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Household Awareness of Recycling Food Waste as Fertilizer for Agriculture in Kelantan

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Faculty of Agro Based Industry
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DECLARATION

I hereby declare that the work embodied in here is the result of my own research except for the excerpt as cited in the references.

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FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

FYP FIAT

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UNIVERSITI
MALAYSIA
KELANTAN

Household Awareness of Recycling Food Waste as Fertilizer for Agriculture in Kelantan

ABSTRACT

Nowadays, most households in Malaysia are still not sensitive to food waste that is thrown away, wasted just like that. Statistics state that about 4,600 tonnes of food that is still in good condition has been wasted throughout Peninsular Malaysia since 2017. Therefore, this study was conducted to identify the awareness of households in Kelantan about food waste that can be recycled into fertilizer in agriculture. This study uses a method based on purposive sampling. The sample size of the study was 130 respondents. SPSS version 26.0 was used to analyse reliability tests, descriptive and correlation analysis. Questionnaires were distributed online as a medium to measure the level of households awareness of in the study area. The study also uses demographic factors such as age, occupation and level of education that can influence the level of household awareness in the disposal of food waste that can still be recycled for use as fertilizer in agriculture. The independent variables in this study were knowledge, attitudes, subjective norms and behavioral control while the dependent variable was awareness of recyclable food waste. A quantitative research design was used and questionnaires were compiled based on the Theory of Planned Behavior (TPB). The findings showed that high scores were recorded for household awareness of food waste recycling (M =4.46), attitudes (M = 3.91), subjective norms (M = 3.63) and perceived behaviors (M = 3.68). In general, there was a significant relationship between household awareness of food waste recycling with perceived attitudes, subjective norms and behavioral controls.

Keywords: *food waste, recycling, household, demographic factors, fertilizer, agriculture*

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

Kesedaran Isi Rumah Terhadap Kitar Semula Sisa Makanan Sebagai Baja untuk Pertanian di Kelantan

ABSTRAK

Kini, kebanyakan isi rumah di Malaysia masih tidak peka dengan sisa makanan yang dibuang, dibazirkan begitu sahaja. Statistik menyatakan kira-kira 4,600 tan makanan yang masih dalam keadaan baik telah dibazirkan di seluruh Semenanjung Malaysia sejak tahun 2017. Justeru, kajian ini dijalankan untuk mengenal pasti kesedaran isi rumah di Kelantan tentang sisa makanan yang boleh dikitar semula menjadi baja dalam bidang pertanian. Kajian ini menggunakan kaedah berdasarkan persampelan bertujuan. Saiz sampel kajian ialah 130 orang responden. SPSS versi 26.0 digunakan untuk menganalisis ujian kebolehpercayaan, analisis deskriptif dan korelasi. Soal selidik diedarkan secara dalam talian sebagai medium untuk mengukur tahap kesedaran isi rumah di kawasan kajian. Kajian juga menggunakan faktor demografi seperti umur, pekerjaan dan tahap pendidikan yang boleh mempengaruhi tahap kesedaran isi rumah dalam pelupusan sisa makanan yang masih boleh dikitar semula untuk digunakan sebagai baja dalam bidang pertanian. Pembolehubah bebas dalam kajian ini ialah pengetahuan, sikap, norma subjektif dan kawalan tingkah laku manakala pembolehubah bersandar ialah kesedaran tentang sisa makanan yang boleh dikitar semula. Reka bentuk kajian kuantitatif telah digunakan dan soal selidik telah disusun berdasarkan Teori Tingkah Laku Terancang (TPB). Dapatan kajian menunjukkan bahawa markah tinggi direkodkan untuk kesedaran isi rumah tentang kitar semula sisa makanan (M = 4.46), sikap (M = 3.91), norma subjektif (M = 3.63) dan tingkah laku yang ditanggap (M = 3.68). Secara umumnya, terdapat hubungan yang signifikan antara kesedaran isi rumah tentang kitar semula sisa makanan dengan persepsi sikap, norma subjektif dan kawalan tingkah laku.

Kata kunci: *sisa makanan, kitar semula, isi,faktor demografik, baja, pertanian*

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

TABLE OF CONTENT

FYP FIAT

UNIVERSITI MALAYSIA KELANTAN

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

FYP FIAT

UNIVERSITI MALAYSIA KELANTAN

LIST OF TABLE

LIST OF FIGURE

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

FYP FIAT

CHAPTER 1

INTRODUCTION

1.0 Introduction

In this chapter, the background of the study is based on the Household Awareness of Recycling Food Waste as Fertilizer for Agriculture. The study also includes statements of research problems, hypotheses, research questions, research objectives, the significance of the study and the scope of the study.

UNIVERSITI MALAYSIA KELANTAN

1.1 Background of study

Looking at food waste disposal around the world, this problem needs to be addressed by giving awareness especially to households that excess food waste can be recycled and is useful as fertilizer in agriculture. Landfills can also be reduced if food waste is recycled into organic fertilizer. Based on studies, food waste contains effective microorganisms that function to fertilize the soil when recycled into compost (Shin, 2004). Food waste statistics in our country show that the amount of food waste thrown away in Malaysia is very surprising. About 3,000 metric tons of food waste is basically untouched and still edible yet discarded daily by households. The fact is that that amount is enough to feed two million indigent and starving people.

In total, all types of food waste that make up about 40 percent or even 15,000 metric tons are daily households waste in Malaysia. These figures are based on research sources conducted by the Solid Waste Management and Public Cleansing Corporation (SWC Corp) in 2016. Even the Director of SWCorp from the Federal Territory of Hazilah has stated that the study also found that household consisting of five members spend on average RM900 per month for food and that a quarter of it is wasted during preparation, cooking and consumption, Anim (2018).

Garbage is not just an overflow of products or goods. The most difficult waste problem to solve is that it consists of food waste that even makes up 17% of the world's total waste. The researchers found that regardless of the income level of each country. Each country has substantial levels of food waste that come mostly from households. Even if viewed through the food chain, households produce 11% of waste consisting of food waste.

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

While restaurant services and retail outlets are 5% and 2% respectively (Yatim, 2016).The aim of this study is to open household views about food waste that is wasted every day can actually still be used if recycled. In fact, it has the potential to be compost that can be used in agriculture to produce fresher and more fertile crops.

FYP FIAT

UNIVERSITI
MALAYSIA
KELANTAN

1.2 Problem Statement

Rapid population growth, urbanization and industrialization have led to an increase in solid waste generated by society. Solid waste management is one of the major problems faced by society especially in the city. Solid waste management from the stages of collection, collection, transportation of garbage to the point of disposal, consuming is very high costs. The quantity of solid waste plus food waste, especially domestic waste, needs to be reduced to reduce government spending. The cost aspect is the driver of a good food waste management system. However, as the charges imposed on the community are not commensurate with the cost of waste management, local authorities find it difficult to improve the quality of services to the community due to limited capital, employment, operations, vehicles as well as lack of equipment. As the cost of waste management increases, a recycling program is implemented to reduce the quantity of food waste disposed of,(Dermawan, 2017)

In the current era, we can still see the dumping of garbage and food waste dumped everywhere. Based on statistics, Kelantan is among the states that produce a relatively of garbage and food waste in high amount every day. The Kelantan government itself admits that the "Kota Bharu Bersih" campaign is still not successful to this day. This is because Kelantan is famous for many entrepreneurs and food traders who produce their food products, (Hanan, 2017). If we take this problem seriously, one of the causes of high waste disposal comes from excess food. Resource -intensive food production, loss and food waste indirectly, it will contribute to various environmental effects, such as soil erosion, deforestation, water and air pollution (Mourad, 2016). As economic and social and environmental problems are

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

now seen to be on the rise, food waste is recognized as an increasingly pressing issue among governments, NGOs, academics, and the general public. Along the food production chain much involves evidence based on the amount of food wasted (Mourad, 2016).

On average (previous record estimates of wastage around 15,000 tonnes per day), a Malaysian throws away 1.64 kilograms (kg) of food waste per day, which is higher than the world average of 1.2 kg per day. From an economic perspective, food wastage means wastage the use of economic resources such as water and fuel as well as contributing to carbon dioxide emissions. (Yusof, 2019) ,The problem of food waste disposal needs to be resolved so that the country continues to be under control. For example, the amount of food waste and garbage is thrown away every day is high. Landfills will be congested and accumulate increasing garbage (Thyberg and Tonjes, 2016) . Therefore, exposure to fertilizers and food waste can give some awareness to the community to reduce food waste disposal group of households. This study explores the level of motivation and awareness of households to minimize food waste based on age and gender, in an effort to find progressive, affordable, and environmentally friendly solutions to the problem of food waste in Kelantan. In the future it is hoped that this study can help overcome the problem of garbage dumping by exposing households to the benefits of recycling food waste while avoiding waste.

