

DETERMINANTS OF WILLINGNESS TO PAY FOR FOOD WASTE MANAGEMENT SERVICES

(A Study on the Youth Generation in Jebres District, Surakarta City)

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Abstract

Food waste management has become a major environmental challenge faced by many countries, particularly in urban areas. This study aims to analyze the psychological, demographic, and socioeconomic factors that may influence the willingness to pay (WTP) for waste sorting services among the youth generation in Jebres District, Surakarta City. This research employs the Contingent Valuation Method (CVM) and binary logistic regression analysis within a quantitative framework. The sample involved 190 youth respondents selected through a specific sampling technique to represent the district's demographics. Data were gathered through structured questionnaires distributed directly to the participants to capture their socio-demographic profiles, psychological traits, and WTP valuations. The collected data were analyzed using CVM to estimate the average WTP value and binary logistic regression to identify the significant determinants of WTP. The results revealed that the average WTP value was Rp 23,443 per month, with age, perceived behavioral control, location, and innovation showing a significant effect on WTP, while other sociodemographic and psychological factors had no significant influence. In conclusion, analyzing the younger generation's willingness to pay serves as a crucial preventive measure against consumerist lifestyles while optimizing their active role in environmental sustainability by supporting adequate waste sorting facilities.

Keywords:

Food waste, Willingness to pay, Young generations, Environmental awareness

INTRODUCTION

Global food production is estimated to experience food loss and waste (FLW) of approximately 1.3 billion tons of food, equivalent to one-third of the total food produced, across various stages of the food supply chain (Kawata & Kubota, 2018). This waste is accompanied by the increasing global human population, which is projected to reach 9.1 billion people by 2037. This condition raises the challenge of how the global food system can reduce food loss and waste (FLW), which has significant economic, environmental, and social impacts (Abdelradi, 2018; Principato et al., 2021).

Food waste has become an important issue in both developed and developing countries. Although developed countries generate greater amounts of food waste at the consumption stage compared with developing countries, the issue ultimately affects a country's food security and nutritional conditions (Principato et al., 2021).

Indonesia, as a developing country, continues to face challenges related to food security. Food Consumption Statistics released by the Ministry of Agriculture for the 2022–2024 period indicate an imbalance between food production and utilization in Indonesia, making the country vulnerable to food insecurity. Food insecurity often occurs due to unequal access rather than supply constraints (Odorico et al., 2019). However, this condition is rather contradictory to the fact that Indonesia is one of the largest contributors to FLW globally, ranking second after Saudi Arabia, with an estimated amount of 300 kg per capita per year. Based on the projected Business as Usual (BAU) scenario, FLW generation in Indonesia during the 2020–2045 period is expected to increase, with an annual average of 45–112 million tons per year and BAU/Baseline FLW generation of approximately 165–344 kg per capita per year (Bappenas, 2021).

The provision of adequate waste management services in Indonesia continues to face challenges due to high management costs and low public awareness. Zeng et al. (2016) demonstrated that adequate waste treatment facilities can significantly encourage community participation. Meanwhile, the Partnership for Action on Green Economy (PAGE, 2021) reported that the absence of clear financial incentive and disincentive mechanisms to control food waste causes substantial amounts of food waste to continue ending up in landfills. The provision of waste management services is therefore an important issue, particularly in urban areas, which are major contributors to waste generation due to their high population density and intensive economic activities.

Surakarta City, as a regional growth center in southern Central Java, faces similar challenges in managing waste at the source due to limited public awareness and inadequate facilities (Yusmaman et al., 2024). According to data from the National Waste Management Information System (SIPSN) in 2025, daily waste generation in Surakarta City reached 421.48 tons, with food waste accounting for the largest proportion at 49.55%. Waste management practices in Surakarta City are still dominated by open dumping, resulting in overcapacity at the Putri Cempo Landfill and potentially causing negative environmental impacts (Supratikno et al., 2023).

Reducing waste generation can be achieved through clear and measurable financial mechanisms. One method that can be applied is the Contingent Valuation Method (CVM). This method is used to assess goods and services that do not have market prices by applying a utility-based approach to estimate willingness to pay (WTP). In addition to determining the amount of WTP, it is necessary to analyze the factors that influence WTP so that waste management policy schemes can be formulated more effectively, efficiently, and appropriately.

