

Determinants of Urban Waste Generation: A Case Study of Imopuro Subdistrict, Metro City

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Abstract

The problem of food waste in urban areas is becoming an increasingly pressing issue due to increasing public consumption, population growth, and low awareness of waste management. This study aims to analyze the influence of various socio-economic factors on household food waste generation in Imopuro Subdistrict, Metro City. The method used is a quantitative approach with multiple linear regression techniques. The independent variables studied include years of education, number of family members, household expenditure on food, proportion of food expenditure, knowledge of waste management, and involvement in waste management. The results show that the number of family members, household expenditure on food, and proportion of food expenditure have a positive effect on food waste generation, while years of education, knowledge of waste management, and community involvement in waste management have a negative effect. These findings indicate the need for community education and empowerment in sustainable consumption practices as well as strengthening community-based policies for food waste management. This study is expected to serve as a reference for policymakers in designing effective and participatory waste management strategies.

Keywords: Food Waste Generation, Consumption Behavior, Education, Household Expenditure, Community Participation.

INTRODUCTION

Waste is a chronic and growing environmental issue, particularly in urban areas under pressure from high population growth, residential expansion, and changing consumption patterns.

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This massive population increase has led to increased domestic and economic activity, which directly impacts the volume and types of waste produced. Various studies have shown that as prosperity increases and consumer lifestyles change in urban areas, the volume of household waste also tends to increase, both in terms of quantity and compositional complexity.

This problem becomes even more serious when public awareness of the environment and sustainable waste management practices remains relatively low. Many individuals and households still treat waste as a finished product without understanding its potential and the environmental risks it poses. The lack of education and public involvement in waste management from the source also exacerbates this situation, where waste that should be reduced, sorted, or reused ends up in landfills (TPA), which in many cases are already over capacity.

According to data from the National Waste Management Information System (SIPSN), in 2024, Indonesia generated 34.21 million tons of waste from 317 regencies and cities. Of this total, only 20.44 million tons (59.74%) were successfully managed, while another 13.77 million tons (40.26%) remained unmanaged. This figure indicates that nearly half of the total national waste generation remains an environmental burden that has not been optimally addressed. This situation reflects the complexity of the waste problem faced by urban areas in Indonesia, where population growth, consumption activities, and lifestyle changes are not accompanied by adequate waste management systems.

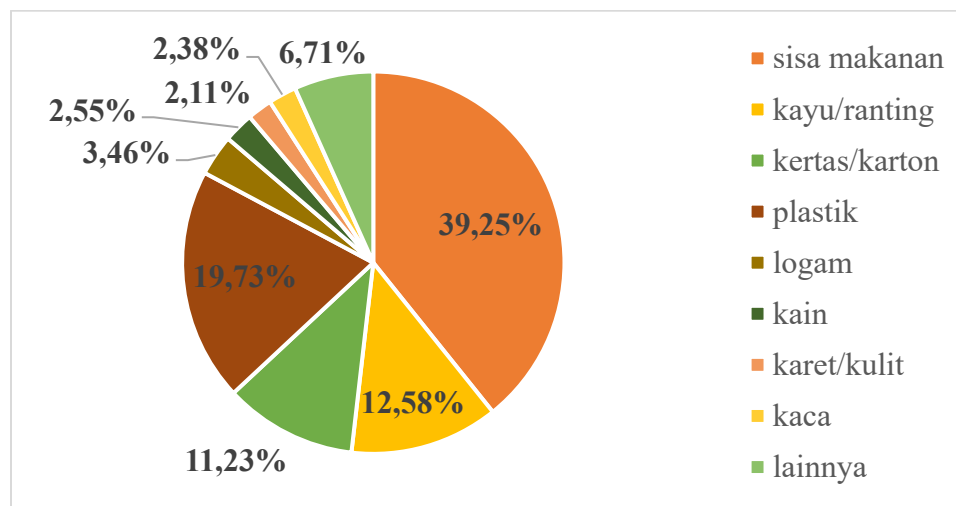


Figure 1.1 Composition of Waste Generation in Indonesia (Percent)

Source: National Waste Management Information System (SIPSN)

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Figure 1.1 shows that the composition of waste generated in Indonesia is diverse, but food waste accounts for the largest portion, at 39.25%. This indicates that food waste is the primary component of waste in Indonesia, reflecting the population's tendency to overconsume.

