

Extending the Theory of Planned Behavior to Predict Waste Bank Utilization Intention in Pantai Indah Kapuk

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ABSTRAK

Keterlibatan aktif seluruh lapisan masyarakat merupakan prasyarat penting bagi pengelolaan sampah yang efektif, khususnya dalam menangani sampah *non-biodegradable*. Meskipun kerangka 3R (*Reduce*, *Reuse*, dan *Recycle*) telah banyak dipromosikan dan didukung melalui pembentukan bank sampah berbasis komunitas untuk memfasilitasi kegiatan daur ulang, tingkat partisipasi masyarakat dalam memanfaatkan fasilitas tersebut masih relatif rendah. Penelitian ini bertujuan untuk mengkaji faktor-faktor yang memengaruhi niat pemanfaatan bank sampah dengan memperluas *Theory of Planned Behavior* (TPB) melalui penambahan faktor stimulus yang diadopsi dari kerangka *Stimulus-Organism-Response* (SOR). Data dikumpulkan melalui survei kuesioner terstruktur yang melibatkan 175 responden. Variabel yang diteliti meliputi sikap, norma subjektif, persepsi kontrol perilaku, pengetahuan tentang lingkungan, dan pengetahuan tentang bank sampah. Analisis data dilakukan menggunakan *Partial Least Squares Structural Equation Modeling* (PLS-SEM). Hasil penelitian menunjukkan bahwa sikap, norma subjektif, dan persepsi kontrol perilaku berpengaruh positif dan signifikan terhadap niat pemanfaatan bank sampah, dengan sikap sebagai determinan paling dominan ($\beta = 0,353$). Selain itu, pengetahuan tentang lingkungan ($\beta = 0,426$) dan pengetahuan tentang bank sampah ($\beta = 0,392$) terbukti berpengaruh signifikan terhadap sikap terhadap pemanfaatan bank sampah. Model yang diusulkan memiliki kemampuan eksplanatori yang moderat dengan menjelaskan 64,3% variasi niat pemanfaatan bank sampah dan 50,1% variasi sikap. Secara keseluruhan, temuan ini menunjukkan bahwa ekstensi TPB mampu menjelaskan niat pemanfaatan bank sampah di kawasan Pantai Indah Kapuk, dengan pengetahuan sebagai antecedent kunci dalam pembentukan sikap, yang selanjutnya berkontribusi terhadap niat pemanfaatan bank sampah.

Kata kunci: Bank Sampah, Manajemen Sampah Berkelanjutan, Niat Pemanfaatan Bank Sampah, Pengetahuan Lingkungan, *Theory of Planned Behavior*

ABSTRACT

Active involvement of all sectors of society is essential for effective waste management, particularly in addressing non-biodegradable waste. Although the 3R (*Reduce*, *Reuse*, and *Recycle*) framework has been widely promoted and supported by the establishment of community-based waste banks to facilitate recycling activities, public participation in utilizing these facilities remains limited. This study aims to investigate the determinants of waste bank utilization intention by extending the Theory of Planned Behavior (TPB) with stimulus-based factors derived from the Stimulus-Organism-Response (SOR) framework. Data were collected through a structured questionnaire survey involving 175 respondents. The variables examined include attitude, subjective norms, perceived behavioral control, environmental knowledge, and waste bank knowledge. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that attitude, subjective norms, and perceived behavioral control have a significant positive effect on waste bank utilization intention, with attitude being the most influential determinant ($\beta = 0.353$). In addition, environmental knowledge ($\beta = 0.426$) and waste bank knowledge ($\beta = 0.392$) significantly influence attitudes toward waste bank utilization. The proposed model demonstrates moderate explanatory power, explaining 64.3% of the variance in waste bank utilization intention and 50.1% of the variance in attitude. Overall, these findings indicate that the extended TPB effectively explains waste bank utilization intention in the Pantai Indah Kapuk area, with knowledge serving as a key antecedent of attitude, which in turn contributes to waste bank utilization intention.

Keywords: Environmental Knowledge, Sustainable Waste Management, Theory of Planned Behavior, Waste Bank, Waste Bank Utilization Intention

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1. INTRODUCTION

Waste is an unwelcome result of human activities, which have become more intricate due to population expansion and economic development. This ultimately leads to heightened waste production. According to data from the Ministry of Environment and Forestry KLHK (2024a), Indonesia generated a total of 34.27 million tons of waste in 2024, with the Special Capital Region of Jakarta (DKI Jakarta)—the center of the nation's economy and government—ranking fourth with 3.17 million tons. Households contribute 60% of the total waste of the country, and 38% of the total waste in DKI Jakarta alone, with a relatively balanced composition of organic and inorganic waste, such as plastic, paper, and metal (KLHK, 2024b). The large volume of garbage, especially non-biodegradable items, necessitates the active engagement of all members of the community in the creation and implementation of sustainable waste management methods (Rauf, 2024), one of which is the 3R (Reduce, Reuse, and Recycle) program. Active community involvement in the consistently advocated 3R program, especially in recycling and sorting waste (Budiyarto et al., 2025), can facilitate the attainment of Sustainable Development Goal (SDG) 11 of promoting sustainable cities and communities.

To assist communities in carrying out the 3R program, the Indonesian government has been encouraging the establishment of waste banks as a cutting-edge and developing community-based strategy for managing recyclable waste (Marpaung et al., 2025). For this purpose, waste banks are frequently constructed in densely populated areas or bustling public places (Adinata & Maradona, 2025; Ulhasanah et al., 2025). Waste banks have been established in every province in Indonesia, particularly in DKI Jakarta, one of the regions with the most waste. Local governments have been striving to get people involved in waste bank programs. By the end of 2024, 2,287 waste banks were operating in DKI Jakarta (DLH, 2025). To help the government collect inorganic waste from the community, RS—a new company that focuses on technology-based waste processing—has set up the Waste Station, whose concept is similar to that of a traditional waste bank, but with more advanced implementation. However, while RS operates several Waste Stations, not all of them are utilized to the same extent. For example, a station in North Jakarta has the lowest usage rate and fails to meet the operational goal. This situation illustrates the broader challenge faced by waste bank operators in encouraging community utilization of waste bank facilities. Therefore, understanding the factors that shape waste bank utilization intention is essential for identifying ways to encourage greater community utilization of waste bank facilities. The present study does not specifically focus on the Waste Station operated by RS; rather, it examines waste bank utilization intention more generally in the Pantai

Indah Kapuk (PIK) area, where the RS Waste Station and other waste bank facilities are present.

Community participation in waste bank operations can be better understood by applying the TPB, which may explain how and why people choose to take a particular action or exhibit certain behavior (Ajzen, 1991). One of the practices that has gained widespread recognition as a reflection of the TPB model is waste management (Marpaung et al., 2025). In their studies on waste separation behavior, Maghfiroh et al. (2024) and Emmanouil et al. (2024) used TPB and the norm activation model to predict people's intention to separate their waste. Sweetty et al. (2024) enhanced TPB by including moral obligation, environmental understanding, perceived trust, and perceived inconvenience to predict the intention of women's organizations in Dhaka to separate waste. Sasana et al. (2022) employed the TPB framework to examine community engagement in recycling garbage generated through the utilization of waste banks in rural areas. TPB was also used by He et al. (2021) to investigate environmental concern as a predictor of attitude, subjective norms, and perceived behavioral control, as well as its effect on willingness to pay for municipal solid waste (MSW) management. Similarly, Raghu and Rodrigues (2022) used environmental knowledge and contextual factors with TPB and the value-belief-norm (VBN) theory to predict solid waste management behavior in students. Meanwhile, Lou et al. (2021) augmented the TPB model by including belief as a factor influencing the behaviors of the communities in urban and rural settings toward household waste separation. Likewise, Astuti and Linarti (2020) developed TPB by including knowledge as a factor contributing to community interest in participating in waste bank activities.