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

1.3 Hypothesis of the Study

H1: There was a significant relationship between attitudes and household awareness of recycling food waste.

H2: There is a significant relationship between subjective norms and awareness of the recycling of food waste into fertilizer.

H3: There is a significant relationship between perceived behavioral control and awareness of food waste to be recycled into fertilizer.

1.4 Research Questions

1. What is the level of household awareness on food waste that can be recycled into agricultural fertilizer?

2. What is the level of attitude, subjective norms and behavioral control felt by households in Kelantan towards food waste that can be recycled into agricultural fertilizer?

3. Is there a relationship between perceived attitudes, subjective norms and behavioral control with household awareness of food waste recycled to produce agricultural fertilizers?

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

1.5 Scope of study

In this study, household awareness of food waste that can be recycled into fertilizer in agriculture is the focus of this study. The independent variables for this study are attitudes, subjective norms and perceived control of behavior. Therefore, several household factors in Kelantan were selected as respondents and the target population. The number of target respondents is 150 household around Kelantan.

1.6 Significant of study

This research was conducted to examine the household awareness of food waste that can be recycled to be used as fertilizer in agriculture. It is important from this study to determine the level based on household awareness on the recycling of food waste to be used as agricultural fertilizer. Based on Global Food Losses and Food Waste, Food waste or food waste is food that is discarded or not eaten. The cause of food waste is when household overspend, over -produce, process, and retail. In order to sustain the world's limited resources and secure enough food to all humans, the amount of food waste needs to be reduced. In prepared food, the environmentally educated household wasted less. Due to passed "best before date" they also wasted less food (Williams, 2012). This study can help reduce the dumping of food waste and garbage in Kelantan in addition to applying awareness to household to recycling food waste that can be used as fertilizer in agriculture. So this study

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

will increase household awareness to reduce the quantity of food waste and dumping of garbage at home, especially in Kelantan.

1.7 Research Objectives

The specific objectives are to:

1. To determine the level of household awareness on food waste that can be recycled into fertilizer in agriculture.

2. To identify the level of attitudes, subjective norms and behavioral control felt by household in Kelantan towards the recycling of food waste that can produce fertilizer for agriculture.

3. To analyze the relationship between attitudes, subjective norms and perceived behavioral control with household awareness of food waste that can be recycled to produce fertilizer, especially Kelantanese.

FYP FIAT
UNIVERSITI
MALAYSIA
KELANTAN

FYP FIAT

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the review of related studies as well as empirical findings that are important to the development of the theoretical and conceptual framework and methodological consideration in order to achieve the objectives of this study.

UNIVERSITI
MALAYSIA
KELANTAN

2.1 Concept of Level Awareness of Recycling Food Waste

Factors that influence the awareness of household on food waste recycling is when there is a dumping of food waste in Malaysia. Lately, an increase in attention to the problem of food waste and social status can be seen. (Radzyminska, 2016) mentioned that the number of studies showing food waste yields with irresponsible behavior in society is starting to increase. Such studies indicate that behavioral awareness of food consumption is a very important aspect in addressing the problem of food waste. At the household level, it is recognized that they can still shape their behavior through sound decision -making (USAID, 2012). Further, (Stern, 2000) argues that "environmental influencing behaviors are environmentally significant behaviors in which changes in daily life patterns. Behaviors alone are not sufficient in determining the environment of significant households behaviors." In developed countries, food shortages and waste are strongly related to consumer behavior, whereas the relationship is less specific in developing countries (FAO, 2011). A set of specific reasons for the dumping of food waste from the home was identified by (WRAP, 2007) , including excessive purchases from household healthy to continue. Food organization is in an adequate way that is to recycling food waste if it has reached the expiration date. Recycling food waste can be used as fertilizer in agriculture. The level of awareness of household to manage food waste properly is still at an unsatisfactory level (Danyi Qi, 2016) Based on a study conducted by (Watanabe, 2013) ,the results indicate that many households may have realized the advantages of recycling in the home area through newspapers and publications from the government. Thus, there was no significant difference on conception between male or female households. According to (Jarjusey, 2017), there are information of how awareness represented in understanding approaches to food waste recycling, and how

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

households can recycling food waste at home for fertilizer. In these modern days, we can see the level of awareness based on how household spend a lot of money to buy the food which made to gain the food waste.This kind of attitude undesirable behaviors of food waste that related to information of awareness (Sharmin, 2021) .According to (Danyi Qi, 2016) online information about recycling, food waste showed instability in the level of awareness on social media.The result displayed that household with high level of realizing benefit of recycling food waste over personal information on social media.

FYP FIAT

UNIVERSITI
MALAYSIA
KELANTAN

FYP FIAT

2.2 Theoretical Framework

In TRA, it is aims to explain the influence sought by individuals based on all behaviors. Planned Behavior Theory (TPB) is used to predict a person's intent to participate in a particular behavior at a particular time and location. This hypothesis explained that a person's intention towards behavior is formed by two main factors, namely attitude towards the behavior and subjective norms (Ajzen, 1975), while in TPB, another factor is added, namely perceived behavioral control. A common tool used to predict and describe various domains is TPB (Azura, 2018).

2.3 Theory of Planned Behaviour (TPB)

Attitudes present readiness for actions that lead to behavior and not behavior alone (Ajzen, 1991).An individual will do something according to his attitude towards a behavior. The attitude towards the behavior that he considers positive is that the individual will later choose to behave in his life. Therefore, attitude is a vehicle in guiding an individual to behave, (Sabeen, 2019). Under the control of individual, household behavior cannot fully controlled. In every situation condition it can be the other way around where an household can control their behavior under the control. There are several factors on the control of household

UNIVERSITI MALAYSIA KELANTAN

behavior such as internal factors as well as external factors. Skills, abilities and knowledge constitute as internal factors that come from within the household while the environment around becomes household external factor (Khana, 2019).

The household will perform a certain behavior if their behavior can be accepted by people and their behavior life is when all can accept what they do .Normative beliefs will create household awareness of food waste recycling in subjective norms or social environments (Alavi, 2015). According to TPB, intention defines actions directly, and is expected by behaviours, subjective norms, and perceived regulation of behaviour. TPB will be included many studies focusing on food waste and household activity. An individual's attitude is a significant marker of whether or not a specific action is acceptable for them. Subjective norms, on the other hand, are made up of expectations. Perceived regulation of actions, the third aspect of TPB, refers to having enough opportunities and resources to engage in such behaviour. Psycho-social influences are the term given to these three elements.

TPB is a useful hypothesis in analysing the factors that influence household food waste behaviour when it comes to the decision not to dispose of food. Injuries influenced the decision not to throw food away. Norms that don't function are connected to the purpose not wasting of food. The larger amount of household who feel they cannot throw away food waste, the more determined they are to do so. The intention to not waste food away at home is also positively related to attitudes toward food waste. Perceived standards and behavioural controls have a significant effect on intention (Tahir Mapa, 2019).

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

2.3.1 Level of Attitudes

Attitudes refers to the degree to which a person has a favorable or unfavorable evaluation or assessment of the behavior in question (Ajzen, 2002). Attitudes of the household can help to reduce the rate of food waste in Kelantan. Knowing the household attitudes about recycling food waste can give some information about the household that want interest to recycling food waste to reduce waste (Ali, 2015). Food waste recycling can only be successful if the household support and actively participate in it (Chaza, 2015). In order to determine householder 'attitude in household solid waste recycling, it became necessary to find out how much respondents are aware of the recycling initiatives in their areas. Behavioral attitude refers to the person attitude without any other effects. The level of awareness of households to manage food waste properly is still at an unsatisfactory level. The majority of households think that food waste management work is under the responsibility of the government and cleaning workers alone, while each household can play a specific role in recycling food waste at home, (DS Dr Ismail, 2020). The situation is similar to the findings of a study by (Moh and Latifah, 2016) who found that environmental issues, especially food waste management in Kelantan still cannot be resolved because of household attitudes is at a low level. Lack of participation and commitment as well and level of attitudes among households is low (Zaini Sakawi, 2017).

