The Association Between Javanese Culture and Food Waste Among Gen Z

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Abstract. Household food waste is a global issue that needs to be addressed due to its significant impact on the environment, economy, and social well-being. In Indonesia, Generation Z has emerged as one of the primary contributors to household food waste, driven not only by sociodemographic factors but also by local cultural values. This study aims to analyze the relationship between Javanese cultural norms particularly *pakewuh* and the amount of food waste among Generation Z, while also considering sociodemographic determinants. A total of 100 respondents were surveyed, and the data were analyzed using Spearman's correlation test. The findings indicate that *pakewuh* culture has a significant negative relationship with food waste, suggesting that strong commitment to cultural norms and values reduces the tendency to discard food. Age also shows a significant negative relationship with food waste, with the 18-22 age group generating the highest amount of food waste. In contrast, gender, education level, and income show no substantial relationship with food waste levels. This study highlights the dual role of Javanese culture in shaping food waste behavior and contributes to the gap literature by providing empirical evidence on the interaction between cultural norms particularly *pakewuh* and sociodemographic factors in a developing country context.

1 Introduction

Household food waste is an increasingly urgent global issue due to its significant environmental, economic, and social impacts. Approximately 1.05 billion tons of food (including inedible parts) are wasted globally across the retail, food service, and household sectors [1]. Of this amount, 79 kilograms per capita per year come from households, making them the most significant contributors to global food waste. The consequences of food waste extend beyond the mere loss of resources, exacerbating both the climate crisis and global hunger. Food waste contributes to 8–10% of global greenhouse gas (GHG) emissions, primarily through methane production during the organic decomposition of food. Economically, food waste is estimated to cost over USD 940 billion annually. From a social and humanitarian perspective, around 783 million people were reported to be experiencing severe food insecurity in the same year.

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This crisis has attracted global attention and is addressed through the Sustainable Development Goals (SDG 12.3), which target halving per capita food waste at the consumer and retail levels by 2030.

In Indonesia, the Special Region of Yogyakarta (DIY) is among the regions with a relatively high proportion of household waste. 51.37% of the region's waste is food scraps[2]. Low public awareness regarding waste management was identified, especially downstream, as a primary issue in Yogyakarta, contributing to increased waste generation. University students, predominantly from Generation Z, are among the region's major contributors to food waste. The literature found a significant negative correlation between age and food waste quantity, indicating that younger generations, particularly Generation Z, tend to produce more food waste than older ones [3].

Previous studies also show that education and age negatively correlated with food waste quantity [5]. Households with higher education levels tend to have better awareness of food management. Similarly, older individuals manage household waste more effectively [5]. Another influencing factor is gender, [6] report that gender plays a role in household food waste. There was no significant difference between young males and females in the amount of food waste generated [6]. Income also significantly influences the amount of food waste, with higher-income individuals more likely to generate more waste [7].

Cultural aspects also influence the consumption of staple foods in Indonesia, which is known for its strong cultural values [8]. One example is the Javanese tradition of the "*pakewuh*" ethic, or a sense of reluctance that increases waste [9]. This sense of reluctance encourages someone not to finish their food at significant events such as weddings or celebrations. It is further explained that finishing food is considered impolite or lacking in manners because it can result in guests who are too greedy or ungrateful. These values are still upheld as a form of respect and an effort to maintain harmony in the social environment [10]. The social environment reflects the interactions and relationships between individuals in a community that significantly influence attitudes, behaviors, beliefs, and values. Thus, the culture inherent in the surrounding environment can shape habits, including food consumption and disposal behavior.

Despite the existing literature discussing the role of cultural values, most previous studies on food waste have primarily focused on sociodemographic determinants. This suggests that relatively few studies have examined the relationship between food waste and cultural values, particularly among Generation Z in developing countries including Indonesia. Such a condition highlights a research gap regarding the implications of cultural values that may either increase or reduce food waste behavior, an aspect that cannot be fully explained by social or economic variables alone. Therefore, this study aims to analyze the relationship between Javanese cultural norms, specifically *pakewuh*, and food waste behavior among Generation Z in Yogyakarta, while also considering sociodemographic factors such as age, gender, income, and education. By addressing this gap, the study offers new insights and a deeper understanding of how cultural and social values interact in shaping food waste behavior among Generation Z households in Yogyakarta.

