# Working towards Sustainable Behavior in Household Waste: The Role of Consequence Awareness and Responsible Consumption

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**Abstract.** This research was conducted to clarify consumer household behavior toward waste sorting as it is known that the proportion of waste originating from households in developing countries is significant, and the amount continues to increase every year. This quantitative research was conducted on a total of 404 data taken from consumer households using a 5-point Likert scale questionnaire. Data processing was carried out by measuring the model and testing the structural model with the help of Smart-PLS 4. Responsible consumption is a construct that can mediate the relationship between awareness of the consequences of waste sorting behavior. Consequence awareness constructs and responsible consumption patterns are a strong foundation for creating household waste-sorting behavior. The novelty in this study is related to the involvement of the consumption pattern construct in research on waste behavior in developing countries. Household consumption patterns in developing countries like Indonesia tend to have high consumption levels, which impact the potential for the generated amount of waste.

**Keywords:** Consequence Awareness, Household Waste Behavior, Responsible Consumption, Waste-Sorting.

## 1    INTRODUCTION

The spirit of sustainable living has been a concern since the United Nations announced it. Sustainability issues are urgently needed to guarantee the lives of future generations amidst global environmental changes and the risk of damage to natural ecosystems [1]. Indonesians generate millions of tons of waste every day, of which 69% of them ends up in landfills that are difficult to process, 24% pollutes the ecosystem, and only 7% can be recycled [2]. Based on data from the Ministry of Environment and Forestry, in 2022, there were 19.5 million tons of waste, and only around 9.9 million tons can be handled. The classification of sources, as much as 47.1% of waste comes from households, 22.1% comes from traditional markets, and the rest comes from commerce, offices, and public areas [3]. This conditions, especially in developing countries, are the

impact of the level of consumption and behavior of household consumers; the biggest expenditure for consumers is to meet household needs [4], so most of the waste problem is caused by consumptive household behavior.

Various ways have been done to minimize waste, but the amount is actually increasing. The amount of waste in developing countries is increasing significantly, almost 2% every year [5], and large amounts of waste are usually disposed of directly without segregation [6]. Waste that is immediately disposed of without segregation will reduce the effectiveness of waste management at landfills [7]. Various studies have been conducted to address the problem of waste, one of which is through an approach that focuses on understanding consumer behavior towards the environment [8]. Consumers are critical agents in the waste problem because the number of consumers is very large and all of them carry out consumption activities which of course will produce waste. Developing household involvement in waste segregation allows for sustainable resource recovery and improves reverse logistics, which benefits industry and can reduce waste [9].

Responsible consumption has received attention from academics and environmental practitioners in recent years. A lot of environmental damage is caused by irresponsible consumption. Critical conditions of resources and environmental damage provide a signal to make changes in consumption patterns [10]. Rationally, humans as resource manager are responsible for the consumption they do for life and ensure sustainability for future generations. Individuals who have concern for the environment will carry out consequences for the environment by behaving in a more environmentally friendly manner by consuming resources responsibly so as not to endanger the environment. Applying responsible consumption patterns can help reduce waste because, through responsible consumption patterns, consumers will consider using single-use plastics, choosing products with environmentally friendly packaging, buying durable products, using used goods, and carrying out waste recycling activities [11]. Therefore, responsible consumption behavior occurs because consumers care about the environment which has implications for household behavior towards the waste they produce.

Consumers are morally obligated to protect their environment when they know the consequences and implications of environmental damage caused by their consumption activities. According to the Norm-Activation Model theory, if people believe their behavior has inevitable consequences and are willing to take responsibility, then their behavior tends to be consistent with moral norms [12]. The behavior of other people can also influence moral norms, then personal intentions and behavior will be formed. If the consequences of environmental awareness are high, then a person's recycling intention will increase. Similar to pro-environmental and altruistic recycling behavior, waste sorting behavior can increase among citizens when they realize the negative consequences of littering. Someone who is pro-environmental will be ready to sacrifice their resources to save the environment [13].

## 2        METHODS

This research focuses on the behavior of household consumers who consume and generate waste. Obtaining a complete list of household consumer populations is nearly impossible, so this study employed convenience sampling rather than a probabilistic method. Convenience sampling is also used to collect data, allowing the researcher to construct an accessible population sample [14]. Questionnaires were distributed online with limited household respondents who had the knowledge and characteristics of the population that matched the research objectives.

This research model was measured using three constructs consisting of 15 question items. A five-point Likert scale was used in the research questionnaire, ranging from 1 (strongly disagree) to 5 (strongly agree). This study used a two-stage data analysis process. First, Partial Least Squares (PLS) based on variance to assess the reliability and validity of constructs in evaluating measurement models using the SMARTPLS algorithm. Second, validating the structural model and confirming the hypotheses proposed using SMARTPLS Bootstrapping. PLS is a suitable method for evaluating latent constructs used in this study because the sample size is in the small and medium categories, and the data distribution is not normal [15].

## 3        RESULTS AND DISCUSSION

### 3.1        Result

The research was conducted using the SMART-PLS 4, and the analysis was carried out through two-step verification, the first step was the PLS algorithm and the second step was PLS bootstrapping. These two steps are used to assess the validity and reliability of construct variables using external loadings, Cronbach's alpha, composite reliability (CR), and average variance extract (AVE). Discrimination conditions are fulfilled if the loading factor value is greater than 0.6 [16]. The results of data processing showed that there was 1 item that could not be processed further, namely WSB4 "Acquisition and consumption of recycled materials" and RC3 "Increasing the efficiency of natural resources" since their loading coefficient value was below 0.6 so they do not meet the criteria and must be dropped from research. The model test measurement stage showed that the reliability of the composite and Cronbach Alpha was greater than 0.7 and AVE was greater than 0.5. Thus, the construct used in this study is valid and reliable. The next step is to measure the model to test the hypothesis as in Figure 1.