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

2.3.2 Level of Subjective norm

Subjective norm can be referred to as the social pressure felt by a person (Ajzen, 1991). These perceptions can play an effective role and put pressure on an individual to perform a specific behavior. From the study (Tan, Johanim and Annis Fadilla, 2015) say that subjective norm based on individual depend on their perception of their significant others, for example family members, friends, and colleague. The social environment encourages the majority of households to engage in food waste recycling. The government is also in an effort to encourage the people to recycling food waste at home. Various awareness campaigns and Trash to Cash programs that allow households to convert garbage or food waste at home into additional financial resources (DS Dr Ismail, 2020). For example, Malaysia has developed an Action Plan Malaysia Towards Zero Use of Disposable Plastics 2018-2030 towards a sustainable future. Vision of the Action Plan towards zero use of disposable plastics so that the environment in Malaysia is cleaner and healthier by 2030. However, the study found that awareness of the efforts made by the government are low as well as the recycling of food waste among households in Kelantan. (FOMCA, 2021). Only 15 percent of Kelantanese practice the method of recycling food waste even though the government introduced a recycling program by separating solid waste by category. the recycling program at Kelantan did not show the results expected by the government. this failure may be due to the government's unproactive policy to make food waste recycling as an alternative, inadequate facilities in some areas and very low household awareness (MN Naim, 2020).

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

2.3.3 Level of Perceived behavioural control

Perceived behavioural control can be define as a person belief about his or her skills that show certain behaviour (Sanghyo Kim, 2020). Other research state that perceived behavioral control can be define as a person able to control their behavior and level of confidence in their skill to do or not. Based on (Hyeon Lee, 2020), behavior intention of person is strongly influenced by their level of confidence in performing the actual behavior. For example if household want to continue recycle their food waste, they may go though there are other things that will probably prevent them from going. (Karen Refsgaard, 2009), state that perceived behavioral is a moderate level in their study because not all household have experience with food waste recycling (Attiq, 2021).

FYP FIAT

UNIVERSITI MALAYSIA KELANTAN

2.3.4 The Effect of attitude on Household Awareness of Food Waste Recycling

The failure to control attitudes in predicting specific behaviors directed by attitude targets has been demanded to abandon the concept of attitudes (Bravi,L, 2019). Attitudes also indicate general attitudes and personalities involved in human behavior such as housewives. (Murmura, 2019) say that the influential attitude of the household to realize that recycling food waste is aimed at reducing garbage dumping. The household who believe in valuable positive outcomes will be produced from the behavior as well as will have a positive attitude towards the behavior in managing food waste. In this study, household 'attitudes towards food waste recycling awareness will determine their behavioral perceptions.

Attitude will influence behavioral intention to perform some action, (De Rijk et al , 2009). Attitudes had a positive and significant effect on the awareness of household to recycling food waste to produce fertilizer in this study. (Haliza, 2020), say based on other countries is to show the problem of negative attitudes comes from the household who are indifferent. They allow excess food to be thrown away just like that. Not behaving as a good or bad respondent will be able to be assessed if referred through household' attitudes towards wasting food.

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

The relationship between attitudes towards food waste and intention to recycling food waste will be focused on through this study. The desire to recycling food waste among household in Kelantan buying is positively influenced by the attitude towards excessive food. This was reported by (Mohamed Sayuti, 2011). In predicting and explaining household behavior, attitudes towards daily food waste are considered a very important part. Therefore, we will submit the following hypothesis that the intention to recycling food waste from household is positively related to attitudes towards food waste. Attitudes toward food waste are an important antecedent of the intention to recycling food waste and form the basis of subjective norms. There was significant correlation between attitude and level of household awareness of recycling food waste at home. (Brian E, 2016) The attitude of households that play a role in recycling food waste at home will be a right step to reduce the pile of garbage in landfills (Jarjusey, 2017). While there are households that frequently associate the phrase 'food waste' to inedible pieces of food and surplus, there are also households that tend to like to study the definition beyond that. They argue that excess food production is in line with population growth so it is not wrong to start measures to recycling food waste at home and can reduce garbage dumping in Kelantan (Norshamliza Chamhuri, 2017).

FYP FIAT

UNIVERSITI MALAYSIA KELANTAN

2.3.5 The Effect of Subjective Norm on Household Awareness of Food Waste Recycling

Subjective norms are based (Tam, 2018), saying that an individual's perception of social pressure to perform or not perform a behavior. This independent variable influences the awareness of household on food waste recycling which influences the behavior as expected to reduce the dumping of garbage waste in Kelantan. Household behavior based on their subjective norms has the intention to recycling food waste and know very little about compost in agriculture. The study of (Kate Parizeau, 2015) says that household want to know about food waste as well as recycling to make fertilizer in agriculture. Previous studies have said that subjective norms are important for classifying intentions to recycling food waste (Mamun, 2019). Therefore, subjective norms can provide a significant influence on household' awareness of food waste recycling.

The most influential based on subjective norms are incentives in managing food items and family attitudes on food waste recycling to reduce waste (Martin, 2015) Subjective norms are also related to household foods that affect the amount of food waste. For example, routine household planning such as checking inventory or planning meals in advance, can contribute to a decrease in the amount of food waste. However, if food is cooked too much or in excess of the quantity of family members causes an increase in the amount of food waste in the home. Family members who plan meals on a regular basis, help the household estimate the amount of food purchased and the amount of food that is covered. This in turn will reduce the probability of waste, there was positive correlation of household family toward recycling food waste due to high level of awareness. (Dalilawati, 2019) The practice of recycling food waste at home by the whole family aims, planning to reuse food waste for other foods such

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

as storing food waste safely by storing it in the correct container with lid before storing in the refrigerator has a positive impact on the home environment in time the same reduces garbage dumping, (Khana, 2019).

2.3.6 The Effect of Perceive Behavioural Control on Household Awareness of Food Waste Recycled as Fertilizer

According to TPB theory, PBC has a strong influence on behavioral intentions on food waste recycling awareness (Mamun, 2019). Perceived behavioral control is based on the assumption of consistently following from easily accessible beliefs, as these situations are beliefs about sources and barriers that can facilitate or influence the performance of a given behavior. Perceived behavioral control can conceptualize a person's ability to control their behavior and the level of confidence in their ability to perform or not, (Dalilawati, 2019). This behavior, the household can determine and can make a decision based on the beliefs of those who want to recycling food waste or not. From previous studies, a person's behavior greatly influences their confidence level (Tam, 2018).

Based on a study, behavioral observations can also have a positive and significant impact on awareness of recyclable food waste. The study of (Tammara Soma, 2019) household behaviors that encourage food disposal is negligence in managing food such as forgetting to cover food or storing food until the food is stale and inedible. Household behavior does not practice good planning in managing food menus, purchasing and storing food stocks. Household behavior control makes good planning in terms of food storage and recycling spoiled food reduces the waste generated on a daily basis. There is high positive

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

correlation between the behavior control with awareness towards recycling food waste at home by household. In terms of stock keeping, household behavior control that cares about checking food stocks avoids buying the same food over and over again while reducing the risk of food being spoiled or has reached expiration date. which is produced every day (Taufique and Vaithianathan, 2018).

2.4 Summary

This chapter describes the level of awareness on food waste recycling and the theory that used in this study. This chapter also briefly explains the awareness on food waste recycling based on independent variables such as attitudes, subjective norms and perceived behavioral control using the theory Planned Behavior (TPB). In addition, the influence of attitudes, subjective norms and household behaviors on recycling food waste is explained to show the significance of two relationships between independent variables and dependent variables.

FYP FIAT
UNIVERSITI MALAYSIA KELANTAN

FYP FIAT

CHAPTER 3

METHODOLOGY

3.0 Introduction

In this section,the method, conceptual framework and model used in this study were discussed. How the research was conducted as well in the research briefly in this chapter were discussed. In the first part the data, research design and questionnaire respectively were discussed. In the second part the temporary framework of the research were discussed.Then,in the third part of the research, instrumentation procedures, population, sampling and how data preparation were performed.

UNIVERSITI MALAYSIA KELANTAN

3.1 Research Design

Based on this study, this study,the quantitative research design was used to obtain information from the respondents.The dependent variable is the awareness of households in Kelantan on food waste that is recycled to produce fertilizer for agriculture. To include data and analysis on demographic profiles, independent variables and dependencies, the data was analysed using SPSS.

