

THE ANTECEDENTS OF FOOD WASTE RECYCLING BEHAVIOUR AMONG HOUSEHOLDS IN KUALA TERENGGANU

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Abstract: *Food waste occurs at every stage of the food chain, and studies on food waste indicate that households account for a significant portion of the total quantity of food wasted. Therefore, in order to reduce the issue of food waste, household consumers can implement recycling practises. Thus, this study aims to identify the relationship between the anticipated negative emotions of guilt, awareness of consequences, and habits toward recycling food waste among households in Kuala Terengganu. The importance of each proposed variable is revealed by the analysis of a total of 177 valid respondents using the 27th version of the Statistical Package for the Social Sciences (SPSS). Using a questionnaire created in Google Forms and a direct response system, the data were gathered in Kuala Terengganu among local respondents ranged in age from 18 to 64. Convenience sampling was the method employed in this study to select the respondents. The results revealed that only one independent variable, the anticipated negative emotion of guilt, significantly impacts households' food waste recycling behaviour. However, the results did not support the relationship between awareness of consequences, habits, and financial concerns and households' food waste recycling behaviour. The findings will be*

useful to households, governments, and researchers looking for a solution to the problem of food waste. It is also advised that more variables be considered for future research. Future researchers can also consider the practical and theoretical ramifications of food waste recycling studies.

Keywords: *Food waste, households, recycling, food waste recycling behaviour*

Introduction

Food waste happens at every stage of the food chain. The United Nations Environment Programme estimates that the world generates around 931 million tonnes of food waste annually, with households responsible for 569 million tonnes of that total. According to Malaysia's average waste composition results, food waste makes up 32% of total garbage, followed by paper and plastics, which make up 21% and 14% of waste, respectively (Ramdzan et al., 2018). The nation wastes 16,650 tonnes of food daily, all from households. Additionally, households generated 38% more food waste than wet markets, restaurants, and hotels (24%, 23%, and 23%, respectively), according to the SWCorp data. Food waste is primarily brought on by excessive food purchases, insufficient food storage, and a lavish lifestyle (SWCorp, 2019). Moreover, academics have hypothesized that wasting food may adversely affect emotions, such as unease and guilt; hence, people who are likely to feel guiltier about wasting food may be more motivated to cut back on wasting food. In addition, scholars agree that there needs to be more awareness regarding the potential effects of wasting food along the food production chain and at the household level.

However, past literature on habit and financial concerns regarding food waste was minimal (Khan et al., 2019). As such, the study aims to identify the antecedents of a household's anticipated negative emotions of guilt, awareness of consequences, habit, and financial concern toward food waste recycling behaviour in Kuala Terengganu, Terengganu, by using the Theory of Interpersonal Behaviour (TIB). However, household behaviour also impacts how well recycling systems work. By offering a sound theoretical framework that incorporates behaviours into the theory of interpersonal behaviours, which accounts for the behavioural elements of food waste recycling, it thus contributes to the field of study on food waste recycling. There are studies on attitudes toward preventing food waste in Malaysia, but studies have yet to be done on how households recycle other food waste. This study aimed to identify the antecedents of food waste recycling behaviour among households in Kuala Terengganu, Malaysia by figuring out anticipated negative emotions, awareness of consequences, habits, and financial concerns. Thus the study objectives were as follows: (I) Identify the relationship between anticipated negative emotions of guilt toward a household's food waste recycling behaviour (II) Determine the relationship between awareness of consequences towards a household's food waste recycling behaviour (III) Identify the relationship between habits toward household's food waste recycling behaviour (IV) Identify the relationship between financial concerns toward household's food waste recycling behaviour.

