

## Unveiling the Drivers of Consumers Food Waste Behavior in Batticaloa's Manmunai North Division

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### ABSTRACT

Investigating the variables that influence "consumers' food waste behavior" in Manmunai, Batticaloa-North division, is the goal of this paper. The author has created a questionnaire that takes into account contextual aspects to explain the food waste behavior, and the study uses the theory of planned behavior (TPB) as its theoretical framework. The findings indicate that the attitude toward food waste, injunctive norms, moral norms, and perceived behaviors all strongly influenced the desire to not waste food. The primary goal of this study is to identify the factors that have the greatest impact on "consumer's food waste behavior" in developing nations like Sri Lanka.

Keywords- Food waste, consumer behavior, the desire to reduce food waste, the theory of planned behavior, moral norms, and attitude

### 1. Introduction

Due to the technological advancement of the agriculture sector in recent years, there has been an abundance of food available, which has led to an increase in food waste behavior of individuals. (Stuart, 2009) In every year, a massive amount of food is wasted through all the phases of the supply chain from production to consumption (Principato, Secondi, & Pratesi, 2015). According to an FAO report, 1.3bn tons of food is wasted each year around the world (Gustavsson et al., 2011; Buzby & Hyman, 2012; Brautigam et al., 2014). Similarly in Sri Lanka especially 30% of food is wasted every year (Samarawickrema, 2016).

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Food waste is regarded as a societal issue that has a negative impact on people's health and, as a result, to a greater problem of feeding the world's growing population. Thus, the food that is thrown away at every stage is the food that is worth consuming, at the same time, 815 million people worldwide suffer from chronic malnutrition as a result of a lack of adequate food, and over 150 million children are facing starvation (FAO, IFAD SND WFP, 2016). From a financial point of view, food wastage can also cause monetary losses to consumers, the food service business, and the government.

(Salhofer, Obersteiner, F, & Lebersorger, 2008) Food waste encompasses both food that is lost and food that is thrown away. Food loss and food waste differ, depending on the position inside the supply chain. Food loss occurs anywhere along the supply chain from the beginning to the middle, considered losses from agricultural produce, harvesting, transport, storage, and processing activities (Gustavsson et al., 2011). Food waste occurs in the final stage of the food supply chain, in the distribution, retail, and consumption phases (Parfitt, 2010).

Food scraps or losses are an irrational use of resources that has a direct negative impact on the income of businesses and customers. As a result, a coordinated approach that enhances the efficiency of the entire supply chain is required (Garnett, 2009). Addressing the social, environmental, and economic effects of food waste has become a top priority for governments and industry stakeholders (McCarthy, Kapetanaki, & Wang, 2020).

One of the most important practices is reducing food waste at the end of the value chain because it reduces the loss of the highest value-added after the food has been passed through various stages of the supply chain, such as farming, harvesting, processing, packing, storage, distribution and finally consumption by the end user (Aktas et al., 2018).

Food loss and food waste are directly linked to food security since eliminating them will help feed more people, relieve strain on natural resources, and offset the negative environmental impact of greenhouse gas emissions from food chain operations and loss of biodiversity due to agricultural activities (Aktas et al., 2018).

Despite the fact that developed countries' effective and efficient cold chain systems help to extend product shelf life, still a large volume of food is lost every day (Hodges

et al., 2011). The developed countries, on the other hand, have recognized the gravity of the situation and have taken a variety of steps to tackle the problem of food waste. Food waste legislation has been approved by the European Union in order to govern and reduce food waste in its member countries, but such practices and concerns are less in developing countries (Pellegrini et al., 2019).

Consumers are significant contributors to food waste, exceeding the waste generated in harvesting, processing, and distribution of food. Reducing food waste during the consumption phase has been one of the biggest challenges for the food industry in recent years. As a result, the purpose of this research is to study into consumer food waste behavior.

In this paper, the first step is to analyze the food waste behavior and the influence factors. The research methodology and data analysis utilizing Univariate, bivariate, and multivariate analysis is then explained. This is followed by a discussion of the findings, as well as implications and limitations in the conclusions. In particular, the Researcher proposed and tested an extended Theory of planned behavior model for food waste behavior among consumers in the Batticaloa Manmunai North Divisional Secretariat area.

## **2. Literature Review**

To understand the indicators of consumer behavior, the theory of planned behavior (TPB) is most often used as a theoretical base. In this theory, Fishbein & Ajzen (1975) propose that individuals control their socially relevant behaviors, and one driver of this behavior is their intention to engage it. This present study uses TPB to predict consumer behavior toward food waste in developing countries.

### ***2.1 Factors influencing intention not to waste food***

#### ***2.1.1 Attitude toward food waste***

The general favorable and unfavorable appraisal of executing the behavior is represented by attitudes toward the behavior and more favorable attitudes toward the behavior are predicated to translate into stronger intents to perform the behavior (Ajzen, 1991). When a person's perception of food waste behavior is negative, the intention to reduce food waste increases (Barone et al., 2019; Graham-Rowe et al., 2015; Stefan et al., 2013; Visschers et al., 2016).

A person's favorable or unfavorable view regarding a particular behavior informs their attitude, which is truly a mentality. In the case of food waste, the question is whether people think it is a significant issue deserving of reduction efforts. It appears to be one of the most powerful factors identified in the literature, whether it's through the TPB (Graham-Rowe et al., 2015; Visschers et al., 2016). or other studies (Brennan, 2017; Baker et al., 2009; Koivupuro et al., 2012; Abeliotis, 2014; Secondi et al., 2015; Thyberg et al., 2016). Studies suggest that consumers feel guilty and are concerned about wasting food, and this informs a negative attitude towards this behavior (Evans, 2012; Watson & Meah, 2012; Abeliotis, 2014).

### *2.1.2 Injunctive norms*

The extent to which consumers consider wasting food as a behavior that is denied by others important to them. Consumers' perceived social pressure to engage in the behavior and are hypothesized to contribute to stronger intentions to perform the behavior are accounted for by subjective norms (Ajzen, 1991). According to the literature on social influence, there is a significant difference between social injunctive and descriptive norms. The first refers to what is habitually accepted or rejected behavior in a culture, i.e., shared beliefs about how one should behave, called the "ought" norms. The latter is the so-called "is" norms, which refer to what is commonly done (Cialdini, Reno, & Kallgren, 1990; Cialdini & Kallgren, 1993).