FYP FIAT

UNIVERSITI MALAYSIA KELANTAN

FYP FIAT

3.2 Research Framework

A research framework is provided to identify the level of household awareness of food waste that can be recycle to produce fertilizer in agriculture. The dependent variable was household awareness of food waste recycling while the independent variable was attitudes, subjective norms and perceived behaviors that had been adapted from the Theory of Planned Behavior (TPB).

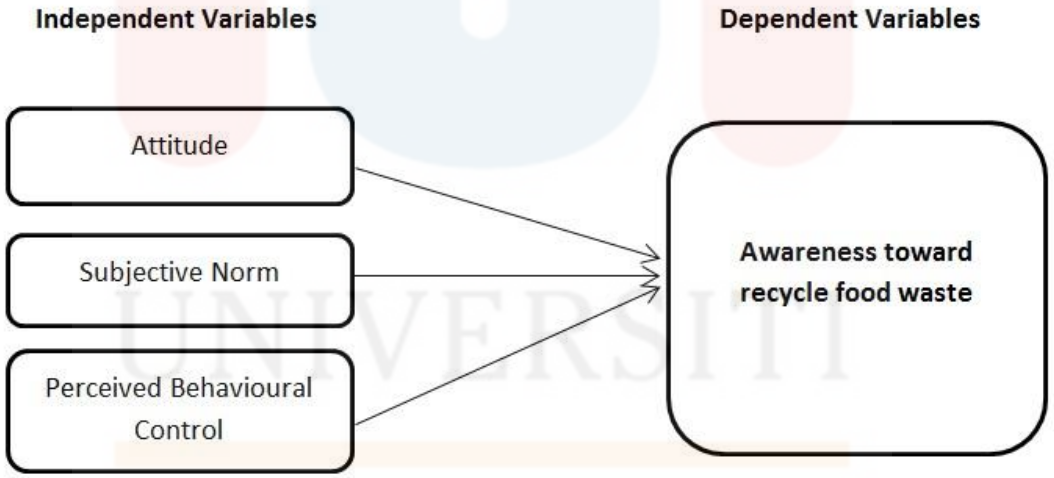

Figure 3.1: The conceptual framework.
(Source: Adapted model from Ajze (1991)).

UNIVERSITI MALAYSIA KELANTAN

3.3 Instrumentation

Questionnaires will be distributed to respondents in groups of households around Kelantan and the completed questionnaires will be analyzed. Through this study, we can see the level of household awareness of food waste that can be used as fertilizer if recycled involving attitudes, subjective norms, perceived behavior. The questionnaire for this study will involve parts A, B, C, D and E. Part A is a demographic profile that includes gender, age, race, level of education. For part B, the questionnaire covers the level of awareness of recyclable food waste (dependent variables) and parts C, D and E are independent variables that include attitudes, subjective norms and perceived behavioral control. Responses to the questionnaire questions were recorded using a 5-30 likert scale present from strongly disagree, disagree, average, agree and strongly agree respectively for a scale of 1 to 5.

FYP FIAT

UNIVERSITI
MALAYSIA
KELANTAN

3.3.1 Part A: Demographic Profile

In this section, the questions ask for the study bio of the producer.The questions in this section include gender, age, race, monthly income, level of educator and experience in recycling food waste.

3.3.2 Part B: Independent Variable

This section has seven question items based on the level of awareness of households in Kelantan on food waste that can be used as fertilizer.

3.3.3. Part C, D and E: Dependent Variable

The questions answered by the respondents in this section are based on independent variables.Part C is attitudes, part D is subjective norms and part E is considered behavioral control.

FYP FIAT
UNIVERSITI
MALAYSIA
KELANTAN

3.4 Population and sample

Households located around Kelantan were selected as the population and sample for this study because the management of waste and food waste in Kelantan is relatively unmanaged. The State of Kelantan has not yet signed the Solid System Management and Public Cleansing Agreement Act 672 (Fazlina Rahim, 2020) .130 respondents that are targeted answered the questionnaire of this study.

3.4.1 Sample size

This study targeted households in Kelantan to study the level of awareness of food waste that can be recycled. The sampling technique that was used for this study is simple random sampling where the sample was selected randomly. The sample size is 130 respondents and all of them answered the questionnaire provided. The recommended sample size is more than 100.If the sample is to be provided as many as 130 can already be categorized in a good and suitable condition.

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3.4.2 Sampling procedure

This study was selected using purposive sampling. Purposive sampling under the probability sampling method was selected because the respondents consist of households around Kelantan. To sampling methods involved coincidence or randomness in the process of selecting a sample. Each element in the population that was selected as positive probability and was included in the sample.

3.5 Data Provision

The completed questionnaire was tested by a pilot study to check the questionnaire. Then, the pilot test was analyzed using a reliability test.

3.5.1 Pilot study

Pre-testing was done by distributing it to households in Kelantan to ensure the likelihood of their response so that significant results reached the level of understanding of entrepreneurs. Statistical Package for Social Science Software (SPSS) was used in this study to analyze the data that was collected.

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3.5.2 Reliability test

According to (Jeffrey S, 2011), the reliability test is consistency test, survey, observation or other measuring device without error. The procedure of reliability analysis analyses a number of commonly used measures of scale reliability and also provides information on the relationships between individual items of the scale. Cronbach's alpha was used to measure the reliability of the questionnaire in this study. The variables were reliable if the response was stable after the test administration was repeated.

By looking at Cronbach's alpha, the reliability coefficient ranges between 0 to 1, but no lower limit is actually existing for the coefficient. Cronbach's alpha coefficient became closer to value 1.0, therefore the internal consistency of the items in the scale is larger. Based on (George & Mallery, 2003) they show that the rules of thumb are excellent it is >0.9, good if it is >0.8, acceptable if it is >0.7, questionable if it is >0.6, poor if it is >0.5 and unacceptable if it is <0.5. The unreliable items will delete or restructured to ensure the value of Cronbach's alpha for each measurement tool must be exceeding 0.7, which was at a correct level.

Table 3.2 showed the result of the reliability test analysis for this study. The result shows that attitudes,subjective norm and perceived behavioral control and awareness of household in food waste recycling are reliable because have the value of Cronbach's Alpha, larger than 0.7.

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Table 3.2 Reliability Test

Variable	Cronbach's Alpha	Number of items
Attitudes	0.902	7
Subjective Norm	0.965	7
Perceived behavioral control	0.961	7
Awareness household of recycling food waste	0.945	6

3.6 Data analysis

Data was checked to prove the accuracy of the data collected from the survey. Data cleaning also be done by checking the frequency and descriptive statistics as well as coding and data entry. Descriptive statistics such as mean, minimum, maximum, frequency, percentage and standard deviation were analyzed by interpreting the data collected using the SPSS program. Once the data is collected, the data were analyzed through SPSS Statistic version 26.0 such as reliability test, descriptive analysis and factor analysis to achieve the objectives of this study.

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3.7 Summary

In this chapter, the methodology of this study is explained briefly. By using SPSS, quantitative methods were demonstrated in the research design to analyze the data according to the objectives of the study. Recycled and three independent variables namely attitudes, subjective norms and perceived behavioral control. In addition, 130 respondents among household were selected as sample measures.

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CHAPTER 4

RESULT AND DISCUSSION

4.0 Introduction

In this chapter,the results and discussion of this study were covered.130 households from Kelantan in which consists of several areas such as Kuala Krai, Kota Bharu, Machang, Tanah Merah and Jeli were selected as respondents and the questionnaire was collected for future analysis.Based on the objectives of the study, analysis has been employed.

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4.1 Descriptive Analysis

Descriptive analysis that easy to understand the transformation of raw data in the form. Descriptive analysis was employed in this study to analyze demographic background such as gender, age, district, area, education level, religion, race and household monthly income. Besides, the descriptive was analysis also used to analyze the level of independent variables like attitude, subjective norm, perceive behavioral control and dependent variable which is household awareness of recycling food waste as fertilizer for agriculture in Kelantan.

