

DETERMINANTS OF DOMESTIC WASTE SEGREGATION IN RURAL SECTOR OF SRI LANKA: AN EMPIRICAL ANALYSIS

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ABSTRACT

Domestic waste in the rural sector in Sri Lanka is a significant problem since there is no proper mechanism to collect waste. Hence, domestic waste is disposed of improperly without being segregated. Therefore, this study aims to determine the factors that affect domestic waste segregation in the rural sector. Primary data collected from 500 households in four rural villages of Hakmana divisional secretariat division in Matara district were used to analyze the objective. Factor analysis and the Probit regression model were used to determine the factors that affect waste segregation. The results revealed that only 11 percent of households properly dispose of waste after segregation, while other households dispose of waste improperly, resulting in numerous adverse consequences. Factor analysis identified five factors: awareness, behaviour and attitudes, moral norms and responsibilities, situational factors, and trust in local authorities. The Probit model indicated that age, number of family members, and situational factors have a negative effect on waste segregation. In contrast, income, female decision-makers, education, land size, awareness, attitudes, norms and responsibilities, and trust in local authorities positively impact waste segregation. Provision of necessary facilities and intensive implementation of waste collection methods, awareness programmes and enhancing the knowledge on consequences and benefits of waste segregation are recommended policies that can be implemented. Implementation of recycling industries in the rural sector is also recommended.

KEYWORDS: Domestic Waste Segregation, Factor Analysis, Probit Model, Rural Sector, Sri Lanka

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1. INTRODUCTION

1.1 Background of the Study

Waste has become an enormous problem all over the world that is directly related to environmental, health, social, political, and economic problems. Global waste generation is, on average, 0.74 Kilograms per day by a person (Kaza et al., 2018). This amount varies according to the country, from 0.11 to 4.54 Kilograms (Kaza et al., 2018). Household waste significantly influences and exacerbates the waste problem, mainly because many countries lack an effective system for managing it. Inappropriate disposal methods, such as land filling and open burning, which are commonly used, contribute significantly to environmental damage. Worldwide over 2 billion tons of household waste dump yearly, and it is more than 60 tons of waste every second (<https://www.theworldcounts.com/challenges/planet-earth/waste/waste-from-households>). The waste problem becomes increasingly hazardous as the global population continues to grow. Household waste is estimated to grow by 70 percent, reaching 3.4 billion tons a year by 2050 (Kaza et al., 2018).

Solid waste has become a huge problem more in low-income countries than in high-income countries since only 4 percent of waste in low-income countries is recycled, while more than one-third of waste in high-income countries is recycled (Kaza et al., 2018). Waste is an unsolved problem in Sri Lanka also, which needs more attention from policymakers. Around 7500 MT of waste is generated per day in Sri Lanka. Per-person waste generation is also beyond the world's situation. On average, 0.4 to 1.0 Kilogram of waste is generated per person per day in Sri Lanka (<https://cleanupsrilanka.lk/status-of-waste-management-in-sri-lanka>).

The household sector generates various types of solid waste such as food and green, glass, metal, paper and cardboard, plastic, rubber and leather, wood, and e-waste. With increased income and changing lifestyles, household waste composition is changed by increasing non-biodegradable waste, including in the rural sector.

Domestic waste in the rural sector has become a vast problem in Sri Lanka in the absence of a proper mechanism to collect and manage it. Households usually dump waste on the side of streets, water streams, unused land, and the home garden without segregating. Unsegregated waste cannot be reused or recycled, creating environmental and health problems. Hence, waste segregation is an integral part of waste management. Waste segregation can be defined as grouping waste into different categories at the point of dumping or collection. Many researchers have analyzed waste management in various countries from different perspectives, including factors that affect waste segregation in the domestic sector. However, it is difficult to find research that especially focuses on factors that affect domestic waste segregation in the rural sector in Sri Lanka. Therefore, the research question examined in this study is: What are the factors influencing domestic waste segregation in the rural sector of Sri Lanka? Based on this research question, the objective of this study is to determine the factors that affect domestic waste segregation in the rural sector in Sri Lanka by focusing on socio-economic characteristics and behavioural patterns. Households are not a homogeneous group. Their attitudes and behaviour influence the environment in different ways. Identification of those differences in the environmental behaviour of the heterogeneous group is highly important to formulate policy. Therefore, the significance of this study is to provide fundamental insights for policymakers to implement effective policies to enhance waste management in the rural sector.

