, Medan City generates 628.7 thousand tons of waste per year, with households as the predominant source at 44.99% (SIPSN, 2022). The rapid population growth in Medan City has made it the most productive city, leading to an increase in both the quantity and quality of waste generated (Syahputra, 2021). In light of these considerations, Presidential Regulation Number 97 of 2017, through the National Policy and Strategy, has set forth a framework for managing household waste and similar household waste, to achieve a 30% reduction and a 70% handling rate by 2025. Accordingly, a paradigm shift in waste management, namely a community-based approach, is imperative. This entails the active involvement of the community in the entire waste management process to create economic value through the utilization of a waste bank.

According to Regulation of the Minister of Environment and Forestry No. 14 of 2021, a waste bank is defined as a facility for the management of waste in accordance with the 3R principle. This is intended to serve as an educational tool, facilitate behavioral change in waste management practices, and support the implementation of a circular economy, to be established and managed by the community, business entities, and the government. Waste management must be conducted in a comprehensive and integrated manner, from the source to the end-user, by all relevant stakeholders, including the central government, local governments, and communities. This approach should align with the principles of a circular economy, in which waste is used as an industrial raw material.

A complex interplay of internal and external factors, including knowledge, attitudes, and actions, shapes an individual's behaviour. Internal factors include an individual's intelligence and gender, while external factors encompass the physical, social, cultural, economic, and political environments, among others (Notoatmodjo, 2012). An individual's knowledge, attitudes, and actions regarding the use of a waste bank can influence the volume of waste generated. The use of waste banks in the management of household waste has been shown to reduce waste by 300 grams per person per day. Furthermore, this approach has the potential to enhance customer income and contribute to environmental preservation (Prasanti & Yudhastuti, 2023).

The preliminary survey at Citra Aur Waste Bank in Aur Village, Medan Maimun Sub-district, revealed that all members of the waste bank's customer base had received continuous education both before and after the waste bank's inauguration by the non-governmental organization (NGO). However, of the 10 waste bank customer members, 7 demonstrated effective utilization of the waste bank, while the remaining 3 exhibited less optimal usage. The total average volume of waste generated was 3.88 L/person/day.

2. Method

This study is an analytical survey research with a cross-sectional design. It aims to determine the relationship between waste bank utilization behaviour and the amount of household waste in Aur Village, Medan Maimun Sub-district, through approaches such as observation and data collection (Azwar, 2013). The research aims to analyze the relationship between waste bank utilization behaviour and household-level domestic waste volume in Aur Village, Medan Maimun Sub-district. The study was conducted in Aur Village, Medan Maimun Sub-district, because this location has one waste bank managed by the Medan City Environment Agency and non-governmental organizations. The entire population of housewives who are customers of the waste bank was selected as the sample, totaling 40 people. A total sampling technique was employed due to the relatively small population size. The inclusion criteria for this study were housewives who had actively deposited waste at the waste bank for the past six months. The instruments utilized in this study were questionnaires, observation sheets, and measurements of domestic waste volume. The data analysis methods were conducted in two stages, univariate analysis with frequency to describe the characteristics of each research variable, and bivariate analysis with chi-square and spearman correlation tests to see the strength of the relationship between the characteristics of housewives and behavior, namely knowledge and attitudes towards utilization of waste banks and volume of domestic waste at the household level with a 95 percent confidence level ($\alpha = 5\%$). If $p < 0.05$, the statistical results are considered significant.

3. Result & Discussion

3.1 Characteristics of housewives

Table 1. Distribute Characteristics of Housewives

Characteristics of Housewives	n	%
Age		
Young Adults	13	32,5
Older Adults	27	67,5
Education Level		
Lower Education	22	55,0
Intermediate Education	18	45,0
Occupation		
Not employed	26	65,0
Employed	14	35,0
Income		
Income <UMP	25	62,5
Income >UMP	15	37,5