Studies on food waste-related WTP for waste management have predominantly been conducted in rural areas due to limitations in waste management facilities (Addai & Danso-Abbeam, 2014; Afroz et al., 2009; Zeng et al., 2016). In addition, food waste behavior has generally been studied at the household level (Abdelradi, 2018; Bernstad, 2014; Schanes et al., 2018; Soorani & Ahmadvand, 2019; Stancu et al., 2016; Tadesse et al., 2025). However, studies focusing on younger generations, particularly migrant groups living in rented accommodations or boarding houses with high potential for food waste generation, remain limited. Previous studies have identified younger people as a group that generates a relatively large proportion of food waste (Parfitt et al., 2010). Young people also exhibit distinctive behavioral

characteristics, particularly shifts toward increasingly modern lifestyles. These changes tend to encourage less home cooking and unplanned consumption patterns, while reducing their ability to utilize leftover food (Akhter et al., 2024; Damanik et al., 2025).

This research gap provides the basis for analyzing food waste behavior among young people and their willingness to pay for waste management services in Jebres District. This study is important because young people are generally considered to have a relatively high level of awareness regarding environmental degradation issues; however, their awareness does not always translate into corresponding actions. Jebres District was selected as the primary research location because it has a Generation Z population of 34,314 people, along with a high concentration of educational institutions and residential accommodations. This study develops the analytical framework proposed by Zeng et al. (2016) by integrating the Theory of Planned Behavior, including perceived behavioral control, attitudes, subjective norms, and behavior, to provide a more comprehensive understanding of young people's food waste behavior in relation to WTP. Location and innovation factors are also considered as additional variables relevant to the context of urban food waste management. Furthermore, this study targets a more specific population than previous studies, which have generally examined food waste behavior at the household level.

METHODOLOGY

Research Design

This study employed a confirmatory research design, with the primary objective of testing the hypotheses that had been formulated. The study examined the effects of psychological variables (attitude, subjective norms, and perceived behavioral control), sociodemographic variables (age, gender, income, expenditure, education, and occupation), as well as location and innovation variables on willingness to pay (WTP) for a waste sorting program at the source. This study aimed to measure the WTP value among young people in Jebres District using the Contingent Valuation Method (CVM), as well as to examine the variables influencing WTP.

In terms of the time dimension, this study falls under the category of cross-sectional research, in which data are collected at a single point in time using a survey design as the data collection technique. The research instrument adopted from previous studies was measured using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Population, Sample, Type, and Source of Data

The population in this study consisted of young people residing in boarding houses or rented accommodations in Jebres District. The size of this population could not be determined precisely because official data regarding the number of young people living in boarding houses or rented accommodations in the area were not available. Therefore, the population was categorized as an infinite population. Due to limitations in obtaining population data, the exact population size could not be determined. Thus, the sample size in this study was determined based on the theory proposed by Green (1991).

Green's theory provides a formula for determining the minimum number of participants based on a medium effect size and a statistical power of 0.8. This approach has been widely used in studies where the population size cannot be determined precisely, such as the study conducted by Adichandra (2023). The calculation resulted in a minimum sample size of ≥ 146 participants. In this study, data were collected from 190 respondents; therefore, the final sample consisted of 190 respondents.

The sampling technique used in this study was purposive sampling. Purposive sampling is a sampling technique in which respondents are selected based on specific criteria relevant to the objectives of the study. Purposive sampling is categorized as a non-probability sampling technique, in which not all members of the population have an equal opportunity to be selected as respondents (Neuman, 2014). In this study, purposive sampling was applied based on the following respondent characteristics: Generation Z (aged 13–28 years), consisting of students, university students, or workers, who reside in boarding houses or rented accommodations in Jebres District.

The data collected in this study were primary data obtained through two techniques: online questionnaire distribution and structured interviews. Interviews were conducted as a supporting method to obtain more in-depth information. According to Neuman (2014), interviews can be conducted in three ways: face-to-face interviews, telephone interviews, and computer-assisted interviews. In this study, structured interviews were conducted using a questionnaire in the form of a Google Form containing written questions and predetermined response options (Sugiyono, 2013). The interview process involved approaching target respondents, namely Generation Z residents (aged 13–28 years) living in boarding houses in Jebres District. The interviews were subsequently conducted both directly and online using the prepared questionnaire.