1.2 Literature Review

Waste segregation is the main and fundamental activity of waste management. Many researchers have analyzed waste segregation in many countries from different points of view and highlighted the impact of socio-economic and behavioural factors that influence waste segregation.

Nguyen et al. (2015) have examined the factors influencing waste separation in households in Vietnam based on the amount of cash fine that each household

was willing to pay as the commitment to participation using information gathered from 180 households both who have experience and who do not have experience in waste segregation. The study found that waste segregation behaviour mainly affected trust, moral norms, perceived difficulties, and reciprocity. The study suggested improving the institutional capacity to collect waste and conduct communication campaigns to consolidate trust and enhance moral obligations. Further, Chinh et al. (2020) have estimated willingness to pay for household waste management in Vietnam using 200 closed-ended questionnaires. The results revealed that people like to pay 10,000 to 15,000 VND per month for waste management. According to the regression analysis, monthly income, education level, age, occupation, and volume of solid waste are the main factors determining willingness to pay.

Afroz. et al. (2010) analyzed the factors affecting household waste management using 402 respondents in Dhaka city in Bangladesh. According to the Ordinary Least Square method, the study found household size, income, concern about the environment, and willingness to separate are highly influential factors in waste management.

Aini (2010) determined the motivation factors for solid waste management using information from 150 households in urban residential areas in Malaysia. The results indicate that the knowledge, awareness, and attitudes regarding waste management are very low. The study proposes increasing knowledge and awareness regarding the consequences of waste and sustainable consumption patterns.

Odonkor et al. (2020) analyzed household solid waste management in Ghanaian districts in Ghana using six hundred respondents. The study found that distance from households to waste collection points and lack of waste collection points are the main reasons for improper waste disposal methods. The provision of waste disposal bins and strengthening the laws regarding the disposal of waste were recommended. People's behaviour and attitudes towards waste segregation are also significantly influenced, especially in the absence of proper mechanisms or regulations.

Loan et al. (2017) analysed the psychological divine force behind the behaviour of municipal organic waste separation in Vietnam using 357 respondents. Factor analysis emphasized that moral norms, attitudes, situational factors, and trust in local authorities significantly affect waste separation. Malik et al. (2015) have investigated community participation in solid waste segregation by focussing on attitudes and knowledge on waste management based on the views of 382 respondents in Putrajaya in Malaysia and found a weak and positive correlation between community participation in recycling programmes with attitudes and knowledge. The study recommended reviewing the policies implemented by the government to enhance community participation in recycling programmes. Xu et al. (2017) examined the household waste separation behaviour in the city of Hangzhou using 628 households based on the theory of Planned Behaviour. A partial least squares equation modelling system indicate that subjective norms, perceived behavioural control, past behaviour, and intention significantly affect household waste separation behaviour. Apart from those psychological factors, gender, age, income level, and perceived policy effectiveness also affected household waste separation. The results highlight the importance of implementing laws, improving waste collection and separate waste facilities, and implementing recycling projects and community campaigns to boost knowledge and positively change attitudes.

It is difficult to determine factors affecting waste segregation only using common variables. It is necessary to test some individual factors, including psychological reasons, along with the common factors. Based on the Theory of Planned Behaviour (Ajzen, 1991), attitudes are considered the main factor that affects waste segregation, as many researchers also pointed out (Tonglet et al., 2004). Apart from attitudes, moral norms are also vital in shaping behavioural targets. Moral norms can be explained as people's beliefs about the correctness or incorrectness of some concepts (Chen & Tung, 2014; Tonglet et al., 2004). Those beliefs become moral norms when most of the people in society adopt those beliefs. Literature on waste management shows that positive moral norms cause positive behaviour.

The value-belief-norm theory developed by Stern et al. (1999) also emphasized the importance of moral norms and responsibilities for common practice, and some empirical studies have proved it (Chu & Chiu, 2003). Rompf (2014) emphasised the significance of people's trust and perception of local authorities regarding effectiveness and reliability in promoting waste segregation. Situational factors such as difficulty in segregating waste, lack of time and space, less support of family members negatively impact on waste segregation. Literature shows that people who are concerned about situational factors have a negative perception of waste segregation (Tonglet et al., 2004; Nguyen et al., 2015; Zhang et al., 2015; Chen & Tung, 2014). Many other researchers, including Olukoju (2018), Fiorillo (2013), Ong et al. (2019), Banga (2013), and Curitis et al. (2011), have also analysed domestic waste segregation behaviour.

