INTENTIONS TO REDUCE FOOD WASTE IN YOGYAKARTA: THE INFLUENCE OF RESPONSIBILITY AWARENESS, NORMS, AND BEHAVIORAL CONTROL

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Abstract

This study examines household intentions to reduce food waste in the Special Region of Yogyakarta by testing the effects of awareness, personal responsibility, social norms, and perceived behavioral control within the TPB and NAM perspective. A cross sectional survey was administered to households in Yogyakarta using a structured questionnaire. Data were analyzed with descriptive statistics and multiple linear regression using SPSS to estimate both partial and simultaneous effects. Descriptive results indicate that intention to reduce food waste, awareness, personal responsibility, social norms, and perceived behavioral control are generally high, suggesting strong readiness for more sustainable food management practices. The regression model is significant with an F value of 53.266 and a p value below 0.001. The coefficient of determination is 0.448, meaning the four predictors explain 44.8 percent of the variance in intention. Each variable has a positive and significant partial effect with t values of 3.907 for awareness, 4.418 for responsibility, 4.048 for social norms, and 8.154 for perceived behavioral control. Perceived behavioral control is the most dominant predictor with a beta value of 0.390.

Keywords: Food Waste, Intention, Awareness, Personal Responsibility, Social Norms, Perceived Behavioral Control

INTRODUCTION

Food waste is a global problem that affects environmental, social, and economic sustainability. The Food and Agriculture Organization defines food waste as edible food that is not utilized so that it deteriorates and becomes waste (Nations, 2014). In practice, food that is still fit for consumption is often discarded due to factors such as improper storage and consumptive behavior (Parfitt et al., 2010). Food waste also contributes to global warming through greenhouse gas emissions, which makes its management crucial for climate change mitigation.

At the global level, food waste is closely linked to food loss and is recognized as a major barrier to sustainability (Y. Wang et al., 2018). This issue is becoming more urgent as the world population is projected to reach 9.3 billion by 2050, which is expected to increase food demand by 50 to 70 percent (Bond et al., 2013). Despite this increasing demand, about one third of edible food is wasted each year, equivalent to 1.3 billion tons (Nations, 2020). This condition not only causes economic losses but also limits access to nutrition for millions of people facing hunger.

In Indonesia, the food waste problem is increasingly pressing, particularly in urban areas and regions with intensive consumption activities. Indonesia is reported as the second largest food waste producer globally, with an average of 300 kg of food waste per capita per year. In the Special Region of Yogyakarta, food waste contributes 57.08 percent of Municipal Solid Waste, especially in Yogyakarta City which is widely known as a tourism destination (Farahbida et al., 2023). This indicates that food waste is not only a global concern but also a local challenge that requires contextual understanding.

Households represent a critical point of intervention because many waste generating decisions occur at the downstream level, including planning purchases, storing food, and managing leftovers. In Yogyakarta, household food waste is often associated with low public awareness in waste management (Mulasari et al., 2016), while consumption patterns related to tourism activities and cultural events may intensify over-purchasing and over-serving. However, empirical research on household food waste behavior in the Special Region of Yogyakarta remains limited, creating a need for deeper investigation of the factors that shape households' intention to reduce food waste.

This study focuses on intention because intention reflects an individual's readiness to perform a behavior and is a key psychological precursor of action. The Theory of Planned Behavior explains that intention is influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). Within this framework, awareness is relevant because understanding the consequences of food waste can strengthen pro-environmental intentions, while perceived behavioral control reflects whether households feel capable of implementing practical actions to reduce waste.

Personal responsibility is another important factor because reducing food waste often requires a moral commitment to manage household consumption outcomes. The Norm Activation Model emphasizes that personal responsibility can activate altruistic and pro-environmental behavior (Schwartz, 1977). Prior evidence also shows that awareness, responsibility, norms, and behavioral control can play significant roles in food waste reduction, such as findings reported in a Malaysian context (Onwezen et al., 2013), which supports the relevance of testing these determinants in other settings.

Social norms are also expected to influence household intention to reduce food waste. The Focus Theory of Normative Conduct suggests that descriptive norms and injunctive norms shape behavior by signaling what most people do and what most people approve or disapprove (Cialdini et al., 1990). Strong injunctive norms may persist over time and influence behavior across contexts (Morgan & Filippova, 2018). In Yogyakarta, cultural expectations such as not leaving food on the plate and social disapproval of waste may reinforce normative pressure to manage food more wisely.