This problem is not only national but also evident in regional areas, including Lampung Province, which recorded 629,000 tons of waste generation in 2024. This large volume indicates that Lampung Province faces serious challenges in managing domestic and urban waste. The high level of waste production, particularly from households, indicates that the waste management system has not been able to keep pace with the ever-increasing consumption dynamics of the population.

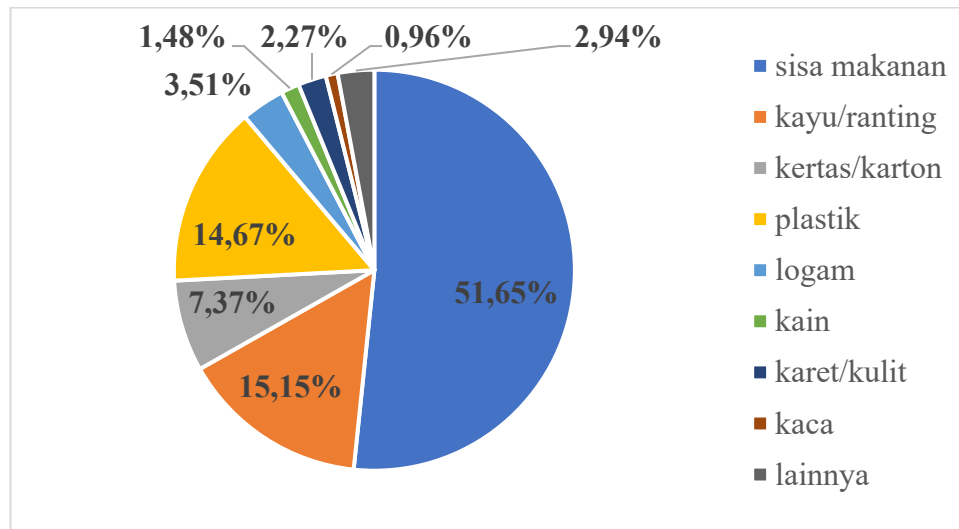


Figure 1.2 Composition of Waste Generation in Lampung Province (Percent)

Source: National Waste Management Information System (SIPSN)

Figure 1.2 explains that the composition of waste generated in Lampung Province has various types, but the largest value is dominated by food waste at 51.65%. This means that the dominance of food waste as the main component of waste in Lampung Province reflects the community's tendency to overconsumption, a lack of awareness in managing food wisely, and minimal practices of reducing and recycling organic waste at the household level. Food waste generally comes from households, traditional markets, restaurants, and social activities such as celebrations and religious events that are widely

held by the people of Lampung. The high amount of food waste thrown away presents a serious challenge in waste management efforts.

This situation is not only prevalent at the provincial level but is also clearly reflected at the city level, one of which is Metro City, an autonomous region in Lampung Province with relatively developed urban characteristics. As a city with a high population density and dynamic economic activity, Metro City also faces similar challenges in terms of high waste generation, particularly food waste, which dominates the composition of daily waste.

In recent years, Metro City has shown a trend of increasing waste volume, in line with the growth of the trade sector, restaurants, traditional markets, and increasing public purchasing power. According to data from the Metro City Environmental Agency, the household sector remains the main contributor to municipal waste, with organic waste—especially food waste—making up the largest component. This indicates that food waste is not only a macro issue at the provincial level but also a local issue that requires special attention in Metro City.

To gain a deeper and more contextual understanding of this problem, this research will focus on Imopuro Village, one of the densely populated villages in the Metro Pusat District. This village was chosen because of its diverse socio-economic conditions. This region represents a unique urban landscape characterized by the interaction of demographic factors, consumption patterns, and limited waste management systems. Furthermore, there is limited research specifically examining the determinants of household food waste in this region, despite the complexity of local environmental issues requiring a micro-data-based understanding, such as household characteristics, community knowledge, and their level of involvement in environmental management.

METHODOLOGY

Types Of Research

This study uses a quantitative approach. The quantitative approach itself is used to assist in decision-making, develop mathematical models, and determine the relationships between variables in a population (Amruddin, 2022). In this study, the sampling technique used was multi-stage random sampling. Multi-stage random sampling is a random probability sampling technique carried out through several stages. At each stage, sampling is carried out randomly, starting from the largest unit to the smallest unit (Imam, 2021).



