

## A STUDY OF SUSTAINABLE WASTE MANAGEMENT USING THEORY OF PLANNED BEHAVIOUR IN TRADITIONAL AGRICULTURAL MARKETS

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### Article history:

Received  
15 September 2022

Revised  
17 October 2022

Accepted  
21 November 2022

Available online  
31 March 2023

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**Abstract:** The waste management of agricultural commodities in traditional markets need serious attention as they remain because agricultural commodities usually pollute the streets and public spaces. This had a detrimental impact on both public health and traditional market image. By using the perspective of the Theory of Planned Behavior (TPB), the study was conducted to empirically examine the effects of attitudes, subjective norms, and perceived behavioral control (PBC) on the intention and behavior of separating waste in traditional markets. The research was conducted in a quantitative design. The sampling technique used was simple random sampling. A total of 210 agricultural commodity traders in traditional markets in Semarang was taken as sample in this study. The data was analyzed by using Structural Equation Modeling (SEM) with SmartPLS software. The results showed that attitudes, subjective norms, and PBC had significant effects on increasing intention in separating waste, which in turn would imply increasing the behavior in separating waste. The findings also report the mediating role of intention in strengthening the TPB constructs on behavior. This study emphasized the importance of establishing sustainable waste management and the connection between the behavior of waste management and to the adoption of a circular economy to make a more strategic impact to society and economy.

**Keywords:** theory of planned behavior, agribusiness, waste management, traditional markets

**Abstrak:** Pengelolaan limbah komoditas pertanian di pasar tradisional perlu mendapat perhatian serius karena masih banyaknya sisa komoditas jualan yang mencemari jalan dan ruang publik. Hal ini berdampak buruk bagi kesehatan masyarakat dan citra pasar tradisional. Dengan menggunakan perspektif Theory of Planned Behavior (TPB), penelitian dilakukan untuk menguji secara empiris pengaruh sikap, norma subyektif, dan perceived behavioral control (PBC) terhadap niat dan perilaku memilah sampah di pasar tradisional. Penelitian dilakukan dengan desain kuantitatif. Teknik pengambilan sampel yang digunakan adalah simple random sampling. Sebanyak 210 pedagang komoditas pertanian di pasar tradisional di Semarang menjadi sampel dalam studi ini. Data dianalisis dengan menggunakan Structural Equation Modeling (SEM) dengan perangkat lunak SmartPLS. Hasil penelitian menunjukkan bahwa sikap, norma subyektif, dan PBC berpengaruh signifikan terhadap peningkatan niat memilah sampah yang selanjutnya berimplikasi pada peningkatan perilaku memilah sampah. Temuan juga melaporkan peran mediasi niat dalam memperkuat konstruksi TPB pada perilaku. Studi ini menekankan pentingnya membangun pengelolaan sampah yang berkelanjutan dan hubungan antara perilaku pengelolaan sampah dengan penerapan ekonomi sirkular untuk memberikan dampak yang lebih strategis bagi masyarakat dan ekonomi.

**Kata kunci:** teori perilaku terencana, agribisnis, pengelolaan sampah, pasar tradisional

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## INTRODUCTION

People are familiar with the traditional market. This market provided ease of transactions for low and middle income of society in exchanging goods they had with the goods they wanted. Their locations made them wide-in-use by the common public to fulfill people's daily lives, both in urban and rural areas. Along with the rapid economic and technological advances today, the role of the traditional market was challenged by its close image regarding cleanliness, digital payment, and management. Contemporary economic and technological development is one important aspect of the entry of investors in the modern market sector. The existence of modern markets, such as hypermarkets, supermarkets, malls, and mini-markets, is rapidly growing. Modern markets offer shopping practicality, product cleanliness, and convenience of the place. The digital era has also given rise to online markets or marketplaces as a place to shop with digital payments. This has become a challenge for the activities and economic development of small people such as micro, small, and medium enterprises and traditional market traders. With their important function, traditional markets need to increase cleanliness and waste management to attract not only low-class customers but also middle-class customers and millennial generations. However, traditional markets in Indonesia are closely associated with unfavorable perceptions in terms of cleanliness and waste management. As a result, there is a detrimental image of traditional markets in the public. On the other hand, the role of traditional markets is very important in providing cheap and fresh foods. Traditional markets driven by small-scale traders and consumers play an important role in driving the people's economy. Supported by agile and efficient supply chain lines, traditional markets become instrumental intermediaries in bringing agricultural commodities from farmers to end consumers (Vetter et al. 2019; Slamet et al. 2017). Waste is closely related to public health and specifically in the traditional market. Its management was crucial in building a positive image of traditional markets in general public perception (Gaeta et al. 2021).