The data in the table above indicates that the age grouping of housewives comprises individuals in the young adult and old adult categories. The average age of the housewives is 44 years, with the age grouping according to Hurlock (1991): young adulthood (21-39 years) and old adulthood (40-60 years). Specifically, the data shows that 13 individuals (32.5%) are in the young adult category, while 27 individuals (67.5%) are in the old adult category. The data revealed that 22 individuals (55%) had received a basic education, having completed only elementary and junior high school. In contrast, 18 people (45%) had completed secondary school. Notably, no respondents had obtained a higher level of education. The grouping of housewives based on occupation revealed that most of those who did not work (65%) had become housewives, while 35% were engaged in trading and tailoring. The family income grouping indicated that 62.5% of the respondents had an income below Rp 2,800,000, while 37.5% had an income above this amount, as the only source of family income is the head of the family.

3.2 Housewives behaviours

Table 2. Distribution of Housewives Behaviours

Housewives Behaviours	n	%
Housewives Knowledge		
Good Knowledge	25	62,5
Poor Knowledge	15	37,5
Housewives Attitude		
Positive Attitude	27	67,5
Negative Attitude	13	32,5
Waste Bank Utilization		
Good Utilization	24	60,0
Bad Utilization	16	40,0
Total	40	100,0

Calculations for knowledge, attitudes, and utilization of waste banks by housewives were obtained from the average responses to the questionnaire. If knowledge is good, the score is above 8; poor knowledge is below 8; positive attitude is above 42; negative attitude is below 42; and good utilization is above 13; poor utilization is below 13.

As shown in the table above, the majority of housewives demonstrate a high level of knowledge, with 25 individuals (62.5%) exhibiting a comprehensive understanding of the subject. Education can influence an individual's cognitive, experiential, and motivational development. As posited by Budiman and Riyantio (2013), the higher a person's level of education, the more accessible it is to receive information. This assertion is exemplified by the case of housewives who have become waste bank customers and have received continuous education from non-governmental organizations. This educational intervention has the potential to influence not only attitudes but also behaviours. This finding aligns with the research conducted by Sulistiyorini and Demiyati (2023). Providing education on household waste management, including the use of a waste bank for respondents, has been shown to increase knowledge by 0.8%. This has also been observed to influence respondents' attitudes and behaviors.

The majority of housewives surveyed (27, 67.5%) exhibited a positive attitude. It can be reasonably inferred that housewives with good knowledge will have a positive impact on attitude. This finding aligns with the research of Suwerda et al. (2018), which suggests that the positive attitudes observed in waste management in Bantul Regency are likely the result of the community's acquired knowledge through education on waste management practices.

The possession of good knowledge and positive attitudes by housewives will lead to the undertaking of beneficial actions, namely the use of the waste bank. The majority of housewives use waste banks for beneficial purposes, with 24 individuals (60%) engaging in optimal use. One indicator of effective waste bank utilization is active deposit and waste sorting. The results demonstrate that 52.5% of housewives are active in depositing waste at the waste bank, and 67.5% are engaged in waste sorting. This finding aligns with the research conducted by Sholihin et al. (2019), which classified the participation of housewives in waste management through the waste bank in Ragajaya Village, Bojonggede District, Bogor Regency, West Java as active. This

classification was based on the observation that housewives consistently deposited waste in the bank and sorted waste at home.

3.3 Domestic waste volume at the household level

Table 3. Descriptive Analysis of Domestic Waste Volume at the Household Level

	Mean	SD	Min	Max	Confidence Interval (CI)
Organic Waste Volume	2,43	0,68	1,55	4,25	2,21 – 2,65
Inorganic Waste Volume	2,98	0,78	1,79	4,82	2,72 – 3,23
Total Waste Volume	5,41	1,30	3,34	8,34	4,99 – 5,83

Based on observations conducted over 7 days, the average volume of domestic waste from all housewives who became customers was 5.41 l/person/day, with organic waste at 2.43 l/person/day and inorganic waste at 2.98 l/person/day.