In the Theory of Planned Behavior, subjective norms can be viewed as a type of injunctive norms (Thøgersen, 2006) because they account for the perceived social pressure to undertake the behavior. Prior data shows that subjective norms operationalized in accordance with the theory of planned behavior have a weak effect in applications of the theory (Armitage & Conner, 2001) and this is also true when it comes to food waste behavior (Stefan et al., 2013). Therefore, the norms were operationalized as injunctive norms in the current study.

### *2.1.3 Moral norms*

(Ajzen, 1991) suggested that moral obligations of moral norms be included in the theory of planned behavior model to increase the predictive validity of subjective norms. It is a person's perception of what is ethically correct or incorrect. The moral norms have an effect on the psychological processes of individuals.

#### *2.1.4 Perceived behavioral control*

Perceived behavioral control refers to perceived simplicity or difficulty in behaving in a certain way. In interview research, issues relating to perceived behavioral control over the quantity of food waste were frequently mentioned. Consumers, for example, report that they attempted to plan their shopping and meals well, but that they still wasted food because family members either did not want to eat the food that had been prepared or could not eat it because they were not at home (Evans, 2011). Similarly, some participants said that the package sizes were too large, so that the perishable foods had gone bad before they could be consumed (Evans, 2012; Williams et al., 2012). Perceived behavior control had a substantial indirect relationship with food waste behavior through the intention to bring down food waste behavior (Graham-Rowe et al., 2015), and through planning and shopping routines (Stefan et al., 2013).

The final precursor of intention included in the theory of planned behavior, perceived behavior control, was added to expand the applicability of the theory to behaviors that are not under optional control. This setup accounts for earlier experiences as well as potential barriers or facilitators of the behavior and mentions the perceived ease or difficulty engaging in the behavior. It contributes to stronger intentions and it contributes to the prediction of behavior in the presence of inadequate volitional control (Ajzen, 1991). Prior research suggests some evidence that in the case of food waste behavior, perceived behavioral control can influence behavior through food-related routines and not the intention (Stefan et al., 2013).

#### *2.2 Intention not to Waste Food*

"Intentions signify a readiness to take specific actions; prior studies have found a strong association between a heightened intention to avoid or diminish food waste and reduced instances of food wastage (Graham-Rowe et al., 2015; Stefan et al., 2013). An individual's inclination to adopt certain behaviors is shaped by their intention towards those behaviors (Aktas et al., 2018; Graham-Rowe et al., 2015; Russell et al., 2017). However, there have been challenges in using intention alone to accurately predict food waste behavior (Stefan et al., 2013), implying a potential link between individuals' intentions to minimize food waste and the actual amount of food they discard."

### ***2.3 Food waste behavior***

Food waste cannot be defined by a single behavior, but rather by a combination of several behaviors that can increase or decrease the likelihood of food waste. Food waste at the consumer level has the greatest economic, social, and environmental consequences because of its value-added loss, the opportunity cost of not feeding other people who may be hungry, and the loss of natural resources, biodiversity, and other resources such as labor and energy. To reduce food waste, we must first comprehend the elements that influence food waste behavior. (Savelli, Franconi, & Curina, 2019).

According to the prior literature consumer's food waste behavior has been determined with situational factors, Demographic factors, and social factors. In this study, consumer food waste behavior is known using the theory of planned behavior. Because, as stated by (Ajzen, 1991) theory of planned behavior is the best framework for understanding consumer behavior.

### ***2.4 Hypothesis development***

#### ***2.4.1 Influence of Attitude toward Food Waste on Intention Not to Waste Food***

As an important precursor to intentions, attitude shows the common assessment of people towards a particular behavior (Greaves et al., 2013). A research by (Karim et al., 2013) Confirmed that attitude had the greatest impact on intention. The general favorable or unfavorable evaluation of actual behavior is characterized by attitudes. According to (Ajzen, 1991), the more favorable the attitude, the higher is the expected intentions to perform that behavior. Both the TRA and the TPB have established attitude as an important determining factor of behavior, frequently through behavioral intent.

Attitude is comprised of consistent or conflicting beliefs about the consequences of specific behavior (Povey et al., 2001; Tourangeau et al., 1991). The intention to perform or not to perform a particular behavior is impacted by the attitude. Furthermore, attitudes are predictors of intention and consequently the actual behavior (Povey et al., 2001). Several researchers in this area have found that attitude is a significant predictor of behavioral intention (Ajzen, 1991; Povey et al., 2001; Tourangeau et al., 1991; Kaiser et al., 1999). According to their findings, attitude is the most important predictor of behavioral intentions. Taylor and Todd (1995) and Kelly et al. (2006) established

that recycling behavior is strongly linked to recycling behavior. On the contrary, (Karim et al., 2013), found a positive significant relationship between attitude and behavior when it came to waste food separation. Moreover, studies of the literature consistently show that attitude is positively connected to intention (Brug et al., 1995; Fabrigar et al., 2005). Thus, on the basis of the above literature, propose the following hypothesis:

*H<sub>1</sub>*: Attitudes toward food waste are positively influence the intention not to waste food.

#### *2.4.2 Influence of Injunctive Norms on Intention not to waste food*

Subjective norms interpret consumers' perceived social pressures to engage in behavior, and thus presumably contribute to stronger intentions to apply in behavior (Ajzen, 1991). Previous data reveals that subjective criteria, as indicated by the TPB, have a minor or insignificant impact on the theory's (Armitage & Conner, 2001) applications in general and food waste behavior in particular (Stefan et al., 2013; Pakpour et al., 2014). In collectivist societies, when people are in a greater position to impose societal pressure on others, injunctive norms are especially important (Kumar, 2012; Shabnam, 2013). (Arvol et al., 2008). In their research concerning the purchase of organic food, they found that injunctive norms cause a significant difference in intentions.