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4.1.1 Socio-Demographic Background of Respondents

The overall result shows,most respondent were female(62.3 %) and the male respondent is (37.7 %).This data respondent based on the household at Kelantan.The highest age percentage is between 27-32 years (38.5%) followed by ages 21-26 years and ages 33-38 years both showed a percentage of (20.8%).For ages 45-50 years (12.3%), 39-44 years (5.4%) and 51-56 years (2.3%).For the district, the respondent from Kota Bharu is the highest percentage (33.8%) followed by Kuala Krai (22.3%),Machang (13.8%),Tanah Merah (13.1%) and Jeli (6.2%). while the other respondents which are (10.8%) consist of households from other districts in Kelantan that are not categorized such as pasir mas, Tumpat, Bachok, Pasir Puteh and Gua musang. Most of the respondents were from urban area (56.9%) followed by rural area (43.1%). For education level, the highest percentage is respondent categorized by Degree/Master/PhD level (35.4%) followed by Diploma level (33.8%),SPM level (20.8%),STPM level (7.7%) and respondent are not going to school (2.3%). For religion, Islam is the highest (86.9%) followed by Buddhist (7.7%),Christian(3.1%),Hindu(1.5%) and others (0.8%). For race, Malay respondent are the highest (86.9%),followed by Chinese(9.2%),Indian(2.3%) while Buddha and others both percentage are (0.8%).Refers to the employment status, the highest is self-employed respondent (43.8%) followed by respondent from Private Sector(36.2%) and (20%) from Government Sector. Next for household monthly income, the highest percentage is rm2100-3000 (36.2%) followed by RM2100-3000 (22.3%), RM3100-4000 (20%), RM4100-5000 (11.5%), RM5000 and above (6.2%) and less than 1000 (3.8%).(60%) of respondents have never recycled waste at home and (40%) of respondents used to recycled waste at home.

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Table 4.1: Demographic Background of Respondents of Household in Kelantan

Characteristics	Frequency (n=130)	Respondent (%)
Gender		
Male	49	37.7
Female	81	62.3
Age		
21-26 years	27	20.8
27-32 years	50	38.5
33-38 years	27	20.8
39-44 years	7	5.4
45-50 years	16	12.3
51-56 years	3	2.3
District		
Jeli	8	6.2
Machang	18	13.8
Tanah Merah	17	13.1
Kota Bharu	44	33.8
Kuala Krai	29	22.3
Others	14	10.8
Area		
Urban	74	56.9
Rural	56	43.1
Education Level		
Not going to school	3	2.3
SPM	27	20.8
STPM	10	7.7
Diploma	44	33.8
Deg/Master/PhD	46	35.4
Religion		
Islam	113	86.9
Christian	4	3.1
Hindu	2	1.5
Buddhist	10	7.7
Others	1	0.8
Race		
Malay	113	86.9
Chinese	12	9.2
Indian	3	2.3
Buddha	1	0.8
Others	1	0.8
Employment Status		
Self-employed	57	43.8
Government Sector	26	20.0
Private Sector	47	36.2
Household Monthly Income	5	3.8
<1000	29	22.3
1100-2000	47	36.2
2100-3000	26	20.0

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3100-4000	15	11.5
4100-5000	8	6.2
>5000		
Have Ever Recycle Waste at home	52	40.0
Yes	78	60.0
No		

4.1.2 Level of awareness of recycling food waste as fertilizer for agriculture

Descriptive analysis was used in order to identify the household awareness of recycling food waste as fertilizer in agriculture. (52.3%) strongly agree that they are aware about food waste recycling is important as fertilizer for agriculture. (40%) agree and (7.7%) either disagree or agree. It shows the result that many response are aware about food waste recycling is important as fertilizer for agriculture. The result show, (63.1%) strongly agree that they are known recycling food waste can reduce contributing to pollution. While (30.8%) agree and (6.2%) either disagree or agree to this statement.(62.3%) strongly agree that they are aware recycling food waste can reduce the dumping of garbage. While (30.8%)agree,(6.2%) either disagree or agree and (0.8%) disagree with this statement.

Besides, (57.7%) strongly agree, (34.6%) agree, (6.9%) either disagree or agree and (0.8%) disagree that they are aware about food waste is a waste and can be recycled.For the statement knowing that recycling food waste can produce fertilizer for agriculture, (52.3%) strongly agree, (35.4%) agree, (11.5%) either disagree or agree and (0.8%) was disagree.Know that food waste has many nutrients that are good for crops. According to this statement,(54.6%) strongly agree.(30.8%) agree,(13.1%) either

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disagree or agree and (1.5%) disagree.Lastly,value mean for household awareness of recycling food waste are (M=4.40)high mean score. It supported in other study by (Radzyminska, 2016) that mention most of household or housewives believe that recycling food waste are important and not difficult to do at home.

Table 4.2: Mean score household awareness of recycling food waste as fertilizer

Factors	Frequency	Percentage	Mean	SD
Household awareness of recycling food waste			4.40	0.502
Low(1.00-2.33)	0	0.0		
Moderate(2.34-3.66)	9	6.9		
High (3.67-5.00)	121	92.9		

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Table 4.3: Descriptive Analysis household awareness of recycling food waste

Statement	Percentage (%)					Mean	Standard Deviation
	1*	2*	3*	4*	5*		
1.I am aware about food waste recycling important as fertilizer for agriculture	0	0	7.7	40.0	68	4.45	0.636
2.I know food waste can contribute to pollution	0	0	6.2	30.8	63.1	4.57	0.609
3.I know garbage disposal caused from food waste	0	0.8	6.2	30.8	62.3	4.55	0.648
4.I know food waste is a waste and can be recycled	0	0.8	6.9	34.6	57.7	4.49	0.662
5.I know recycling food waste can produce fertilizer for agriculture	0	0.8	11.5	35.4	52.3	4.39	0.721
6.I know compost is made from recycling food waste	0	0.8	11.5	32.3	55.4	4.42	0.725
7.I know compost manure from the recycling of food waste is useful in agriculture	0	1.5	13.1	30.8	54.6	4.38	0.771

*Indicator:(1).Strongly Disagree (2).Disagree(3).Either disagree or agree(4).Agree(5).Strongly Agree

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4.1.3 Level of attitude on household awareness of recycling food waste

The descriptive analysis was also used in this study to describe the level of attitude of household awareness toward recycling food waste as fertilizer in agriculture. It is important to measure the level of attitude of household awareness of recycling food waste in order to achieve the objective of this study. The analysis results of household attitude towards awareness of recycling food waste were presented in table 4.3.Mostly respondent are agree (43.8%) followed by strongly agree (39.2%), either disagree or agree (13.1%), disagree (2.3%) and strongly disagree (1.5%) that they are intend to recycle food waste at home. (38.5%) of respondents are agree, (29.2%) strongly agree, (27.7%) either disagree or agree, (3.8%) were disagree and (0.8%) strongly disagree that they are interested in recycling food waste for fertilizer manufacturing in agriculture. Besides, most respondents agree (42.3%), while (26.2%) either disagree or agree, (24.6%) strongly agree, (6.2%) disagree and (0.8%) strongly disagree that they are believe by recycling food waste can reduce the dumping of garbage in Kelantan.

Morever, (40.8%) respondents are agree, (29.2%) strongly agree, (25.4%) either disagree or agree, (3.8%) were disagree and (0.8%) strongly disagree that they believe food waste recycling is important and useful for agriculture. Based on this study, (47.7%) agree that they believe recycling food waste is easy and not complicated. But there is still (23.8%) either disagree or agree, (22.3%) strongly agree, (4.6%) disagree and (1.5%) strongly agree to this statement. (47.7%) respondents agree that they are confident recycling food waste to be used as fertilizer in agriculture can help the government curb the problem of garbage being dumped evenly. Followed by (23.8%) strongly agree, (23.1%) either disagree or agree, (4.6%) disagree and (0.8%) strongly agree to this statement.

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Additionally, (41.5%) of respondents agree, (31.5%) either disagree or agree, (23.1%) strongly agree. Followed by (3.1%) disagree and (0.8%) strongly disagree that they will collect food waste at the house and recycling it to be used as fertilizer. Based on table 4.1 ,the mean score for level of attitude are (M=3.91).It can be categorized as a high mean and it can be asserted that most the household agree to attitude with awareness of recycling food waste as fertilizer. It supported to other study by (MN Naim, 2020) that the result is indicator that household have positive attitude and good knowledge of recycling food waste as fertilizer at home.