Some researchers have analysed the waste management system in Sri Lanka by focusing on different areas and different aspects. Kumara and Pallegedara (2020) identified urban and wealthier households headed by older and well-educated people properly dispose of waste using waste collection arrangements, while older and highly educated heads of households, large land size, ownership of the house, presence of the spouse and being in the wealthiest expenditure quartile positively influence to composting waste by analysing the trend and mechanism of waste disposed in Sri Lanka from 2007 to 2016. Additionally, the study found that others primarily practice improper waste disposal mechanisms, such as burning or dumping within the premises.

Fernando (2019) has identified payment and facilities provided for the officials, commitment of the staff, support from political leadership, and contribution of society and business community as the key factors that influence the success of policies of solid waste management by considering the situation of the Western province in Sri Lanka. Further, the study highlighted that solid waste management has not been successful at the implementation stage due to administrative problems such as insufficient land for dumping, composting, and recycling, poor transportation system, lack of necessary instruments

and technology, insufficient regulations, poor labour productivity, disruption from political parties and lack of awareness of the general public. Ahaliyagoda and Premathilake (2016) have investigated municipal solid waste management practices concerning Balangoda municipal council in Sri Lanka. Waste collection, on-site separation, waste transportation, grading, composting, recycling, producing sludge fertiliser, and final disposal at open dump sites are the main procedures that are implemented to manage municipal solid waste management. Further, the study revealed that training sessions on waste management systems were also conducted to ensure the success of the waste management process.

Soysa et al. (2025) have examined the factors influencing household waste segregation behaviour and waste generation among educated communities using 402 households. The results indicate that income, involvement of government, age of the head of household, and house type are the main factors that influence the waste segregation behaviour, while age, family size, attitude, land area, ownership of the house, income, and involvement of government are influencing factor for household waste generation.

Implementing proper mechanisms and policies was recommended for better household solid waste management. Similarly, Marvin (2019) has identified unsegregated waste, the absence of an appropriate collection mechanism, and poor public commitment as the main reasons for the waste problem in Sri Lanka. Vidanchchi et al. (2006) have found that access to waste collection is poor in rural areas compared to other areas by examining the situation of the southern provinces in Sri Lanka.

Further, the study revealed that there is a high demand for home composting. Knutsson et al. (2021) have investigated the perception and practices of household waste management based on qualitative data collected from focus group discussions in urban, sub-urban, and rural areas. Shukri and Jayasena (2024) found that attitudes, costs and benefits, and moral norms are the main factors influencing waste segregation by examining 388 households representing the entire Sri Lanka.

Even though many studies have focused on waste management in Sri Lanka, the household waste management system in the rural sector has been poorly explored for several reasons. The lack of a proper formal waste management system in rural areas prevents researchers from examining household waste segregation in rural areas. Similarly, limited funding for research and development has led to attention in the urban sector, where waste is a pressing problem. Further, less attention to the rural sector was influenced by cultural practices, lack of awareness of communities, and poor attention to the environmental sustainability of the rural sector, while waste disposal was not a huge problem for rural households since most households have large land or abundant areas to dispose of waste. However, rural waste became a huge problem because of improper disposal practices. Hence, examining this significant gap in understanding the influential factors that determine household waste segregation is essential.

2. METHODOLOGY

Primary data, which were collected from Hakmana divisional secretariat division in Matara district in Sri Lanka, were used to analyse the objective of this study. Four villages that represent the rural sector were randomly selected as sample area. The sample size is determined according to the sample size selection rule of Rosca (1975). Primary data were collected from randomly selected 500 households using a structured questionnaire. Factor analysis and the Probit regression model were used to analyse the objective.

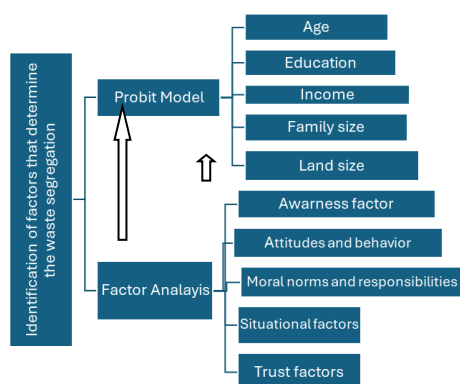


Figure 01: Conceptual Framework

Factor Analysis

Factor analysis is mainly used to sort the variables according to the correlation of the variables. Many statements were included in the questionnaire to measure decision-makers' attitudes, knowledge, awareness, situational factors, and trust regarding local authorities. A five-point Likert Scale ranged from 1 (strongly disagree) to 5 (strongly agree) was used to measure the responses.