Research Instrument

Before the questionnaires were distributed, their validity and reliability were tested. A validity test is used to assess the accuracy of an instrument in measuring the construct or variable it is intended to measure (Zayrin et al., 2025). Data validity was tested using the Pearson Product-Moment correlation. Questionnaire items were considered valid or invalid by comparing the calculated correlation value with the critical value. An item was considered valid when the calculated value exceeded the critical value, and conversely, an item was considered invalid when the calculated value was lower than the critical value, using a significance level of 5%.

Meanwhile, reliability testing refers to an index used to determine the extent to which a measurement instrument can be relied upon (Sugiyono et al., 2020). According to Mardiani Sanaky et al. (2021), reliability refers to the consistency of a series of measurement instruments used in a study. Reliability differs from validity, although the two are related. A valid measurement instrument is always reliable, whereas a reliable measurement instrument is not necessarily valid (Mulyani & Hidayat, 2025). In this study, internal consistency was assessed using Cronbach's alpha. The reliability test results were interpreted based on the following category table.

Table 1. Reliability Categories

Cronbach's Alpha Value	Category
≥ 0.90	Excellent reliability
0.70–0.90	High reliability
0.50–0.70	Moderate reliability
< 0.50	Low reliability

Hypothesis Testing

The analytical methods employed in this study were the Contingent Valuation Method (CVM) and Binary Logistic Regression. CVM is a method used to estimate the value of goods or services that do not have a directly observable market price (Fadhilla et al., 2025; Kopp et al., 1997). In this study, CVM was used to estimate the economic value assigned by Generation Z, particularly those residing in boarding houses around the Universitas Sebelas Maret campus. Meanwhile, Binary Logistic Regression is a method used to examine the relationship between a dichotomous dependent variable (a nominal or ordinal variable with two categories) and one or more independent variables, which may be categorical (Putri et al., 2022). The logistic regression model was used to identify the factors that influence respondents' willingness to pay for the provision of adequate waste management facilities. Hypothesis testing was conducted using STATA software.

Several aspects need to be considered before testing the structural model using the Multiple Logistic Regression approach, including the Odds Ratio, Log-Likelihood Ratio (LR), Coefficient of Determination (Pseudo R^2), Z-Test, Hosmer–Lemeshow Test (Goodness of Fit), Classification Test, and Area Under the Curve (AUC).

RESULTS AND DISCUSSION

Respondent Characteristics

Sociodemographic Characteristics

This section presents key information regarding the demographic characteristics of the respondents, including age, gender, income level, expenditure level, educational attainment, and occupation. The table below presents the number and percentage of respondents for each demographic variable. Overall, these descriptive data allow the researchers to examine whether certain groups, such as young people within specific age ranges, respondents with higher incomes, or those with higher levels of education, tend to have a greater willingness to pay (WTP) to support a food waste sorting program.

Table 2. Sociodemographic Characteristics

Variable	Category	Number of Responden		Percentage
		Willing	Unwilling	
Age	18–20 years	39	6	23,68%
	21–22 years	103	16	62,63%
	23–27 years	25	1	13,68%
Gender	Male	22	4	13,68%
	Female	145	19	86,32%
Income	< 2,500,000	116	20	71,58%
	> 2,500,000	51	3	28,42%
Expenditure	< 1,000,000	85	16	53,16%
	> 1,000,000	82	7	46,84%
Education	Junior High School or Equivalent	2	0	1,05%

	Senior High School/Vocational High School/Islamic High School	102	15	61,58%
	Diploma (D3/D4)	6	0	3,16%
	Bachelor's Degree (S1)	56	7	33,16%
	Master's/Doctoral Degree (S2/S3)	1	1	1,05%
Occupation	Not employed	144	22	87,37%
	Employed	23	1	12,63%

Psychological Variables (Attitude, Subjective Norms, Perceived Behavioral Control) and External Variables (Location and Innovation)

a. Attitude

Table 3. Frequency and Mean of Attitude

Attitude	Frequency					Mean	Category
	SD	D	N	A	SA		
I believe that sorting food waste at home is beneficial.	-	3,2%	6,8%	44,2%	45,8%	4,33	Very Good
In my opinion, wasting food is negative.	1,6%	4,2%	10,0%	39,5%	44,7%	4,22	Good
Wasting food is irresponsible.	1,1%	3,7%	10,0%	40,0%	45,3%	4,25	Good
In my opinion, wasting leftover food has a negative impact on the environment.	-	5,8%	12,6%	41,1%	40,5%	4,16	Good