Previous research confirmed that behavior is predicted by norms, moral obligations, situational factors, individual awareness, and knowledge (Heidari et al. 2018). The theory that is widely used to predict behavior is the Theory of Planned Behavior (TPB), which was

first coined by Ajzen (1985). In particular, in predicting the intention and behavior of waste management, this theory assumes that there are constructs that shape behavior, namely subjective norms, attitudes, and perceived behavioral control (PBC). In TPB, these three constructs influence the formation of intentions to carry out certain behaviors (Heidari et al. 2018). There are several studies that investigate extended TPB constructs in waste management. Loan et al. (2017), Pakpour et al. (2014) Ghani et al. (2013) showed that the TPB constructs of moral norms, attitudes towards waste separation, and perceived behavioral control have a significant effect on the behavior of separating waste in public spaces such as municipal waste separation. Furthermore, Pakpour et al. (2014) showed that extended TPB constructs with predictors of moral obligation, attitude, perceived behavioral control, intention, action planning, and past recycling behavior had a significant effect on the behavior of separating waste. This showed that behavioral constructs are relevant to be investigated using the Theory of Planned Behavior (TPB).

Previous research theoretically demonstrated contradicting results related to the relationship between the TPB constructs of subjective norms, attitudes towards waste management, and perceived behavioral control on the intention of separating wastes and behavior. While several studies (Loan et al. 2017; Zhang et al. 2015; Chan & Bishop, 2013; Nguyen et al. 2018) have found subjective norm as a determinant of the intention to separate wastes and behavior, Mohamad et al. (2022), Shaharudin et al. (2020), Wan et al. (2017) and Botetzagias et al. (2015) found that subjective norms had no significant effect on the intention to recycle waste. In the relationship between attitude towards intention and behavior of separating waste, Malik et al. (2015), Tonglet et al. (2004), Rhodes et al. (2015), and Ramayah et al. (2012) found a significant effect, whereas Davis et al. (2006), Mohamad et al. (2022) found an insignificant relationship between attitude and intention to recycle waste. The findings demonstrated by previous research also reported that perceived behavioral control had a significant influence on the intention to separate waste (Wang et al. 2018; Nigbur et al. 2010; Nguyen et al. 2018; Botetzagias et al. 2015), while Mohamad et al. (2022) found no significant result obtained from the relationship.

Practically speaking, another issue that makes the waste problem in traditional Indonesian markets even more complicated is the increasing standard of living of the people with the growth of the middle class who prefer to shop at modern markets (Purwanti et al. 2022). This showed that the management of traditional markets has been less successful in attracting the middle class and the millennial generation to make traditional markets their shopping choice. Education and socialization on hygiene and the involvement of stakeholders in the independent management of waste in the market have so far not been running optimally (Pandebesie et al. 2019). This is because the waste segregation system has not been implemented properly by stakeholders in traditional markets. To resolve this issue, there are many options, either through public policy or community self-help (Yenny, 2015). Of the many sorting options, the most recommended choice is through recycle, reuse, reduce (3R) which emphasizes public awareness. To gain this awareness, aspects regarding behavioral interventions, and consideration of factors related to intentions need more attention. This is because behavioral aspects will lead positively with interventions, norms and controls that are continuously affirmed. Here, this study practically examines TPB factors that are widely considered relevant to aspects of the intention and behavior to do something.

As to fill these research gaps, this study aims to empirically examine the effects of subjective norms, attitudes towards waste management, and perceived behavioral control on intention of separating wastes and behavior with the extended TPB constructs in traditional market traders in Semarang City. Specifically, the purpose of this study is to analyze the effect of attitude, subjective norms, and perceived behavioral control on the intention to separate waste on the behavior to separate waste. In addition, it also examines the direct effect of intention to separate waste and on behavior to separate waste and the mediating effect of intention to separate waste in bridging the relationship between the three independent variables on behavior to separate waste. The theoretical contribution of this research is to provide empirical evidence of TPB factors in waste management in traditional market environments. In addition, the expected practical contribution of this research is to be taken into consideration in behavioral interventions for separating agricultural commodity waste in traditional markets. This research investigated the extended TPB constructs on waste management in traditional markets in Semarang. Data from Bappeda

(2020) showed that in 2019, the total waste of 1276 tons/day was dominated by households at 29.05%, markets at 25.83%, and other sources at 31.2%. With reference to this percentage, there were around 330 tons of waste originating from markets per day in Semarang City. As one of the main sources of municipal waste, the role of traders and suppliers was crucial in urban waste management.