The Probit Regression Model

The Probit model was used to determine the factors that affect waste segregation. The Probit model was selected to identify the factors influencing waste segregation, mainly because the dependent variable is binary. Both the Probit and Logit models can be used when the dependent variable is binary, since they handle binary outcomes effectively. However, the Probit model is considered better because the distribution of the unobserved effects is assumed to be normal, and it often performs better based on goodness-of-fit measures.

The estimated model is as follows.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + e$$

The variables are defined as follows.

Dependent variable:

$Y =$ 1- if waste is segregated, 0 -Otherwise

Independent Variables:

$X_1 =$ Gender: 1- if female, 0-Otherwise

$X_2 =$ Age: Years

$X_3 =$ Number of years of formal education

$X_4 =$ Number of family members

$X_5 =$ Total monthly income: LKR

$X_6 =$ Land size: Perches

$X_7 =$ Awareness

1- Adequate level, 0-Otherwise

$X_8 =$ Attitudes and behavior:

1- Positive, 0- Otherwise

$X_9 =$ Moral norms and responsibilities:

1-Positive, 0-Otherwise

$X_{10} =$ Situational factors:

1- Positive, 0- Otherwise

$X_{11} =$ Trust factors:

1-Trusted, 0- Otherwise

The Likert Scale method is used to measure the independent variables identified from factor analysis. Likert Scale method used five measurements, such that; 1- strongly disagree, 2-disagree, 3-slightly agree, 4-agree and 5-strongly agree. Binary variables were formulated according to their responses: 1 represents if the respondents strongly agreed, agreed, or slightly agreed, and 0 represents if the respondents strongly disagreed or disagreed.

3. RESULTS AND DISCUSSION

Out of 500 questionnaires, 21 were removed from the analysis due to incomplete data. The results were based on information provided by the remaining respondents.

Socio-Economic Background

Out of the total sample, 82 percent of households have their own house while others live in a rented house. Rural people in Sri Lanka try to build their own houses, at least with the minimum conditions, even though land does not legally belong to them because they do not have enough money to rent a house. Data were collected by interviewing decision makers of the household, and their socio-economic information was analysed.

The survey information revealed that women are responsible for disposing of waste in most households. The following Table summarizes the basic statistics of the sample.

Table 01: Basic Information of the Households

Information	Mean values
Age- Years	44.9
Number of years schooling	8.9
Land size- Perches	14.4
Monthly income-LKR	22,347
Number of family members	5

Source: Field survey, 2024

According to the basic information, the sample consisted of people with low education and low income. Very few respondents (16 percent) were educated up to G.C.E. Advanced Level or above. The majority of respondents have an education level up to G.C.E. Ordinary Level, and a significant percentage of people have only primary education.

A small percentage of respondents did not have formal education. The majority of respondents are between 35 and 45 years of age. Of the total sample, 13 percent of respondents are below 35 years of age, and 11 percent are above 60 years of age. The majority of houses were on small land of approximately 10 to 20 perches. In most cases, more than one separate house are located on the same land that may be inherited from their relatives.

Waste Management

The details of waste disposal methods and waste segregation were collected to identify the domestic waste management practices in the rural sector. Only 12 per cent of households properly dispose of waste after segregation while the remaining households dispose waste without segregating. Most respondents mentioned that the unavailability of a proper mechanism to collect segregated waste discourages them to segregate waste. The following Table shows the waste disposal methods.

Table 02: Waste Disposal Methods

Waste Disposal Methods	Percentage of Households
Proper dispose of waste	12
Dumping in home garden	36
Dumping in vacant land	09
Dumping on roadside	08
Dumping in water stream	05
Burning	30
Hand over to waste collection vehicle of government	0

Source: Field survey, 2024

According to the above information, only 12 percent of households dispose of domestic waste properly. Most of those households make compost using segregated waste for home gardening. Other waste that cannot be used to make compost, such as metal, glass, and paper, is handed over to vehicles that collect waste for recycling. Those vehicles come from time to time to collect only the waste they require. The majority of households dispose of waste in an insecure way, dumping it on the roadside, water stream, vacant lands, their home garden and burning it without segregating.