Although the TPB has been widely applied to waste management, previous studies have extended the framework by incorporating environmental knowledge and other informational, moral, and contextual factors. Raghu and Rodrigues (2022) and Sweetty et al. (2024), for example, examined environmental knowledge as an antecedent of attitude, while other studies have incorporated additional factors as direct predictors of behavioral intention. However, less attention has been given to knowledge that is specific to the behavioral context, particularly knowledge of the waste bank system itself, and how such knowledge, together with broader environmental knowledge, contributes to attitude formation and subsequently to behavioral intention. The SOR framework provides a complementary perspective for explaining this process by conceptualizing informational factors as stimuli that can influence an individual's internal evaluative state before a behavioral response is formed (Pavlov, 2010). In this study, environmental knowledge and waste bank knowledge are conceptualized as stimulus factors, attitude represents the organismic evaluative state, and waste bank utilization intention represents

the behavioral outcome within TPB. Integrating SOR with TPB therefore provides a process-oriented explanation of how environmental and behavior-specific knowledge may contribute to attitude formation and, subsequently, waste bank utilization intention. Accordingly, this study develops an integrated SOR-TPB framework in which environmental knowledge and waste bank knowledge influence waste bank utilization intention through attitude.

2. THEORETICAL FRAMEWORK

Developed from the Theory of Reasoned Action (TRA), TPB holds that intent has the most significant influence on behavior (Ajzen, 1991). According to this theory, individuals are rational agents who make choices informed by previous knowledge and experience, and their behavior is directly affected by intentions and perceived behavioral control. Similarly, an individual's intent is formed by their attitude toward the activity, personal standards, and perceived behavioral control. The TPB model is extensively used to comprehend diverse behaviors (Ajzen, 1991), including environmental actions such as recycling waste (Gadiraju, 2016; Juliana et al., 2022; Liu & Yang, 2022; Xu et al., 2023), sorting waste (Emmanouil et al., 2024; Lou et al., 2021; Maghfiroh et al., 2024; Pan & Liu, 2024; Sweet et al., 2024), participating in compensated urban waste management (He et al., 2021), and utilizing waste banks (Astuti & Linarti, 2020).

Attitude is an individual's judgment of whether or not an action will be useful Ajzen (1991). It represents individuals' propensity to behave depending on their emotions, whether positive or negative. A positive attitude toward certain behavior might improve an individual's chances of exhibiting the behavior. This is because people are more likely to behave in ways that they believe will benefit them than those that will not. Previous empirical studies have demonstrated how attitude may influence environmental behavior. For example, He et al. (2021) reported that positive attitudes and community support may help shape environmental behavior. Individuals who have a favorable attitude about waste separation are more inclined to participate in it; people are more inclined to recycle their rubbish when they have a favorable attitude about it. (Gadiraju, 2016). Based on the explanation provided above, the first hypothesis is presented as follows. **Hypothesis 1:** Attitude has a positive effect on waste bank utilization intention.

A subjective norm describes how the social system accepts or rejects a particular action (Ajzen, 1991). In this regard, people may refrain from exhibiting inappropriate behavior as their response to their social circumstances, or vice versa. Furthermore, individuals' perception of the views of people around them may influence their decision to engage in the conduct under consideration. According to Venkatesh and Davis (2000), the presence of subjective norms may encourage people to display certain behavior

even if they do not agree with or value the activity being performed. In addition, approval or support for certain activities from one's surroundings, such as family members, neighbors, friends, and government or non-governmental groups, may motivate someone to develop and maintain a habit. Interactions among residents create considerable social cohesion and bonds, which may have a positive impact on waste separation behavior. Abus et al. (2024) have demonstrated how female organizational leaders may urge their members to actively engage in trash management. Suggestions, pressure, or personal and professional ties all affect community involvement in sustainable waste management efforts (Saleh et al., 2024). Based on the above explanation, the second theory is as follows. **Hypothesis 2:** Subjective norms have a positive effect on waste bank utilization intention.

Perceived behavioral control refers to an individual's perception of whether the activity they want to take part in is simple or complex (Ajzen, 1991). Individuals' ability to control their behavior frequently results in a desire to modify it to make themselves more attractive and appealing to people around them. Likewise, people are more inclined to display certain behavior if they have a strong sense of control over it. The availability of supportive resources, compatibility, opportunities that support the behavior, and competency may all influence an individual's perceived behavioral control. According to He et al. (2021), people who believe they have greater resources to contribute to municipal solid waste management are more likely to respond positively to environmental behavior. In this regard, numerous factors may influence community participation in the waste bank program, including conveniently accessible sites, the ease of becoming a member, and the availability of assistance in using the waste bank. Studies by Adinata and Maradona (2025) and Meidiana et al. (2021) have found that establishing waste banks in readily accessible sites can increase the frequency of waste deposits to the waste banks. Similarly, Asih and Nadira (2021) revealed that people are more likely to use a waste bank's services if it is located close to where they reside. Furthermore, people who find it easy to sign up for the waste bank program are more inclined to engage in it (Astuti & Linarti, 2020). The third hypothesis is presented based on the explanation provided above. **Hypothesis 3:** Perceived behavioral control has a positive effect on waste bank utilization intention.

Attitude is perceived as a cognitive assessment developed in reaction to various stimuli, including knowledge, motivation, and demographic factors. Within the SOR framework, knowledge serves as a stimulus for cognitive processing in the "organism" phase, subsequently resulting in a behavioral reaction (Hochreiter et al., 2023; Indrawati et al., 2024; Jeong et al., 2022). This is in line with the Knowledge-Attitude-Practice (KAP) paradigm that knowledge

affects attitudes and ultimately drives behavior (Hassan & Rosli, 2022). In this context, knowledge of the environment is believed to influence pro-environmental behavior. However, its effect in shaping waste management behavior, particularly in developing nations, remains underexplored (Raghu & Rodrigues, 2022). Therefore, this study incorporates knowledge as a driver of attitudes by concentrating on two types of information: (1) knowledge of waste banks, and (2) knowledge of the environment, adapted from Gadiraju (2016).