Similarly, the injunctive known is a crucial means of viewing the lives of individuals who live in collectivistic societies, where people place a more emphasis on the emotional side of decision-making rather than the rational cost-benefit analysis aspect (Sinha et al., 2001). People in collectivistic societies are more attentive and responsive to the environment than those in individualistic societies, according to research (McCarty & Shrum, 1994). So, it is critical to understand the cultural orientation of people living in a society, i.e., whether they are ide-centric (Preferring personal goals over group) or all-centric (Preferring group goals), knowing this is quite important since this will help in determining the societal pressure and motivation to comply (Triandis et al., 1988) if injunctive norms represent perceived social pressure on behavior. Therefore, propose the following hypothesis:

*H<sub>2</sub>*: Injunctive norms for food waste are positively influence the intention not to waste food

#### *2.4.3 Influence of Moral norms on Intention not to waste food*

The literature on food waste has combined the traditional TPB with other non-cognitive factors such as ethics (Graham-Rowe et al., 2015; Mondejar-Jomenez et al., 2016; Statcu et al., 2016), customs (Visschers et al., 2016), and emotions (Russell et al., 2017). Moral norms are a strong predictor of recycling behavior (Largo-Wight et al., 2012) as well as waste prevention behavior among Brazilian consumers (Bortoleto et al., 2012). I propose the following hypothesis based on the above finding:

*H<sub>3</sub>*: Moral norms for food waste are positively influence the intention not to waste food.

#### *2.4.4 Influence of Perceived Behavioral Control on Intention not to waste food*

Perceived behavior control, according to the TPB, refers to how ease or difficult it is to act in a certain way. Graham-Rowe et al. (2015) used the extended theory of planned behavior to explore the decrease of household food waste and discovered that the intention to reduce household waste related to fruit and vegetables was predetermined by the perceived behavior control. In like manner, (Pakpour et al., 2014) found that perceived behavior control significantly predicts the household waste behavior in Iranian consumers. (Ghani et al., 2013) also found “controlled belief” as an important predictor of behavior intentions for food waste separation. Therefore, based on the above theoretical or empirical findings, the following hypothesis is proposed:

*H<sub>4</sub>*: Perceived behavioral controls for food waste are positively influence the intention not to waste food.

#### *2.4.5 Influence of Intention Not to waste food on Food waste behavior*

A person's tendency to do or inclination toward doing a particular act is characterized as behavioral intention. The term “behavior intention” is used in the context of food waste behavior in this study; it refers to a positive attitude toward reducing food waste. The current study is based on the TPB, which claims that behavioral intentions are the best predictors of actual behavior (Ajzen, 1991). The literature on consumer behavior also strongly supports this theory, and intentions have been shown to be a strong predictor of actual behavior in individuals. (Russell et al., 2017) explained food waste behavior using the idea of TPB, in which the intention is defined as “using the intention to reduce food waste” and the behavior is defined as “food waste behavior”, with a



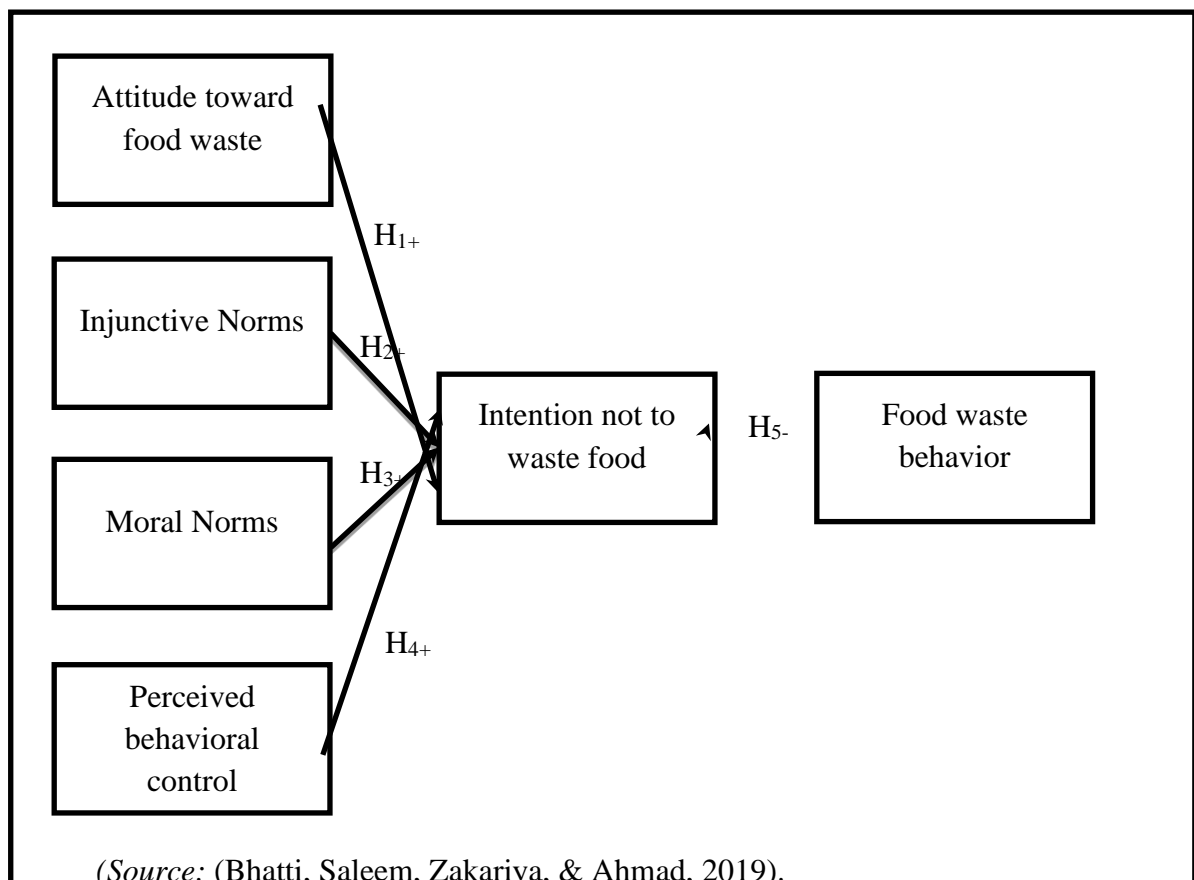
negative relationship between the two. Because consumers generally avoid waste (Boltan & Alba, 2012), there is a reason to believe that deliberate processes

*H<sub>5</sub>*: Intention not to waste food is negatively influences Food waste behavior.

### 2.5 Conceptualization

A conceptual framework is defined as a “Plane” or network of interconnected concepts (Jabareen, 2009). A conceptual framework consists of one or more formal theories (in part or whole), as well as other concepts and empirical findings from the literature. It is used to demonstrate the connections between these concepts. As well as how they relate to the research study. Figure 1 shows the conceptual framework of this study. This conceptual framework has two separate models. Model one includes attitude toward food waste, injunctive norms, moral norms and perceived behavioral control as independent variables and intention not to waste food as dependent variables. In model two; intention not to waste food is an independent variable and food wastage behavior is a dependent variable.