So, this waste cannot be used for any purpose and creates huge environmental damage. Physical factors such as the unavailability of facilities and the unavailability of a proper way to dispose segregated waste are the highly influential factors for unsegregated waste. Most households have low income. Therefore, they do not have money to buy necessary items that need to separate and store waste. If the government or local authorities provide necessary items and collect regularly sorted waste, they are willing to segregate waste. Yau (2010) has indicated that economic incentives significantly influence waste segregation at the household level. Zhang and Wen (2014) also highlighted that the source of separation facilities highly influenced household waste segregation. Similarly, most respondents mentioned limited space in their houses and gardens as the main barriers in segregating waste since they have to store it safely until they collect it.

Thus, many respondents have dumped their waste on the roadside, land, and water streams or burned them insecurely. Most respondents mentioned that if local authorities established waste collection centres in common places quite near their houses, they would be willing to separate waste. According to Bernstad, (2014) availability of infrastructure related to waste segregation highly influences waste segregation at the source. The unavailability of a proper mechanism to collect waste in rural areas is a huge problem since local authorities do not implement waste collection mechanisms.

Information was collected to identify the reasons that people avoid waste segregation. The following Table illustrates the main reasons that households avoid waste segregation.

Table 03: Reasons for Unsegregated Waste

Reasons	Percentage
Disposal difficulties	42
Attitudes and irresponsibility	27
Lack of awareness	31

Source: Field survey, 2024

The main reason that hinders waste segregation is disposal difficulties. People tend to dispose waste without segregating if there is no proper way to dispose waste even after segregation.

Most respondents are not aware of the harmful effects of improper waste disposal because of low education. A significant number of respondents do not have adequate knowledge of how to segregate waste properly. Otitoju (2014) has pointed out that a lack of knowledge hinders the recycling of waste. Atthirawong (2016) has indicated that promotional campaigns and training programmes positively influence waste segregation by increasing awareness. Negative attitudes and irresponsibility also cause increased waste problems.

The Results of the Factor Analysis

Number of statements were included in the questionnaire to understand and measure the people's knowledge, awareness, attitudes, and perception about waste segregation. Those statements were categorised into five factors using factor analysis.

The adequacy of the sample size is measured using Kaiser Meyer Olkin (KMO) and Bartlett's Test. The data set is appropriate for factor analysis if the KMO value is 0.5 or above. The KMO value is 0.737, and according to Bartlett's test of Sphericity Chi-Square value is 924.211, which is significant at 0.001. Therefore, the sample is adequate to estimate factor analysis. The Table 04 illustrates the variables of the factor analysis and Table 05, the results of the factor analysis.

Table 04: The Variables of the Factor Analysis

Number	Variables
1	Improperly disposing of waste negatively affects to health
2	Improperly disposing of waste leads to many environmental problems
3	Inappropriate waste disposal has a negative effect on the future generation
4	Aware of the value of waste segregation
5	Aware of the complications of improper waste disposal
6	Waste separation at the source of generation is useful
7	Waste segregation is a good activity
8	I have a positive attitude toward waste segregation
9	I often segregate waste
10	Waste segregation should be promoted in the rural sector
11	I am responsible for waste generation

Number	Variables
12	I committed to minimizing waste
13	I feel guilty if I did not separate the waste
14	All members of society responsible for waste management
15	Waste segregation does not damage my personality
16	Waste segregation is too complicated
17	Waste segregation takes too much time
18	There is no enough space for waste segregation
19	Do not have family support for waste segregation
20	Government should take necessary steps to minimize waste
21	Local authorities should have the ability to treat segregated waste
22	Waste segregation enhances the recycling benefits
23	Laws should be imposed to prevent insecure waste dispose

**Table 05: The Results of the Factor Analysis
(Factor Loading)**

Variable number	Awareness factor	Behaviour and attitude factor	Moral norms and responsibilities	Situational factor	Trust factor
1	0.734	0.432			
2	0.765				
3	0.764				
4	0.732				
5	0.743				
6	0.783				
7		0.762			
8		0.722	0.312		
9		0.763			
10		0.783			
11	0.454		0.732		
12			0.745		
13			0.764	0.401	
14			0.762		
15			0.673		
16				0.873	
17			0.331	0.722	
18				0.764	
19				0.724	
20			0.441		0.721
21					0.689
22				0.456	0.753
23	0.405				0.871

Table 05 contains the rotated factor loadings, and any of the correlations that are less than 0.3 are not recorded since the blank option for less than 0.3 is used at the analytical stage.