Therefore, this study aims to describe the level of household intention to reduce food waste and the levels of awareness, personal responsibility, social norms, and perceived behavioral control in the Special Region of Yogyakarta, to analyze the partial and simultaneous effects of these factors on intention, and to identify the most dominant factor among awareness, personal responsibility, social norms, and perceived behavioral control in influencing household intention to reduce food waste in the region.

REVIEW OF LITERATURE

Food waste reduction at the household level is commonly explained through behavioral theories that link psychological drivers to intention and action. This study adopts an integrative perspective by combining the Theory of Planned Behavior and the Norm Activation Model to understand why households intend to reduce food waste, particularly through the roles of awareness, personal responsibility, social norms, and perceived behavioral control (Ajzen, 1991; Schwartz, 1977).

The Theory of Planned Behavior explains that behavior is preceded by intention, and intention is shaped by three key determinants, namely attitude toward the behavior, subjective norms, and perceived behavioral control. Subjective norms refer to perceived social pressure from important others, while perceived behavioral control reflects the perceived ease or difficulty of performing the behavior, which can strengthen intention when individuals feel capable of acting consistently (Ajzen, 1991). Ajzen (2002) further emphasizes that perceived behavioral control can influence intention strongly when the behavior requires skills, resources, or self management in daily routines.

The Norm Activation Model is frequently used to explain pro environmental and altruistic behavior. NAM highlights that individuals may act for collective benefits when moral considerations are activated through a set of psychological conditions (Onwezen et al., 2013). The model emphasizes awareness of consequences and ascription of responsibility as key triggers that activate personal norms, which then encourage pro environmental intentions and behavior (Fang et al., 2019; Schwartz, 1977; Steg et al., 2017).

In this study, intention is conceptualized as a cognitive readiness to perform food waste reduction practices at home, such as planning purchases, managing portions, and utilizing leftovers (Ajzen, 1991). Within TPB, intention is the most immediate predictor of behavior, while within NAM, intention is strengthened when individuals recognize negative consequences and feel personally responsible for mitigating them (Schwartz, 1977). In the context of food waste, individuals who acknowledge environmental and economic harm and internalize responsibility tend to show stronger intention to reduce waste (Schanes et al., 2018).

Awareness is framed as awareness of consequences, which refers to an individual's understanding of the negative impacts of food waste on the environment, society, and household economy (Schwartz, 1977). In food waste contexts, awareness includes recognizing impacts such as increased emissions from wasted food and pressure on waste management systems (Nations, 2014). NAM suggests that higher awareness strengthens pro environmental motivation, thereby increasing intention to reduce waste (Steg et al., 2017). From a TPB perspective, awareness can also reinforce intention indirectly by shaping perceptions of norms and strengthening confidence to act when individuals understand what actions are effective (Ajzen, 1991; Quested et al., 2013).

Personal responsibility in this study is aligned with ascription of responsibility, which refers to the belief that one has a personal obligation to act after realizing negative consequences. This construct represents internalized moral accountability, not merely passive knowledge. Prior studies show that responsibility can activate moral norms and support intentions toward pro environmental behavior, including waste reduction (Chen & Tung, 2014; Han, 2014). Evidence from Indonesian contexts also indicates that higher personal responsibility is associated with stronger participation in household waste management and that early and continuous moral environmental education can strengthen responsibility based motivations (Nurhasanah et al., 2020; Setyaningrum & Listyorini, 2021).

Social norms represent unwritten rules and expectations that guide behavior in social settings and can influence individuals even when the influence is not consciously recognized. Nolan et al. (2008) highlight that people often conform to norms due to social signals and perceived expectations. The Focus Theory of Normative Conduct distinguishes descriptive norms, which reflect what people commonly do, and injunctive norms, which reflect what people approve or disapprove. Both types can shape intention and behavior through social approval mechanisms and avoidance of negative evaluation (Cialdini, 2007).

Perceived behavioral control is a central construct in TPB and refers to perceived capacity and control to perform a behavior. In household food waste reduction, perceived behavioral control includes confidence in one's ability to plan meals, store food properly, manage time for cooking, and handle leftovers effectively (Ajzen, 1991, 2002). Barriers such as limited time, low cooking skills, inadequate storage facilities, and household constraints can lower perceived control and weaken intention, while supportive resources and skills can strengthen it (Fami et al., 2019; Lin & Guan, 2021).

Empirical evidence supports the relevance of these predictors for food waste reduction intention. For awareness, prior studies show that higher awareness of negative impacts is associated with stronger intention to reduce food waste, including findings that environmental campaigns can increase awareness and intention among consumer groups (Graham-Rowe et al., 2015; Wastutiningsih & Aulia, 2023). Evidence in Yogyakarta also indicates that environmental awareness significantly influences household intention to manage food more wisely (Anggrasari et al., 2023).