This study used a multiple linear regression analysis method because it consists of more than one independent variable. This study aims to determine whether there is an influence of Years of Education (X1), Number of Family Members (X2), Household Expenditure on Food (X3), Proportion of Expenditure on Food (X4), Knowledge of Waste Management (X5), and Involvement in the Environment (X6) on Total Food Waste (Y) in Imopuro Village, Metro City.

Time and Location of Research

The research was conducted from February to April 2025. The research location was Imopuro Village, Metro City. Imopuro Village itself is one of the villages located in the Metro District, in the center of Metro City, with an area of 119 hectares. Imopuro Village is also an area with high economic activity and community activity.

Data Types and Sources

The data used in this study is primary data. Primary data is data obtained directly from respondents. Primary data consists of questionnaires and observation results.

Data collection technique

To obtain results that align with the research objectives, the research design requires data collection. The primary data used in this study were obtained directly from respondents.

A. Primary Data

Primary data is data originating from original or primary sources, collected by researchers to address the research problems identified in the study. It is obtained directly from informants, either through interviews or questionnaires. The primary data in this study include information on Years of Education (X1), Number of Family Members in the Household (X2), Household Expenditure on Food (X3), Proportion of Household Expenditure on Food (X4), Knowledge of Waste Management (X5), Involvement in the Environment (X6), and (Y) Total Food Waste. These data were obtained through questionnaires distributed to heads of families in Imopuro Village, Metro City.

B. Observation

This data collection technique involves direct and indirect observation by the researcher. This technique allows us to determine the total food waste generated in Imopuro Village, Metro City.



C. Questionnaire

A data collection technique conducted by providing respondents with a set of written questions or questionnaires to answer. The data collection instrument was an open-ended questionnaire to allow respondents freedom of response. The questionnaire was administered to respondents, namely heads of families in Imopuro Village.

Sampling Method

In this study, the sampling technique used was multilevel random sampling to determine the number of research respondents.

$$n = \frac{N}{1 + N(d)^2}$$

Where:

n = sample size

N = population size

d = margin of error (10%)

$$n = \frac{2149}{1 + 2149(0,1)^2}$$

$$n = \frac{2149}{1 + 2149(0,01)}$$

$$\frac{n = 2149}{1 + 21,49}$$

$$n = 95,52 \rightarrow n = 96$$

Based on calculations, the number of respondents from the population who were used as research objects based on the Slovin formula was 96 families.

Data Analysis Techniques

In this study, the author applied the multiple linear regression analysis method using cross-sectional data. Cross-sectional data is data collected from a number of objects or individuals over a specific period. The multiple linear regression model involves

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one dependent variable and several independent variables, which can be expressed by the following formula:

$$Y = \beta_0 + \beta_1 [X_1] + e$$

Where Y and X are the response and predictor variables, respectively. Data analysis was performed to determine the relationship between the dependent variable and one or more independent variables. In this study, STATA was used as the analytical tool. The following is a model for cross-sectional regression data:

$$\text{TSM} = \beta_0 + \beta_1 [\text{LP}] + \beta_2 [\text{JAK}] + \beta_3 [\text{PRTM}] + \beta_4 [\text{PPM}] + \beta_5 [\text{PPS}] + \beta_6 [\text{KDL}] + e$$

Where:

β_0	= Constant
$\beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6$	= Regression Coefficients
TSM	= Total Food Waste (Kilograms)
LP	= Years of Education (Years)
JAK	= Number of Family Members (People)
PRTM	= Household Expenditure on Food (Rupiah)
PPM	= Proportion of Expenditure on Food (Percent)
PPS	= Knowledge of Waste Management (0-3 points)
KDL	= Environmental Involvement (0/1 point)
e	= Error Term

RESULTS AND DISCUSSION

Variabel	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
TSM	96	1.848958	2	3	1	0.398
LP	96	13.156	12	18	9	2.754
JAK	96	3.542	3	6	2	1.160
PRTM	96	3.010	3	5	1	0.8644
PPM	96	1.906	2	3	1	0.358
PPS	96	2.156	2	3	1	0.654
KDL	96	0.135	0	1	0	0.344