## METHODS

This research was conducted using a quantitative approach. This study uses the help of a questionnaire instrument which is carried out cross-sectionally or at a certain time. The scale used is 5-point Likert scale, ranging from totally disagree (1) to totally agree (5). The sampling technique used is purposive sampling which conducts research on a group of subjects with certain characteristics or is considered closely related to previously known population characteristics. The location of this research was in Ngaliyan, Peterongan, Johar, and Bulu traditional markets in Semarang. The sampling technique used was simple random sampling. The respondents in this study were 210 people. This number was taken with reference to Loehlin (1998), who stated that the minimum sample size required to reduce bias in all types of SEM estimates is 200. The criteria used for sample selection were traders, both retailers and wholesalers, as well as suppliers selling agricultural commodities in traditional markets in Semarang City. This research practically took a different focus from previous research, which mostly analyzed household waste separation.

Attitude is largely defined as a disposition to respond favorably or unfavorably to objects, people, institutions, or events (Ajzen, 2005). Attitude towards behavior are determined by beliefs about the consequences of the behavior (Ajzen, 2005). This belief is referred to as behavioral belief that connects behavior to certain consequences of the emergence of the behavior or to several other attributes, such as the advantages/disadvantages that may arise when performing the behavior. Attitude is a state of the mind that is prepared to respond to an object, which is organized through experience. For instance, attitude toward cleanliness play a major role in shaping behavior and business performance sustainability (Permana et al. 2015; Nupus & Ichwanudin, 2021). From the TPB perspective, an individual's attitude towards a behavior

is obtained from the aspects of behavioral beliefs and outcome evaluation. Meanwhile, outcome evaluation is an individual's assessment of the consequences or results of the behavior displayed. Individuals who believe that displaying a behavior will produce positive consequences will have a great tendency to perform the behavior (Ajzen, 2005). Previous research has revealed a significant effect of attitude on the intention and behavior of separating waste (Malik et al. 2015; Tonglet et al. 2004; Rhodes et al. 2015; Ramayah et al. 2012).

A subjective norm is a person's perception of social pressure to show or not show behavior with certain considerations (Fishbein & Ajzen, 2005). Subjective norms are also defined as perceptions of social pressure to carry out certain behaviors (Feldman, 1995). Subjective norms are the product of individual perceptions of the beliefs of others (Vaughan & Hogg, 2005). So, subjective norms are norms that are obtained by a person from the perception of the extent to which a sufficiently influential social environment will support or not carry out the behavior. Ajzen (2005)'s TPB stated that subjective norms are determined by the existence of normative beliefs and the desire to follow a certain individual or group when he performs the behavior or referents. Subjective norm as a person's perception of social pressure to show or not show behavior with certain considerations appears against the background of normative belief that other people or certain groups (which affect the individual) will agree or disagree if the individual performs the behavior (Ajzen & Fishbein, 1975; Ajzen, 2005). It is not only determined by agreeing/disagreeing with other people or groups that influence the individual, but subjective norms are also influenced by a motivation to comply, namely the strength/power that other people or groups have over individuals, and how far individuals will follow referent individual or groups and other people's opinions. Previous research has revealed the significant effect of subjective norm on sustainable waste management (Heidari et al. 2018; Loan et al. 2017; Zhang et al. 2015; Chan & Bishop, 2013; Nguyen et al. 2018).

Perceived behavioral control (PBC) is a feeling of self-efficacy or a person's ability to demonstrate the desired behavior (Ajzen, 2005). PBC is considered as a factor in the perception of a person's ability to control the behavior to be carried out. PBC is determined by a person's beliefs, called control beliefs, to control

the factors that inhibit or encourage behavior. PBC is a feeling of self-efficacy or a person's ability to demonstrate the desired behavior (Ajzen, 2005). Two components that makeup PBC are individual beliefs about the presence of controls that function as supporters or barriers to individual behavior (control beliefs) and individual perceptions of how strong these controls are to influence themselves in acting (perceived power). Previous research found that PBC has a significant effect on the intention and behavior in separating waste management (Zhang et al. 2015; Wang et al. 2018; Nigbur et al. 2010; Nguyen et al. 2018; Botetzagias et al. 2015).