According to factor analysis, mainly, five factors are identified: Awareness factor, Behaviour and attitudes factor, Moral norms and responsibility factor, Situational factor, and Trust factor. Shukri and Jayasena (2024) also found some similar factor loading, including factors such as attitudes, subjective and moral norms, and policy regulation, by considering the entire Sri Lanka. However, there are some specific factors in this analysis since the current study especially focuses on the rural sector. Bazrbachi et al (2023) also use factor analysis to identify the factors that influence the source of separation using Malaysian data.

Results of the Probit Model

The Probit model was performed to determine the factors that affect waste segregation. The results of the Probit model are as follows.

Table 06: Results of the Probit Model

LR Chi² = 24.2

Prob > Chi² = 0.0001

Variables	Coefficients	P-Values
Gender	0.15	0.03**
Age	-0.09	0.08*
Education	0.11	0.03**
Number of family members	-0.03	0.04**
Income	0.02	0.06*
Land size	0.06	0.07*
Awareness factor	0.15	0.02**
Behaviour and attitudes	0.11	0.01***
Moral norms and responsibilities factor	0.04	0.00***
Situational factor	-0.09	0.01***
Trust factor	0.07	0.05**
Constant	-138.69	0.03**

Note: *** significant at 1%, ** significant at 5%, significant at 10% significance level.

According to the significance of the LR Chi square test, the Probit model fitted well to measure factors influencing waste segregation. All the variables significantly influence domestic waste segregation. Age, number of family members, and situational factors negatively influence waste segregation, and all other factors have a significant positive effect on waste segregation. Older people do not have enough knowledge to separate waste properly, and enough knowledge about the harmful effects of waste. Thus, they do not think or care about waste segregation and burn or dump in a harmful way. However, this situation may differ according to education, attitudes, and other personal perceptions. De Feo and De Gisi (2010); Dai et al., (2017); Al-Khateeb et al. (2017) and Owusu et al., (2013) have indicated that older people are more satisfied than younger people in separate waste. Situational factors are the external factors that go beyond the control of the responsible person, such as the lack of cooperation among family members and the inability to provide enough facilities. Those reasons negatively affect waste segregation. The number of family members also has an inverse impact on waste segregation. If all family members commit to waste segregation, increases in family members do not have a negative impact on waste segregation. However, if all family members do not commit to waste segregation, those households mostly have unsegregated waste. As the number of family members increases, the amount of waste generated is also increased, worsening this problem. Sivakumar and Sugirtharan (2010) and Soysa et al (2022) found a positive relationship between waste generation and family size. However, people's attitudes are highly influential for this matter. Kaur et al. (2023) and Zakianis & Djaja (2017) have found that large household size significantly influences waste segregation. Income is one of the main factors that influences waste segregation. The results show a positive relationship between income and waste segregation as found by Zakianis & Djaja, (2017) and Alhassan, et al (2018). However, Maskey (2018) and Kaur et al. (2023) found high income negatively effect waste segregation. The regression analysis shows that women are keen to segregate waste compared to males. Otitoju (2014); Dai et al., (2017) and Owusu et al., (2013) also found that females are more likely to participate in waste recycling than males.

Maskey (2018) also indicated that females are more intensive in segregating waste than males by focusing on the Nepal context. Since, women are mostly responsible for household work such as cooking and cleaning, they can easily segregate waste at the disposal source without sacrificing extra time. Also, mostly women like to keep their surroundings clean and present. Because of those reasons, women are responsible for disposing of waste properly. Lack of awareness, low education level, attitudes and behaviour negatively affect waste segregation of old people. Education is another prominent factor that affects waste segregation. Since, educated people have knowledge about the consequences of improper disposal of waste they tend to segregate waste compared to poorly educated people. Kaur et al. (2023) show that higher education positively impacts waste segregation while Guerin et al., (2001); Saphores et al. (2006) and Owens et al. (2000) found that education level is positively related to waste management. Most people have knowledge on the simple consequences of waste, such as bad smells and simple illnesses, but they do not have knowledge of environmental hazards, the danger to health, and the effects on future generations. As an example, most people do not know they can easily get cancer and respiration-related illnesses if they burn plastic and polythene. However, previous research has found the insignificant impact of education level on waste segregation (Abebe (2017), Otitoju and Seng (2014), and Adefris and Damene (2023). Land size positively affects segregation of waste properly since those households have enough space to make compost or store waste until they remove it correctly. Awareness of waste segregation and the negative impact of in-segregated waste are also highly influential factors for waste segregation. Maskey (2018) also indicated that if people have adequate awareness about negative consequences of waste segregation, they tend to segregate waste. Research conducted by Kaur et al. (2023) also highlighted that awareness positively impacts waste segregation.