Table 1 Descriptive Statistics

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Table 1 explains that the observed data comprises a total of 96 observations obtained from heads of households in Imopuro Village, Metro City. The results of the descriptive analysis of this data are as follows:

1. Food waste generation in Imopuro Village shows a mean of 1.84 kg. The highest food waste generation is 3 kg, while the lowest is 1 kg.
2. Years of education in Imopuro Village show a mean of 13.15 years. The highest education level is 18 years, while the lowest is 9 years.
3. The number of family members in Imopuro Village shows a mean of 3.54 people. The highest level is 6 people, while the lowest is 2 people.
4. Household expenditure on food in Imopuro Village shows a mean of 3,010. The highest score is in category 5, while the lowest score is in category 1.
5. The proportion of household expenditure on food in Imopuro Village shows a mean of 1.9. The highest score is in category 3, while the lowest score is in category 1.
6. Knowledge of waste management in Imopuro Village shows a mean of 2.1 points. The highest score is 3 points, while the lowest score is 1 point.
7. Involvement in waste management in Imopuro Village shows a mean of 0.1 points. The highest score is 1 point, and the lowest score is 0 points.

Normality Test

Variabel	Skewness	Kurtosis	Keterangan
Total Food Waste	-1,009712399	3,224719588	NORMAL
Length of Education	-0,24963778	-1,297367562	NORMAL
Number of Family Members in the Household	0,557954124	-0,352803501	NORMAL
Household Expenditure on Food	0,578843468	0,226235563	NORMAL
Proportion of Household Expenditure on Food	-1,292178866	3,94819293	NORMAL
Knowledge of Waste Management	-0,169868343	-0,663445959	NORMAL

Table 2. Results of the Skewness and Kurtosis Normality Test

Source: MS Excel

Based on the results in Table 2, it shows that the variables total food waste, length of education, number of family members in the household, household expenditure on food, proportion of household expenditure on food and knowledge of waste management meet the skewness and kurtosis values to be declared normally distributed.



Multicollinearity Test

Variabel	VIF
Length of Education	1.50
Number of Family Members in the Household	1.07
Household Expenditure on Food	1.41
Proportion of Household Expenditure on Food	1.18
Knowledge of Waste Management	1.28
Mean VIF	1.29

Table 3 Multicollinearity Test Results

Source: STATA 17

Based on the VIF calculation results in Table 3, all independent variables have VIF values well below the threshold of 10, with a mean VIF of 1.15. This value indicates that there are no multicollinearity issues in the regression model. This means that each independent variable in the model is not highly correlated with each other, thus not causing interference in the model parameter estimation.

Heteroscedasticity Test

H0: CONSTANT VARIANCE		
Chi2 (1)	0.13	
Prob >Chi2	0.7202	

Table 4 Heteroscedasticity Test Results

Source: STATA 17

Based on the results of the Breusch–Pagan/Cook–Weisberg test, the Prob value > χ^2 of 0.7202 was obtained, which is greater than the significance level of $\alpha = 0.05$ but still within the marginal significance range. Therefore, there is insufficient evidence to reject the null hypothesis, so it can be concluded that the model does not show significant heteroscedasticity.

Multiple Linear Regression

TSM	Coeff	Std. Err Robust	P>(t)
Cons	0.3711531	0.2385578	0.124
LP	0.0490428	0.019072	0.012

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JAK	0.0201668	0.0320352	0.531
PRTM			
Category 2	0.7251887	0.1439326	0.000
Category 3	0.7340358	0.1347886	0.000
Category 4	0.4665541	0.1717414	0.008
Category 5	0.9671099	0.2414101	0.000
PPM			
Category 2	- 0.0619608	0.091597	0.501
Category 3	- 0.0090786	0.5054851	0.986
PPS			
Category 2	0.1089077	0.1321067	0.412
Category 3	0.1481592	0.150223	0.327
KDL	0.058827	0.0797022	0.463

Table 5. Multiple Linear Regression Estimation Results

Source: STATA 17

Based on these estimation results, the following regression equation model was formed:

$$\text{TSM} = 0.3711531 + 0.0490428 + 0.0201668 + 0.0201668 + 0.7251887 + 0.7340358 + 0.4665541 + 0.9671099 - 0.0619608 - 0.0090786 + 0.1089077 + 0.1481592 + 0.058827$$