2 Research method

This study employed a quantitative descriptive approach to obtain factual and systematic information about the factors influencing the amount of food waste among Generation Z in the Special Region of Yogyakarta (DIY). Respondents were selected using purposive sampling based on specific criteria: aged between 18 and 27 years, residing in the Special Region of Yogyakarta, and having purchased food in either raw ingredient or ready-to-eat meal form. A total of 100 respondents participated in this study, a sample size that is comparable with previous food waste studies that used correlation based analyses [5,10].

Primary data were collected through an online questionnaire that included questions about the types and amounts of food discarded over the past week. Respondents were asked to self-report their food waste amounts across 11 food categories, covering both avoidable and unavoidable types. Based on the reported data, food waste amounts were categorized into three levels: low, moderate, and high. In addition to primary data, secondary data were also used to support the analysis, obtained from relevant sources such as official reports and academic literature on consumption behavior, waste management, and Generation Z characteristics.

In this study, the dependent variable is the amount of food waste (*Y*). This variable was analyzed about six independent variables: age (*X1*), gender (*X2*), education level (*X3*), monthly income (*X4*), food-related values or teachings (*X5*), and food culture (*X6*). To determine the relationship between each independent variable and the amount of food waste, the Spearman's Rank correlation test was used. This test was selected because all collected data are ordinal and do not meet the assumptions of a normal distribution. The operational definitions of the variables used in this study are presented in Table 1.

Table 1. Operational definition

Variable	Code	Operational Definition	Measurement
Amount of Food Waste	*Y*	The total amount of food discarded by the household within one week	Categorized: Low (0-5 cups), Moderate (5-10 cups), High (>10 cups)
Age	*X1*	Respondent's age in years	Grouped: 18-22 years and 23-27 years
Gender	*X2*	Respondent's gender identity	Male or Female
Education Level	*X3*	The highest level of formal education completed by the respondent	Elementary School, Junior High School, Senior High School, Higher Education
Income	*X4*	Total income received per month	Categories: <1 million IDR, 1-2,5 million IDR, 2,5-4 million IDR, >4 million IDR
Food socialization	*X5*	The values and behaviors related to food consumption that are learned during upbringing, typically from parents or environment	Example: "Finish your food." "Don't be picky about food."
Cultural Eating Norms	*X6*	Local socio-cultural values that influence eating behavior and food disposal	Example: *pakewuh*, customs during traditional feasts, etiquette during communal meals

3 Results and discussion

3.1 Respondent characteristics

This study involved a total of 100 respondents from Generation Z, all residing in the Special Region of Yogyakarta and aged between 18 and 27 years (Table 2). Respondents were selected using purposive sampling based on specific criteria: individuals who had previously purchased food, either in the form of raw ingredients or ready-to-eat meals. In terms of

gender, the majority of respondents were female (76%), while male respondents accounted for 24%. Regarding age distribution, those aged 18–22 years made up 60%, while the remaining 40% were aged 23–27 years. For educational level, most respondents were university graduates (59%), followed by those who had completed senior high school or vocational school (39%), and a small proportion who had completed only junior high school (2%). No respondents reported having completed only elementary school. In terms of monthly income, 49% of respondents reported earning less than IDR 1,000,000, while others had higher earnings: 32% fell within the IDR 1,000,000–2,500,000 range, 12% earned between IDR 2,500,000–4,000,000, and 7% earned more than IDR 4,000,000 per month.