Dissemination of information to the public can facilitate the acquisition of knowledge about waste banks and their roles in effective waste management. Abus et al. (2024) and Anjani et al. (2024) found that awareness of waste bank operations and benefits has a substantial impact on the establishment of good behavioral intentions. Similarly, Gunawan and Ansyori (2023) asserted that information about waste banks can directly lead to a more optimistic view of community involvement in it. Adinata and Maradona (2025) also noted that the public should be given enough information to understand the function of waste banks in ecologically responsible garbage disposal. In addition to trash bank information, general environmental knowledge, such as understanding the environmental effects of waste disposal, might drive more consistent, ecologically friendly behavior. Studies by Sweetty et al. (2024) and Raghu and Rodrigues (2022) have shown that individuals who possess greater levels of environmental literacy tend to have more favorable attitudes toward sustainable practices. A study by Marpaung et al. (2025) has also indicated that both formal and informal environmental education can affect individuals' growing perceptions of waste disposal. In the context of food waste disposal, educational and awareness initiatives related to food waste are viable strategies for influencing public behavior to reduce household food waste in Indonesia

(Diana et al., 2022). In light of the preceding explanation, the fourth and fifth hypotheses are articulated as follows. **Hypothesis 4:** Waste bank knowledge has a positive effect on attitude. **Hypothesis 5:** Environmental knowledge has a positive effect on attitude.

Figure 1 illustrates how the extended TPB model predicts waste bank utilization intention.

3. METHOD

3.1. Measurement Instrument

This study adopted measurement items from previously established instruments and modified them to fit the context of waste bank utilization. The measurement items for waste bank utilization intention were adopted from Raghu and Rodrigues (2022) and modified to refer specifically to individuals' intention to utilize waste bank. The attitude items were adopted from Lou et al. (2021) and modified by replacing the original behavioral context with waste bank utilization while retaining the original evaluative structure. The subjective norm items were adopted from Sweetty et al. (2024) and modified to reflect social expectations and approval regarding waste bank utilization. The perceived behavioral control items were adopted from Astuti and Linarti (2020) and modified to capture individuals' perceived ease and control in participating in and utilizing waste bank facilities. The waste bank knowledge items were adapted from Gadiraju (2016), whose original measures focused on recycling knowledge; the items were therefore modified to capture individuals' awareness and understanding of waste bank operations and utilization. Finally, the environmental knowledge items were adopted from Raghu and Rodrigues (2022) and modified where necessary to maintain consistency with the waste management context of this study.

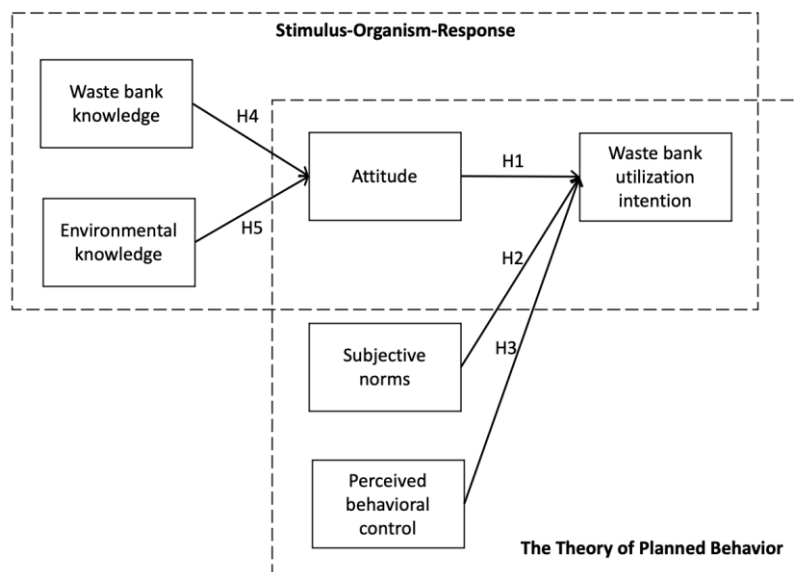


Figure 1. A Model of Waste Bank Utilization Intention

Prior to the main survey, a pre-test was conducted with five respondents to assess the clarity, comprehensibility, and suitability of the questionnaire items. After completing the questionnaire, respondents were invited to provide comments and suggestions regarding the wording and relevance of the items. Three substantive suggestions resulted in revisions to the questionnaire. First, a respondent noted that the item 'I know that waste separation provides benefits' was too general and suggested specifying the type of benefit. Accordingly, the item was revised to 'I know that waste separation provides economic benefits.' Second, a respondent noted that the item 'I know waste banks' overlapped with the screening criterion used to identify eligible respondents. Therefore, the item was revised to 'I know how waste banks operate.' Third, a respondent

found the statement 'Waste banks can help me make use of my free time' under perceived behavioral control confusing. Therefore, the item was replaced with 'I can deposit waste at the waste bank whenever I want' to provide a clearer expression of perceived behavioral control. These revisions were incorporated into the final questionnaire prior to the main survey. The final measurement items and their respective sources are presented in Table 1.

All measurement items in this study were specified as reflective indicators, consistent with the measurement approach of the instruments adopted from the cited prior studies. Thus, the indicators are treated as manifestations of their respective latent constructs, with changes in the underlying construct expected to be reflected in the corresponding indicators.

Table 1. Operational Definitions and Indicators of Variables

Variable	Operational definition	Indicators	Sources
Waste bank utilization intention (I)	An individual's willingness and conscious motivation to make an effort to utilize waste bank facilities.	I intend to use the waste bank regularly to manage the waste I generate. (I1) I will make an effort to utilize the waste bank for waste management. (I2) I intend to participate in programs organized by the waste bank. (I3) I intend to deposit recyclable waste at the waste bank. (I4)	Raghu and Rodrigues (2022)
Attitude (A)	An individual's positive or negative evaluation of waste bank utilization.	I think utilizing a waste bank is good. (A1) I think utilizing a waste bank is worthwhile. (A2) I think utilizing a waste bank is meaningful. (A3) I think utilizing a waste bank is pleasant. (A4)	Lou et al. (2021)
Subjective norms (SN)	Social pressures and perceptions of whether important people and the surrounding community approve of or expect waste bank utilization.	Most people who are important to me support my utilization of waste bank facilities. (SN1) My neighbors expect me to utilize waste bank facilities. (SN2) My community expects me to utilize waste bank facilities. ((SN3) My family expects me to utilize waste bank facilities. ((SN4) People I know who utilize waste bank facilities speak positively about this activity. (SN5)	Sweety et al. (2024)
Perceived behavioral control (PBC)	How easy or hard a person thinks it is to show an action, which is affected by their past experiences and expected limitations.	Waste banks make it easy for me to manage my waste. (PBC1) I find waste sorting easy. (PBC2) It is easy for me to participate in waste bank activities. (PBC3) I can deposit waste at the waste bank whenever I want. (PBC4)	Astuti and Linarti (2020)
Waste bank knowledge (KWB)	An individual's awareness and understanding of waste bank operations and utilization.	I know that having information about waste banks is important for utilizing their facilities. (KWB1) I know how waste banks operate. (KWB2) I know how to utilize waste bank facilities. (KWB3) I know what happens to waste after it is deposited at a waste bank. (KWB4)	Gadiraju (2016)
Environmental knowledge I(KE)	An individual's knowledge of waste management practices and their environmental and economic implications.	I know that separation of household waste reduces landfill spaces. (KE1) I know that improper waste management can cause the extinction of thousands of species. (KE2) I know that waste separation provides economic benefits. (KE3)	Raghu and Rodrigues (2022)

3.2. Data Collection

In this research, data were collected through a survey, which is recognized as an appropriate technique for investigating social phenomena such as attitudes, emotions, and behavioral intentions (Phillips, 2017). The target population comprised individuals who lived in PIK area and were aware of the presence or operation of waste banks. A non-probability purposive sampling technique was employed because respondents were selected based on predefined eligibility criteria. The study was geographically focused on the PIK area, North Jakarta, to maintain a relatively homogeneous waste management context and avoid differences associated with waste composition and management conditions across regions (UNEP, 2024). The accessible sampling frame was limited to community members who received the questionnaire through local administrative and community communication channels. The recruitment process began with the local administrative leadership, which facilitated the distribution of the questionnaire to Heads of Neighborhood Associations (RWs). The respective RW leaders then disseminated the questionnaire link to residents, primarily through WhatsApp groups.