From the equation above, it can be seen that the dependent variable, food waste generation, has a constant of 0.3711531, which represents the average value of food waste generation (in kilograms) when all independent variables are zero. The following is an interpretation of each independent variable:

1. The regression coefficient of 0.0490428, with a probability value of $0.012 < 0.05$, indicates that the variable "year of education" has a positive and significant effect on

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food waste generation. This means that every one-year increase in the length of education will increase food waste generation by 0.04 kg, assuming other variables remain constant.

2. The regression coefficient of 0.0201668, with a probability value of $0.531 > 0.05$, indicates that the variable "number of family members in the household" has a positive but not statistically significant effect on food waste generation at the 0.05 level. This means that every one-year increase in the number of family members will increase food waste generation by 0.020 kg, assuming other variables remain constant, although this increase does not have a significant impact on food waste generation, *ceteris paribus*.
3. The regression coefficient of 0.7251887, with a probability value of $0.000 < 0.05$, indicates that household food expenditure in category 2 has a positive and significant effect on food waste generation. This means that every 1-unit increase in household food expenditure will increase food waste generation by 0.7251887 kg, assuming other variables remain constant.
4. The regression coefficient of 0.7340358, with a probability value of $0.000 < 0.05$, indicates that household food expenditure in category 3 has a positive and significant effect on food waste generation. This means that every 1-unit increase in household food expenditure will increase food waste generation by 0.7340358 kg, assuming other variables remain constant.
5. The regression coefficient of 0.4665541 with a probability value of $0.008 < 0.05$ indicates that household food expenditure in category 4 has a positive and significant effect on food waste generation. This means that every 1 unit increase in household food expenditure will increase food waste generation by 0.4665541 kg, assuming other variables remain constant.
6. The regression coefficient of 0.9671099 with a probability value of $0.000 < 0.05$ indicates that household food expenditure in category 5 has a positive and significant effect on food waste generation. This means that every 1 unit increase in household food expenditure will increase food waste generation by 0.9671099 kg, assuming other variables remain constant.
7. The regression coefficient of -0.0619608 with a probability value of $0.501 > 0.05$ indicates that the variable proportion of household expenditure on food in category 2 has a negative but not statistically significant effect at the 0.05 level on food waste generation. This means that every 1 unit increase in the proportion of household expenditure on food will reduce food waste generation by 0.0619608 kg, assuming

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other variables remain constant, although this increase does not have a significant impact on food waste generation, assuming *ceteris paribus*.

8. The regression coefficient of -0.0090786 with a probability value of $0.986 > 0.05$ indicates that the variable proportion of household expenditure on food in category 3 has a negative but not statistically significant effect at the 0.05 level on food waste generation. This means that every 1 unit increase in household expenditure on food will reduce food waste by 0.0090786 kg, assuming other variables remain constant, although this increase has no significant impact on food waste generation, *ceteris paribus*.
9. The regression coefficient of 0.0967879 with a probability value of $0.412 > 0.05$ indicates that the waste management knowledge variable in category 2 has a positive but not statistically significant effect on food waste generation at the 0.05 level. This means that every 1 unit increase in waste management knowledge will increase food waste generation by 0.0967879 kg, assuming other variables remain constant, although this increase has no significant impact on food waste generation, *ceteris paribus*.
10. The regression coefficient of 0.1481592 with a probability value of $0.327 > 0.05$ indicates that the waste management knowledge variable in category 3 has a positive but not statistically significant effect on food waste generation at the 0.05 level. This means that every 1 unit increase in waste management knowledge will increase food waste generation by 0.1481592 kg, assuming other variables remain constant, although this increase does not have a significant impact on food waste generation, *ceteris paribus*.
11. The regression coefficient of 0.058827 with a probability value of $0.463 > 0.05$ indicates that the environmental waste management involvement variable has a positive but not statistically significant effect on food waste generation at the 0.05 level. This means that every increase in waste management involvement in the environment by 1 unit will increase food waste generation by 0.058827 kg, assuming other variables are constant, even though this increase does not have a real impact on food waste generation with the *ceteris paribus* assumption.