Literature review

Theoretical Lens: Theory of Interpersonal Behaviour

Despite the emotional role being primarily disregarded up until now, interpersonal behaviour theory recognizes emotions as one of the essential functions of consumer behaviour and their ability to influence behaviour (Triandis, 1977). Triandis' (1977) theory of interpersonal

behaviour has stressed that emotions are a substantial factor in the conduct of people who waste food (or conservation). Since food waste is a major global problem, engaging consumers in waste reduction practices is crucial to changing their behaviour. The most prevalent theory, the Theory of Planned Behaviour (TPB), appears unable to describe the emotional component of consumer behaviour due to the complexity of human behaviour. The theory of interpersonal behaviour (TIB) is used as the study's theoretical framework to close this gap. It proved how important habits and feelings are in creating intentions and behaviours. Negative emotions during food consumption and wastage are a crucial psychological component in assessing food waste prevention actions because emotions and habits are not considered in being harmed by consumer ignorance of the effects of food waste (Falasconi et al., 2019; Bhatti et al., 2019).

Food Waste Recycling Behaviour

Food waste is a consequence of poor food-management behaviours and habits, such as planning, purchasing, cooking, eating, storing, and managing leftovers which are pervasive throughout society and can lead to a tremendous amount of food waste (Attiq et al., 2021; Berjan et al., 2021). Research by Fogarty et al. (2021) anticipated that a fast-expanding global population would increase the total volume of food produced while also leading to a rise in the amount of lost or wasted food. Food storage habits, cooking prowess, family eating customs, food expenditure, and frequency of purchases are some of the top factors influencing food waste behaviour at home (Ananda et al., 2021). In addition, there are other causes for household food waste, such as overcooking, pet care practices, leftovers, and improper food storage (Bravi et al., 2020). Therefore, consumers may learn more about food waste's environmental, economic, and social implications and share this knowledge with their social circles to persuade them to reduce, reuse, and recycle food waste at home (Attiq et al., 2021). Recycling food waste through animal feed or industrial products is the most desirable form of recycling, followed by compost production and then electricity generation through incineration or anaerobic digestion (Zahara et al., 2019).

Anticipated Negative Emotion of Guilt and Food Waste Recycling Behaviour

The psychological elements that affect consumer behaviour regarding food waste cannot be quantified, contrary to what the earlier studies predicted. A typical negative emotion is anticipated guilt, which involves instant punishment through painful inner feelings to stop engaging in wasteful activity (Lefebvre et al., 2019). Thus, consumers who do not feel guilty about wasteful actions are more prone to throwing away food (Gao et al., 2019). Prior research has found a favourable correlation between customers' desire to reduce food waste and their propensity for environmentally friendly behaviour (Gao et al., 2019). A researcher also found that anticipated guilt motivates young consumers to practice sustainable behaviours such as environmental sustainability and food waste reduction (Bravi et al., 2019; Soorani & Ahmadvan, 2019). According to a cited material, it may be predicted that:

Hypothesis 1: Anticipated negative emotion of guilt significantly impacts consumers' food waste recycling behaviour.

Awareness of Consequences and Food Waste Recycling Behaviour

Awareness of consequences is "the cognition that an individual feels that failure to undertake a given behaviour may have negative implications for others" (Shen et al., 2020). A researcher discovered that behavioural goals, such as return intention, were favourably associated with awareness of the consequences (Khan, Ahmed, & Najmi, 2019). Awareness of consequences influences behavioural intention in an indirect manner (Gkargkavouzi et al., 2019). Similarly,

when people understand the environmental impact of recycling, they are more likely to cooperate to recycle their food waste. Therefore, researchers discovered a substantial positive connection between waste behaviours and recycling intention (Khan et al., 2019). Understanding consequences predicts behavioural intention to recycle (Gkargkavouzi et al., 2019; Khan et al., 2019). Consequently, a hypothesis can be made:

Hypothesis 2: Awareness of consequences significantly impacts consumers' food waste recycling behaviour.