The variables were assessed using an online questionnaire developed based on the operational definitions and indicators described in the preceding section. A 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), was used to measure respondents' agreement with the questionnaire statements. Respondents were screened through the questionnaire to ensure that they lived in the PIK area and were aware of the presence or operation of waste banks. Data was collected over a one-month period, yielding 184 responses. Nine responses were excluded because they did not meet the eligibility criteria, leaving 175 valid responses for analysis. Because recruitment depended on community-based communication networks, individuals who did not receive the questionnaire through these channels had no opportunity to participate, which may introduce selection bias. Therefore, the findings should be interpreted within the context of the sampled PIK community and should not be generalized beyond the study setting without further evidence.

Sample size adequacy was assessed following Hair et al. (2021) using the minimum expected path coefficient approach. The most complex endogenous construct in the present model was waste bank utilization intention, which was predicted by three TPB constructs: attitude, subjective norms, and perceived behavioral control. A comparable study by Raghu and Rodrigues (2022), which examined the same three TPB predictors of solid waste management intention, reported significant path coefficients of 0.282 for attitude, 0.443 for subjective norms, and 0.137 for perceived behavioral control. Accordingly, the smallest significant path coefficient fell within the 0.11–0.20 range. Based on Hair et al.

(2021), this range requires a minimum sample size of 155 at a 5% significance level and 80% statistical power. The 175 valid responses obtained in this study therefore exceeded the minimum sample-size requirement.

Table 2 presents the demographic characteristics of the respondents. The gender distribution among the responders is well balanced. The majority were under 36 years of age and had either a Diploma or a bachelor's degree. Regarding waste management behavior, only a small portion of respondents already have the habit of separating waste, while the rest rely on waste collectors to handle their waste.

Table 2. Respondent Profiles

Profile	Number of Respondents	Percentage
Gender		
Male	80	46%
Female	95	54%
Age (years old)		
< 26	59	34%
26–35	95	54%
> 35	21	12%
Education		
Senior high school	24	14%
Diploma	40	23%
Undergraduate	96	55%
Postgraduate	15	8%
Household waste management		
Sorting waste	35	20%
Not sorting or handing waste to the cleaning personnel	140	80%

4. RESULTS AND DISCUSSION

4.1. Model Testing

The developed model was evaluated using Partial Least Squares Structural Equation Modeling (PLS-SEM). According to Hair et al. (2022), PLS-SEM is highly suitable for exploratory research focused on prediction, particularly when the sample size is moderate (below 200), the data does not have multivariate normality, and the model is complex (involving numerous variables and relationships). This study aims to predict behavioral intention in utilizing waste banks as a target variable through interconnected factors, involving a sample size of 175. Therefore, PLS-SEM is the most suitable method of analyzing the proposed model.

The measurement model was initially assessed using indicator loadings, composite reliability (CR), and average variance extracted (AVE). As shown in Table 3, two indicators of the subjective norms construct, SN2 and SN5, showed relatively low factor loadings and were therefore further evaluated rather than removed solely based on the 0.70 threshold. Their contribution to construct reliability and convergent validity was assessed by comparing the initial and revised measurement models. As reported in Table 4, removing SN2 and SN5 increased the CR of

subjective norms from 0.827 to 0.880 and its AVE from 0.594 to 0.808. From a content-validity perspective, the removal of these two indicators did not substantially change the conceptual meaning of subjective norms, as the remaining indicators continued to capture perceived social expectations and approval regarding waste bank utilization. Accordingly, SN2 and SN5 were removed, and the measurement model was re-estimated. The revised factor loadings are presented in Table 3, while the CR and AVE values before and after indicator removal are reported in Table 4.

Internal consistency reliability was evaluated using Cronbach's Alpha and CR, with rho_A reported as the estimate of composite reliability. As indicated in Table 4, all constructs had values above the proposed threshold (minimum value of 0.70), indicating that they were highly consistent with one another (Hair et al., 2022). Furthermore, the AVE for each construct was examined to test the convergent validity of the questionnaire. Fornell and Larcker (1981) define an appropriate AVE value as 0.50 or above, suggesting that the latent construct explains more than half of the variance in the indicators. For the revised model, all constructs had AVE values exceeding the threshold (Table 4). This signifies that each construct has sufficient convergent validity.

The Heterotrait-Monotrait Ratio (HTMT), a new and comprehensive tool for discriminating across ideas, was used to evaluate the discriminant validity of all components in the model. According to Henseler et al. (2015), the HTMT value must be less than 0.90 for the associated constructs to fulfill the discriminant validity requirement. As seen in Table 5, all HTMT

values were less than the set threshold, demonstrating persuasive evidence that the conceptions differ in reality. The evaluation findings show that the final measurement model is both reliable and valid, with indications that properly evaluate the components and are distinct enough to proceed with hypothesis testing and structural model testing.

The structural model was assessed to see if the predicted relationships between constructs were supported by the data. Collinearity assessment, path coefficient estimate, model explanatory power evaluation (R^2), and effect size measurement (f^2) are used to examine the theoretical framework's validity and predictive value.

Before analyzing the path links between latent constructs, it is crucial to examine any collinearity concerns among the exogenous or predictive factors. This is because the estimates of regression coefficients and the validity of significance tests may both be compromised by the presence of colinearity (Hair et al., 2022). The variance inflation factor is a standard measure for assessing collinearity, with VIF values less than 5 being the commonly recognized threshold. If the values reach this threshold, multicollinearity occurs, which may result in confused model outputs. As demonstrated in Table 6, all associated constructs in this investigation had VIF values that were much lower than the recommended criterion of 5. As a result, the structural model's predictor variables do not exhibit significant multicollinearity. Following the reduction of collinearity, the anticipated correlations between the latent variables were assessed.