In the theory of planned behavior, the intention is the possibility that a person will display behavior and is a function of three basic determinants, which are personal attitude, subjective norms, and PBC (Ajzen & Fishbein, 1975). The intentions can be used to predict how strong an individual's desire to perform a behavior is and how much effort is planned or made by an individual to carry out the behavior. This formed intention will remain a behavioral disposition until there is the right time and opportunity. The intention is a good predictor of how individuals behave in the future because the intention is an individual's intention to do something in the future. The intention is a function of three factors, namely personal factors, social factors, and control factors (Ajzen, 2005). Personal factors are individual attitudes towards behavior in the form of positive or negative evaluations of the behavior to be displayed. Social factors are termed subjective norms which include individual perceptions of social pressure to display or not display behavior. The latter is a controlling factor called perceived behavioral control, which is the individual's feeling that it was easy or difficult to display certain behaviors. Choi et al. (2004) found the significant relationship between attitudes, subjective norms, and PBC and intention and behavior from the TPB perspective. Ramayah et al. (2019), Nguyen et al. (2018), Wan et al. (2017), and Zhang et al. (2015) also found the significant effects of attitudes, subjective norms, and perceived behavioral control on the intention to separate waste. Accordingly, the following hypotheses were proposed:

- H1: Attitude has a significant effect on the intention of separating agricultural commodity waste.
- H2: Attitude has a significant effect on the behavior of separating agricultural commodity waste

- H3: Subjective norm has a significant effect on the intention of separating agricultural commodity waste.
- H4: Subjective norm has a significant effect on the behavior of separating agricultural commodity waste.
- H5: Perceived behavioral control has a significant effect on the intention of separating agricultural commodity waste.
- H6: Perceived behavioral control has a significant effect on the behavior of separating agricultural commodity waste.
- H7: Intention has a significant effect on the behavior of separating agricultural commodity waste.
- H8: Intention mediates the relationship between attitude, subjective norms, perceived behavioral control, and the behavior of separating agricultural commodity waste.

The model that was used in this study refers to the research model used by Ajzen (2005) on Theory of Planned Behavior. Based on the description of the literature review and previous research, the framework of thought developed in this study is described in Figure 1. Furthermore, the operational items for each variable as well as the results of validity testing, are shown in Table 1. The findings showed that all items in this study are declared valid because they have a factor loading value > 0.6.

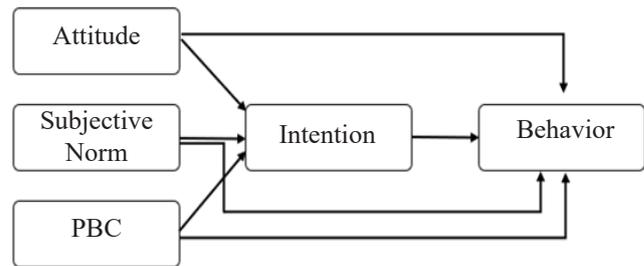


Figure 1. Theoretical Model

Table 1. TPB constructs

Constructs	Code	Loading	Indicator
Attitude	X11	0.825	I'm interested in waste separation in traditional markets
	X12	0.911	In my opinion, waste separation in traditional markets is an interesting activity
	X13	0.902	I think waste separation in traditional markets is very important
	X14	0.904	Waste separation in traditional markets needs to be promoted
Subjective Norm	X21	0.939	People who are important to me (friends, family, and groups) expect me to do some sorting of trash
	X22	0.932	The community we live in expects their member to separate their trash
	X23	0.772	In the traditional market, I will be criticized if I don't do waste sorting
	X24	0.801	My community criticizes me if I don't do waste sorting
PBC	X31	0.965	The decision to separate the trash is up to me
	X32	0.975	Waste separation in traditional markets is an easy task for me
	X33	0.894	I separate my waste, regardless of whether the traditional market manager has an incentive for it or not
	X34	0.966	If I want, I can separate the waste at the traditional market
Intention	Y11	0.806	I plan to separate the trash regularly at the traditional market if there is a trash box
	Y12	0.850	I plan to participate in waste separation in traditional markets, if the authorities provide convenient and readily available recycling containers
	Y13	0.919	I want to separate waste if I know the benefits and importance of sorting waste
	Y14	0.955	I plan to separate waste in traditional markets if the authorities provide appropriate services for the collection of recyclable materials
Behavior	Y21	0.903	I regularly recycle other pieces of trash and put them in the recycling bin in the traditional market
	Y22	0.933	I always try to produce less waste in traditional markets
	Y23	0.827	I regularly recycle recyclable trash materials and use them for other useful purposes
	Y24	0.833	I once recycled part of the trash
	Y25	0.953	I often recycle the trash in traditional markets