Table 4.4 :Mean score attitude on household awareness of recycling food waste

Factors	Frequency	Percentage	Mean	SD
Attitude			3.91	0.682
Low(1.00-2.33)	4	3.1		
Moderate(2.34-3.66)	30	23.0		
High (3.67-5.00)	96	73.8		

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Table 4.5 :Descriptive Analysis attitude on household awareness of recycling food waste

Statement	Percentage(%)					Mean	Standard Deviation
	1*	2*	3*	4*	5*		
1. I intend to recycle food waste in my home	1.5	2.3	13.1	43.8	39.2	4.17	0.855
2. I am interested in recycling food waste for fertilizer manufacturing in agriculture	0.8	3.8	27.7	38.5	29.2	3.92	0.890
3. I believe that by recycling food waste can reduce the dumping of garbage in Kelantan	0.8	6.2	26.2	42.3	24.6	3.84	0.896
4. I believe food waste recycling is important and useful for agriculture	0.8	3.8	25.4	40.8	29.2	3.94	0.878
5. I believe recycling food waste into fertilizer can evoke positive emotions.	1.5	4.6	23.8	47.7	22.3	3.85	0.876
6. I believe recycling food waste is easy and not complicated	0.8	4.6	23.1	47.7	23.8	3.89	0.847
7. I am confident that recycling food waste to be used as fertilizer in agriculture can help the government curb the problem of garbage being dumped evenly	0.8	3.1	31.5	41.5	23.1	3.83	0.846

*Indicator:(1).Strongly Disagree (2).Disagree(3).Either disagree or agree(4).Agree(5).Strongly Agree

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4.1.4 Level of subjective norm on household awareness of recycling food waste

The descriptive analysis was also used in order to describe the level of a subjective norm among the household in Kelantan. It has a significant impact on awareness toward recycling food waste as fertilizer. The result based on table 4.5 shows a descriptive statistic of the level of subjective norm on household awareness of recycling food waste as fertilizer. (37.7%) agree, (29.2%) strongly agree, (27.7%) either disagree or agree and (5.4%) disagree that the family member encouraged them to recycle food waste. (38.5%)of respondents was agree, (34.6%) either disagree or agree. Followed by (20%) strongly agree, (6.2%) disagree and (0.8%) Strongly disagree with the statement that the 'Kelantan Bersih' campaign introduced by the government encouraged me to recycling food waste into fertilizer.

Based on this study, (34.6%) of household respond to either disagree or agree that they neighbor always remind to recycling food waste into fertilizer. Followed by (26.9%) agree, (18.5%) strongly agree, (17.7%) disagree and (2.3%) strongly disagree with this statement. Besides, (37.7%) agree, (31.5%) either disagree or agree, (18.5%) strongly agree. While (10%) disagree and (2.3%) strongly disagree that social media introduced they to the benefits of recycling food waste.

According to the statement advertisements and television programs motivate me to recycling food waste at home, (42.3%) of household agree, (34.6%) either disagree or agree, (13.8%) strongly agree, (6.9%) disagree and (2.3%) strongly disagree with this statement. (41.5%) responds either disagree or agree, (33.8%) agree, (16.9%) strongly agree. Followed by (6.2%) disagree and (1.5%) strongly disagree that the government's efforts to tackle the problem of garbage dumping prompted me to recycling food waste to be used as fertilizer in agriculture. Moreover, (37.7%) agree, (34.6%) either disagree

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or agree, (17.7%) strongly agree. While (9.2%) disagree and (0.8%) strongly disagree that workshops and training on recycling food waste as fertilizer enlightened them to recycling food waste at home. subjective norm mean(M=3.63) was moderated level. It show that household awareness involve in the social environment. The findings are consistent with the findings of (Fazlina et al, 2016) which demonstrates subjective norms are at moderated level.

Table 4.6 :Mean score subjective norm on household awareness of recycling food waste

Factors	Frequency	Percentage	Mean	SD
Subjective Norm			3.63	0.737
Low (1.00-2.33)	7	5.4		
Moderate (2.34-3.66)	60	46.0		
High (3.67-5.00)	63	48.6		

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Table 4.7: Descriptive Analysis subjective norm on household awareness of recycling food waste

Statement	Percentage (%)					Mean	Standard Deviation
	1*	2*	3*	4*	5*		
1. I agreed to recycle food waste to be used as fertilizer in agriculture	0	5.4	27.7	37.7	29.2	3.91	0.884
2. Family members encouraged me to recycling food waste	0.8	6.2	34.6	38.5	20.0	3.71	0.884
3. The 'Kelantan Bersih' campaign introduced by the government encouraged me to recycle food waste into fertilizer	2.3	17.7	34.6	26.9	18.5	3.42	1.055
4. The municipality around my house introduced the benefits of recycling food waste	2.3	10.0	31.5	37.7	18.5	3.60	0.977
5. My neighbors always remind to recycling food waste into fertilizer	2.3	6.9	34.6	42.3	13.8	3.58	0.896
6. Social media introduced me to the benefits of recycling food waste	1.5	6.2	41.5	33.8	16.9	3.58	0.896
7. The government's efforts to tackle the problem of garbage dumping prompted me to recycling food waste to be used as fertilizer in agriculture	0.8	9.2	34.6	37.7	17.7	3.62	0.909

*Indicator:(1).Strongly Disagree (2).Disagree(3).Either disagree or agree(4).Agree(5).Strongly Agree

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4.1.5 Level of perceived behavioral control on household awareness of recycling food waste as fertilizer

Descriptive analysis result for perceived behavioral control of household awareness of food waste recycling as fertilizer in agriculture was shown in table 4.7. (40%) of the household was agreed, (33.8%) either disagree or agree, (20.8%) strongly agree, (3.8%) disagree and (1.5%) strongly disagree that they knew they could recycling food waste to be used as fertilizer in agriculture. (42.3%) household was agree, (26.2%) either disagree or agree, (22.3%) strongly agree, (8.5%) disagree and (0.8%) strongly agree that was easy for them to practice recycling food waste at home. According to table 4.7, (40.8%) of household agree that it easy for them to produce agriculture fertilizer as a result of recycling food waste at home. Followed by (31.5%) either disagree or agree, (20%) strongly agree, (6.9%) disagree and (0.8) strongly disagreed with this statement.

Besides, (43.1%) of household agree, (32.3%) either disagree or agree, (16.9%) strongly agree and (7.7%) disagree that they managed to use fertilizer from recycling food waste for they crops. Moreover, (40.8%) agree that it is easy for them to get information about fertilizer production from recycling food waste at home. Followed by (35.4%) either disagree or agree, (18.5%) strongly agree, (4.6%) disagree and (0.8%) strongly disagree. (36.9%)of household agree that they know the right way to recycling food waste into fertilizer. While (30.8%) either disagree or agree, (20%) strongly agree, (10.8%) disagree and (1.5%) strongly disagree with this statement. Additionally, according to the statement that they know the correct method of producing fertilizer using food waste recycling. Most of the respondent were agreed (36.2%). Followed by (32.3%) either disagree or agree,(16.9%) strongly agree. While (13.3%) disagree and (1.5%) strongly disagree with this statement.

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Perceived behavioral shows the high mean score. Based on the finding, household agree with perceived behavioral control in awareness of recycling food waste as fertilizer. It contrast with findings by (Wilma, 2018) ,on their research found that mean score for perceived behavioral control toward awareness of recycling food waste similar to level which is M=3.30. However, her stated that respondents do not feel that they have control over their ability to recycle.

Table 4.8 :Mean score perceived behavioral control on household awareness of recycling food waste

Factors	Frequency	Percentage	Mean	SD
Perceived Behavioral Control			3.68	0.712
Low (1.00-2.33)	5	3.9		
Moderate (2.34-3.66)	58	44.5		
High (3.67-5.00)	67	51.6		

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Table 4.9: Descriptive Analysis perceived behavioral control on household awareness of recycling food waste

Statement	Percentage (%)					Mean	Standard Deviation
	1*	2*	3*	4*	5*		
1. I knew I could recycling food waste to be used as fertilizer in agriculture	1.5	3.8	33.8	40.0	20.8	3.75	0.883
2. It is easy for me to practice recycling food waste at home	0.8	8.5	26.2	42.3	22.3	3.77	0.920
3. It is easy for me to produce agricultural fertilizer as a result of recycling food waste at home	0.8	6.9	31.5	40.8	20.0	3.72	0.889
4. I managed to use fertilizer from recycling food waste for my crops	0	7.7	32.3	43.1	16.9	3.69	0.843
5. It is easy for me to produce fertilizer in agriculture because I know food waste can be recycled	0.8	4.6	35.4	40.8	18.5	3.72	0.847
6. I know the right way to recycling food waste into fertilizer	1.5	10.8	30.8	36.9	20.0	3.63	0.974
7. I know the correct method of producing fertilizer using food waste recycling	1.5	13.1	32.3	36.2	16.9	3.54	0.974

*Indicator:(1).Strongly Disagree (2).Disagree(3).Either disagree or agree(4).Agree(5).Strongly Agree

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4.2 Normality Test

Normality test process to determine sample or any group of date fits as standards normal distribution. In this statistical process, the value of significant must be >0.05 to achieve the normality of distribution. If the value of significant is >0.05,thus Pearson Correlation will be used. Meanwhile, if the value of significant is <0.05,Spearman Correlation will be use. According to the table 4.10, the significant value are 0.000 which is <0.05.Thus,Spearman correlation was applied in this study.