*Figure 1: Conceptual Framework*



### 3. Methodology

According to the Batticaloa municipal council health unit, 250kg to 300kg of food is wasted per day at major hotels in the Batticaloa Manmunai north divisional secretariat area, including KFC and Pizza Hut. Similarly, there are 200 registered restaurants in the area. Based on this, 250kg of food will be wasted in per day while 91250kg of food will be wasted in a year. If 91,250 kilograms of food waste is generated by just 200 registered restaurants, it suggests a potential substantial food waste issue within the 27,568 families across the 48 Grama Nilathari divisions.

The study focused on individuals from the 27,568 families within the Batticaloa Manmunai North Division Secretariat, specifically those belonging to the 48 Grama Nilathari Divisions in the area as a study population. The questionnaire, created in Tamil, was distributed to 394 families both directly and through Google Forms. Potential respondents received a link and provided their answers to the questions. A total of 289 families participated in this survey, by means of a questionnaire it's based on previous research on the TPB by Bahatti et al (2019). The questionnaire was designed using factor analysis as a foundation. With KMO values for these questions surpassing 0.5, it indicates a reasonably suitable basis for analyzing the questionnaire.

This research was carried out with positivist philosophy, deductive approach, survey strategy, and quantitative methodological manner with cross-sectional time horizon. There is a thorough and clear list of the entire population of the study's research site. Therefore, stratified random sampling can be used.

This questionnaire will consist of 24 questions with a total of 6 variables. Those variables are attitude toward food waste, injunctive norms, moral norms, perceived behavioral control, intention not to waste food, and food waste behavior conduct were all assessed using a five-point Likert scale.

Environmental concerns: This questionnaire employs a 4-item scale on environmental concerns adapted from Wang et al. (2018), with a sample item addressing personal worries about the global environmental situation and its implications for the future. Time pressure: Defined as a scarcity of free time in a day (Lumpkin, 1985), this survey utilizes a six-item scale adapted from Black et al. (2004) as employed by Pellegrini et al. (2019). A sample item reflects the challenge of not having enough time for desired

activities. Attitude toward food waste: This variable is assessed using a four-item measure borrowed from Aktas et al. (2018), drawing on the work of Stefan et al. (2013) and Visschers et al. (2016). A sample item reflects upbringing beliefs against food wastage. Based on this the questions for each variable are sourced from various articles and references.

**4. Analysis and Discussion**

The data analysis for the current model was carried out in two models. In model one, Attitude toward food waste, Injunctive Norms, Moral Norms, and Perceived Behavioral Control is the independent variable, and Intention not to waste food is the Dependent variable. In model two Intentions not to waste food is the independent variable, and food waste behavior is the Dependent variable. In the first step, a reliability test was performed for each variable.

In the second step, in order to identify the level of each variable among selected families, univariate analysis was conducted. After univariate analysis, Pearson's Correlation Analysis was conducted to identify the Direction, Strength, and significance of the bivariate relationship between all the study variables. In the last step, a regression test was performed to examine the influence of independent variables on dependent variables. After that hypothesis, test was performed to finalise the decision.

Table 1: personal information about families.

	Frequency	Percentage
<b>Gender</b>		
Male	133	46%
Female	156	54%
<b>Age</b>		
Bellow 22	59	20.4%
21-35	100	34.6%
36-50	91	31.5%
Above 50	39	13.5%

<b>Education qualification</b>		
Bellow ordinary level	17	5.9%
Ordinary level	43	14.9%
Advanced level	148	51.2%
Undergraduate	41	14.2%
Degree	32	11.1%
Postgraduate	8	2.8%
<b>Income</b>		
Bellow 20000	102	35.3%
20001 to 50000	123	42.6%
50001 to 80000	52	18%
Above 80000	12	4.2%

**4.1 Univariate analysis**

Under the Univariate analysis researcher used descriptive statistics. For this analysis mean values and standard deviation of the variables were taken into consideration in order to find out the level of each variable. Mean: it is the most important measure of central tendency. The arithmetic means usually denoted by  $\bar{X}$  (Jordan & Jocobs, 1994). Standard deviation (SD): The standard deviation is an absolute measure of dispersion and it is used to indicate dispersion of variables (Baland & Altman, 1996). The researcher used 5 decision criteria for univariate analysis, all study variables are between  $2.6 < X \leq 3.4$ (moderate level) and  $3.4 < X \leq 4.2$ (high level). Details present in table2.

Table 2: Univariate analysis

No	Variables	Mean	SD
01	Attitude toward food waste	4.0727	0.79298
02	Injunctive Norms	3.9542	0.71036
03	Moral Norms	4.0023	0.78074
04	Perceived Behavioral Control	3.8201	0.83928

05	Intention not to Waste Food	3.7154	0.73752
06	Food Waste Behavior	3.1609	1.18387

**4.2 Pearson's Correlation Analysis**

A correlation coefficient is a method of putting a value to the relationship. Correlation coefficients range between -1 and 1. A "0" indicates that there is no relationship between the variables, whereas a "-1" or "1" indicates that there is a perfect negative or positive correlation. The complete model including all eight variables under study was tested in one measurement model. Details presents in table3.

Table 3: Pearson's Correlation Analysis

Relationship		R	P
ATF	INW	0.658	0.000
IN	INW	0.640	0.000
MN	INW	0.590	0.000
PBC	INW	0.560	0.000
INW	FB	-0.509	0.000

**4.3 Regression test**

This study uses two main types of regression analysis, simple regression analysis and multiple regression analysis. Simple regression analysis uses one independent variable to explain or predict the outcome of the dependent variable Y, while multiple regression analysis uses two or more independent variables to predict the outcome. Tables 4,5,6 are displaying the results of model one by using multiple regression analysis and table 7,8,9 are displaying the results of model two by using simple regression analysis.

4.3.1 Regression analysis for Model 1

Table 4: Model Summary of Model 1

Model Summary					
Model	R	R Square	Adjusted Square	R	Std. Error of the estimate
1	.741a	.548	.542		.49911
Predictors: (Constant), Attitude toward food waste, Injunctive Norms, Moral Norms, PBC					

(Source: Survey Data)

Multiple regression test was performed to examine the influence of Attitude toward food waste, Injunctive Norms, Moral Norms, and Perceived Behavioral Control and Intention not to Waste Food. Based on the Table 4 illustrates that the “R Square” statistic value is 0.548 which means 54.8% of the variation in Intention not to Waste Food is explained by the Attitude toward food waste, Injunctive Norms, Moral Norms, and Perceived Behavioral Control.