Table 3. Factor Loadings

Variable	Indicator	Loadings	
		Initial Measurement Model	Revised Measurement Model
Attitude	A1	0.828	0.828
	A2	0.856	0.856
	A3	0.704	0.704
	A4	0.743	0.743
Waste bank utilization intention	I1	0.946	0.946
	I2	0.923	0.923
	I3	0.883	0.883
	I4	0.912	0.912
Environmental knowledge	KE1	0.903	0.903
	KE2	0.854	0.854
	KE3	0.865	0.865
Waste bank knowledge	KWB1	0.817	0.817
	KWB2	0.894	0.894
	KWB3	0.914	0.914
	KWB4	0.915	0.915
Perceived behavioral control	PBC1	0.860	0.860
	PBC2	0.738	0.738
	PBC3	0.786	0.786
	PBC4	0.862	0.862
Subjective norms	SN1	0.840	0.835
	SN2	0.655	Deleted
	SN3	0.885	0.926
	SN4	0.884	0.932
	SN5	0.520	Deleted

Table 4. Cronbach's Alpha, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variable	Cronbach's alpha		CR (rho a)		AVE	
	Initial	Revised	Initial	Revised	Initial	Revised
	Measurement Model	Measurement Model	Measurement Model	Measurement Model	Measurement Model	Measurement Model
Attitude	0.797	0.797	0.831	0.831	0.617	0.617
Waste bank utilization intention	0.936	0.936	0.937	0.938	0.840	0.840
Environmental knowledge	0.846	0.846	0.851	0.851	0.764	0.764
Waste bank knowledge	0.908	0.908	0.908	0.908	0.785	0.785
Perceived behavioral control	0.829	0.829	0.845	0.845	0.661	0.661
Subjective norms	0.827	0.880	0.886	0.890	0.594	0.808

Table 5. Heterotrait-Monotrait Ratio (HTMT)

	HTMT of the Initial Measurement Model	HTMT of the Revised Measurement Model
Waste bank utilization intention <-> Attitude	0.790	0.790
Environmental knowledge <-> Attitude	0.751	0.751
Environmental knowledge <-> Waste bank utilization intention	0.602	0.602
Waste bank knowledge <-> Attitude	0.674	0.674
Waste bank knowledge <-> Waste bank utilization intention	0.749	0.749
Waste bank knowledge <-> Environmental knowledge	0.564	0.564
Perceived behavioral control <-> Attitude	0.797	0.797
Perceived behavioral control <-> Waste bank utilization intention	0.794	0.794
Perceived behavioral control <-> Environmental knowledge	0.443	0.443
Perceived behavioral control <-> Waste bank knowledge	0.721	0.721
Subjective norms <-> Attitude	0.654	0.761
Subjective norms <-> Waste bank utilization intention	0.740	0.762
Subjective norms <-> Environmental knowledge	0.429	0.521
Subjective norms <-> Waste bank knowledge	0.706	0.729
Subjective norms <-> Perceived behavioral control	0.733	0.780

Table 6. Variance Inflation Factor (VIF)

	VIF
Attitude -> Waste bank utilization intention	2.194
Environmental knowledge -> Attitude	1.329
Waste bank knowledge -> Attitude	1.329
Perceived behavioral control -> Waste bank utilization intention	2.242
Subjective norms -> Waste bank utilization intention	2.162

Table 7. Significance of Path Coefficient

	Hypotheses	Path Coef.	t-Statistics	P-Values	Conclusions
H1	Attitude -> Waste bank utilization intention	0.353	3.681	0.000	Supported
H2	Subjective norms -> Waste bank utilization intention	0.264	2.260	0.024	Supported
H3	Perceived behavioral control -> Waste bank utilization intention	0.288	3.823	0.000	Supported
H4	Waste bank knowledge -> Attitude	0.392	5.134	0.000	Supported
H5	Environmental knowledge -> Attitude	0.426	6.072	0.000	Supported

For the path coefficient analysis, Hair et al. (2022) have recommended bootstrapping through resampling the dataset with 5,000 subsamples. This facilitates the assessment of the significance and strength of correlations among constructs, enabling a precise estimation of standard errors and significance levels, particularly in the presence of deviations from a normal distribution. The bootstrapping results presented in Table 7 indicate that the hypothesized structural relationships are statistically significant, although their significance levels vary. Specifically, H2 is statistically significant at the 5% level ($p = 0.024$), while the other hypothesized relationships are significant at the 1% level. P-values reported as 0.000 are presented as $p < 0.001$. The path coefficient values in the structural relationships range from 0.264 to 0.426, indicating a positive and significant effect of

each independent variable on its respective dependent variable.

The coefficient of determination (R^2) evaluates a structural model's capacity to predict changes in the dependent variable by predictor variables. It represents the proportion of variance in the dependent variable that can be explained by the independent variables. (Hair et al., 2022). Based on the calculation results, which can be seen in Table 8, the R^2 values of the dependent variables "waste bank utilization intention" and "attitude" are 0.643 and 0.501, respectively. This indicates that the structural model can explain 64.3% of the variation in behavioral intention and 50.1% of the variation in attitude. The R^2 values of between 0.50 and 0.75 suggest that the predictive power of the structural model is at a moderate level (Hair et al., 2022).

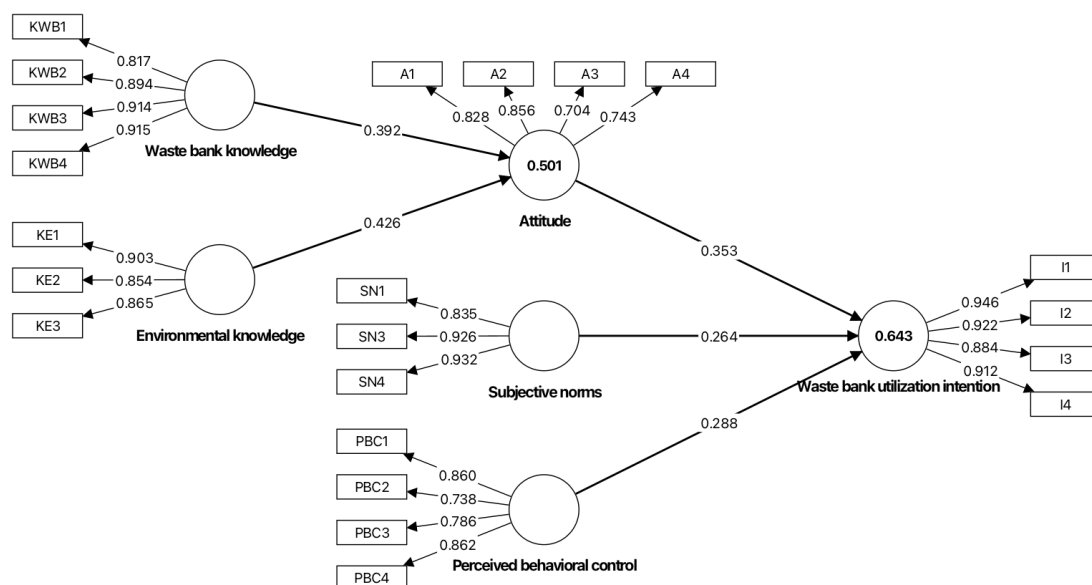


Figure 2. Summary of Measurement Model and Structural Model Testing Results

Table 8. Values of R²

Endogenous Variables	R-Squared	Adjusted R-Squared
Attitude	0.501	0.496
Waste bank utilization intention	0.643	0.636

The practical relevance of the structural model can be evaluated by assessing the effect size (f^2) values, which measure the extent to which each predictor variable has an effect on the dependent variable within the model (Hair et al., 2022). The f^2 values shown in Table 9 indicate that all predictor variables have statistically and practically significant impacts on the dependent variables. Attitude has a moderate practical influence on the waste bank utilization intention, demonstrating its importance in shaping behavioral intention. Meanwhile, perceived behavioral control and subjective norm have a minor but considerable practical effect on the desire to use a waste bank.

