Willingness to participate analysis of urban waste management in West Sumatra, Indonesia

Idris Idris[*]; Dewi Zaini Putri; Zul Azhar; Joan Marta; Isra Yeni

Faculty of Economics, Universitas Negeri Padang, Indonesia

*To whom correspondence should be addressed. Email: idris_rara@fe.unp.ac.id

Abstract

Waste management shares the same purposes with the Sustainable Development Goals (SDGs) target in 2030. This program encourages all countries to substantially reduce waste through prevention, reduction, recycling, and reuse its waste so that the sustainability of development can be achieved. The success rate of sustainable waste management is largely determined by the participation and behavior of people, households, and citizens in managing their waste. This study analyzes socio-economic factors and the role of social capital in affecting households' willingness to participate in waste management in West Sumatra's urban areas. This study used National Socio-Economic Survey data in the Social Resilience module. The sample in this study is 1011 households spread across the urban areas of West Sumatra. Using logistic regression, this study found that per capita household expenditure, homeownership status, knowledge, and household involvement in mutual cooperation activities to clean up their environment significantly affect the probability of households participating in urban waste management. The relevant policy, such as implementing the 3R concept, namely reduce, reuse, and recycling is needed for the Sustainable Development Goals to be achieved.

Keywords: Sustainable Development Goals, Waste management, Willingness to participate

JEL Classification: Q50, Q53, Q56

INTRODUCTION

Waste is one of the environmental issues faced by many countries around the world. Increasing industry, population size, urbanization, and economic growth are factors that cause the emergence of waste in many countries (Dhokhikah & Trihadiningrum, 2012). The increasing number of people living in urban areas contributes to more waste (Ayvaz-Cavdaroglu et al., 2019). In addition to this, demographic and economic factors also have a positive effect on increasing waste in households (Ayvaz-Cavdaroglu et al., 2019)

Higher-income is known to be a factor of households tend to consume food in large quantities. Households create so much rubbish and leftover. The lifestyle of the community also causes an increase in waste. Shopping's habit, which relies on plastic groceries provided by producers, has led to an increase in the production of plastic

waste (Di Talia et al., 2019; Widyaningsih et al., 2015). Furthermore, household leftovers, fresh vegetables, and fruits are the categories of waste most frequently discarded by the community. This condition shows that the higher incomes, the higher amount of waste being produced. In contrast to other studies, it explains no relationship between income and increased waste growth. It is due to the tendency of people with high incomes to spend more at discounted prices to increase consumption at a discount period (Koivupuro et al., 2012).

Increasing the volume of waste by households certainly has a bad impact on the environment and health. So regulation is needed to solve this problem, such as Sustainable Development Goals (SDGs) targets developed by United Nations. Many studies show that one of the ways to achieve Sustainable Development Goals (SDGs) is through prevention, reduction, reuse, and recycling (Andersson & Stage, 2018; Bassi et al., 2017; Das et al., 2019; Gambella et al., 2019; Kaplan Mintz et al., 2019). The research found by (Bergeron 2016; Fuldauer et al., 2019; Guérin et al., 2018; Margallo et al., 2019; Warunasinghe & Yapa, 2016) said that waste sorting is one strategy where households can prevent, reduce, reuse, and recycle its waste. In sorting waste, households should separate, reuse, and recycle its waste to reduce the volume of waste.

(Union & All, 2019) said that there is no effective way in waste management besides reducing, reusing, and recycling the waste. People who habit of sorting waste can reuse and recycle the organic and inorganic waste, which are economically valuable. This recycling process will have a positive impact on both the economy and also environment. However, research done by (Bassi et al., 2017) shows that there is only a little significant effect between countries recycling their waste on the environment.

Waste sorting carried out by households is based on their knowledge about the social capital of waste management (Vassanadumrongdee & Kittipongvises, 2018). Households that are concern about the environment will tend to do waste sorting. So household's knowledge and awareness about handling waste problems are very important to be applied by the community (Talia et al., 2019). Research conducted by (Vassanadumrongdee & Kittipongvises, 2018) explains that knowledge about the dangers of waste has a positive influence on people's tendencies in sorting waste. The higher the social capital knowledge owned by the community, the higher the desire of the community to sort waste.