t test

Variabel	Coeff.	t-hitung	t-tabel	Prob>t	Conclusion
Length of Education	0.0490428	2.57	1.662	0.012	Reject H_0
Number of Family Members in Household	0.0201668	0.63	1.662	0.531	Fail to Reject H_0
Household Expenditure on Food					
Category 2	0.7251887	5.04	1.662	0.000	Reject H_0
Category 3	0.7340358	5.45	1.662	0.000	Reject H_0
Category 4	0.4665541	2.72	1.662	0.008	Reject H_0
Category 5	0.9671099	4.01	1.662	0.000	Reject H_0

Proportion of Household Expenditure					
Category 2	-0.0619608	-0.68	1.662	0.501	Fail to Reject H_0
Category 3	-0.0090786	-0.02	1.662	0.986	Fail to Reject H_0
Knowledge of Waste Management					
Category 2	0.1089077	0.82	1.662	0.412	Fail to Reject H_0
Category 3	0.1481592	0.99	1.662	0.327	Fail to Reject H_0
Involvement in Waste Management	0.058827	0.74	1.662	0.463	Fail to Reject H_0

Table 6. Statistical T-Test Results

Source: STATA 17

1. The results of the t-statistic test show that the coefficient value for the variable of years of education is 0.0490428 with a probability level of $0.012 < 0.5$ and a calculated t-value of $2.57 > t\text{-table } 1.662$. This means that H_0 is rejected and H_a is



accepted, so that the variable of years of education has a positive and significant effect on food waste generation.

2. The results of the t-statistic test show that the coefficient value for the variable of number of family members in the household is 0.0201668 with a probability level of $0.531 > 0.5$ and a calculated t-value of $0.63 > t\text{-table } 1.662$. This means that H_0 is accepted and H_a is rejected, so that the variable of number of family members in the household has a positive but insignificant effect on food waste generation.
3. The results of the t-statistic test show that the coefficient value for the household expenditure variable for food in category 2 is 0.7251887 with a probability level of $0.000 < 5$ and a calculated t-value of $5.04 > t\text{-table } 1.662$. This means that H_0 is rejected and H_a is accepted, so that the household expenditure variable for food in category 2 has a positive and significant effect on food waste generation.
4. The results of the t-statistic test show that the coefficient value for the household expenditure variable for food in category 3 is 0.7340358 with a probability level of $0.000 < 5$ and a calculated t-value of $5.45 > t\text{-table } 1.662$. This means that H_0 is rejected and H_a is accepted, so that the household expenditure variable for food in category 3 has a positive and significant effect on food waste generation.
5. The results of the t-statistic test show that the coefficient value for the household expenditure variable for food in category 4 is 0.4665541 with a probability level of $0.008 < 5$ and a calculated t-value of $2.72 > t\text{-table } 1.662$. This means that H_0 is rejected and H_a is accepted, so that the household expenditure variable for food in category 4 has a positive and significant effect on food waste generation.
6. The results of the t-statistic test show that the coefficient value for the household expenditure variable for food in category 5 is 0.9671099 with a probability level of $0.000 < 5$ and a calculated t-value of $4.01 > t\text{-table } 1.662$. This means that H_0 is rejected and H_a is accepted, so that the household expenditure variable for food in category 5 has a positive and significant effect on food waste generation.
7. The results of the t-statistic test show that the coefficient value for the proportion of household expenditure for food in category 2 is -0.0619608 with a probability level of $0.501 > 0.05$ and a calculated t-value of $-0.68 > t\text{-table } 1.662$. This means that H_0 is accepted and H_a is rejected, so that the proportion of household expenditure for food in category 2 has a negative but insignificant effect on food waste generation.
8. The results of the t-statistic test show that the coefficient value for the variable proportion of household expenditure on food in category 3 is -0.0090786 with a probability level of $0.986 > 0.05$ and a calculated t-value of $-0.02 > t\text{-table } 1.662$.

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This means that H_0 is accepted and H_a is rejected, so that the variable proportion of household expenditure on food in category 3 has a negative but insignificant effect on food waste generation.