For personal responsibility, studies suggest that responsibility can mediate or directly strengthen intention to reduce food waste. Findings show that individuals with stronger responsibility are more committed to preventing waste, including among consumers and students, and responsibility can work through moral norms to reinforce intentions (Chandra et al., 2024; Obuobi et al., 2023). Research in food service contexts also indicates that

responsibility related motives can influence norms and reduce excessive portions and waste producing behavior (Iriyadi et al., 2023).

For social norms, prior research shows that normative influence is a meaningful predictor of pro environmental intentions, including waste related intentions. Studies report that norms can significantly shape intention among young consumers in Yogyakarta and among Indonesian Gen Z, even when the effect is weaker than other predictors (Novitasari et al., 2024; Wastutiningsih & Aulia, 2023). Cross country evidence also supports that stronger social norms can reinforce consumer intention to manage food efficiently (J. Wang & Chen, 2023).

For perceived behavioral control, empirical findings consistently show that perceived control and practical capability are among the strongest predictors of intention, especially for behaviors requiring routine skills and household organization. Studies report positive relationships between perceived behavioral control and intention to manage food and reduce waste, including evidence from university settings and Indonesian urban household contexts that highlight perceived control as a key determinant in waste prevention practices (Amir et al., 2025; Indarti et al., 2025; Mawar & Adiati, 2025).

Finally, integrated models combining TPB and NAM are often found to explain intention more comprehensively than single theory approaches because they capture both cognitive control processes and moral normative processes. Evidence indicates that combining awareness, norms, responsibility, and perceived control yields stronger predictive power for intention and provides a clearer basis for intervention design (Liu et al., 2025; Radde et al., 2025). Based on these theoretical arguments and prior findings, this study proposes that awareness, personal responsibility, social norms, and perceived behavioral control positively influence household intention to reduce food waste, both individually and simultaneously, with the expectation that one factor may emerge as the most dominant predictor in the Special Region of Yogyakarta.

RESEARCH METHOD

This quantitative study employed a cross sectional survey to examine household intention to reduce food waste in the Special Region of Yogyakarta. The population comprised households in the region, and respondents were household members responsible for daily food management. Purposive sampling was applied with inclusion criteria of being domiciled in Yogyakarta, aged 18 years or older, and directly involved in purchasing, preparing, storing, and managing leftovers, with a minimum sample size of 267 respondents and a pilot test involving 30 respondents. Data were collected using an online structured questionnaire distributed via Google Form through community and social media channels. The instrument consisted of 20 items measuring five constructs, namely intention, awareness, personal responsibility, social norms, and perceived behavioral control, using a five point Likert scale from 1 strongly disagree to 5 strongly agree. Data were processed in SPSS using descriptive statistics and multiple linear regression to test partial and simultaneous effects at $\alpha = 0.05$. Instrument validity was assessed using Pearson correlation and reliability using Cronbach's Alpha with a minimum threshold of 0.60, while regression assumptions were checked through normality tests, multicollinearity using Tolerance greater than 0.10 and VIF less than 10, and heteroscedasticity using residual scatterplots.

RESULTS AND DISCUSSION

This section presents the empirical results and discussion of household intention to reduce food waste in the Special Region of Yogyakarta. The analysis is based on 267 valid responses and is supported by instrument testing, classical assumption tests, and multiple linear regression analysis.

Respondents were dominated by males (62.0 percent) and the largest age group was 18 to 25 years (89.5 percent). Most respondents had a bachelor degree (83.0 percent), indicating that the sample was largely composed of young and educated households.

Instrument testing indicates that all indicators are valid because each corrected item total correlation exceeds the r table value of 0.120. Reliability testing also confirms acceptable internal consistency, with Cronbach's Alpha values above 0.60 for all constructs, namely awareness (0.689), personal responsibility (0.683), social norms (0.736), perceived behavioral control (0.651), and intention (0.653).

Classical assumption tests show that the residuals are normally distributed with the Kolmogorov Smirnov Asymp Sig value of 0.200. Multicollinearity is not indicated as tolerance values range from 0.767 to 0.918 and VIF values range from 1.089 to 1.304. The Glejser test also suggests no heteroscedasticity because all significance values are above 0.05.