Table 4.10: One Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test		
		Awareness
N		130
Normal Parameters a,b	Mean	4.4648
	Std Deviation	.50258
Most Extreme Differences	Absolute	.153
	Positive	.143
	Negative	-153
Test Statistic		.153
Asymp.Sig.(2-tailed)		.000
a.Test distribution is Normal		
b.Calculated from data		
c.Lilliefors Significance Correction		

4.3 Spearman Correlation

Spearman correlation analysis was used to determine the relationship between attitudes,subjective norm and perceived behavioral control based on household awareness of recycling food waste as fertilizer in agriculture. The correlation coefficient would take a range in value between -1.0 to 1.0.Both sign (positive and negative) and its absolute value should be consider to interpret the correlation coefficient. The coefficient of 1.0 shows the perfect positive correlation while -1.0 shows negative correlations. To interpret the correlation coefficient, there are many rules of thumb used but all of them are domain specific. The rule of thumb for interpreting the size of a correlation coefficient from (Hinkle,et al, 2003) are shown in Table 4.11.

Table 4.11: Rule of Thumb for Interpreting the Size of a Correlation

Size of Correlation	**Interpretation**
0.90 to 1.00(-0.90 to -1.00)	Very high positive(negative)correlation
0.70 to 0.90 (-0.70 to -0.90)	High positive (negative) correlation
0.50 to 0.70 (-0.50 to -0.70)	Moderate positive(negative) correlation
0.30 to 0.50 (-0.30 to -0.50)	Low Positive (negative) correlation
0.00 to 0.30 (0.00 to -0.30)	Negligible correlation

Source:Hinkle et al,(2003)

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4.3.1 Relationship between attitude and household awareness of recycling food waste as fertilizer

Spearman correlation analysis was used to measure the relationship between an independent variable with dependent variables. The correlation between attitude and household awareness of recycling food waste is 0.329 and it is categorized as a low positive correlation. Attitude has a positive relationship between awareness of recycling food waste. It can be asserted that household with positive attitudes recycling to have greater awareness of recycling food waste as fertilizer in agriculture. (Nor Fazilah, 2020) agreed that there is positive and significant correlation with the attitudes of recycle food waste by household.

4.3.2 Relationship between subjective norm and awareness of recycling food waste as fertilizer in agriculture

Subjective norm also has the significant result for spearman correlation analysis at the level of 0.469 and it categorized as a low positive correlation between subjective norm and awareness of recycling food waste as fertilizer in agriculture. This is because subjective norm could directly affect the awareness among the household. The result of the correlation analysis as shown in table 4.12 was accepted. Based on finding (Tan, Johanim and Fadilla, 2015) state that social is major reasons to influence the subjective norm with respondent. It is support that has positive correlation between subjective norm and household recycling food waste as fertilizer in agriculture.

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4.3.3 Relationship between perceived behavioral control and awareness recycling food waste as fertilizer in agriculture.

The correlation between perceived behavioral control and awareness of recycling food waste among household is significant at level 0.706 and categorized as high positive correlation. This result that perceived behavioral control between awareness of recycling food waste among household was accepted. The correlation result base on table 4.12 between perceived behavioral control and awareness among household was accepted. This finding was supported by earlier study by (Mamun, 2019). which is perceived behavioral control has significant relationship with household awareness of recycling food waste as fertilizer in agriculture.

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Table 4.12: Spearman Correlation

			CORRELATION			
			Awareness	Attitude	Subjective norm	Perceived behavioral control
Spearman's rho	Awareness	Correlation Coefficient	1.000	.329**	.278**	.395**
		Sig.(2 tailed)		.000	.001	.000
		N	130	130	130	130
	Attitudes	Correlation Coefficient	.329**	1.000	.469**	.441**
		Sig.(2 tailed)	.000		.000	.000
		N	130	130	130	130
	Subjective Norm	Correlation Coefficient	.278**	.469**	1.000	.706**
		Sig.(2 tailed)	.001	.000		.000
		N	130	130	130	130
	Perceived behavioral control	Correlation Coefficient	.395**	.441**	.706**	1.000
		Sig.(2 tailed)	.000	.000	.000	
		N	130	130	130	130

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

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CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter reviews the factors found in this study that can influence household awareness of the recycling of food waste that can be used as fertilizer in agriculture. This study focuses on the relationship of three factors, which where attitudes, subjective norms and perceptual behavioral control with household awareness of food waste recycling can be used as fertilizer in agriculture. This chapter includes a summary of the results of the research questions. In addition, this chapter also discusses the theoretical and methodological implications of the study.

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5.1 Conclusion

There are three objective in this study. First objective was to determine the level of households' awareness on food waste that can be recycled into fertilizer in agriculture. The second objective was to identify the level of attitudes, subjective norms and behavioral control among households in Kelantan towards the recycling of food waste as fertilizer for agriculture. Analyze the relationship between attitudes, subjective norms and perceived behavioral control on households awareness of food waste recycled to produce fertilizer, especially in Kelantan. The study was achieved the objective and answered research questions.

Spearman correlation and descriptive analysis were applied in this study to find out the relationship between attitudes,subjective norm and perceived behavioral control toward awareness of recycling food waste among the household. Spearman correlation was chosen due to the normality test result based on the Kolmogorov-Smirnov test. Spearman was applied based on the value of significant in this study is 0.000 which not archived the normality distribution.

130 household in Kelantan were interested to engage in this study.All the variables in this study,which are attitude,subjective norm,and perceived behavioral control have a relationship with awareness of recycling food waste as fertilizer.In general,the findings show that awareness of recycling food waste (M=4.46), attitude (M=3.91), and perceived behavioral control (M=3.68) were high mean scores, while subjective norm (M=3.63) was moderate mean score. Besides,the result of this study also shows that there is a positive relationship between attitude,subjective norm,perceived behavioral control toward awareness of recycling food waste as fertilizer in agriculture.

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Based on the result,indicate that attitude,subjective norm,and perceived behavioral control were effect the awareness recycling food waste as fertilizer among the household.

5.2 Recommendation

Based on this study, there are some recommendation that can be implemented for household awareness on the recycling of food waste to be used as fertilizer in agriculture.The research found that from this study, more households are sensitive to recycling that can be done at home. It is because it is possible to get more data on household awareness on the recycling of food waste that can be used as fertilizer. In addition, this study can provide changes to households and housewives who do not work are aware that recycling food waste can be used as fertilizer. This can help to get better results on household awareness of recycling food waste. In addition, this study can also be used for other broader target respondents such as housewives, civil servants, university students, lecturers, youth and the general public to get their views on awareness of food waste recycling that can be used as fertilizer in agriculture for research. Finally, this study can be improved by adding new variables such as knowledge to find out the relationship with the awareness of food waste recycling can be used as fertilizer or not.

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APPENDIX

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Housewives Awareness of Recycling Food Waste as Fertilizer for Agriculture In Kelantan

Kesedaran Surirumah Di Kelantan Terhadap Kitar Semula Sisa Makanan Boleh Dijadikan Baja untuk Pertanian.