b. Subjective Norms

Table 4. Frequency and Mean of Subjective Norms

Subjective Norms	Frequency					Mean	Category
	SD	D	N	A	SA		
I feel obligated not to waste food.	-	5,3%	14,7%	33,7%	46,3%	4,21	Good
I feel guilty when I waste food.	0,5%	2,1%	5,3%	25,3%	66,8%	4,56	Very Good
I feel that wasting food is morally wrong.	2,1%	5,3%	8,4%	44,7%	39,5%	4,14	Good
People close to me (family/friends/partner) think that I should reduce food waste.	6,3%	22,1%	13,7%	34,7%	23,2%	3,46	Good
My family expects me not to waste food.	3,2%	3,7%	6,8%	40,5%	45,8%	4,22	Good

My friends believe that I should be careful not to waste food.	4,2%	7,9%	14,7%	45,3%	27,9%	3,85	Good
People in my community think that wasting food is unacceptable.	1,1%	12,6%	20,5%	45,3%	20,5%	3,72	Good

c. Perceived Behavioral Control

Table 5. Frequency and Mean of Perceived Behavioral Control

Perceived Behavioral Control	Frequency					Mean	Category
	SD	D	N	SD	D		
For me, not wasting food is easy to do.	2,1%	12,6%	10,5%	45,8%	28,9%	3,87	Good
For me, sorting food waste at my boarding house is easy to do.	6,3%	15,3%	19,5%	33,7%	25,3%	3,56	Good
If I want to, I can sort food waste at my boarding house.	0,5%	7,9%	8,4%	42,6%	40,5%	4,15	Good
In my opinion, wasting food can be avoided.	1,6%	4,2%	5,3%	42,1%	46,8%	4,28	Very Good
In my opinion, placing an environmental burden through waste can be avoided.	1,1%	4,2%	10,0%	50,0%	34,7%	4,13	Good

d. Behavior

Table 6. Frequency and Mean of Behavior

Behavior	Frequency					Mean	Category
	SD	D	N	SD	D		
I do not leave leftover food on my plate after eating.	1,6%	10,5%	13,2%	34,7%	40,0%	4,01	Good
I do not cook more food than I need.	1,6%	5,8%	10,0%	42,6%	40,0%	4,14	Good
I do not buy more food than I need.	1,1%	5,3%	11,1%	47,9%	34,7%	4,10	Good
I store food properly so that it can be consumed before it spoils or expires.	1,1%	4,7%	11,6%	42,6%	40,0%	4,16	Good
I make sure that opened food products (cans, sauces, etc.) are completely consumed.	-	4,2%	9,5%	43,7%	42,6%	4,25	Good
I routinely dispose of all food waste separately from other types of waste.	7,9%	25,8%	15,3%	30,5%	20,5%	3,30	Moderate
I sort food waste at my boarding house because it facilitates waste management.	8,9%	25,8%	15,3%	27,9%	22,1%	3,28	Moderate
I sort food waste at my boarding house because the government	20,5%	27,9%	11,1%	22,1%	18,4%	2,90	Moderate

provides adequate collection facilities.

e. Location

Table 7. Frequency and Mean of Location

Location	Frequency					Mean	Category
	SD	D	N	SD	D		
In my boarding house environment, my friends actively participate in sorting food waste.	20,5%	30,0%	20,5%	14,7%	14,2%	2.72	Moderate
In my boarding house environment, people are sufficiently concerned about sorting food waste.	23,7%	30,5%	17,9%	17,4%	10,5%	2.61	Poor
Separate bins for food waste and other waste are available at my boarding house.	33,7%	28,9%	6,8%	20,0%	10,5%	2.45	Poor
A food waste sorting facility is available in my residential environment.	32,1%	28,4%	9,5%	15,8%	14,2%	2.52	Poor

f. Innovation

Table 8. Frequency and Mean of Innovation

Innovation	Frequency					Mean	Category
	SD	D	N	SD	D		
I believe that innovation in food waste management would be beneficial to the environment.	-	-	4,2%	31,6%	64,2%	4.60	Very Good
I believe that food waste management innovations would make it easier for me to reduce food waste at my boarding house.	-	0,5%	6,8%	42,6%	50,0%	4.42	Very Good
I am willing to support innovations in food waste management even though they are not currently available in my residential environment.	-	0,5%	5,3%	35,8%	58,4%	4.52	Very Good

Willingness to Pay Analysis

Before calculating the WTP value, this method begins with the construction of a hypothetical market that describes a potential change in the future. In this study, the target level offered was the availability of adequate facilities, such as waste sorting facilities and sustainable food waste management innovations.