Table 9. Values of f^2

Relationship	f^2	Effect Size
Attitude -> Waste bank utilization intention	0.159	Medium
Environmental knowledge -> Attitude	0.274	Medium
Waste bank knowledge -> Attitude	0.232	Medium
Perceived behavioral control -> Waste bank utilization intention	0.103	Small
Subjective norms -> Waste bank utilization intention	0.090	Small

Furthermore, the evaluation results also demonstrate that both environmental knowledge and waste bank knowledge have a moderate practical impact, significantly promoting a positive attitude. These data indicate that despite their statistical significance, the practical impacts of all variables

differ in magnitude, with attitude being the most potent determinant of intention.

Figure 2 presents an overview of the model testing results. The research shows that community knowledge of both waste banks and the environment significantly influence people's positive attitude toward waste banks, which in turn becomes the main rationale behind their intention to utilize waste banks. Subjective norms and perceived behavioral control, albeit not as much as attitude, also increase the waste bank utilization intention.

4.2. Discussion

The results of this study are consistent with the TPB, which claims that three elements determine behavioral intention: attitude, subjective norms, and perceived behavioral control. This suggests that all parts of TPB have a favorable effect on waste bank utilization intention. Furthermore, the findings lend credence to the SOR framework, which holds that attitudes toward waste banks, as judged inside an individual or organism, are impacted by external knowledge that serves as a stimulus for the attitude.

Of the three determinants, attitude influences waste bank utilization intention the most, with an effect size of 0.159 (a moderate practical impact). This indicates that individuals' intention to utilize the waste bank is more strongly associated with their evaluation of waste bank utilization than with subjective norms and perceived behavioral control. One possible explanation is that waste bank utilization can be considered a voluntary pro-environmental behavior, for which individuals' personal evaluations of the behavior may play an important role in forming waste bank utilization intention. This interpretation is consistent with Lin et al. (2017), who found that attitude was the strongest predictor of behavioral intention for a voluntary pro-environmental program. Thus, a favorable evaluation of waste bank utilization may play a more prominent role in shaping waste

bank utilization intention than subjective norms or perceived behavioral control. These findings confirm those of previous studies by He et al. (2021) and Raghu and Rodrigues (2022) that attitudes have a greater influence on waste sorting behavior compared to subjective norms and perceived behavioral control. Other studies, such as Astuti and Linarti (2020), Gunawan and Ansyori (2023), Sekito et al. (2020), Annashr et al. (2024) and Ulhasanah et al. (2025), also reached a similar conclusion that attitude exerts the greatest influence compared to other determinants. Therefore, in the PIK area, the relatively stronger influence of attitude may reflect the importance of individuals' personal evaluations in forming their waste bank utilization intention.

The second determinant of the intention to participate in the waste bank program is subjective norms, which have a significant but small effect with an effect size of 0.09. This indicates that individuals are less likely to take into account the expectations of their closest social circle, such as family members and neighbors, when determining whether or not to utilize the waste bank. Although support from family members, neighbors, or community leaders may influence individual intention, the relatively small effect indicates that subjective norms are not the principal determinant of intention in this study. These findings are consistent with those of Raghu and Rodrigues (2022) and Sweety et al. (2024), who concluded that subjective norms have an inconsiderable positive influence on environmental behavior, particularly among students and female groups in urban areas. Similarly, studies by He et al. (2021) and Putri et al. (2024) have shown that subjective norms have no significant influence on behavior related to willingness to pay for municipal solid waste management or waste sorting procedures in urban settings. The differences in these findings indicate that the role of subjective norms may vary across waste-management contexts.

Perceived behavioral control, the final TPB determinant influencing waste bank utilization intention, also has a significant impact with a small effect size of 0.1. This suggests that individuals' perceptions of ease or difficulty in involvement do not predominantly influence behavioral intention. Rather, perceived behavioral control has a smaller contribution to intention than attitude in this study. This finding aligns with the results of a study by He et al. (2021), who concluded that perceived behavioral control has a significant effect on waste management behavior. Likewise, Saleh et al. (2024) and Wahfiuddin and Riyanto (2024) have demonstrated that the impression of an individual's ability to engage with waste banks positively influences the level of participation. Nonetheless, the magnitude of its influence varies depending on the situation. Raghu and Rodrigues (2022) also regarded perceived behavioral control as the factor with the minimal impact compared to attitude and subjective norms.

Furthermore, the results of this study reveal that individuals' understanding of both the waste bank system and the environment has a significant influence on their views about waste banks. In this study, the two distinct types of knowledge exhibit a moderate degree of practical influence, with effect sizes greater than 0.15. An individual's comprehension of the function and benefits of waste banks, along with their awareness of the detrimental effects of waste on the environment, correlates positively with their attitude toward waste management initiatives. This suggests that educating the general public with knowledge and information about waste banks and environmental issues may support the development of a more positive attitude toward waste bank. Providing information through appropriate communication channels may therefore be relevant to increasing understanding of waste bank operations and environmental aspects of waste management. These findings are in line with those of Raghu and Rodrigues (2022) and Sweety et al. (2024), who have found a significant positive relationship between environmental knowledge and attitude in the context of solid waste management operations.

The results of this study provide several practical recommendations for policymakers, waste bank administrators, and community groups in the PIK area. First, efforts to enhance public understanding of the ecological impact of improper waste management, as well as the benefits of waste banks, are highly recommended as strategic steps to raise public awareness of the importance of environmentally friendly waste management. This effort can be made by disseminating information through various means, such as using social media platforms, socializing at community events, or collaborating with local community leaders. Second, establishing waste banks in strategic places that are easily accessible to the public and providing flexible operational schedules may help reduce potential barriers to waste bank utilization. Additionally, the use of technology by waste bank operators, such as mobile applications for registration, scheduling, or tracking incentives, may provide greater convenience for waste bank utilization and potentially support perceived behavioral control. Third, increasing social influence through the involvement of community leaders or social networks may strengthen subjective norms and support waste bank utilization intention.

Theoretically, this study contributes to the growing body of literature on sustainable behavior by providing empirical support for the integration of the TPB and the SOR framework. The findings indicate that environmental knowledge and waste bank knowledge significantly affect attitudes, thereby supporting the role of knowledge as a stimulus in the SOR framework. This integration illustrates how attitude can link knowledge-related factors to behavioral intention. This study extends previous research on pro-environmental behavior by examining waste bank utilization intention in the PIK

area of North Jakarta, thereby providing empirical evidence on the application of TPB-SOR integration in an urban waste-management context in a developing country.

5. CONCLUSION

This study examines the factors influencing waste bank utilization intention in the PIK area of North Jakarta by combining the TPB with the SOR framework. The findings indicate that attitude, subjective norms, and perceived behavioral control significantly influence waste bank utilization intention, with attitude serving as the strongest predictor. Attitude toward waste bank utilization is significantly and positively influenced by both environmental knowledge and waste bank knowledge. The model proposed in this study explains 64.3% of the variation in waste bank utilization intention and 50.1% of the variation in attitude, highlighting the importance of knowledge and favorable attitudes in supporting waste bank utilization intention in the PIK area.