Habit and Food Waste Recycling Behaviour

Habit is a "learned and instinctive response that, in specific circumstances, keeps one performing the same actions" (Boulet et al., 2021). In addition, habit is a behaviour performed in the same manner on a regular and consistent basis. It is a psychological factor that predicts behaviour (Mumtaz, 2022). According to Nabi et al. (2021), shopping habits are an essential factor that plays a role in determining the amount of wasted food. According to Zainal and Hassan (2019), the term shopping list refers to the physical planning of the shopping activity and the extent to which a person uses a shopping list to have a planned food purchase rather than an impulsive purchase. Therefore, effective management of the household is necessary (Bravi et al., 2020). Furthermore, cooking habits, or a lack of cooking abilities, are also believed to contribute to food waste (Kim et al., 2020). Considering the previous literature, the following theory can be formed:

Hypothesis 3: Habit significantly impacts consumers' food waste recycling behaviour.

Financial Concerns and Food Waste Recycling Behaviour

Financial concerns about the money lost from discarding food are frequently considered the primary reason for reducing food waste (Ahmad et al., 2021). According to Ahmad et al. (2021), only some people believe throwing away food is equivalent to throwing away money, and bad habits cost them money. Additionally, there was a strong correlation between the amount of food wasted and income level, with those with higher incomes more willing to waste less food (Ammann et al., 2021). According to van Geffen et al. (2019), the participants identified cost savings as a motivation for reducing waste. Furthermore, previous research found financial implications associated with food waste and predicted that there would be an intention to reduce food waste (Schanes et al., 2018). Food waste behaviour can be described significantly by the consumer's choice of foods, financial situation, and social and situational circumstances (Aktas et al., 2018). It can be hypothesised from the literature mentioned above that:

Hypothesis 4: Financial concern significantly impacts consumers' food waste recycling behaviour.

Research Methodology

The convenience sampling approach was used in this study using the self-administered questionnaire. This study aims to identify the antecedents of food waste recycling behaviour among households in Kuala Terengganu, Malaysia by figuring out anticipated negative emotions, awareness of consequences, habits, and financial concerns. The researchers targeted households in Terengganu for the survey because the monthly household consumption expenditure by the state in 2019 showed that Terengganu state expenditure was high compared to the other two states on the East Coast (Household Expenditure Survey Report, 2019). Using a sample t-test with correlation, a Point biserial model with two tails, the ideal sampling size

for this research is 134 respondents. However, the researchers could reach 261 respondents throughout the survey, and only 177 surveys were completed and returned with accurate and significant results. The questionnaire was developed using Google Forms and distributed via WhatsApp, Instagram, Twitter and Facebook. There are six sections: Section A is the respondent's demographic profile; Section B is on food waste recycling behaviour; Section C is the anticipated negative emotion of guilt; Section D is on awareness of consequences; Section E is about habits; Section F is about financial concerns. A five-point Likert scale is implemented, with one representing strongly disagree and five indicating strongly agree. Experts pre-tested the questionnaire for content validity prior to data collection. Three experts evaluated the clarity of the statements, the presentation of the questionnaire, and the respondents' acceptance of the assertions in this test. Changes were made in response to expert criticism. Data for the study were obtained utilising scaling survey questions and conducted by qualified research assistants under the supervision of the researchers once the questionnaire was revised. The data was evaluated by the researchers using IBM SPSS Statistics for Windows, version 26.

Results and Analysis

Reliability Analysis

Table 1: Reliability Analysis

Variable	Cronbach's Alpha	No. of items	Results of Reliability
Food Waste Recycling Behaviour	0.914	5	Excellent
Anticipated Negative Emotion	0.896	4	Good
Awareness of Consequences	0.896	4	Good
Habits	0.923	6	Excellent
Financial Concerns	0.417	4	Unacceptable

Table 1 shows the extent of the value is around 0.896 to 0.923, indicating four variables are acceptable while the financial concerns variable is unacceptable because of its lower Cronbach's Alpha value. Therefore, the financial concerns variable is removed.