Table 5: ANOVA for Model 1

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	85.907	4	21.477	86.214	.000 <sup>b</sup>
	Residual	70.747	284	.249		
	Total	156.654	288			
Dependent Variable: INWF						
Predictors: (Constant), Attitude toward food waste, Injunctive Norms, Moral Norms, PBC						

(Source: Survey Data)

As per the Table 5, the proposed model was adequate as the F statistic (F=86.214) was significant as the 5% level since the p-value is less than 0.05.

Table 6: Coefficient of Model 1

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficient	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.368	.184		1.998	.047
	Attitude toward food waste	.302	.053	.325	5.745	.000
	Injunctive Norms	.307	.057	.296	5.395	.000
	Moral Norms	.122	.056	.129	2.189	.029
	PBC	.109	.049	.124	2.232	.026
Dependent Variable: INWF						

(Source: Survey Data)

Based on Table 6, regression equation can be written as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$$

Where, Y = INWF

X<sub>1</sub>- Attitude toward food waste

X<sub>2</sub>- Injunctive Norms

X<sub>3</sub>- Moral Norms

X<sub>4</sub>- Perceived Behavioral Control

$$INWF = 0.368 + 0.302X_1 + 0.307X_2 + 0.122X_3 + 0.109X_4$$

The result indicated that Attitude toward food waste ( $\beta = 0.302$ ,  $p < 0.05$ ), Injunctive Norms ( $\beta = 0.307$ ,  $p < 0.05$ ), Moral Norms ( $\beta = 0.122$ ,  $p < 0.05$ ), Perceived Behavioral Control ( $\beta = 0.109$ ,  $p < 0.05$ ) significantly influence the Intention not to Waste Food.

The study shows highest influence on the INWF is described by Injunctive Norms ( $\beta = 0.307$ ,  $p < 0.05$ ).

The B Coefficient for Attitude toward food waste is 0.302, which means when Attitude toward food waste increases by one unit, Intention not to Waste Food will increase by 0.302 units, B Coefficient for Injunctive Norms is 0.307, which means when Injunctive Norms increase by one unit, INWF will increase by 0.307 units, B Coefficient for Moral Norms is 0.122, which means when Moral Norms increase by one unit, INWF will increase by 0.122 units, B coefficient for PBC is 0.109, which means when PBC increase by one unit, INWF will increase by 0.109 units.

Further, the same table indicates that p-values are less than 0.05, which indicates attitude toward food waste, Injunctive Norms, Moral Norms, and Perceived Behavioral Control are statistically significant at a 5% level of significance. Therefore, there is enough evidence to reject the null hypothesis, and the following hypothesis of the study is accepted.

*H<sub>1</sub>: Attitudes toward food waste are positively influence the intention not to waste food.*

It can be concluded from the findings that attitude toward food waste has a positive influence on Intention not to waste food. There are some findings that empirically support the positive influence of the Intention not to waste food. A study by (Karim et al., 2013; Brug et al., 1995; Fabrigar et al., 2005) tells the positive influence of Attitudes toward food waste on the Intention not to waste food and suggests that consumers are willing to reduce food waste because they have favorable attitudes on food waste.

*H<sub>2</sub>: Injunctive norms for food waste are positively influence the intention not to waste food.*

It can be concluded from the findings that injunctive norms have a positive influence on Intention not to waste food. There are some findings that empirically support the positive influence of the Intention of not to waste food. A study by (Kumar, 2012; Shabnam, 2013; and Arvola et al., 2008) tells the positive influence of Injunctive norms on the Intention not to waste food and suggests that consumers are willing to reduce food waste because they have accepted the Injunctive norms of the society in which they live.

*H<sub>3</sub>: Moral norms for food waste are positively influence the intention not to waste food.*



It can be concluded from the findings that moral norms have a positive influence on Intention not to waste food. There are some findings that empirically support the positive influence of Intention not to waste food. A study by (Largo-Wight et al., 2012; and Bortoleto et al., 2012) tells positive influence of Moral norms on the Intention not to waste food and suggests that consumers are willing to reduce food waste because they have positive emotions about reducing food waste.

**H4:** *Perceived behavioral controls for food waste are positively influence the intention not to waste food.*

It can be concluded from the findings, that perceived behavioral control has a positive influence on Intention not to waste food. There are some findings that empirically support the positive influence of the Intention not to waste food. A study by (Pakporu et al., 2014; and Ghani et al., 2013) tells the positive influence of Perceived behavioral control on the Intention not to waste food and suggests that consumers are willing to reduce food waste because they are “controlled belief” believed that food waste can be controlled.

Therefore, it can be concluded that Attitude toward food waste, Injunctive Norms, Moral Norms, and Perceived Behavioral Control have a positive and significant influence on INWF.

4.3.1 Regression analysis for Model 2

Table 7: Model summary of INWF and Food Waste Behavior

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.509a	.259	.256	1.02109
Predictors: (Constant), Intention not to waste food				

(Source: Survey Data)

Simple regression test was performed to examine the influence of Intention not to Waste Food, and Food Waste Behavior. Based on Table 7 illustrates that ‘R Square’ statistic value is 0.259 which means 25.9% of the variation in Food Waste Behavior is explained by the Intention not to Waste Food.

Table 8: ANOVA for INWF and Food Waste Behavior

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	104.409	1	104.409	100.140	.000 <sup>b</sup>
	Residual	299.234	287	1.043		
	Total	403.643	288			
Dependent Variable: Food Waste Behavior						
Predictors: (Constant), INWF						

(Source: Survey Data)

As per the Table 8, the proposed model was adequate as the F statistic (F=100.140) was significant at the 5% level since the p-value is less than 0.05.

Table 9: Coefficient of INWF and Food Waste Behavior

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Sta. Error	Beta		
1	(Constant)	6.194	.309		20.045	.000
	INWF	-.816	.082	-.509	-10.007	.000
Dependent Variable: Food Waste Behavior						

(Source: Survey Data)

Based on Below Table 9, regression equation can be written as follows:

$$Y = \beta_0 + \beta_1 X_1 + e$$

Where, Y – Food Waste Behavior (FWB)

X – Intention not to Waste Food (INWF)

$$FWB = 6.194 + -.816X1$$

The results indicates that Intention not to Waste Food ( $\beta = -.816, p < 0.05$ ) significantly influence the Food Waste Behavior.