3.4 The Relationship between housewife behaviours and waste bank utilization

Table 4. Relationship Between Housewives' Behaviours and Waste Bank Utilization

Housewives Behaviours	Waste Bank Utilization				Pvalue
	Good		Bad		
	n	%	n	%	
Housewives Knowledge					
Good Knowledge	20	80,0	5	20,0	0,003
Bad Knowledge	4	26,7	11	73,3	
Housewives Attitude					
Positive Attitude	20	74,1	7	25,9	0,023
Negative Attitude	4	30,8	9	69,2	

The results indicated a statistically significant correlation between housewives' knowledge and the utilization of the waste bank (P-value = 0.003). Based on the findings from the field research, it can be concluded that housewives who are customers of the waste bank have received continuous education from non-governmental organizations. It can reasonably be assumed that an individual's knowledge will influence their subsequent behaviour, which, in this case, would be the optimal utilization of the waste bank. The results of Fiermanzah et al. (2021) indicate a relationship between community knowledge and the utilization of the waste bank (P-value = 0.000) in Kapasa Raya Village, Makassar City. Individuals with high knowledge are more likely to engage in beneficial behaviours, such as using a waste bank or processing waste by type. This is despite the absence of instructions from health workers and local community leaders.

The results indicate a significant correlation between housewives' attitudes and the utilization of waste banks (P-value = 0.023). It can be posited that n housewives who have received continuous education will possess enhanced knowledge, which may subsequently lead to a more positive attitude. This finding is consistent with the results of research conducted by Anwary and Ernandi (2017), which demonstrated a significant relationship between attitudes and the utilization of waste banks (P-value = 0.000). Attitudes are known to be influenced by perceptions and sentiments that can be readily collected, stored, and retained, which, in turn, affect the formation of positive perceptions and intentions to continue saving and to become waste bank customers.

3.5 The Relationship between Waste Bank Utilization by housewives and domestic waste volume at the household level

Table 5. The Relationship Between Waste Bank Utilization By Housewives and Domestic Waste Volume at the Household Level

Correlation between Variables	Domestic Waste Volume		
	n	r	Pvalue
Waste Bank Utilization by Housewives	40	0,069	0,673

The results of the research conducted in Aur Village, Medan Maimun Sub-district, based on the data normality test, indicate that the data are not normally distributed. Consequently, the data analysis employs nonparametric statistics, including the Spearman test. This reveals no relationship with a positive pattern ($r = 0.069$), indicating that as housewives' use of waste banks increases, the volume of domestic waste generated also increases.

This result depends on the assumption that most housewives engage in activities that generate considerable waste, such as cooking and selling. Consequently, the presence or absence of a waste bank does not affect the overall volume of household waste. Furthermore, the predominant waste type generated is inorganic waste, which can be deposited in the waste bank. According to housewives, the more waste they deposit in the waste bank, the greater their savings will be. Furthermore, housewives have not employed reuse strategies for the remaining organic and inorganic waste that cannot be deposited in the waste bank. This includes the production of fertilizer/compost, coenzyme, and eco-bricks. Consequently, this may contribute to the observed increase in household waste volume. This finding aligns with the observations made by Ridwan et al. (2017) at the Toddupuli Waste Bank in Makassar City. The authors noted that the waste management practices at this waste bank were suboptimal, particularly regarding organic waste. This was attributed to a lack of understanding and technical expertise among waste bank managers in processing community household organic waste into compost. Consequently, residents lacked the knowledge and skills to manage their household waste, particularly organic waste, effectively.

4. Conclusion

Based on the results of this study involving 40 housewives who are waste bank customers, related to knowledge, attitudes, waste bank utilization, and domestic waste volume. There is a significant relationship between housewives' knowledge and attitude toward the utilization of waste banks, but there is no positive relationship between the utilization of waste banks by housewives and the volume of domestic waste in Aur Village, Medan Maimun Sub-district. Suggestions to the Medan City Environment Agency to monitoring and maintaining the performance conditions of the Citra Aur Waste Bank and to Non-Governmental Organizations to always provide education to improve the knowledge and attitudes of waste bank customers who have low education, especially in terms of waste management that can be done in addition to the utilization of waste bank and the functions and requirements for sorting waste and storing waste.

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