Inferential Analysis

Pearson Correlation Coefficient Analysis

Table 2: Pearson Correlation Coefficient Analysis

	ANE	AOC	HAB	FRB
ANE	1			
AOC	.322**	1		
HAB	.353**	.225**	1	
FRB	.301**	.076	.202**	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The Pearson Correlation Coefficient measures the direction and strength of the linear association between two variables (Sedgwick, 2012). Based on Table 2, AOC (0.076) and HAB (0.202) have unfortunately shown a weak relationship with DV because, according to Sedgwick

(2012), a weak relationship is shown if the value appears between 0 to 0.3. However, a moderate relationship is shown if the value falls between 0.3 to 0.7. Meanwhile, a value falling between 0.7 to 1.0 indicates a strong linear relationship. In other words, ANE (0.301) has shown moderate relationships with FRB since they are between the range of 0.3 and 0.7.

Multiple Regression Analysis

Table 3: Model Summary

R	R Square	Adjusted R Square	Standard Error of the Estimate
.318 ^a	.101	.086	.85700

According to Fernando (2021), R-Square is a statistical measure of fit that indicates how much the IVs explain variation in a DV in a regression model. An R Square value between 0.5 and 0.7 is considered a moderate effect size (Moore, Notz & Flinger, 2013). In this research, table 3 shows the model summary, and the R-Square value of 0.101 indicates that 10.1% of the findings are insignificant to analyse the regression line. Therefore, all IVs did not affect food waste recycling behaviour in Kuala Terengganu.

Hypotheses Testing

Table 4: Model Summary

Hypotheses	Hypotheses supported
H1 Anticipated Negative Emotions (ANE) → Food Waste Recycling Behaviour (FRB)	Yes
H2 Awareness of Consequences (AOC) → Food Waste Recycling Behaviour (FRB)	No
H3 Habits (HAB) → Food Waste Recycling Behaviour (FRB)	No

All data and information collected were analysed and explained in this finding, proving that ANE is significant in the food waste recycling behaviour in Kuala Terengganu.

Conclusions

The researchers aim to identify the relationship between the anticipated negative emotions of guilt, awareness of consequences, and habits toward recycling food waste among households in Kuala Terengganu. Only anticipated negative emotions of guilt, according to the study, had a beneficial association with households' food waste recycling activities. These findings are critical for households, governments, and researchers seeking to solve the food waste problem. Recycling food waste is a major global challenge that is likely to persist in the coming years. The study gives some positive fresh ideas on the factors that should be targeted in this endeavour to reduce the amount of food thrown out at the household level. This data can help practitioners and future researchers reduce the amount of food wasted in households. In terms of practical implications, local governments could take a systematic approach by establishing a food recovery system to recover edible food that would otherwise go to waste and distribute it to those in need. Partnerships with food banks, food service, industry actors, and local communities can help reduce food insecurity in the community of Terengganu. Residents' food refuse and surplus can be repurposed into new food products or ingredients. In terms of

theoretical implications, the study provided a substantial contribution by examining the direct relationship between predicted negative feelings of guilt, awareness of consequences, and habits on food waste recycling behaviours. Furthermore, this recent study expands on the theoretical foundation established by previous investigations into the factors that influence people's attempts to recycle food waste. Despite the fact that the theory of planned behaviour (TPB) was the most prevalent, the researchers were unable to use it since it appears to be incapable of describing the emotional component of consumer behaviour due to the complexity of human conduct. To bridge this gap, the theory of interpersonal behaviour (TIB) is used as the study's theoretical foundation. Future research should consider adding other relevant variables, such as education, religion, and others, to see a different result. In addition, the researchers recommend that future studies focus on households in Terengganu or other countries with high municipal wastage. Future researchers may also consider conducting research using a qualitative approach. Finally, for the future study, it is hope that national agencies on waste such as 11th Malaysian Plan, Solid Waste and Public Cleansing Management Corporation (SWCorp), Majlis Bandaraya Kuala Terengganu (MBKT), Jabatan Pengurusan Sisa Pepejal Negara (JPSPN) and other authorities that involved in waste management is responsible for educating the general public about recycling food waste as a practise that can serve as an alternative to normal waste disposal.

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