Notwithstanding the broader perspective on community behavior toward waste bank utilization provided by this study, several limitations should be acknowledged. First, the cross-sectional design captures environmental knowledge, waste bank knowledge, attitude, subjective norms, perceived behavioral control, and waste bank utilization intention at a single point in time. Although this design allows the relationships among these constructs to be examined, it does not capture how these relationships may develop over time. The effects of the determinants on waste bank utilization intention may not occur simultaneously, and therefore the temporal sequence between changes in the determinants and subsequent changes in intention cannot be established. Second, all constructs were measured using self-reported questionnaire responses collected from the same respondents, which may introduce common-method and response bias, including the possibility of socially desirable responses. Third, the use of non-probability purposive sampling and recruitment through community channels may limit the representativeness and generalizability of the findings. Fourth, this study was conducted in a single urban setting, specifically the PIK area of North Jakarta, which may limit the applicability of the findings to other geographical and socio-cultural contexts. Fifth, the study examined waste bank utilization intention rather than actual waste bank utilization, and therefore does not address the potential intention-behavior gap. Further research is therefore needed to investigate how intentions translate into actual utilization behavior. For example, longitudinal studies are recommended to investigate how prolonged educational interventions influence waste bank utilization intention and actual utilization over time. A comparative analysis between cities can be performed to identify socio-cultural and infrastructural elements that influence the

relationship between TPB and SOR constructs. Furthermore, case studies that link survey data on intention with actual waste disposal records can validate the intention-behavior relationship and enhance the practical significance of the research in green waste management. Although the measurement items were based on established instruments and underwent pre-testing, formal expert assessment of the adapted questionnaire was not conducted. Future studies could further assess the content validity of the adapted measures through expert evaluation.

REFERENCES

- Abus, N. A. A., Suriadi, A., Lubis, T., Abus, A. A., and Abus, A. F. (2024). Waste Bank Management as An Alternative Community-based Waste Management Strategy in Langsa City, Aceh Province. *IOP Conf. Series: Earth and Environmental Science*, 1375 (012007). <https://doi.org/10.1088/1755-1315/1375/1/012007>
- Adinata, K. H., and Maradona, A. F. (2025). Social Marketing Strategy of The Deep Waste Bank Increasing Community Participation in Denpasar City. *Journal Eduvest*, 5(5), 5151-5164. <https://doi.org/10.59188/eduvest.v5i5.51144>
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Anjani, A. D., Budiaman, B., and Hidayat, A. N. (2024). Environmental Care Behavior through Waste Bank (Study at Teratai Waste Bank Pondok Pucung Sub-district, Pondok Aren District, South Tangerang City). *Advances in Social Humanities Research*, 2(5), 721-730. <https://doi.org/10.46799/adv.v2i5.238>
- Annashr, N. N., Muharry, A., Yogaswara, D., and Khoerunisa, N. (2024). The Determinant Factors of Community Involvement in Becoming a Customer of the Waste Bank in Tamanjaya Village, Tamansari District, Indonesia. *Jurnal Ilmu Lingkungan*, 22(3), 743-755. <https://doi.org/10.14710/jil.22.3.743-755>
- Asih, A. M. S., and Nadira, W. F. (2021). An Agent-Based Model of Waste Bank's Adoption Strategy. *Proceedings of the First Central American and Caribbean International Conference on Industrial Engineering and Operations Management*, 2-9.
- Astuti, R. D., and Linarti, U. (2020). Model Perilaku Partisipasi Warga di Bank Sampah (Studi Kasus di Bantul, DIY). *Jurnal Optimasi Sistem Industri* 19(1), 50-58. <https://doi.org/10.25077/josi.v19.n1.p50-58.2020>
- Budiarto, A., Clarke, B., and Ross, K. (2025). Overview of Waste Bank Application in Indonesian Regencies. *Waste Management & Research*, 43(3), 306-321. <https://doi.org/10.1177/0734242X24124269>
- Diana, R., Martianto, D., Baliwati, Y. F., Sukandar, D., and Hendriadi, A. (2022). Household Food Waste Policy: A Literature Review. *Journal of Environmental Health*, 14(4), 218-228. <https://doi.org/10.20473/jkl.v14i4.2022.218-228>
- DLH. (2025). *Bang Doel Canangkan 1 RW 1 Bank Sampah*. Dinas Lingkungan Hidup Provinsi DKI Jakarta. Retrieved August 2, 2025 from <https://lingkunganhidup.jakarta.go.id/detail-artikel/bang-doel-canangkan-1-rw-1-bank-sampah>