B coefficient for the Intention not to Waste Food is -0.816, which means when the Intention not to Waste Food increases by one unit, Food Waste Behavior will decrease by 0.816 units. Food Waste Behavior is equal to 6.194 when the Intention not to Waste Food is zero.

Further, the same table indicates p-values are less than 0.05 indicating that the Intention not to waste Food is statistically significant at a 5% level of significance. Therefore, there is enough evidence to reject the null hypothesis, and the following hypothesis of the study is accepted.

*H<sub>5</sub>: Intention not to waste food is negatively influencing the Food waste behavior.*

It can be concluded from the findings that intention not to waste food has a negative influence on Food waste behavior. There are some findings that empirically support the negative influence on Food waste behavior. This finding is consistent with what being proposed in the Theory of Planned Behavior (Ajzen, 1991) and the work of (Bolton & Alba, 2012) tells the negative influence of Intention not to waste food on Food waste behavior and this study suggests that consumers who intend to reduces food waste are more likely to have a negative influence on food waste behavior than others. Therefore, it can be concluded that INWF has a negative and significant influence on Food Waste Behavior.

All five hypotheses were accepted in this study. Attitudes toward food waste, Injunctive norms, Moral norms, and perceived behavioral controls for food waste were positively associated with Intention not to waste food, however, Intention not to waste food was negatively associated with food waste behavior, thereby all five hypotheses were accepted.

## 5. Conclusion

In conclusion, this study focused on investigating the drivers of consumer food waste behavior in Batticaloa Manmunai North Division. From a total of 289 families selected from the 48 Grama Nilathari Divisions in the Batticaloa Manmunai North Divisional

Secretariat Area. Based on the research conducted, it was revealed that a significant majority, specifically 70% of the population in Batticaloa Manmunai North Division, partakes in the wastage of food during the consumption phase. This statistic holds notable implications, particularly in the current economic climate characterized by widespread crises, leading to extensive shortages in essential food resources.

The factors identified by the researcher in this study were found to be substantial contributors to the issue of food wastage. These elements, which were meticulously selected and analyzed, exert significant influence on the patterns of wasteful behavior among consumers. Recognizing the magnitude of their impact is pivotal in developing effective strategies to combat food wastage.

One noteworthy revelation from this study is the potential efficacy of instigating a collective consciousness among the populace regarding the importance of avoiding food wastage. By cultivating a sense of responsibility and awareness among individuals, it is possible to make substantial strides in reducing the prevalence of food wastage in Batticaloa. This implies that efforts towards education and advocacy on this matter hold substantial promise in ameliorating the problem.

In summation, this research underscores the critical need to address food wastage in Batticaloa, emphasizing its far-reaching consequences in the context of the ongoing economic crisis. By targeting the influential factors identified in this study and fostering a culture of mindful consumption, meaningful progress can be made toward mitigating the issue of food wastage in the region. The findings of this research offer valuable insights for various stakeholders, including policymakers, decision-makers, and others responsible for food waste reduction and environmental protection in the Batticaloa Manmunai North Divisional Secretariat Area. This study provides a crucial foundation for informed decision-making towards reducing food waste in the area.

However, it's important to acknowledge that this study has some limitations. The research population was limited to the Batticaloa Manmunai North Divisional Secretariat Area, which is more condensed in comparison to the broader context of the entire Batticaloa district. Future research endeavors may benefit from considering a wider scope to gain a more comprehensive understanding of consumer food waste behavior in the region.

The second limitation of this study is the Covid-19 pandemic situation. Due to this pandemic situation study survey was collected from only 289 families in 394 sample sizes. It represents only a 73.35% response rate of the survey.

The final limitation of this study is that the data was collected using a single measurement tool, a survey-based questionnaire, which is a quantitative approach. Using a qualitative research method, such as interviews and observation, will be more effective in obtaining more information because qualitative research is the most appropriate method for identifying consumer behavior when compared to quantitative research.

This study examines only the food waste behavior of the final stage of the food supply chain. Therefore, a clear understanding can be obtained by extending the study from the initial stage to the final stage of the food supply chain in the future study. The present study focuses only on the self-reported scale of data collection. Therefore, the responses may be affected by social desirability response bias. That is why future research in this area will be using multiple sources.

In this research work, the researcher could not focus on weddings or other celebrations where an increased amount of food waste is observed; so, future research can investigate how people's behavior changes at such events compared to their day-to-day practices.

## **References**

Abeliotis, K., Lasaridi, K. and Chroni, C., 2014. Attitudes and behaviour of Greek households regarding food waste prevention. *Waste Management & Research*, 32(3), pp.237-240.

Abu Hassan, Z., Schattner, P., & Mazza, D. (2006). Doing a pilot study: Why is it essential. *Malaysian Family Physician*, Vol.1(No.2), pp. 70-73.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action control* (pp. 11-39). Springer, Berlin, Heidelberg.

Ajzen, I., & Fishbein, M. (1970). The prediction of behavior from attitudinal and normative variables. *Journal of experimental social Psychology*, Vol.6(No.4), pp. 466-487.

Aktas, E., Sahin, H., Topaloglu, Z., Oledinma, A., Huda, A.K.S., Irani, Z., Sharif, A.M., van't Wout, T. and Kamrava, M., (2018). A consumer behavioural approach to food waste. *Journal of Enterprise Information Management*.

Allen, M. (Ed.). (2017). *The SAGE encyclopedia of communication research methods*: Sage Publications.

Armitage, C.J. and Conner, M., 2001. Efficacy of the theory of planned behaviour: A meta-analytic review. *British journal of social psychology*, 40(4), pp.471-499.

Arvola, A., Vassallo, M., Dean, M., Lampila, P., Saba, A., Lähteenmäki, L. and Shepherd, R., 2008. Predicting intentions to purchase organic food: The role of affective and moral attitudes in the Theory of Planned Behaviour. *Appetite*, 50(2-3), pp.443-454.

Baker, R.S. and Yacef, K., 2009. The state of educational data mining in 2009: A review and future visions. *Journal of educational data mining*, 1(1), pp.3-17.