9. The results of the t-statistic test show that the coefficient value for the variable knowledge of waste management in category 2 is 0.1089077 with a probability level of $0.412 > 0.05$ and a calculated t-value of $0.82 < t\text{-table } 1.662$. This means that H_0 is accepted and H_a is rejected, so that the variable knowledge of waste management in category 2 has a positive but insignificant effect on food waste generation.
10. The results of the t-statistic test show that the coefficient value for the waste management knowledge variable in category 3 is 0.1481592 with a probability level of $0.327 > 0.05$ and a calculated t-value of $0.99 < t\text{-table } 1.662$. This means that H_0 is accepted and H_a is rejected, so that the waste management knowledge variable in category 3 has a positive but insignificant effect on food waste generation.
11. The results of the t-statistic test show that the coefficient value for the waste management involvement variable is 0.058827 with a probability level of $0.463 > 0.5$ and a calculated t-value of $0.74 < t\text{-table } 1.662$. This means that H_0 is accepted and H_a is rejected, so that the waste management involvement variable has a positive but insignificant effect on food waste generation.

F test

F-hitung	F-tabel	Prob.	Kesimpulan
71.22	2.31	0.000	Menolak H_0

Table 7. F-Statistic Test Results

Source: STATA 17

Based on the table above, it is known that the F-statistic test in this study shows that the calculated F-value of 71.22 is greater than the F-table value of 2.31 with a probability of $0.0000 < 0.05$, meaning that H_0 is rejected so that it can be concluded that together the independent variables in this study have a significant influence on the dependent variable.



Coefficient of Determination

R-square
0,2894

Table 8. Results of the Coefficient of Determination

Source: STATA 17

An R-squared value of 0.2894 means that 28.94% of the variation in the dependent variable can be explained by the independent variables used in the model. The remaining 71.06% is explained by other factors not included in the regression model.

The Effect of Length of Education on Food Waste Generation

The results of this study indicate that years of education have a positive and significant influence on the total amount of household food waste. The higher the years of education of the household head, the greater the amount of food waste generated. This is evident from the positive coefficient value.

This finding supports previous research by Rada (2016), which states that individuals with higher levels of education tend to have higher consumption levels, resulting in increased household waste, including food and non-food waste. While education is expected to increase environmental awareness, in practice, this does not necessarily reduce the volume of consumption and waste generated.

The Influence of the Number of Family Members on Food Waste Generation

The results of this study indicate that the number of family members has a positive effect on total household food waste. However, this effect is not statistically significant ($p = 0.5311$). This suggests that increasing the number of family members does not always correlate directly with the amount of food waste generated.

This result may be due to differences in household consumption patterns, which depend not only on the number of members but also on other factors such as age composition, consumption behavior, food processing efficiency, and awareness of reducing food waste. Therefore, even though a household has more members, it does not necessarily produce more food waste than a household with fewer members but with wasteful consumption patterns.

This finding supports research by Balqis (2021) in Nusukan Village, Surakarta, which found a positive relationship between the number of family members and waste

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generation. This means that a larger number of family members in a household tends to produce more waste. This is due to the higher activity levels of households in smaller areas.

The Impact of Household Expenditure on Food on Food Waste Generation

The results of this study indicate that high household spending on food is a major factor in the formation of household waste, particularly food waste. Increased spending not only reflects purchasing power or well-being but also implies a high potential for food waste and packaging waste.

This supports the view that public consumption patterns need to be directed to be more prudent and sustainable, particularly in terms of food purchasing and utilization. Greater food consumption without proper waste management will exacerbate waste generation. The increase in each expenditure category shows a clear trend: the higher the amount of food consumed in a household, the greater the total food waste generated.

This finding supports research by Diana (2024) in Bogor Regency, which showed a positive correlation between food expenditure and total food waste generation. This means that the larger the budget allocated to food, the higher the level of household food waste. This factor is measured by the positive relationship between the proportion of food expenditure and the volume of food waste.

The Influence of the Proportion of Household Expenditure on Food on Food Waste Generation

The results of this study indicate that the proportion of household expenditure on food has a negative impact on food waste generation. This indicates that families who allocate a larger portion of their budget to food are generally more efficient in consuming and managing their food supplies, resulting in less waste. Although increased household expenditure on food is generally associated with increased consumption and potential waste, some studies suggest the opposite. A greater proportion of household expenditure on food can actually reduce food waste generation.