Table 9. WTP Frequency

WTP	Frequency	Percentage
Unwilling	23	12.1%
Willing	167	87.9%
Total	190	100.0%

Table 9 shows that 23 respondents stated that they were unwilling to pay for the proposed program, while 167 respondents, representing the majority of the total sample, stated that they were willing to support the proposed program.

Table 10. Reasons for Respondents' Unwillingness to Pay

Reason for Unwillingness to Pay	Percentage
Do not have additional financial capacity	8.07%
Already contribute by reducing food waste	26.09%
The program should be the government's responsibility	60.87%
Not interested in the waste sorting program	4.35%

Of the 23 respondents who stated that they were unwilling to pay, the majority (60.87%) believed that the proposed program should be the responsibility of the government. This was followed by 26.09% of respondents who stated that they were unwilling to spend additional money because they believed they were already capable of managing food waste independently by avoiding waste and leftover food.

Furthermore, the 87.9% of respondents who were willing to pay were asked a follow-up question involving several offered payment amounts, namely Rp 10,000, Rp 25,000, Rp 50,000, and Rp 100,000. The offered amounts were obtained from secondary data referring to the Regional Regulation on waste service fees in Surakarta City in 2025.

Table 11. Total WTP

No.	WTP (Rupiah)	Frequency	Percentage	Total WTP
1	10,000	74	44.3%	740,000
2	25,000	71	42.5%	1,775,000
3	50,000	16	9.6%	800,000
4	100,000	6	3.6%	600,000
Total		167	100.0%	Rp 3,915,000

Based on the total WTP obtained, the average WTP for the waste sorting program can be estimated as follows:

Average WTP = Rp 23,443/month

The estimated average WTP of respondents for the waste sorting program in Jebres District was Rp 23,443 per month. Based on Bappenas' standard for ideal waste management costs of Rp 427,292 per person per year, equivalent to Rp 35,607 per person per month, the WTP of boarding house residents in Jebres District can be considered relatively high because it is capable of covering up to 65.8% of the cost component. However, this value remains below the ideal target. This finding is consistent with the statement by the Head of the Environmental Agency (DLH) of Surakarta City, who stated that the government still bears approximately 90% of waste management costs, while residents are responsible for only 10%. This gap provides an opportunity to further explore willingness to pay, particularly among young people who have a high level of environmental awareness.

Instrument Testing

Validity Test

The validity test employed the Pearson Product-Moment correlation, with an item considered valid if $r\text{-calculated} > r\text{-table}$. For a sample size of $n = 190$, the $r\text{-table}$ value used was 0.142.

Table 12. Validity Test

Variable	r-Calculated	Description
Attitude	0.492–0.762	Valid
Subjective Norms	0.499–0.731	Valid
Perceived Behavioral Control	0.536–0.791	Valid
Behavior	0.434–0.800	Valid
Location	0.902–0.919	Valid
Innovation	0.756–0.778	Valid

Reliability Test

The reliability test employed Cronbach's alpha values, with the following categories:

Table 13. Reliability Categories

Cronbach's Alpha Value	Category
≥ 0.90	Excellent Reliability
0.70–0.90	High Reliability
0.50–0.70	Moderate Reliability
< 0.50	Low Reliability

Table 14. Reliability Test

Variable	Cronbach's Alpha	Category
Attitude	0.63	Moderate Reliability
Subjective Norms	0.71	High Reliability
Perceived Behavioral Control	0.66	Moderate Reliability
Behavior	0.77	High Reliability
Location	0.93	Excellent Reliability
Innovation	0.65	Moderate Reliability

All variables were declared reliable, with the highest Cronbach's alpha value found for the Location variable (0.93, excellent reliability) and the lowest value for Perceived Behavioral Control (0.63, moderate reliability). Most variables fell within the moderate-to-high reliability range, indicating that the research instrument was consistent and suitable for further analysis.

Model Goodness-of-Fit Test

Several criteria were employed in this study:

1. Likelihood Ratio Test ($\text{Prob} > \chi^2$), which measures the overall significance of the model and indicates the probability that the independent variables jointly have a relationship with the dependent variable. A $\text{Prob} > \chi^2$ value of < 0.05 is expected for the model to be considered statistically significant.