Bhatti, S. H., Saleem, F., Zakariya, R., & Ahmad, A. (2019). The determinants of food waste behavior in young consumers in a developing country. *British Food Journal*.

Birks, M., & Mills, J. (2015). *Grounded theory: A practical guide*. Sage, 60, 4-10.

Black, G. S. (2004). The impact of the English language on cross-cultural consumer research in Asia and Latin America. *Asia Pacific Journal of Marketing and Logistics*.

Bolton, L.E. and Alba, J.W., 2012. When less is more: Consumer aversion to unused utility. *Journal of consumer psychology*, 22(3), pp.369-383.

Bortoleto, A.P., Kurisu, K.H. and Hanaki, K., 2012. Model development for household waste prevention behaviour. *Waste Management*, 32(12), pp.2195-2207.

Brennan, E.J., 2017. Towards resilience and wellbeing in nurses. *British Journal of Nursing*, 26(1), pp.43-47.

Brug, J., Lechner, L. and De Vries, H. (1995), "Psychosocial determinants of fruit and vegetable consumption", *Appetite*, Vol. 25 No. 3, pp. 285-296.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Sage publications.

Chetty, R. (2016). Traditional serrated adenoma (TSA): morphological questions, queries and quandaries. *Journal of clinical pathology*, 69(1), 6-11.

Cialdini, R.B., Reno, R.R. and Kallgren, C.A., 1990. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of personality and social psychology*, 58(6), p.1015.

Collins, S. E., & Carey, K. B. (2007). The theory of planned behavior as a model of heavy episodic drinking among college students. *Psychology of Addictive Behaviors*, 21(4), 498.

Davis, R. B., & Mukamal, K. J. (2006). Hypothesis testing: means. *Circulation*, 114(10), 1078-1082.

Evans, D. (2012). Beyond the throwaway society: Ordinary domestic practice and a sociological approach to household food waste. *Sociology*, 46(1), 41-56.

Evans, D., (2011). Blaming the consumer—once again: the social and material contexts of everyday food waste practices in some English households. *Critical public health*, 21(4), pp.429-440.

Fabrigar, L. R., MacDonald, T. K., & Wegener, D. T. (2005). The Structure of Attitudes.

Field, A. P. (2005). Is the meta-analysis of correlation coefficients accurate when population correlations vary?. *Psychological methods*, 10(4), 444.

Frederiks, E. R., Stenner, K., & Hobman, E. V. (2015). Household energy use: Applying behavioural economics to understand consumer decision-making and behaviour. *Renewable and Sustainable Energy Reviews*, 41, 1385-1394.

Garnett, T. (2009). Livestock-related greenhouse gas emissions: impacts and options for policy makers. *Environmental science & policy*, 12(4), 491-503.

Ghani, W.A.W.A.K., Rusli, I.F., Biak, D.R.A. and Idris, A., 2013. An application of the theory of planned behaviour to study the influencing factors of participation in source separation of food waste. *Waste management*, 33(5), pp.1276-1281.

Gollwitzer, P. M., & Bayer, U. C. (1999). Deliberative versus implemental mindsets in the control of action (pp. 403-422).

Graham-Rowe, E., Jessop, D.C. and Sparks, P., 2015. Predicting household food waste reduction using an extended theory of planned behaviour. *Resources, Conservation and Recycling*, 101, pp.194-202.

Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk, R., & Meybeck, A. (2011). Global food losses and food waste.

Han, H., & Kim, Y. (2010). An investigation of green hotel customers' decision formation: Developing an extended model of the theory of planned behavior. *International journal of hospitality management*, 29(4), 659-668.

Hodges, R. J., Buzby, J. C., & Bennett, B. (2011). Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use. *The Journal of Agricultural Science*, 149(S1), 37-45.

Jabareen, Y., 2009. Building a conceptual framework: philosophy, definitions, and procedure. *International journal of qualitative methods*, 8(4), pp.49-62.

Johannesson, P., & Perjons, E. (2014). Research strategies and methods. In *An Introduction to Design Science* (pp. 39-73). Springer, Cham.

Jordan, M. I., & Jacobs, R. A. (1994). Hierarchical mixtures of experts and the EM algorithm. *Neural computation*, 6(2), 181-214.

Kaiser, F. G., & Scheuthle, H. (2003). Two challenges to a moral extension of the theory of planned behavior: Moral norms and just world beliefs in conservationism. *Personality and individual differences*, 35(5), 1033-1048.

Kaiser, F. G., Wölfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of environmental psychology*, 19(1), 1-19.

Karim, A. and Arif-Uz-Zaman, K., 2013. A methodology for effective implementation of lean strategies and its performance evaluation in manufacturing organizations. *Business Process Management Journal*.

Kelly, T. C., Mason, I. G., Leiss, M. W., & Ganesh, S. (2006). University community responses to on-campus resource recycling. *Resources, Conservation and Recycling*, 47(1), 42-55.



Koivupuro, H.K., Hartikainen, H., Silvennoinen, K., Katajajuuri, J.M., Heikintalo, N., Reinikainen, A. and Jalkanen, L., 2012. Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International journal of consumer studies*, 36(2), pp.183-191.

Kotler, P., & Armstrong, G. (2006). Principles of marketing. Pearson education.

Kumar, S., 2012. *Kac-Moody groups, their flag varieties and representation theory* (Vol. 204). Springer Science & Business Media.

Labaree, R. V. (2009). Research Guides: Organizing Your Social Sciences Research Paper: 5. The Literature Review.

Largo-Wight, E., Bian, H. and Lange, L., 2012. An empirical test of an expanded version of the theory of planned behavior in predicting recycling behavior on campus. *American Journal of Health Education*, 43(2), pp.66-73.

Lumpkin, J. R. (1985). Shopping orientation segmentation of the elderly consumer. *Journal of the Academy of marketing Science*, 13(1), 271-289.

Lyndhurst, B. (2007). Food behaviour consumer research—findings from the quantitative survey. Briefing Paper.

Mansa, M. (2020). Coping strategies of women intimate partner violence survivors: Perspectives of service providers (Doctoral dissertation, University of Saskatchewan).

Marangon, F., Tempesta, T., Troiano, S., & Vecchiato, D. (2014). Food waste, consumer attitudes and behaviour. A study in the North-Eastern part of Italy. *Italian Review of Agricultural Economics*, 69(2-3), 201-209.