Statistical testing in this study was carried out with the help of the Statistical Structural Equation Modeling (SEM) tool based on Partial Least Square version 3. The validity test was used to measure the validity of the inductor items in a questionnaire. The validity test in this study uses convergent validity by looking at the minimum value of the factor loading indicator for each indicator item, 0.6. The next reliability test is by looking at Cronbach's Alpha value and the Composite Reliability value used to measure internal consistency in the data reliability test, as well as the AVE (Average Variance Extracted) value as the average percentage of variance scores extracted from a set of latent variables estimated through loading standardize. For this test, the study also used the limits of Composite Reliability > 0.7 and Cronbach's Alpha > 0.6, and AVE value > 0.5.

## RESULTS

The results showed the reliability testing as shown in Table 2. The values for Cronbach's Alpha are > 0.6, Composite reliability value > 0.7, and AVE value > 0.5. The criteria used is that all variables used in this study should meet the requirements for the next analysis of hypothesis testing. The results showed the composite reliability values of all variables above 0.70, Cronbach's Alpha > 0.6, and AVE > 0.5. Thus, it can be said that this variable meets high composite reliability.

In addition, Table 3 shows the influence model of attitude, subjective norm, and PBC on intention showing an R-Square value of 0.750. This is able to explain the variable of the intention construct explained by the attitude variable, subjective norm, and 75% PBC. Meanwhile, 25% is explained by other variables not examined in this study. For the influence model of attitude, subjective norm, PBC, and intention to behavior, the R-Square value is 0.836. This is able to explain the behavior variable explained by the variables of attitude, subjective norm, PBC, and

intention of 83.6%. Meanwhile, 12.4% is explained by other variables not examined in this study.

The values used as a basis for accepting a hypothesis are the significance level (p-value) of <0.05 or 5% significance value (p-value < 0.05) and T-statistics > 1.96. The results as shown in Table 3 showed that attitude has a significant influence on behavior, indicated by original sample of 0.206, T-statistics of 4.247, and p-value of 0.000. This means that the hypothesis stating that attitude of agricultural product traders has a significant effect on intention of separating waste was empirically supported. Thus, the first hypothesis is accepted. Moreover, the findings showed a positive and significant effect on attitude toward intention. This was reflected by the original sample of 0.137, T-statistics of 4.268, and p-value of 0.000. This means that the hypothesis stating that attitude has a significant effect on behavior of separating waste was empirically supported. Thus, the second hypothesis was accepted.

The next analysis is to examine the effect of subjective norms on the intention and behavior toward sustainable waste management. Regarding the hypothesis stating that the subjective norm of agricultural product traders has a significant effect on the intention of separating waste, the results found a significant effect in that relationship. This was shown by the original sample of 0.138, T-statistics of 2.369, and p-value of 0.018. This means that the higher the subjective norm, the higher the intention of separating waste. Thus, the third hypothesis was accepted. The output also showed a positive and significant effect of subjective norm on the behavior toward sustainable waste management, indicated by the values of the original sample of 0.245, T-statistics of 5.417, and p-value of 0.000. This means that the higher the subjective norm, the higher the behavior toward sustainable waste management. Thus, the fourth hypothesis stating the subjective norm of agricultural product traders has a significant effect on behavior of separating waste, was accepted.