After the assessment of the suitability of the model meets the criteria, then the next step was the evaluation of the proposed relationship in the hypothesis. The test results are shown in Table 1. The results of structural testing through the adjusted R square value can explain the suggested constructs, and the results showed that consequences awareness could predict the responsible consumption construct conservatively by 63.5%, while consequences awareness and responsible consumption were simultaneously able to predict Waste Behavior by 46.8%. Based on the p-value, consequence

awareness positively affected responsible consumption (β:798) and waste-sorting be-havior (β: 0.252), which means that hypotheses H1 and H2 were accepted. The effect of responsible consumption on waste-sorting behavior was also significant (β: 0.468), which means that H3 hypothesis was accepted. In addition, this study showed that responsible consumption mediated the relationship between consequence awareness and waste-sorting behavior (β: 0.374).
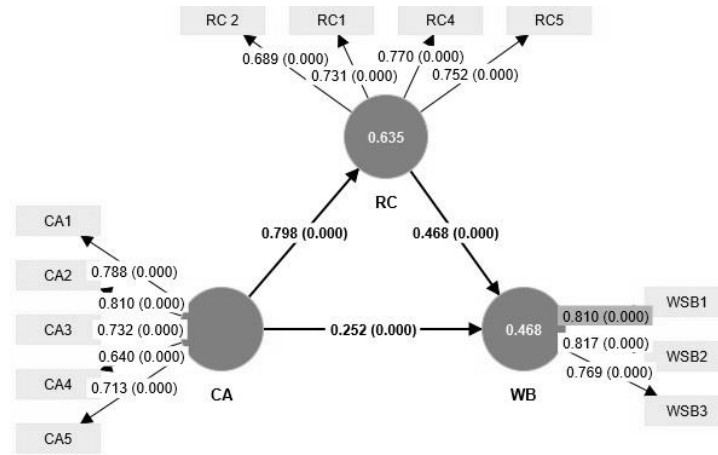


**Fig. 1.** Structural Model Test

**Table 1.** Hypotheis Tested Result

| Path | β | t-value | p-value | Label | Result |
|------|------|---------|---------|-------|--------|
| CA > RC | 0.798 | 0.019 | 0.000 | H1 | Accepted |
| CA > WB | 0.252 | 0.065 | 0.000 | H2 | Accepted |
| RC > WB | 0.468 | 0.063 | 0.000 | H3 | Accepted |
| CA > WB* | 0.374 | 0.052 | 0.000 | H4 | Accepted |

## 3.2    Discussion

Household behavior towards waste will significantly determine the effectiveness of waste management at the final disposal site. The rise and fall of concern for waste in the household sector trigger high and low levels of waste problems in the aggregate. Therefore, there are several important points that can be concluded in this study. First, this research contributes to essential knowledge about the antecedents of household behavior toward waste. This research showed a positive relationship between aware-ness of consequences and responsible consumption patterns on household behavior in sorting waste. Focusing on knowledge from the research results on awareness of the consequences and responsible consumption patterns are formations in strengthening household behavior in sorting waste. From a theoretical point of view, awareness of

consequences plays an essential role in predicting pro- environmental intentions and behavior [17]. Pro- environmental behavior refers to individual beliefs about the adverse consequences of environmental problems. If the consequences of environmental awareness are high, then one's pro-environmental behavior will increase. Consumption by households is the actualization of fulfilling needs which, of course is based on various consequences that are considered. People with a level of concern for the environment will consider everything they consume [13].

Based on research results in shaping household behavior towards waste, the construct of responsible consumption patterns had a more significant impact than awareness of the consequences. This can happen because consumption patterns are actual activities that have a direct impact on waste segregation behavior. Irresponsible consumption patterns can increase excessive waste production [18]. Meanwhile, responsible consumption patterns will help encourage a caring attitude towards waste and the environment in general. Responsible consumption patterns are carried out by choosing environmentally friendly products and minimizing waste disposal. Waste generated from consumption activities can be minimized because consumption will involve the use of products that can be reused and avoiding using disposable packaging, which can generate much waste [18].

The results showed that consumption patterns could mediate awareness of the consequences of household behavior in sorting waste. The mediating effect generated by consumption patterns can magnify the impact received by waste sorting behavior. Conceptually, this happens because a responsible consumption pattern is an actual representation of consumer attitudes and concerns about NEP, so when a person is aware of the consequences and his consumption pattern tends to be responsible, the motivation for behavior in sorting waste will be even greater. Consumption in the household is a manifestation of needs, of course, with various consequences. When consumers are aware of the environmental impact of their products, they tend to make more responsible choices [11].

## 4    CONCLUSIONS

Based on research result, pro-environmental attitudes and concern for waste as important aspects in solving the waste problem because the actors behind the emergence of waste are consumers. Consumers as the main actors in the emergence of waste need to be highlighted because they are considered capable of providing answers to the ever-increasing amount of waste. The results of this study provide insight into creating waste segregation behavior that can be driven by awareness of the consequences and responsible behavior by households. In the demographic findings of respondents, awareness of consequences and sustainable consumption patterns predominate at certain ages, thus allowing recommendations for further research.

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