McCarty, J. A., & Shrum, L. J. (1994). The recycling of solid wastes: Personal values, value orientations, and attitudes about recycling as antecedents of recycling behavior. *Journal of business research*, 30(1), 53-62.

McGuire, S. (2016). FAO, IFAD, and WFP. The state of food insecurity in the world 2016:

Murthy, S. N., & Bhojanna, U. (2009). Business research methods. Excel Books India.

Pakpour, A. H., Zeidi, I. M., Emamjomeh, M. M., Asefzadeh, S., & Pearson, H. (2014). Household waste behaviours among a community sample in Iran: An application of the theory of planned behaviour. *Waste management*, 34(6), 980-986.

Pakpour, A.H., Zeidi, I.M., Emamjomeh, M.M., Asefzadeh, S. and Pearson, H., 2014. Household waste behaviours among a community sample in Iran: An application of the theory of planned behaviour. *Waste management*, 34(6), pp.980-986.

Pellegrini, G., Sillani, S., Gregori, M., & Spada, A. (2019). Household food waste reduction: Italian consumers' analysis for improving food management. *British Food Journal*.

Porpino, G. (2016). Household food waste behavior: Avenues for future research. *Journal of the Association for Consumer Research*, 1(1), 41-51.

Principato, L., Secondi, L., & Pratesi, C. A. (2015). Reducing food waste: an investigation on the behaviour of Italian youths. *British Food Journal*.

Puzzarini, C., Bloino, J., Tasinato, N. and Barone, V., 2019. Accuracy and interpretability: the devil and the holy grail. New routes across old boundaries in computational spectroscopy. *Chemical reviews*, 119(13), pp.8131-8191.

Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D. (2013). Spaghetti soup: The complex world of food waste behaviours. *Resources, Conservation and Recycling*, 79, 43-51.

Reno, R.R., Cialdini, R.B. and Kallgren, C.A., 1993. The transsituational influence of social norms. *Journal of personality and social psychology*, 64(1), p.104.

Roberts, J. A., & Bacon, D. R. (1997). Exploring the subtle relationships between environmental concern and ecologically conscious consumer behavior. *Journal of business research*, 40(1), 79-89.

Russell, K.C., Gillis, H.L.L. and Kivlighan Jr, D.M., 2017. Process factors explaining psycho-social outcomes in adventure therapy. *Psychotherapy*, 54(3), p.273.

Salhofer, S., Obersteiner, G., Schneider, F., & Lebersorger, S. (2008). Potentials for the prevention of municipal solid waste. *Waste management*, 28(2), 245-259.

Secondi, L., Principato, L. and Laureti, T., 2015. Household food waste behaviour in EU-27 countries: A multilevel analysis. *Food policy*, 56, pp.25-40.

Shabnam, N. and Pardha-Saradhi, P., 2013. Photosynthetic electron transport system promotes synthesis of Au-nanoparticles. *PLoS One*, 8(8), p.e71123.

Stancu, V., Haugaard, P., & Lähteenmäki, L. (2016). Determinants of consumer food waste behaviour: Two routes to food waste. *Appetite*, 96, 7-17.

Stefan, V., van Herpen, E., Tudoran, A.A. and Lähteenmäki, L., 2013. Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food quality and preference*, 28(1), pp.375-381.

Stephanie. (2014 December 10). Univariate Analysis: Definition, Examples. Retrieved from <https://www.statisticshowto.datasciencecentral.com/univariate/>Stuart, T. (2009).

Waste: Uncovering the global food scandal. WW Norton & Company.

Takala, M. (1991). Environmental awareness and human activity. *International Journal of Psychology*, 26(5), 585-597.

Thøgersen, J., 2006. Norms for environmentally responsible behaviour: An extended taxonomy. *Journal of environmental Psychology*, 26(4), pp.247-261.

Thyberg, K.L. and Tonjes, D.J., 2016. Drivers of food waste and their implications for sustainable policy development. *Resources, Conservation and Recycling*, 106, pp.110-123.

Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of personality and Social Psychology*, 54(2), 323.

Visschers, V.H., Wickli, N. and Siegrist, M., 2016. Sorting out food waste behaviour: A survey on the motivators and barriers of self-reported amounts of food waste in households. *Journal of Environmental Psychology*, 45, pp.66-78.

Wang, J., Wang, S., Wang, Y., Li, J., & Zhao, D. (2018). Extending the theory of planned behavior to understand consumers' intentions to visit green hotels in the Chinese context. *International Journal of Contemporary Hospitality Management*.

Watson, M. and Meah, A., 2012. Food, waste and safety: Negotiating conflicting social anxieties into the practices of domestic provisioning. *The Sociological Review*, 60, pp.102-120.

William\*, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. *Assessment in education: principles, policy & practice*, 11(1), 49-65.

Williams, R.J., Volberg, R.A. and Stevens, R.M., 2012. *The population prevalence of problem gambling: Methodological influences, standardized rates, jurisdictional differences, and worldwide trends*. Ontario Problem Gambling Research Centre.

Zablotsky, B., Black, L. I., Maenner, M. J., Schieve, L. A., & Blumberg, S. J. (2015). Estimated prevalence of autism and other developmental disabilities following questionnaire changes in the 2014 National Health Interview Survey.

Zamboni, J. (2018). What is the meaning of sample size? Accessed on, 2, 08-20.

**9. Appendix**

Table 10: Questionnaire

Construct	Measurement item
Attitude toward food waste	I feel bad when uneaten food is thrown away.
	I was raised to believe that food should not be wasted.
	I think food should not be wasted.
	Throwing away food would bother me.
Injunctive norms	One should recycle the food waste generated.
	One should Never waste any food.
	One should Reuse leftovers.
	One should Not load the environment with food waste.
Moral norms	Wasting food would Give me a bad conscience
	Wasting food would Make me feel guilty about people who do not have enough food.

	Wasting food would Make me feel guilty about the environment.
Perceived behavioral control	In my opinion wasting food is avoidable
	In my opinion loading the environment with my household's food waste is avoidable.
	In my opinion do not wasting food is easy.
Intention not to waste food	I intend to eat leftover food.
	I intend not to throw away food.
	I intend to generate as little food waste as possible
	I intend to find a use for food trimmings
Food waste behavior	I waste food whenever I go out with friends/family.
	I waste food whenever I have guests at home.
	I waste food at work/school.
	I waste food at home whenever I am due to travel.