This is because households that allocate a larger proportion of their income to food tend to have a higher awareness of the economic value of food. They tend to be more careful in purchasing, storing, and consuming food, as losing food also means a significant loss of funds. In other words, the greater the proportion of total expenditure spent on food, the greater the psychological incentive to avoid wasting it.



Households with limited expenditures or those that prioritize food tend to engage in stricter consumption planning, avoid waste, and maximize the use of leftovers. Therefore, the greater the proportion of food expenditure in the household budget structure, the less likely food waste is generated. These findings support research by Teng (2021), which showed that families with a higher proportion of household expenditure on food tended to have less food waste. Respondents who were more mindful of food expenditures chose efficient consumption strategies, such as buying small portions and consuming all food before it expired, thus minimizing food waste.

The Influence of Waste Management Knowledge on Food Waste Generation

The results of this study indicate that knowledge about waste management has a positive effect on food waste generation. This indicates that individuals with knowledge about waste management actually increase food waste generation. Although, in theory, knowledge about waste management should encourage more responsible consumption behavior, several studies have found that increased knowledge does not always directly correlate with decreased food waste generation. In certain contexts, greater knowledge about waste management is actually accompanied by an increase in the volume of food waste generated by households.

This can be explained by the phenomenon of "moral licensing," where individuals who perceive themselves to have engaged in pro-environmental actions—such as sorting waste or composting—feel freer or "permitted" to engage in other forms of waste, such as throwing away leftovers. Knowledge about waste management can provide a sense of psychological security to throw away more food, assuming that the waste will be "managed properly." In other words, increased knowledge does not always lead to reduced food waste practices, but can lead to compensatory behaviors that actually increase the volume of waste generated.

These findings support research conducted by Russell (2017), which showed that even though individuals possess pro-environmental knowledge and emotions, this is not always followed by concrete actions to reduce food waste—a knowledge–action gap phenomenon exists. In other words, high levels of knowledge do not automatically reduce food waste. Non-cognitive factors such as emotional habits and long-standing behaviors tend to dominate actual practices.



The Influence of Waste Management Involvement in the Environment on Food Waste Generation

The results of this study indicate that involvement in waste management in the environment has a positive influence on food waste generation. This indicates that individuals involved in waste management actually increase food waste generation, even though in theory waste management involvement should encourage more responsible consumption behavior. Conversely, under certain conditions, such involvement actually fosters a sense of moral safety or moral licensing, the perception that throwing away more waste—including food—is justified because the waste will be managed in a manner considered environmentally friendly. Households that regularly participate in recycling or composting activities, for example, tend to view throwing away food as not a major problem, as the waste will decompose naturally or be turned into compost. This perception can create an illusion of environmental responsibility, ultimately leading to increased food waste generation.

Therefore, involvement in waste management is not always inversely proportional to the volume of food waste, especially if it is not accompanied by education and comprehensive changes in consumption lifestyle.

This finding supports the findings of a report by WRAP (2009), which showed that individuals involved in waste management activities such as composting and recycling tend to feel quite responsible and feel less guilty about throwing away their food scraps.

CONCLUSION

Based on the results of a multiple linear regression analysis of six independent variables, it can be concluded that:

Length of education has a negative and significant effect on food waste generation. The higher the level of education, the lower the amount of food waste generated, due to increased environmental knowledge and awareness.

The number of family members in the household has a positive and significant effect on food waste generation. The larger the family, the higher the consumption, resulting in more food waste.

Household food expenditure also has a positive and significant effect. Households with high food expenditures tend to produce more food waste due to inefficient consumption behavior.



The proportion of food expenditure to total household consumption shows a positive and significant effect, indicating that the greater the budget allocation for food, the greater the potential for food waste.

Waste management knowledge has a negative and significant effect, indicating that individuals with a good understanding of waste management tend to produce less food waste.

Involvement in environmental waste management also shows a negative and significant effect. Active community participation in environmental activities has been shown to reduce the amount of food waste generated.

Overall, this study shows that household food waste generation in Imopuro Village is influenced by a combination of social, economic, and behavioral factors.

Therefore, waste management strategies must include an educational approach, increased environmental literacy, and community empowerment to create a more responsible and sustainable consumption system.

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