Apart from the physical factors, some psychological factors also affect waste segregation. Attitudes and behavior are the main psychological factors that affect waste segregation.

Researchers including Chen & Lee, (2020); Karim et al., (2013) Alhassan et al. (2018) ; Ayob et al, (2017); Al-Khateeb, et al, (2017) and Zakianis & Djaja, (2017) found that positive attitudes toward waste segregation have a significant influence on waste segregation. The information from the field survey indicates that a significant percentage of households dispose garbage improperly as a habit. They just want to throw it somewhere and do not care about social responsibilities. Factor analysis and the Probit model revealed that awareness is also an important factor that affects waste segregation. A number of questions were asked to assess awareness of the benefits of waste segregation and the harmful effects of improper waste disposal. Most respondents are unaware of the harmful effects and benefits of waste segregation. A low education level also affects their level of awareness. Adefris and Damene (2023) also found that awareness positively impacts waste segregation. Moral norms and responsibilities have also affected waste segregation. Waste segregation behaviour consists of elements of personal morality and responsibility. If people have confidence in moral correctness, they try to do correct things. Situational factors point out that support from family members is also necessary for good practice. Therefore, awareness, knowledge, and behaviour of all family members are essential for waste management. This reflects that every person has a responsibility for waste management. Policies and laws implemented by local authorities and related government institutions also affect the proper disposal of waste. Especially those authorities should work in a trustworthy way regarding waste management. Those institutions should implement a proper mechanism to collect separated waste. The results of the survey indicate that socio-economic characteristics, physical factors, psychological factors, awareness, attitudes, and perception of government programmes have a significant influence on domestic waste segregation in the rural sector. Identifying these factors is essential for policymakers to design and implement appropriate policies to enhance waste segregation in rural households. By identifying these factors, this study provides significant contributions to the literature by providing solutions for existing research gaps.

4. CONCLUSION AND POLICY IMPLICATIONS

Waste is a global issue, including in Sri Lanka, and it is rapidly increasing. Waste management is one of the leading solutions to lessen the harmful effect of waste. Waste segregation is essential in waste management since unsorted waste cannot be reused or recycled. Most households in the rural sector throw out waste in a harmful way without segregating it because of the unavailability of a proper waste collection system. Hence, this study aimed to determine the factors that affect domestic waste segregation in the rural sector. Primary data collected from four villages in Hakmana divisional secretariat division were used to achieve this objective. Factor analysis and the Probit regression model were mainly used to identify the factors that affect waste segregation.

The results of the Probit model revealed that gender, education, income, land size, attitudes, awareness, norms, responsibilities, and trust on institutions positively affect waste segregation. However, age, number of family members, and situational factors negatively affect waste segregation. The survey results revealed that only a small percent of households properly dispose waste after segregation while majority of households dispose waste in inappropriate ways. Factor analysis identified awareness, attitudes and behaviours, moral norms and responsibilities, and situational and trust factors as highly influential factors for waste segregation.

Based on the results of the study some policy implications can be recommended. Government authorities should establish common garbage collection centres in villages and collect garbage regularly. This may be a solution for people who lack facilities and spaces. Besides, it can be recommended to reward those who segregate waste properly as an incentive for waste segregation. Further, the government can implement various recycling programmes and reuse programmes at the village level to increase employment opportunities while they can practically see the benefits of waste segregation.

Lack of knowledge and awareness negatively affect waste segregation. Therefore, conducting an awareness programme is also worthwhile. Further, it is essential to change people's attitudes regarding waste segregation positively by educating them about the advantages of waste segregation and social responsibilities and by ensuring their trust in policies and waste collection procedures.

Although the current study offers valuable insights into waste segregation, a more in-depth analysis that examines people's psychological aspects and behaviours in relation to their socio-economic background, and connects these factors with waste disposal methods, would be more effective in identifying the key influences on waste segregation. Additionally, further analysis of qualitative data from focus group discussions and in-depth conversations with decision-makers is essential for generating more policy-oriented outcomes.

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