Economic and demographic factors are also the determining factors for society in processing household waste. The research described by (Shabanali et al., 2019) states that economic and demographic factors affect household waste management. These factors can be seen from the variables of age, education, and income. On the other hand, the same study (Chung & Yeung, 2019) explained that gender, age, type of house, and income influence individuals in managing waste. Another study (Wang et al., 2018) also explains that education and income significantly affect household waste sorting behavior. Households that have higher income tend to collect and sort waste.

The Indonesian Government supports Sustainable Development Goals (SDGs) through Law number 18 of 2008 and Presidential Decree number 97 of 2017. The government targets a 30% reduction in waste and 70% handling by 2025. Furthermore, other regulations can be seen from the Regulation of the Minister of Environment of the Republic of Indonesia number 13 of 2012 concerning waste processing through waste banks. However, implementation of waste management requires participation from the community, collaboration between the government and the community, the private sector, non-government organizations (NGOs), and the role of fellow community

members in the neighborhood. In this case, the forefront of processing household waste is the community itself.

The Central Bureau of the Statistics Republic of Indonesia records the four dimensions of environment indifferent behavior index, and the waste management dimension has the largest index, 0.72. It shows that Indonesia's indifference to waste management is high (Ketidakpedulian, 2018). West Sumatra is one of the provinces that has a high level of ignorance towards waste management. The community environmental indifference index of West Sumatra towards waste management is 0.74 higher than the national index (BPS, 2018). It explains that community awareness and participation in carrying out household waste management is still low.

Previous research studies have focused more on participation, willingness to pay, and willingness to manage waste. Still, only a few consider the willingness of households to participate (WTPP) in household waste management in urban areas. So this study aims to analyze the effect of socio-economic factors and the role of social capital on household willingness to participate (WTPP) in household waste management in urban areas of West Sumatra.

LITERATURE REVIEW

Waste management by households is caused by several factors such as social capital, economics, and demographics. Social capital is an important factor in influencing households to carry out waste management. In the context of the urban economy, social capital investment is seen as individual decision-making. Furthermore, social capital investment indicates the opportunity cost of time allocation (Rupasingha et al., 2006). The same argument holds that individuals face a trade-off when deciding to build social capital. To increase the value of social capital, a frequency of interaction between individuals is required. Therefore, spatial centrality is positively related to the formation of social capital. Individuals closer to the city center tend to develop stronger social networks (Patacchini et al., 2015). This framework underlines the importance of spatial proximity in influencing individual decisions in accumulating social capital because it directly affects the cost of investing in social capital (Wood et al., 2008).

Social capital which shows good interaction or networking between social individuals as able to increase knowledge about environment. Through mutual cooperation and community service, we can find this social capital to become a liaison for the community in increasing knowledge about the importance of sorting waste. Household knowledge about the environment significantly affects sorting household waste (Han et al., 2019). The knowledge and awareness owned by the community will help them manage the waste they produce (Shabanali et al., 2019). Other studies also explain that public awareness and knowledge of the use of waste can reduce household waste production (Talia et al., 2019).

Socio-economic and demographic factors affect the desire of the community to process household waste. Some researchers explain that economic factors seen from income have a significant and positive effect on public awareness of the importance of disposing of waste (Dwivedy & Mittal, 2013; Paut Kusturica et al., 2020). Research conducted by (Warunasinghe & Yapa, 2016) stated that socio-economic factors influence the community's desire to manage waste effectively and efficiently. However, it is different from the research described by (Han et al., 2019), which states that income does not affect individual decisions to carry out waste management; even when income increases, the amount of waste also produced increases (Koivupuro et al., 2012).

The role of society in sorting waste can be seen from the results of a research survey (Warunasinghe & Yapa, 2016) which explains that 26% of households do not know about recycling, reuse & waste reduction (recycling, reuse & reduction). However, 96% of respondents agreed to cooperate & participate in the waste management program. However, when asked about their habits in waste management, as many as 48% of households did not separate their waste between organic and inorganic waste before dumping it into the bank waste, while only 26% of households did compost of waste (Warunasinghe & Yapa, 2016).