Table 2. Composite Reliability and Cronbach's Alpha

	Composite Reliability	Cronbach's Alpha	AVE
Attitude	0.936	0.913	0.785
Subjective Norm	0.921	0.906	0.747
PBC	0.974	0.964	0.904
Intention	0.935	0.906	0.782
Behavior	0.951	0.935	0.794

Statistical output also showed the effects of perceived behavioral control. The fifth hypothesis stated that PBC has a significant effect on the intention of separating waste. The findings found a significant effect of PBC on the intention to separate waste, indicated by the original sample of 0.623, T-statistics of 9.006, and *p*-value of 0.000. This means that the hypothesis was accepted. The empirical examination also showed a positive and significant effect of PBC on the behavior of separating waste. This was indicated by the values of the original sample of 0.146, T-statistics of 2.420, and *p*-value of 0.016. As the *p*-value was smaller than 0.05, the hypothesis stating that PBC has a significant effect on behavior in separating waste was empirically proved. Thus, the sixth hypothesis was accepted.

Lastly, the hypothesis testing also showed that intention had a significant effect on the behavior. The output showed the values of the original sample of 0.506, T-statistics of 8.927, and *p*-value of 0.000. As the significant level was below 0.05, the hypothesis stating that intention of separating waste of agricultural product traders has a significant effect on behavior of separating waste was empirically supported. Thus, the seventh hypothesis was accepted.

To examine the mediating role of the intervening variable of intention, the intervening variable test in this study was carried out by bootstrapping the research model by looking at the value of T-Statistics and *p*-value on the specific indirect effects test so that it

can be seen how influential/significant the intervening variable is between the independent variables on the dependent variable as an indirect relationship. Table 4 shows that intention is able to mediate the effects of attitude, subjective norm, and PBC on behavior. This is indicated by the value of significance level of <0.05. Thus, the eighth hypothesis was accepted. The findings empirically prove the ability of intention to strengthen the positive effects of attitude, subjective norm, and PBC on behavior in separating waste.

The results indicate that this attitude has a positive and significant effect on the intention and the behavior of separating waste in traditional markets. The findings confirmed that the hypothesis examining the mediating role of intention was empirically proven. Thus, the eighth hypothesis was accepted. In this regard, attitude is referred to as the disposition to respond favorably or unfavorably to objects, people, institutions or events. The more positive an individual's attitude toward a behavior, the greater individual intention to perform that behavior. It is motivated by the behavioral belief's component, namely the belief in the consequences of the appearance of the behavior and the evaluation of these consequences. The results of this study are in accordance with Botetzagias et al. (2015), Loan et al. (2017), Zhang et al. (2015), and Nguyen et al. (2018) stating that individuals who believe that by displaying a behavior will be more likely to produce positive consequences and to have a great tendency to perform the behavior in separating waste.

Table 3. Path coefficients results

	Original Sample	T-Statistics	P-values
Attitude → Intention	0.206	4.247	0.000
Attitude → Behavior	0.137	4.268	0.000
Subjective Norm → Intention	0.138	2.369	0.018
Subjective Norm → Behavior	0.245	5.417	0.000
PBC → Intention	0.623	9.006	0.000
PBC → Behavior	0.146	2.420	0.016
Intention → Behavior	0.506	8.927	0.000
R Square:			
Behavior	0.836		
Intention	0.750		

Table 4. Indirect effect

Hypotheses	Original Sample	T-Statistics	p-values
Attitude → Intention → Behavior	0.104	3.857	0.000
Subjective Norm → Intention → Behavior	0.070	2.390	0.017
PBC → Intention → Behavior	0.315	6.087	0.000

The results of this study indicate that subjective norms have a positive and significant effect on the intention and behavior of separating waste in traditional markets. The results of this study are also supported by empirical evidence from the research of Botetzagias et al. (2015), Loan et al. (2017), Zhang et al. (2015), Chan & Bishop (2013), Nguyen et al. (2018). This means that a person's perception of social pressure will be adjusted with certain considerations. The more social pressures felt by individuals to do something, the greater the individual's intentions will be.

The results of this study indicate that PBC has a positive and significant effect on the intention of separating waste and the behavior of separating waste in traditional markets. PBC is a person's ability to show the desired behavior. The more convenience an individual has to perform a behavior, the higher the intention will be. It is motivated by the component of control beliefs, namely beliefs about the existence of factors that can encourage or inhibit the emergence of behavior and perceptions of the strength of these factors. The results of this study are in accordance with the theory of planned behavior in separating waste examined in previous research (Graham-Rowe et al. 2015; Aziz, 2019; Maichum et al. 2016; Rahmawati et al. 2018). The theory of planned behavior states that intention is the possibility that a person will display behavior and is a function of three basic predictors, namely attitude, subjective norm, and PBC (Aziz, 2019). In regard to traditional market traders, sustainable waste management is more likely to improve the intention to purchase from urban consumers. The findings are consistent with previous research results in examining the theory of planned behavior in green management (Teng et al. 2015; Han, 2015; Tanwari, 2020; Maichum et al. 2016; Mughal, 2019; Ramadhan & Najib, 2020).