Table 2. Respondent characteristics

Description		Number of Respondents
Age	18-22 years	60
	23-27 years	40
Gender	Male	24
	Female	76
Education Level	Elementary School	0
	Junior High School	2
	Senior High School	39
	Higher Education	59
Income	< IDR 1,000,000	49
	IDR 1,000,000 – 2,500,000	32
	IDR 2,5000,000 – 4,000,000	12
	>IDR 4,000,000	7

3.2 Sociodemographic factors influencing the amount of food waste

This study analyzed four sociodemographic variables: age, gender, education level, and income to examine their relationship with the amount of household food waste generated by Generation Z. The relationships were tested using Spearman's rank correlation. The analysis revealed that age was the only factor that showed a statistically significant correlation with the amount of food waste. The other variables showed no significant relationship.

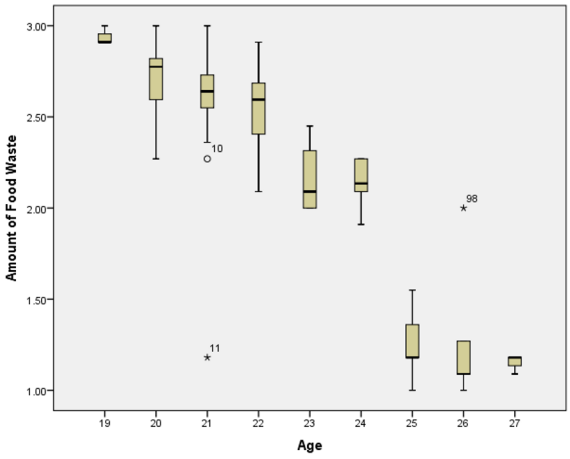

Fig. 1. Relationship between age and average amount of food waste

The variable age demonstrated a strong negative and significant correlation with the amount of food waste ($\rho = -0.871$, $p = 0.000$). This indicates that younger respondents tend to produce more food waste. Respondents aged 18–22 years reported a higher average

amount of food waste than those aged 23–27 years. This suggests that younger individuals may still lack the awareness or skills necessary to manage food consumption efficiently[3]. Potential contributing factors include poor grocery planning, lack of knowledge about proper food storage, and inexperience in repurposing food leftovers. Figure 1 shows the distribution of food waste based on age group. Respondents aged 19–22 years exhibited higher and more variable levels of food waste, whereas those aged 23–27 years showed lower and more stable patterns.

The complete correlation results between sociodemographic variables and the amount of food waste are presented in Table 3.

Table 3. Spearman's rank correlation results between sociodemographic factors and the amount of food waste

Variable	Correlation Coefficient (ρ)	Significance (p-value)
Age	-.871**	.000
Gender	.083	.414
Education Level	-.135	.182
Income	-.303	.767

*Note: **Correlation is significant at the 0.01 level (2-tailed)*

In contrast to age, gender showed no significant correlation with the amount of food waste ($\rho = 0.083$, $p = 0.414$), indicating that both male and female respondents exhibited relatively similar food disposal behavior. This finding aligns with previous studies suggesting that gender is not a determining factor in food waste generation [6,11].

Although education level was negatively correlated with the amount of food waste ($\rho = -0.135$, $p = 0.182$), the relationship was not statistically significant. While there may be a tendency for respondents with higher education levels to waste less food [5], this difference was not strong enough to be conclusive. This may be due to the educational homogeneity of the sample, where most respondents were either university graduates or currently enrolled students. These findings are consistent with prior research [4], which also found no significant association between education level and food waste.

Similarly, income did not show a significant relationship with the amount of food waste ($\rho = -0.303$, $p = 0.767$), suggesting that income is not a key determinant of food-wasting behavior. This result aligns with earlier studies that also found no significant link between income and the amount of food waste [11]. However, this contrasts with other findings [7], which indicate that individuals with higher incomes tend to generate more food waste. This discrepancy may be explained by the characteristics of the respondents mostly students or young workers with relatively low or unstable incomes, resulting in a more homogeneous consumption pattern.