In line with this, cultural and habitual factors also influence household waste production. Whether people are accustomed to recycling or minimizing their waste in every household activity (Chung & Yeung, 2019), communities with a habit of recycling can take advantage of organic and inorganic waste with economic value. The community can reuse this recycling process because it will positively impact the environment when people recycle the waste it produces. Waste management with a recycling process provides clear environmental benefits when the waste is recycled, especially when it is converted into quality materials. However (Bassi et al., 2017) found that there is the little significant effect between countries recycling their waste and the environment

An area must have a strategy to prevent the use of plastic waste and encourage the reuse of waste generated by households. It can be achieved if the strategy established involves all levels of society. An increase in population leads to an increase in household consumption and waste (Fuldauer et al., 2019). So the authors need to research important factors that encourage people to participate in processing household waste.

METHOD

Data and Sample

This study is quantitative. The data used is secondary data that is cross-sectional from the National Socio-Economic Survey (SUSENAS) on Social Resilience Module in 2017. The sample chosen was households in the West Sumatra region. The total of households in urban and rural areas is 2,511 households. However, households that will be used in this study are households in urban areas, so that the total sample of urban areas used in this study is 1,011, where the percentage of households in urban areas is 40.26 percent of the total households in West Sumatra.

Empirical model

The logit model is used to analyze the effect of socio-economic factors and the role of social capital on the willingness of households to participate in waste management in urban West Sumatra. The estimation results of the logit model have a dichotomous or binary character. The main variable used in this study is the per capita income of the household. Meanwhile, the binary dependent variable is households willing to sort waste or do not sort the waste in the household. While willingness to participate in household waste management includes waste separation, recycling, and composting of waste.

$$\ln\left(\frac{P_i(Y_i=1)}{(1-P_i)(Y_i=1)}\right) = BX \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

where: willingness (W) = BX

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 V\_SosEko + \beta_2 V\_ModSos + e \quad \dots\dots\dots\dots\dots\dots\dots \quad (2)$$

118

Where: P is the probability of Y_i, $Y_i = 1$, if the respondent wants to participate (Willingness to Participate / WTPP) in waste management, $Y_i = 0$, others, β_0 is a constant, β_i is the coefficient of the independent variable; V_SosEko is a vector of household social and economic characteristics such as (household income, level of household education, number of household members, age of household head, and household head's level of knowledge regarding household waste processing methods while V_ModSos is a vector of characteristics of community social capital in the neighborhood where the household lives include mutual trust between residents, a sense of togetherness and a sense of concern among residents, the leadership of the RT head and e are error terms.

Based on Equation 2, the first difference of the equation can be seen in the following equation:

$$WTPP_i = \beta_0 + \beta_1 V\_SosEko + \beta_2 V\_ModSos + e \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Where: WTPP is Willingness to Participate, so in detail, it can be reduced to the following equation:

$$WTPP_i = \beta_0 + \beta_1\,HH_{Income} + \beta_2\,HH_{Size} + \beta_3 Sex_{KRT} + \beta_4\,Age_{KRT} + \beta_5\,D\_Workformal + \beta_6\,Edu_{KRT} + \beta_7\,Housestat + \beta_7\,Know_{envi} + \beta_8\,D\_goro + e \quad \dots\dots\dots\dots\dots\dots (4)$$

Equation 4 explains the value of the dummy dependent variable $Y = 1$ is a household that does waste sorting, while the variable $Y = 0$ is a household that does not sort household waste.

Operational definition of variables

The definition of each variable in Equation 4 can be explained in Table 1.

Table 1. Operational definition of variables

Variable	Symbol	Size	Information
Willingness to Participate	WTPP	1	Willing to participate
		0	Willing not to participate
Household characteristics vector			
Income per capita	pce_pctile		Per capita household expenditure category measured by a Likert scale
Household size	hhsize		Number of household members who live in the same house (people)
Head's gender	sex_krt		The sex of the head of the household
Age	age_krt		Age of Head of Household
Work status	Workformal	1	Work in the formal sector
		0	Work in Informal sector
Education	edu_krt2		Level education of household's head
Homeownership	housestat	1	Private house
		0	Rent house
Knowledge about environment	know_envi	1	Knowing about the household waste management
		0	Not Knowing about the household waste management
Community Service	d_goro	0	Do not participate in community service