2. Coefficient of Determination (Pseudo R²), which measures the extent to which variation in the dependent variable (WTP) can be explained by the independent variables included in the model.
3. Hosmer–Lemeshow Test, which measures model goodness of fit by comparing observed and predicted values. A significance value of > 0.05 is expected for the model to be considered fit or consistent with the data.
4. Classification Accuracy Test, which measures the model’s ability to correctly classify respondents into the willing-to-pay and unwilling-to-pay groups, expressed through the overall percentage, sensitivity, and specificity values.
5. ROC Curve and Area Under the Curve (AUC), which measure the model’s ability to discriminate between respondents who are willing and unwilling to pay. An AUC value approaching 1 indicates better predictive performance of the model.

The model goodness-of-fit test produced a Prob > chi2 value of 0.0003 (significant), a Pseudo R² value of 0.3044, a Hosmer–Lemeshow statistic of 6.45 with a significance value of 0.168 (fit), an overall classification accuracy of 89.02%, and an AUC value of 0.8691. All criteria were satisfied; therefore, it can be concluded that the logistic regression model used in this study is adequate and performs sufficiently well for further analysis.

Research Results

Table 4.14. Logistic Regression Analysis

Variable	Odds Ratio	Std. Err.	z	P> z
AGE 19	6,2779	8,7744	1,31	0,189
AGE 20	10,5540	13,2671	1,88	0,061*
AGE 21	22,7554	28,1532	2,53	0,012***
AGE 22	5,2430	5,7626	1,51	0,132
EDC_D	0,9915	0,6291	-0,01	0,989
GDR_D	0,8669	0,7192	-0,17	0,863
INC1	2,1025	2,0229	0,77	0,440
EXP1	1,8228	1,1971	0,91	0,361
PKP	0,3329	0,1918	-1,91	0,056*
NS	1,8862	0,9291	1,29	0,198
SP	1,4961	0,8099	0,74	0,457
P	1,2006	0,6195	0,35	0,723
LK	2,0744	0,7697	1,97	0,049**
INV	8,1392	5,2805	3,23	0,001***

Discussion

For the psychological variables (attitude, subjective norms, perceived behavioral control, and behavior), the first and second hypotheses, concerning attitude and subjective norms, were rejected, indicating that these variables did not have a statistically significant effect on willingness to pay (WTP). Regarding attitude, although the majority of respondents demonstrated positive attitudes toward the waste sorting program, these attitudes were not sufficiently strong to drive actual financial decisions. This may be because the attitude measured in this study was relatively general, focusing on the perceived importance of waste sorting. According to McCarthy & Bo Liu (2017), attitudes toward the inconvenience associated with carrying out waste sorting may be more influential. This finding is consistent with Vassanadumrongdee & Kittipongvises (2018), who found that a more specifically constructed variable, namely environmental attitude, had a positive and significant effect on an individual's willingness to pay.

The second hypothesis indicated that subjective norms did not have a significant effect on WTP. This finding suggests that social pressure among young people in Jebres District is still dominated by internal factors or personal considerations rather than external social pressures from family, friends, and others. Vassanadumrongdee & Kittipongvises (2018) explained that subjective norms, which emphasize social pressure from the surrounding environment, have a positive and significant effect. This may occur because the high level of environmental concern among the people of Bangkok encourages collective participation within the community. In line with Damanik et al. (2025), who found that subjective norms did not have a significant effect, this may be because food disposal behavior is generally not visible to other people. Therefore, strong social pressure is needed to encourage individuals' intentions to reduce food waste.

The third hypothesis indicated that perceived behavioral control had a negative and significant effect at the 10% significance level. This finding contradicts the hypothesized positive and significant direction of the relationship reported in Vicente et al. (2021). The negative effect of perceived behavioral control (PBC) can be explained by the findings from the field data. Although the descriptive analysis showed that respondents perceived it as relatively easy to manage food waste independently, particularly by minimizing food leftovers, this sense of independence was associated with a lower willingness to pay because respondents perceived financial contributions as unnecessary. This condition was further exacerbated by limited access to adequate waste management facilities. Although facilities such as TPS3R are available, their presence has not been sufficiently effective in increasing public awareness of waste sorting at the source. This finding is consistent with the study by Sujitra & Kittipongvises (2018) in Bangkok, which showed that PBC related to inconvenience and mistrust of the waste collection system had a negative effect on WTP, as inadequate facilities and low public trust in the existing waste management system reduced willingness to pay.