- Emmanouil, C., E., C.-C. S., Kyzas, G. Z., and Kungolos, A. (2024). Application of the Theory of Planned Behavior to Predict Waste Source Separation. *Science of The Total Environment*, 956(December 2024), 177356. <https://doi.org/10.1016/j.scitotenv.2024.177356>
- Fornell, C., and Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50. <https://doi.org/10.2307/3151312>
- Gadiraju, T. (2016). *Investigating the Determinants of Recycling Behavior in Youth by Using Theory of Planned Behavior* [Graduate Theses and Dissertation, University of South Florida Scholar Commons]. Florida. <http://scholarcommons.usf.edu/etd/6085>
- Gunawan, M. A., and Ansyori, M. M. (2023). Factors Affecting Community Participation In The Waste Bank Program In The City of Semarang. *Jurnal Ekonomi*, 12(3), 2197-2207.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., and Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*. Springer.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., and Sartedt, M. (2022). *A Premier on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. (Third Edition ed.). Sage Publication.
- Hassan, N., and Rosli, N. S. (2022). Knowledge, Attitude and Practice on Waste Management Among University Students in Malaysia. *Malaysian Journal of Tropical Geography*, 48(2), 1-15.
- He, J., Yu, Z., and Fukuda, H. (2021). Extended Theory of Planned Behavior for Predicting the Willingness to Pay for Municipal Solid Waste Management in Beijing. *Sustainability*, 13, 13902. <https://doi.org/10.3390/su132413902>
- Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling. *Journal of the Academy of Marketing Science*, 43, 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hochreiter, V., Benedetto, C., and Loesch, M. (2023). The Stimulus-Organism-Response (S-O-R) Paradigm as a Guiding Principle in Environmental Psychology: Comparison of its Usage in Consumer Behavior and Organizational Culture and Leadership Theory. *Journal of Entrepreneurship and Business Development*, 3(1), 7-16. 10.18775/jebd.2806-8661.2021.31.5001
- Indrawati, I., Widarmanti, T., Ramantoko, G., Pillai, S. K. B., and Rachmawati, I. (2024). Towards a Unified Model of Planned Obsolescence and Innovation Adoption in Consumer Behavior: A Literature Review and Conceptual Proposition using the Stimulus-Organism-Response Framework. *Management and Production Engineering Review*, 15(2), 25-41. 10.24425/MPER.2024.151128
- Jeong, J., Kim, D., Li, X., Li, Q., Choi, I., and Kim, J. (2022). An Empirical Investigation of Personalized Recommendation and Reward Effect on Customer Behavior: A Stimulus-Organism-Response (SOR) Model Perspective. *Sustainability*, 14, 15369. <https://doi.org/10.3390/su142215369>
- Juliana, N., Lada, S., Chekima, B., and Adis, A. A. (2022). Exploring Determinants Shaping Recycling Behavior Using an Extended Theory of Planned Behavior Model: An Empirical Study of Households in Sabah, Malaysia. *Sustainability*, 14(8), 4628. <https://doi.org/10.3390/su14084628>
- KLHK. (2024a). *Capaian Kinerja Pengelolaan Sampah*. Ministry of Environment and Forestry Republic of Indonesia. Retrieved June 17, 2024 from <https://sipsn.menlhk.go.id/sipsn/public/data/capaian>
- KLHK. (2024b). *Statistik dan Peta Sebaran*. Ministry of Environment and Forestry Republic of Indonesia. Retrieved June 27, 2024 from <https://simba.menlhk.go.id/portal/#peta>
- Lin, S.-C., Nadlifatin, R., Amna, A. R., Persada, S. F., and Razif, M. (2017). Investigating Citizen Behavior Intention on Mandatory and Voluntary Pro-Environmental Programs Through A Pro-Environmental Planned Behavior Model. *Sustainability*, 9(7), 1289. <https://doi.org/10.3390/su9071289>
- Liu, Z., and Yang, J. Z. (2022). Predicting Recycling Behavior in New York State: An Integrated Model. *Environmental Management* (70), 1023-1037. <https://doi.org/10.1007/s00267-022-01708-6>
- Lou, T., Wang, D., Chen, H., and Niu, D. (2021). Different Perceptions of Belief: Predicting Household Solid Waste Separation Behavior of Urban and Rural Residents in China. *Sustainability*, 12(18), 1-17. <https://doi.org/10.3390/su12187778>
- Maghfiroh, M. F. N., Muqimuddin, M., Sartika, W., Red, A. A. N. P., Abdallah, B. N., Hutahaean, G. A., and Apriani, R. A. (2024). Analysis of Waste Separation Drivers in Urban Centers Using the Theory of Planned Behavior and the Norm Activation Model. *Indonesian Journal of Computing, Engineering, and Design*, 6(1), 42-57. <https://doi.org/10.35806/ijoced.v6i1.392>
- Marpaung, S. S. M., Ariswara, K., Rahmila, Y. I., Faubiany, V., Yulianti, M., Setiawan, M., Halwany, W., Putra, H. S., Octoyuda, E., and Hartati, B. R. (2025). A Case Study of Waste Bank Implementation in an Elementary School in Bolang Sub-district, Demak Regency. *Journal of Environmental Health*, 17(3), 277-286. <https://doi.org/10.20473/ijkl.v17i3.2025.277-286>
- Meidiana, C., Sekito, T., and Sasongko, W. (2021). Determining Factors of Community Participation in Waste Bank. *IOP Conf. Ser.: Earth Environ. , 940*(012085). <https://doi.org/10.1088/1755-1315/940/1/012085>
- Pan, J., and Liu, P. (2024). Exploring Waste Separation Using An Extended Theory of Planned Behavior: A Comparison between Adults and children. *Frontiers in Psychology*, 15, 1-11. <https://doi.org/10.3389/fpsyg.2024.1337969>
- Pavlov, P. I. (2010). Conditioned Reflexes: An Investigation of the Physiological activity of the Cerebral Cortex. *Annals of Neurosciences*, 17(3), 136-141. <https://doi.org/10.5214/ans.0972-7531.1017309>
- Phillips, A. W. (2017). Proper Applications for Surveys as a Study Methodology. *Western Journal of Emergency Medicine*, 18(1), 8-11. <https://doi.org/10.5811/westjem.2016.11.32000>
- Putri, R. C., Karuniassa, M., and Wahyono, S. (2024). Behavioral Intention of Domestic Organic Waste Segregation in Urban Communities (Case Study: Depok City, Indonesia). *Journal of Natural Resources and Environmental Management* 14(1), 92-100. <http://dx.doi.org/10.29244/jpsl.14.1.92>
- Raghu, S. J., and Rodrigues, L. L. R. (2022). Solid Waste Management Behavior among the Student Community: Integrating Environmental Knowledge and Situational Factors into the Theories of Planned

Wibisono, Y. Y., Sitorus, H. M., dan Christiana, F. (2026). Extending the Theory of Planned Behavior to Predict Waste Bank Utilization Intention in Pantai Indah Kapuk. *Jurnal Ilmu Lingkungan*, 24(4), 917-929, doi:10.14710/jil.24.4.917-929

- Behavior and Value Belief Norm. *Journal of Environmental Planning and Management*, 65(10), 1842-1874. <https://doi.org/10.1080/09640568.2021.1949969>
- Rauf, A. U. (2024). Electronic Waste Problem in Developing Nations: Mismanagement, Health Implication, and Circular Economy Opportunities. *Journal of Environmental Health*, 16(1), 18-31. <https://doi.org/10.20473/jkl.v16i1.2024.18-31>
- Saleh, M., Alfiah, N., Susilawaty, A., Ikhtiar, M., and Gafur, A. (2024). The Determinants of Rural Community Participation in Waste Bank: An Approach Using the Theory of Planned Behavior. *Al-Sihah: The Public Health Science Journal*, 16(1), 51-59. <https://doi.org/10.24252/al-sihah.v16i1.47909>
- Sasana, H., Wijayanti, D. L., Nurcahyanto, H., and Novitaningtyas, I. (2022). Analysis of Village Community Recycle Participation Behavior to Maintain Environmental Quality. Empirical Evidence in Waste Banks in Indonesia. *Journal of Environmental Management and Toursim*, 13(5), 1416 - 1424. [https://doi.org/10.14505/jemt.v13.5\(61\).17](https://doi.org/10.14505/jemt.v13.5(61).17)
- Sekito, T., Matsumaya, A., Prayogo, T. B., and Dote, Y. (2020). Factors Influencing the Period of Participation in a Waste Bank system in Malang City, Indonesia. *Journal of Material Cycles and Waste Management* 22(5), 1614. <https://doi.org/10.1007/s10163-020-01049-8>
- Sweety, J. B., Mahmud, A., Mahmud, I., Hossainm, A., and K., S. P. (2024). Solid Waste Separation among Women in Dhaka Households: An Extended TPB Perspective. *Journal of Sustainability Science and Management* 19(12), 31-57. <http://doi.org/10.46754/jssm.2024.12.003>
- Ulhasanah, N., Suhardono, S., Lee, C. H., Faza, A. S., Zahir, A., and Suryawan, I. W. K. (2025). Modelling Participation in Waste Bank Initiatives at Public Transport Hubs to Advance Circular economy Development. *Discover Sustainability*, 6(153). <https://doi.org/10.1007/s43621-025-00940-4>
- UNEP. (2024). *Global Waste Management Outlook 2024: Beyond an age of waste – Turning rubbish into a resource*. United Nations Environment Programme <https://wedocs.unep.org/20.500.11822/44939>
- Venkatesh, V., and Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studie. *Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Wahfiuddin, M. H., and Riyanto, R. (2024). Partisipasi Rumah Tangga dalam Program Bank Sampah: Studi Kasus di Kota Depok. *Jurnal Ilmu Lingkungan*, 22(2), 464-471. <https://doi.org/10.14710/jil.22.2.464-471>
- Xu, B. X., Liu, Z., and Rustam, A. (2023). Application of Extended Theory of Planned Behavior to Explore Household Pharmaceutical Waste Recycling Intentions: A Case Study of China. *Journal of Material Cycles and Waste Management*, 25, 2870-2886. <https://doi.org/10.1007/s10163-023-01721-9>