Variable	Symbol	Size	Information
Participation		1	Participate in community service
Environmental Safety Conditions			Household environmental conditions based on the level of security
	d_soscap1	0	Don't worry about parking your vehicle outside your home (bicycle, motorbike, car)
		1	Worry about parking your vehicle outside your home (bicycle, motorbike, car)
	d_soscap2	0	Don't worry about leaving your house unoccupied
		1	Worry about leaving your house unoccupied
	d_soscap3	0	Not implementing the mandatory report for comer
		1	Implementing the mandatory report for comer

RESULTS AND DISCUSSION

Descriptive analysis

The number of observations in urban areas is 1010 observations. Of this total, 294 households did waste sorting, while 717 households did not sort their waste. This number illustrates that households still lack the desire to sort their waste

Furthermore, in Table 2, we can see the differences between households willing to do waste sorting in urban and rural areas. Households that always carry out waste processing are larger in urban areas than in rural areas. It is due to the awareness of people living in urban areas to sort their waste is greater than that of rural areas. Lifestyle in urban areas with a greater level of consumption results in more waste. It encourages urban communities to sort their waste (Shabanali et al., 2019) by 8.61 percent compared to rural areas that are only 6.67 percent. In addition, (Hoornweg & Bhada-Tata, 2012) explained that the increasing population growth in urban areas has resulted in an increase in waste in urban areas so that urban people are encouraged to sort its waste.

Table 2. Household habits of sorting waste

Household habits of sorting waste	Urban	Rural	Total
Always	8.61	6.67	7.45
Frequent	7.52	7.07	7.25
Sometimes	12.96	15.93	14.74
Never	70.92	70.33	70.57
Total	100	100	100

In this research, the variables used to see the probability of a household doing waste sorting is the income per capita, number of family members, sex of the head of the household, age of the head of the household, working in the formal sector, education of the head of the household, Homeownership, knowledge of the environment and participation of mutual cooperation.

Tabel 3. Descriptive statistic

Variable	Obs	Mean	Std.Dev.	Min	Max
Sorting waste	1011	0.290801	0.454357	0	1
pce_pctile	1011	2.998022	1.415612	1	5
hhsize	1011	4.007913	1.800972	1	13
sex_krt	1011	0.820969	0.383568	0	1
age_krt	1011	48.42038	13.08655	16	97
edu_krt2	1011	0.532146	0.499213	0	1
workformal	1011	0.345203	0.47567	0	1
housestat	1011	0.658754	0.474363	0	1
know_envi	1011	0.547972	0.49794	0	1
d_goro	1011	0.274975	0.446723	0	1
d_soscap1	1011	0.242334	0.428708	0	1
d_soscap2	1011	0.317507	0.465737	0	1
d_soscap3	1011	0.478734	0.499795	0	1

The independent variable used in this study is expenditure per capita as measured by a Likert scale with a minimum value of 1 and a maximum of 5. In addition, the largest number of household members in the household is 13 people, with the minimum number being 1 person. In the table above, as many as 82.09 percent of household heads are male, and the rest are female. In addition to this, the age of the head of the household and education is the most important variable in seeing the relationship to the probability of sorting waste.

The work status of the head of the household uses a dummy variable where the value of 0 is the head of the household who works in the informal sector and the value of 1 is the head of the household who works in the formal sector. The number of household heads who work in the formal sector is 349 observations and 662 observations who work in the informal sector. The next variable is home status. Home status variables are measured using dummy variables. Households that own private homes are 1, and households that don't personally own homes are 0.

Household knowledge variables regarding waste management were also used in this study. The measurement of this variable uses a dummy variable where the value is 1 if the household knows how to properly manage waste and 0 if the household does not know or does not care about waste management properly. Furthermore, the participation of households in mutual cooperation was also used in this study by using a dummy variable with a value of 1 if the household participates in mutual cooperation while has a value of 0 if the household does not participate in a mutual participation. From the observations, 278 observations participated in mutual cooperation in the neighborhood, while 733 observations did not do mutual cooperation. The last variable used in this study is the environmental safety conditions which are divided into three parts. The first part is the dummy variable of the desire to park the vehicle outside the house. The second part is the dummy variable of leaving the house unoccupied. The third part is the dummy variable that is obliged to report the arrival of guests or comers.