In addition to limited infrastructure, internal factors related to individual awareness, such as the lack of active participation among young people, may also contribute to the food waste problem. Studies by Balundè et al. (2020) and Powell et al. (2019) identified a paradox of environmental awareness among young people. Many young people are relatively aware of environmental degradation issues; however, they may perceive their individual capacity as insufficient to generate substantial environmental change. This creates a paradox in which environmental awareness does not necessarily translate into corresponding actions. Furthermore, behavior was found to have no significant effect. Vicente et al. (2021) similarly found that Pro-Environmental Behavior (PEB) did not have a significant direct effect on WTP. This finding indicates that even when individuals actively engage in environmentally friendly

behaviors, their financial decisions are not necessarily driven by their everyday behavioral habits. In this study, although the majority of respondents had adopted practices to reduce food waste, such behavior was not sufficient to encourage young people to make financial contributions.

The results for the sociodemographic variables showed that age, particularly among respondents aged 20 and 21 years, had a significant effect on willingness to pay for waste sorting services. This finding indicates that young people's preferences regarding environmental sustainability are important to examine, as changes in age and socioeconomic status may be accompanied by changes in environmental preferences. Meanwhile, other sociodemographic variables, including gender, income, expenditure, and education, did not show significant effects. Many previous studies have employed sociodemographic variables to examine their effects on willingness to pay (WTP); however, these variables generally demonstrate relatively weak levels of significance (Hasiani et al., 2007; Hornik et al., 1995; Mulyani & Hidayat, 2025). Although some studies have identified significant effects, other findings have confirmed inconsistencies in the effects of sociodemographic variables (Chen et al., 2019). Consistent with Vassanadumrongdee & Kittipongvises (2018), who included sociodemographic characteristics as control variables, the results showed that sociodemographic variables did not have a significant effect in either of the two models examined, namely the model explaining intention and the model explaining WTP.

Finally, the analysis of external factors, consisting of location and innovation, showed positive and significant effects on willingness to pay (WTP). Regarding location, although the availability of waste sorting facilities in boarding-house environments tended to be limited, this condition appeared to encourage residents to make financial contributions in order to obtain better waste management services. This finding is consistent with Zeng et al. (2016), who found in China that areas with higher GDP tended to have lower WTP because existing waste management systems were already well established, and vice versa.

Meanwhile, the high level of significance associated with the innovation variable indicates that the community, particularly young people, is highly responsive to approaches that emphasize tangible innovations to promote environmental sustainability. This finding is consistent with He et al. (2025) and Koko & Lee (2023), who showed that respondents' WTP tends to increase when they are provided with a deeper understanding of innovative waste management approaches, such as smart recycling, differentiated waste tariffs, social media campaigns, and other related initiatives.

CONCLUSION

This study found that perceived behavioral control, age, location, and innovation significantly influenced the willingness to pay (WTP) of young people for waste sorting services in Jebres District. The greater the individual's independence in managing food waste, the lower their willingness to pay, as such independence reduces the perceived need for external intervention. Conversely, as age increases, environmental awareness tends to increase, resulting in a higher willingness to pay. Limited access to waste sorting facilities, in turn, encourages a higher willingness to pay by creating a greater need for improved waste management services. This willingness is further strengthened by young people's openness to technology-based innovations, which was found to be the most dominant factor. Using the Contingent Valuation Method (CVM), the average willingness to pay was estimated at Rp 23,443 per month. This value indicates potential for financial participation but remains below the ideal waste management cost standard established by Bappenas, suggesting that policy intervention is still necessary.

For future research, it is recommended that the geographical scope of the study be proportionally expanded to cover all districts within the city, using probability sampling techniques to improve the representativeness and generalizability of the findings. In addition, the Contingent Valuation Method (CVM) could be combined with experimental methods such as the Discrete Choice Experiment (DCE) to obtain WTP estimates that more closely reflect actual payment behavior while reducing hypothetical bias, particularly among migrant respondents who may be more prone to idealistic responses when stating their willingness to pay. The large number of psychological and sociodemographic variables that were found to be statistically insignificant in this study also indicates the need to incorporate more specific contextual variables, such as residential tenure status, length of residence, environmental knowledge, satisfaction with waste collection services, and attitudes toward the inconvenience of recycling. These additional variables may enable future research models to capture the determinants of WTP in a more comprehensive and context-specific manner.

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