Table 1
ANOVA Test Result
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	598.859	4	149.715	53.266	.000[b]
	Residual	736.399	262	2.811		
	Total	1335.258	266			

a. Dependent Variable: Intention to Reduce Food Waste
b. Predictors: (Constant), Behavioral Control, Awareness, Norms, Responsibility
Source: Primary data processed, 2025

As shown in Table 1, the model is statistically significant with $F = 53.266$ and $p < 0.001$, indicating that awareness, personal responsibility, social norms, and perceived behavioral control simultaneously affect the intention to reduce food waste.

Table 2
Multiple Regression Coefficients
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.006	1.117		.900	.369
	Awareness	.186	.047	.192	3.907	.000
	Responsibility	.223	.050	.232	4.418	.000
	Norms	.190	.047	.199	4.048	.000
	Behavioral Control	.367	.045	.390	8.154	.000

a. Dependent Variable: Intention to Reduce Food Waste
Source: Primary data processed, 2025

Table 3
Coefficient of Determination
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670[a]	.448	.440	1.67651

a. Predictors: (Constant), Behavioral Control, Awareness , Norms, Responsibility
b. Dependent Variable: Intention to Reduce Food Waste
Source: Primary data processed, 2025

Table 3 indicates that the model explains 44.8 percent of the variance in intention to reduce food waste (R Square = 0.448). The remaining 55.2 percent may be influenced by other factors not included in this study.

The partial test results in Table 2 show that all independent variables have positive and significant effects on intention. Awareness positively affects intention ($t = 3.907$, $p < 0.001$), indicating that households who understand the environmental and economic consequences of food waste tend to have stronger intentions to reduce it. This finding aligns with the Norm Activation Model, where awareness of consequences triggers pro environmental intention (Schwartz, 1977). It is also consistent with prior findings in Yogyakarta that highlight the role of environmental awareness in food waste reduction intention (Anggrasari et al., 2023; Wastutiningsih & Aulia, 2023).

Personal responsibility has a positive and significant effect ($t = 4.418$, $p < 0.001$). This suggests that moral obligation and a sense of duty in managing food strengthen the intention to reduce food waste. In the NAM framework, ascription of responsibility is a key mechanism that converts awareness into moral motivation. This result supports evidence that personal responsibility is strongly associated with food waste reduction intention (Chandra et al., 2024; Iriyadi et al., 2023; Obuobi et al., 2023).

Social norms also show a significant positive effect ($t = 4.048$, $p < 0.001$). This indicates that expectations and support from family, peers, and the community reinforce household intention. The result is in line with the Theory of Planned Behavior, which explains that perceived social pressure influences behavioral intention (Ajzen, 1991). Given Yogyakarta's communal culture, social approval can become an effective driver for more responsible food management (Novitasari et al., 2024; J. Wang & Chen, 2023; Wastutiningsih & Aulia, 2023).

Perceived behavioral control is the most dominant predictor, with the highest standardized coefficient (Beta = 0.390) and the largest t value ($t = 8.154$, $p < 0.001$). This finding implies that intention is largely determined by perceived capability and practical control, such as planning purchases, regulating portions, storing food properly, and reusing leftovers. In TPB, stronger perceived control increases intention because individuals believe the behavior is feasible in everyday situations (Ajzen, 1991). This result is consistent with studies showing that perceived behavioral control is a key determinant of food waste reduction and zero waste practices (Fami et al., 2019; Lin & Guan, 2021).

Overall, the results support an integrated TPB and NAM perspective. Interventions in Yogyakarta should prioritize strengthening perceived behavioral control through practical

skills and enabling facilities, while reinforcing moral responsibility and social norms through community based campaigns and local wisdom such as gotong royong.

CONCLUSION

This study concludes that household intention to reduce food waste in the Special Region of Yogyakarta is generally strong and is significantly influenced by awareness, personal responsibility, social norms, and perceived behavioral control. Descriptively, the levels of intention, awareness, responsibility, norms, and perceived behavioral control are high, indicating that households recognize the importance of avoiding food waste and are ready to apply practical food management routines such as meal planning, portion control, proper storage, and leftover utilization. The multiple regression results confirm that the four predictors simultaneously affect intention, shown by an F value of 53.266 with p below 0.001, and the model explains 44.8 percent of the variance in intention with an R Square of 0.448. Partially, all variables have positive and significant effects on intention, including awareness with a t value of 3.907, personal responsibility with a t value of 4.418, social norms with a t value of 4.048, and perceived behavioral control with a t value of 8.154, all with p below 0.001. Among these factors, perceived behavioral control is the most dominant determinant, indicated by the highest standardized beta coefficient of 0.390, which highlights that strengthening households' perceived capability to manage everyday food related practices is a key priority for supporting food waste reduction intention in Yogyakarta.

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