Willingness to participate analysis of household waste management

This study analyses the effect of socio-economic factors and the role of social capital in the community on the willingness of households to participate (WTPP) of household waste management in urban areas of West Sumatra. The results of the analysis using the Logit model can be explained using table 3 below.

Table 3. Willingness to Participate/WTP about waste management

Variable	Odds Ratio	Std.Err	z	P > z
pce_pctile (per capita expenditure)				
2	1.32	.32	1.15	0.251
3	1.53*	.37	1.75	0.080
4	1.83**	.46	2.37	0.018
5	2.07***	.56	2.69	0.007
Household member	1.03	.04	0.73	0.466
The sex of the head of the household	1.11	.22	0.52	0.606
Age of the head of household	.99	.00	-1.29	0.197
Education of household	.92	15	-0.47	0.635
Working in the formal sector	1.28	.20	1.57	0.117
Home status	2.35***	.41	4.83	0.000
The knowledge about the environment	1.46***	.21	2.60	0.009
Participation of mutual cooperation	1.65***	.25	3.22	0.001
Number of obs		1011		
Prob > chi2		61.79		
Pseudo R2		0.0000		
Log-likelihood		0.0507		

***Significant at α=1%,   **Significant at α=5%, *Significant at α=10%

The estimation result shows that the dummy variable for household category pce 3 has a significant and positive effect on the willingness of households to participate (WTPP) in household waste management in urban areas in West Sumatra. Based on the odds ratio, households at the 60 percent per capita expenditure group (pce 3) have a 1.53 times greater chance of carrying out waste management than the lowest 20 percent per capita expenditure group (the poorest). Suppose you look at the household expenditure group per capita. In that case, 80 percent (pce 4), and households with more than 20 percent per capita expenditure group (pce 5), also have a significant and positive influence on household waste management participation in urban areas of West Sumatra. The results of this study are in line with research conducted by (Han et al., 2019; Mukherji et al., 2016; Song et al., 2016; Triguero & Cuerva, 2016; Wang et al., 2018). They explained that income influences individual behavior to be willing to do waste sorting.

Furthermore (Dwivedy & Mittal, 2013; Paut Kusturica et al., 2020) also did the same research. He found that the higher the per capita expenditure in the household, the higher the probability of the household participating in processing waste, and then income has a significant and positive relationship with willingness to dispose of waste. However, the opposite was found by (Han et al., 2019), who stated that there was no significant correlation between income and willingness to manage waste. Waste sorting was used as a management category.

Households with high incomes tend to have a high level of knowledge and awareness of waste management. (Islam et al., 2016) found that the level of education or knowledge about waste management affects households in managing their waste. These results are also supported by research conducted by (Atinkut et al., 2020; Han et al., 2019; Song et al., 2016; Zhang & Zhao, 2019) which states that knowledge of the environment is a socio-economic factor that has an important influence on the public's willingness to participate in waste management. It is in line with the result of our study. Households that know the environment have a 1.46 times greater chance than households with less knowledge of the environment

Households who own a home have a 2.35 times greater chance of being willing to process waste than households contracting. It is in line with the research done by (Chung & Yeung, 2019), who found that households that own a house with private ownership are willing to tackle waste in the environment around where they live. Similar research results are also explained by (Afroz et al., 2013; Martínez-Peña et al., 2013; Song et al., 2016; Wang et al., 2018), households that have private homes have more influence on waste sorting compared to households living on a rent house