3.3 Relationship between food socialization and the amount of food waste

The Spearman's rank correlation test between food socialization and the amount of food waste yielded a correlation coefficient of $\rho = -0.161$ with a p-value of 0.109. This result indicates a negative but statistically non-significant relationship at the 5% significance level. Thus, although the direction of the correlation suggests that stronger internalization of food-related values is associated with lower food waste, the strength of the relationship is insufficient to draw firm conclusions in this context.

In this context, food socialization refers to values and norms passed down through family, schools, or social institutions that guide individuals on how to treat food responsibly. These include values such as finishing one's meal, avoiding excessive portions, saving leftovers, and understanding the essential role of food in life [12]. However, with changing times and

shifting consumption patterns, these values appear to be declining, especially among younger generations exposed to instant lifestyles.

A study by [13] conducted through *The Food Waste Lab* found that participatory educational interventions involving students in measuring and reflecting on their household food waste could improve their awareness of the issue. Although significant improvements in food literacy indicators were not observed, notable changes were observed in awareness and knowledge, such as an increased reliance on sensory indicators (e.g., smell, taste) for assessing food edibility. This suggests that experiential and reflective education may be more effective in shaping perceptions and personal norms than passive information delivery.

Despite the availability of food waste education through both family and formal schooling, Generation Z respondents in this study do not consistently apply these teachings in their daily lives. Other factors, such as impulsive consumption and peer influence, may hinder their effectiveness. This aligns with [14], who found that intentions to reduce food waste are often weakened by poor behavioral control and the influence of social norms.

Therefore, it is essential to develop programs that go beyond normative food teachings and instead provide practical support to implement those values in everyday consumption. This can be done by integrating food literacy, social norms, and behavioral control, resulting in a more comprehensive and sustainable strategy.

3.4 Relationship between cultural eating norms (*pakewuh*) and the amount of food waste

The Spearman's rank correlation between cultural eating norms, as measured through *pakewuh*, and the amount of food waste among Generation Z shows a moderate negative and statistically significant relationship ($\rho = -0.522$, $p = 0.000$). This indicates that the stronger an individual's sense of *pakewuh*, the lower their tendency to waste food. This result suggests that cultural values play a substantial role in shaping food consumption behavior in this population.

Pakewuh, a Javanese cultural norm that reflects a reluctance or hesitation to offend others, is part of the region's ethical eating tradition passed down through generations [15]. In food contexts, *pakewuh* may refer to avoiding excessive eating in social settings to avoid being perceived as greedy or impolite, especially during communal events such as weddings or feasts [9]. However, this self-restraint can lead to a cultural paradox: while intended to show respect, it may result in increased food waste. This is supported by [9], who found that *pakewuh* practices during Javanese feasts often result in leftover food, as guests purposely leave uneaten food to avoid appearing impolite. This presents a challenge in addressing food waste driven by cultural norms.

Nevertheless, local communities have developed adaptive strategies to reduce the impact of such waste. In several Javanese communities, leftover food is often redistributed or repurposed informally through family and neighborhood networks, such as leftovers or turning uneaten rice into simple traditional snacks [8,10,15].

From a food security perspective, this finding underscores the ambivalent role of food culture: it can both preserve social norms and contribute to food waste. Therefore, culturally contextualized education is needed—not to impose global values about food consumption, but to understand and adapt local practices wisely.

4 Conclusion and recommendation

This study finds that age is significantly and negatively correlated with food waste among Generation Z households in the Special Region of Yogyakarta. Younger respondents tend to waste more food than older ones. Other sociodemographic factors, such as gender, education,

and income, were not significantly correlated with food waste levels. Although food socialization showed a negative relationship, they were not statistically significant, indicating that such value alone may not be sufficient to reduce the amount of food waste. On the other hand, local cultural values, such as *pakewuh*, showed a significant relationship with food waste reduction, despite sometimes contributing to it in specific social contexts.

For future research, it is recommended that larger and more diverse samples be involved across broader geographical areas to enhance representativeness. Additionally, behavioral and lifestyle variables should be explored to better understand their influence on food waste. Comparative studies across generations or cultures are also suggested to provide deeper insights into the social and cultural determinants of food waste.

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