Overall, the results of this study indicate that the traditional market trader's intention to separate waste has a positive and significant effect on the behavior of sustainable waste management in traditional markets. This confirms the role of intention as assumed to be a motivational factor that influences behavior. In this regard, the intention is an indication of how hard a person tries or how much effort is made to perform a behavior (Setiawati et al. 2018; Sadma, 2021). As a general rule, the more a person's intention to engage in a behavior, the more likely he is to actually perform the

behavior. The intention to behave can become actual behavior only if the behavior is under the control of the individual concerned.

### **Managerial Implications**

This finding has managerial implications for the need for sustainable practices in processing municipal waste originating from traditional markets. The findings indicate that the extended TPB constructs significantly predict the intentions and behavior of traders and suppliers of agricultural commodities in a traditional markets to separate and manage waste. From a management point of view, this holds promise for increasing the awareness and knowledge of all stakeholders in the market by developing a series of continued education, active public campaigns, and behavior change interventions in areas where waste separation is still not optimal. In line with Loan (2017), hygiene education is instrumental in increasing individuals' moral obligation to separate waste and adapt their behavior to that of referent opinions, individuals, or groups. The findings also emphasize the importance of environmental education and environmental preservation campaigns to increase public trust in the municipal authorities responsible for waste management in traditional markets. In addition, the Theory of Planned Behavior states that individual behavior is more likely to change by evaluating the possible outcomes that can be obtained in the future. Practically, this encourages traditional market authorities and municipal waste authorities to develop campaigns that lead to losses or gains as a result of waste management. This kind of campaign is to encourage behavior change and links the relationship between maintaining cleanliness and future outcome in business performance.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

The results found that attitudes, subjective norms, and perceptions of behavioral control had a significant effect on intentions in separating agricultural commodity waste. The findings also show that these three TPB constructs significantly predict behavior in separating waste in traditional markets in Semarang

City. Empirical analysis to examine mediating tests also showed that intention is able to strengthen the influences of the extended TPB constructs of attitudes, subjective norms, and perceptions of behavioral control on behavior in separating agricultural commodity waste.

Theoretically, these findings contribute to affirming the important role of the TPB constructs in the formation of intentions and expected behavioral interventions in separating waste. Another theoretically important contribution from this finding is strengthening the TPB literature on waste management in small and medium-scale businesses in traditional markets. Practically, the findings encourage the importance of sustainable and environmentally friendly waste management to optimize a circular economy for farmers, small and medium scale businesses, and final consumers related to buying and selling of agricultural commodities. In general, the process of a circular economy is to preserve the use of resources as long as possible and extract the maximum value from their use through various recovery and regeneration processes to increase the life of products and services. Sustainable waste management is useful not only in processing existing waste but also in reducing waste through reducing, reusing, and recycling which maximizes product life and reduces resources consumed.

### Recommendations

This study emphasized the importance of establishing clear behavior and sustainable waste management among traders and suppliers in traditional markets in order to encourage the growth of the agribusiness sector and support supply chain lines from farmers to consumers. In addition, the findings also highlight the important role of small-scale traders in the supply chain of agricultural commodities in bridging the relationship between farmers, suppliers, and consumers of agricultural commodities in urban areas. The findings recommend the importance of strong authority to intervene in behavior by imposing sanctions on violators, providing rewards, and using effective communication and information channels about the benefits of separating waste. In addition, the authorities are also proactive in providing mechanisms, education, and knowledge of waste management and responsive in providing the necessary facilities and resources to change behavior in waste management.

However, this research is still considered to have weaknesses because this study only uses a population of traders, suppliers, and managers in traditional markets and uses a relatively small sample. In the future, it is possible to develop a study using research subjects with more diverse demographics and with a larger number of samples in various cities in Indonesia. Further research is also recommended to analyze the connection between the behavior of waste management and to the adoption of a circular economy in order to make a more strategic impact on society and the economy.

**FUNDING STATEMENT:** This research did not receive any specific grant from funding agencies in the public, commercial, or not - for - profit sectors.

**CONFLICTS OF INTEREST:** The authors declare no conflict of interest.

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