The last variable that has a significant and positive effect on household willingness to participate (Willingness to Participate / WTPP) in household waste management in urban areas of West Sumatra is the participation of mutual cooperation. Households that actively participate in mutual cooperation have a 1.65 times greater chance of processing household waste than households that rarely participate in community service work. The participation of household members in mutual cooperation encourages households to love the environment more and choose to manage waste. It is because mutual cooperation is one of the activities that can improve the cleanliness of the environment around the residence.
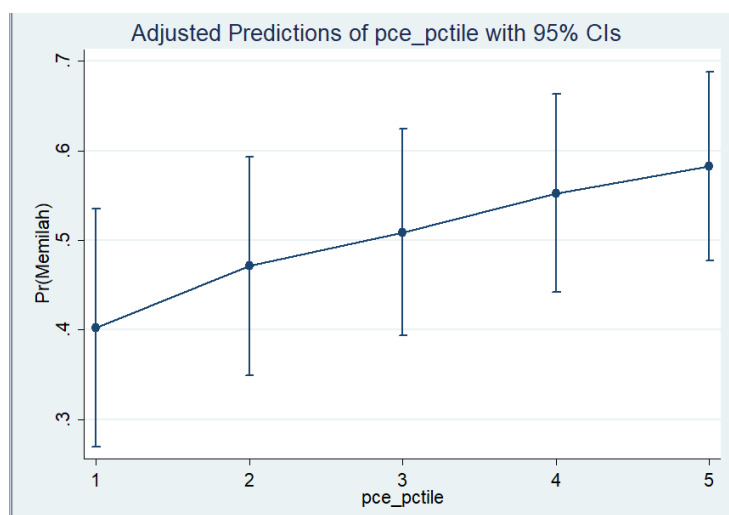

Figure 1. Adjusted Predictions of Expenditure per capita

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Economic activities by households produce waste (Barr, 2007). Then many countries include Indonesia, has tried to implement Sustainable Development Goals (SDGs) through prevention, reduction, reuse, and recycling (Andersson & Stage, 2018; Bassi et al., 2017; Das et al., 2019; Gambella et al., 2019; Kaplan Mintz et al., 2019). So this study aims to analyze the effect of socio-economic factors and the role of social capital on household willingness to participate (WTPP) in household waste management in urban areas of West Sumatra.

Based on the results of the research, it can be concluded as follows. First, an increase in per capita income in the household can increase the opportunity for households to be willing to sort household waste. The household group with a higher per capita income was more likely to sort household waste than the household group with a lower per capita income. Second, households with private homeownership status are willing to participate in sorting waste in their neighborhoods. Households with

private ownership status tend to stay in the neighborhood for a long time. Their chances of participating in managing household waste are higher than households who live in rented houses. Furthermore, households who own a house with a private status tend to want to have a cleaner environment to pay more attention to waste management.

Third, household knowledge about the environment increases household opportunities to sort household waste. Households who know the dangers of waste and are aware of the importance of environmental hygiene will manage household waste. So that by having good knowledge about the environment it will encourage a better environment in the future. The last, the participation of households in participating in community service activities in the neighborhood increases the opportunities for households to sort waste. Participating in mutual cooperation encourages households to love the environment more and choose to manage household waste.

Recommendations

The government and local communities are expected to encourage people to care for the environment by sorting household waste. One of the policy recommendations needed is implementing policies known as the 3R concept, namely reducing, reusing, and recycling. In addition, urban waste management policies also need to involve the community and agencies related to the environment. On the other hand, the local government also conducts evaluation and monitoring of the local community to promote love for the environment.

REFERENCES

Andersson, C., & Stage, J. (2018). Direct and indirect effects of waste management policies on household waste behaviour: The case of Sweden. *Waste Management*, *76*, 19–27. https://doi.org/10.1016/j.wasman.2018.03.038

Atinkut, H. B., Yan, T., Arega, Y., & Raza, M. H. (2020). Farmers' willingness-to-pay for eco-friendly agricultural waste management in Ethiopia: A contingent valuation. *Journal of Cleaner Production*, *261*, 121211. https://doi.org/10.1016/j.jclepro.2020.121211

Ayvaz-Cavdaroglu, N., Coban, A., & Firtina-Ertis, I. (2019). Municipal solid waste management via mathematical modeling: A case study in İstanbul, Turkey. *Journal of Environmental Management*, *244*, 362–369. https://doi.org/10.1016/j.jenvman.2019.05.065

Barr, S. (2007). Factors Influencing Environmental Attitudes and Behaviors: A U.K. Case Study of Household Waste Management. *Environment and Behavior*, 39(4), 435–473. https://doi.org/10.1177/0013916505283421

Bassi, S. A., Christensen, T. H., & Damgaard, A. (2017). Environmental performance of household waste management in Europe - An example of 7 countries. *Waste Management*, 69, 545-557. https://doi.org/10.1016/j.wasman.2017.07.042

Bergeron, F. C. (2016). Multi-method assessment of household waste management in Geneva regarding sorting and recycling. *Resources, Conservation and Recycling*, *115*, 50–62. https://doi.org/10.1016/j.resconrec.2016.08.022

BPS. (2018). *Statistik Lingkungan Hidup Indonesia*. Jakarta: BPS

BPS. (2018). *La*poran *Indeks Perilaku Ketidakpedulian Lingkungan Hidup Indonesia 2018*. Jakarta: BPS

Chung, W., & Yeung, I. M. H. (2019). Analysis of residents ' choice of waste charge methods and willingness to pay amount for solid waste management in Hong Kong. *Waste Management*, *96*, 136–148.

Das, S., Lee, S. H., Kumar, P., Kim, K. H., Lee, S. S., & Bhattacharya, S. S. (2019). Solid waste management: Scope and the challenge of sustainability. *Journal of*

Cleaner Production, *228*, 658–678. https://doi.org/10.1016/j.jclepro.2019.04.323

Dhokhikah, Y., & Trihadiningrum, Y. (2012). Solid Waste Management in Asian Developing Countries: Challenges and Opportunities. *J. Appl. Environ. Biol. Sci. Journal of Applied Environmental and Biological Sciences*, *2*(7), 329–335.

Di Talia, E., Simeone, M., & Scarpato, D. (2019). Consumer behaviour types in household food waste. *Journal of Cleaner Production*, *214*, 166–172. https://doi.org/10.1016/j.jclepro.2018.12.216

Dwivedy, M., & Mittal, R. K. (2013). Willingness of residents to participate in e-waste recycling in India. *Environmental Development*, *6*(1), 48–68. https://doi.org/10.1016/j.envdev.2013.03.001

Fuldauer, L. I., Ives, M. C., Adshead, D., Thacker, S., & Hall, J. W. (2019). Participatory planning of the future of waste management in small island developing states to deliver on the Sustainable Development Goals. *Journal of Cleaner Production*, *223*, 147–162. https://doi.org/10.1016/j.jclepro.2019.02.269

Gambella, C., Maggioni, F., & Vigo, D. (2019). A stochastic programming model for a tactical solid waste management problem. *European Journal of Operational Research*, *273*(2), 684–694. https://doi.org/10.1016/j.ejor.2018.08.005

Guérin, J. É., Paré, M. C., Lavoie, S., & Bourgeois, N. (2018). The importance of characterizing residual household waste at the local level: A case study of Saguenay, Quebec (Canada). *Waste Management*, *77*, 341–349. https://doi.org/10.1016/j.wasman.2018.04.019

Han, Z., Zeng, D., Li, Q., Cheng, C., Shi, G., & Mou, Z. (2019). Public willingness to pay and participate in domestic waste management in rural areas of China. *Resources, Conservation and Recycling*, *140*, 166–174. https://doi.org/10.1016/j.resconrec.2018.09.018

Islam, M. T., Abdullah, A. B., Shahir, S. A., Kalam, M. A., Masjuki, H. H., Shumon, R., & Rashid, M. H. (2016). A public survey on knowledge, awareness, attitude and willingness to pay for WEEE management: Case study in Bangladesh. *Journal of Cleaner Production*, *137*, 728–740.

Kaplan Mintz, K., Henn, L., Park, J., & Kurman, J. (2019). What predicts household waste management behaviors? Culture and type of behavior as moderators. *Resources, Conservation and Recycling*, *145*, 11–18. https://doi.org/10.1016/j.resconrec.2019.01.045

Koivupuro, H., Hartikainen, H., Silvennoinen, K., Katajajuuri, J., Heikintalo, N., Reinikainen, A., & Jalkanen, L. (2012). Influence of socio-demographical , behavioural and attitudinal factors on the amount of avoidable food. *International Journal of Consumer Studies*, *36(2)*, 183–191.

Margallo, M., Ziegler-Rodriguez, K., Vázquez-Rowe, I., Aldaco, R., Irabien, Á., & Kahhat, R. (2019). Enhancing waste management strategies in Latin America under a holistic environmental assessment perspective: A review for policy support. *Science of the Total Environment*, *689*, 1255–1275. https://doi.org/10.1016/j.scitotenv.2019.06.393

Mukherji, S. B., Sekiyama, M., Mino, T., & Chaturvedi, B. (2016). Resident knowledge and willingness to engage in waste management in Delhi, India. *Sustainability (Switzerland)*, *8*(10), 1–14. https://doi.org/10.3390/su8101065

Patacchini, E., Picard, P., & Zenou, Y. (2015). *Urban social structure, social capital and spatial proximity*. CEPR Discussion Paper No. DP10501.

Paut Kusturica, M., Golocorbin-Kon, S., Ostojic, T., Kresoja, M., Milovic, M., Horvat, O., Dugandzija, T., Davidovac, N., Vasic, A., & Tomas, A. (2020). Consumer willingness to pay for a pharmaceutical disposal program in Serbia: A double hurdle modeling approach. *Waste Management*, *104*, 246–253.

https://doi.org/10.1016/j.wasman.2020.01.029

Rupasingha, A., Goetz, S. J., & Freshwater, D. (2006). The production of social capital in US counties. *Journal of Socio-Economics*, *35*(1), 83–101. https://doi.org/10.1016/j.socec.2005.11.001

Shabanali, H., Aramyan, L. H., Sijtsema, S. J., & Alambaigi, A. (2019). Resources , Conservation & Recycling Determinants of household food waste behavior in Tehran city : A structural model. *Resources, Conservation & Recycling*, *143*(8), 154–166. https://doi.org/10.1016/j.resconrec.2018.12.033

Song, Q., Wang, Z., & Li, J. (2016). Residents' Attitudes and Willingness to Pay for Solid Waste Management in Macau. *Procedia Environmental Sciences*, *31*, 635–643. https://doi.org/10.1016/j.proenv.2016.02.116

Talia, E. Di, Simeone, M., & Scarpato, D. (2019). Consumer behaviour types in household food waste. *Journal of Cleaner Production*, 214, 166-172 https://doi.org/10.1016/j.jclepro.2018.12.216

Triguero, A. & Cuerva, M.C. (2016). Factors influencing willingness to accept different waste management policies: empirical evidence from the European Union *Journal of Cleaner Production, 138, 38-46*. https://doi.org/10.1016/j.jclepro.2016.05.119.

Union, E., & All, E. B. V. (2019). *Science of the Total Environment Waste problem in European Union and its in fl uence on waste management behaviours*. *667*, 86–93. https://doi.org/10.1016/j.scitotenv.2019.02.313

Vassanadumrongdee, S., & Kittipongvises, S. (2018). Factors influencing source separation intention and willingness to pay for improving waste management in Bangkok, Thailand. *Sustainable Environment Research*, *28*(2), 90–99. https://doi.org/10.1016/j.serj.2017.11.003

Wang, F., Cheng, Z., Reisner, A., & Liu, Y. (2018). Compliance with household solid waste management in rural villages in developing countries. *Journal of Cleaner Production*, *202*, 293–298. https://doi.org/10.1016/j.jclepro.2018.08.135

Warunasinghe, W. A. A. I., & Yapa, P. I. (2016). A survey on household solid waste management (SWM) with special reference to a peri-urban area (Kottawa) in Colombo. *Italian Oral Surgery*, *6*, 257–260. https://doi.org/10.1016/j.profoo.2016.02.038

Widyaningsih, N., Tjiptoherijanto, P., Widanarko, S., & Sse, F. (2015). Linkage model between sustainable consumption and household waste management. *Procedia Environmental Sciences*, *28*, 195–203. https://doi.org/10.1016/j.proenv.2015.07.026

Wood, L., Shannon, T., Bulsara, M., Pikora, T., McCormack, G., & Giles-Corti, B. (2008). The anatomy of the safe and social suburb: An exploratory study of the built environment, social capital and residents' perceptions of safety. *Health and Place*, *14*(1), 15–31. https://doi.org/10.1016/j.healthplace.2007.04.004

Zhang, Z., & Zhao, L. (2019). Voluntary monitoring of households in waste disposal: An application of the institutional analysis and development framework. *Resources, Conservation and Recycling*, *143*, 45–59. https://doi.org/10.1016/j.resconrec.2018.12.018