DEAR RESPONDENTS:

1) **This research is to:**
   - i. **Determine the level of housewives awareness on food waste that can be recycled into fertilizer in agriculture.**
   - ii. **Identify the level of attitudes, subjective norms and behavioral control among housewives in Kelantan towards the recycling of food waste as fertilizer for agriculture.**
   - iii. **Analyze the relationship between attitudes, subjective norms and perceived behavioral control on housewives awareness of food waste recycled to produce fertilizer, especially in Kelantan.**
2) **Please answer all questions.**
3) **Thank you for your cooperation and information given.**

Kepada responden:

1) Penyelidikan ini adalah untuk:
   - *i. Tentukan tahap kesedaran suri rumah tangga mengenai sisa makanan yang boleh dikitar semula menjadi baja dalam pertanian.*
   - *ii. Kenal pasti tahap sikap, norma subjektif dan kawalan tingkah laku di kalangan suri rumah di Kelantan terhadap kitar semula sisa makanan sebagai baja untuk pertanian.*
   - *iii. Analisis hubungan antara sikap, norma subjektif dan kawalan tingkah laku yang dirasakan terhadap kesedaran suri rumah terhadap sisa makanan yang dikitar semula untuk menghasilkan baja, terutama di Kelantan.*

2) Sila jawab semua soalan.

3) Terima kasih atas kerjasama dan maklumat yang diberikan.

SECTION A – DEMOGRAPHIC INFORMATION /
BAHAGIAN A - MAKLUMAT DEMOGRAFI

Instruction: Please tick (√) in the appropriated box and fill in the blank. /
Arahan: Tandakan (√) di kotak yang sesuai dan isikan tempat kosong.

1	Gender/Jantina	----------
2	Age / *Umur*	_____ years old/ *tahun*
3	State / *Daerah*	□ Jeli □ Machang □ Tanah Merah □ Kota Bharu □ Kuala Krai □ Others
4	Area / *Kawasan*	□ Urban □ Rural
5	Education Level /*Taraf pendidikan*	□ Not going to school □ SPM □ STPM.STAM □ Diploma □ Degree/Master/PhD
6	Religion /*Agama*	□ Islam □ Christian □ Hindu □ Buddhist □ Others, please state: _____
7	Race / *Bangsa*	□ Malay □ Chinese □ Indian □ Bumiputera □ Others, _____
8	Household Monthly Income / *Pendapatan Bulanan Isi Rumah*	□ < RM 2000 □ RM 2001 – RM 4,000 □ RM 40001 – RM 6,000 □ RM 6001 – RM 8,000 □ > RM 8,000

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9.	Have Ever Recycle Waste at home? / Pernahkah anda mengitar semula sisa di rumah?	□ Yes / Ya □ No / Tidak

For the questions on **PART B, C, D and E** please read each item and **give your answer by circling the answer option that is appropriate** to the scale of 1 (strongly disagree) to 5 scale (strongly agree).

*Untuk soalan-soalan **BAHAGIAN B, C, D, DAN E**, sila baca setiap item dan **beri jawapan anda dengan membulatkan pada pilihan jawapan yang bersesuaian** dengan mengikut skala 1 (sangat tidak bersetuju) hungga skala 5 (sangat setuju).*

Strongly disagree / Sangat tidak setuju	Disagree / Tidak setuju	Average / Sederhana	Agree / Setuju	Strongly agree / Sangat setuju
1	2	3	4	5

SECTION B
AWARENESS OF RECYCLING FOOD WASTE AS FERTILIZER FOR AGRICULTURE

BAHAGIAN B
KESEDARAN TERHADAP KITAR SEMULA SISA MAKANAN UNTUK DIJADIKAN BAJA DALAM PERTANIAN

		1	2	3	4	5
1	I am aware about food waste recycling important as fertilizer for agriculture / *Saya sedar mengenai kitar semula sisa makanan penting sebagai baja untuk pertanian.*					
2	I know food waste can contribute to pollution /*Saya tahu sisa makanan boleh menyumbang kepada pencemaran.*					
3	I know garbage disposal caused from food waste / *Saya tahu lambakan sampah berpunca dari sisa makanan.*					

4	I know food waste is a waste and can be recycled / *Saya tahu sisa makanan merupakan satu pembaziran dan boleh dikitar semula.*					
5	I know recycling food waste can produce fertilizer for agriculture / *Saya tahu kitar semula sisa makanan boleh menghasilkan baja untuk pertanian.*					
6	I know compost is made from recycling food waste / *Saya tahu baja kompos dihasilkan dari kitar semula sisa makanan.*					
7	I know compost manure from the recycling of food waste is useful in agriculture /*Saya tahu baja kompos hasil dari kitar semula sisa makanan berguna dalam pertanian.*					

SECTION C
ATTITUDE TOWARDS AWARENESS OF RECYCLING FOOD WASTE

BAHAGIAN C
SIKAP TERHADAP KESEDARAN KITAR SEMULA SISA MAKANAN

		1	2	3	4	5
1	I intend to recycling food waste in my home /*Saya berniat untuk mengitar semula sisa makanan dirumah saya.*					
2	I am interested in recycling food waste for fertilizer manufacturing in agriculture./ *Saya berminat untuk mengitar semula sisa makanan untuk dijadikan baja dalam pertanian*.					
3	I believe that by recycling food waste can reduce the dumping of garbage in Kelantan.*Saya percaya dengan mengitar semula sisa makanan boleh mengurangkan lambakan sampah ni Kelantan .*					
4	I believe food waste recycling is important and useful for agriculture. / *Saya percaya kitar semula sisa makanan adalah penting dan berguna untuk pertanian.*					
5	I believe recycling food waste into fertilizer can evoke positive emotions. / *Saya percaya kitar semula sisa makanan untuk dijadikan baja dapat membangkitkan emosi yang positif.*					

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6	I believe recycling food waste is easy and not complicated. / *Saya percaya Kitar semula sisa makanan adalah mudah dan tidak merumitkan.*					
7	I am confident that recycling food waste to be used as fertilizer in agriculture can help the government curb the problem of garbage being dumped evenly./ *Saya yakin mengitar semula sisa makanan untuk dijadikan baja dalam petanian dapat membantu kerajaan membendung masalah sampah sarap yang dibuang merata.*					

SECTION D
SUBJECTIVE NORM AWARENESS OF RECYCLING FOOD WASTE

BAHAGIAN D
KESEDARAN NORMA SUBJEKTIF TERHADAP SISA MAKANAN YANG DIKITAR SEMULA

		1	2	3	4	5
1	I agreed to recycling food waste to be used as fertilizer in agriculture / *Saya bersetuju untuk mengitar semula sisa makanan untuk dijadikan baja dalam pertanian.*					
2	Family members encouraged me to recycling food waste / *Ahli keluarga mendorong saya untuk mengitar semula sisa makanan.*					
3	The 'Kelantan Bersih' campaign introduced by the government encouraged me to recycling food waste into fertilizer / *Kempen 'Kelantan Bersih'yang diperkenalkan oleh kerajaan mendorong saya mengitar sisa makanan untuk dijadikan baja.*					
4	The municipality around my house introduced the benefits of recycling food waste /*Perbandaran disekitar rumah saya memperkenalkan kebaikan untuk mengitar semula sisa makanan*					
5	My neighbors always remind to recycling food waste into fertilizer / *Jiran tetangga saya sering mengingatkan supaya mengitar semula sisa makanan untuk dijadikan baja.*					

6	Social media introduced me to the benefits of recycling food waste / *Sosial media memperkenalkan saya tentang kebaikan mengitar semula sisa makanan.*					
7	The government's efforts to tackle the problem of garbage dumping prompted me to recycling food waste to be used as fertilizer in agriculture / *Usaha kerajaan untuk menangani masalah lambakan sampah mendorong saya untuk mengitar semula sisa makanan untuk dijadikan baja dalam pertanian.*					

SECTION E
PERCEIVED BEHAVIOR CONTROL (ABILITY TO CONSUME FOOD WASTE RECYCLING AS FERTILIZER)

BAHAGIAN E
PENGENDALIAN PERILAKU YANG DILAKSANAKAN (KEMAMPUAN MENGGUNAKAN KITAR SEMULA SISA MAKANAN SEBAGAI BAJA)

		1	2	3	4	5
1	I knew I could recycling food waste to be used as fertilizer in agriculture / *Saya tahu saya boleh mengitar semula sisa makanan untuk dijadikan baja dalam pertanian.*					
2	It is easy for me to practice recycling food waste at home / *Adalah mudah bagi saya untuk mengamalkan kitar semula sisa makanan dirumah*					
3	It is easy for me to control the behavior of disposing of food waste by recycling food waste at home / *Adalah mudah bagi saya untuk mengawal tingkah laku dari membuang sisa makanan dengan mengitar semula sisa makanan dirumah.*					
4	It is easy for me to produce fertilizer in agriculture because I know food waste can be recycled / *Adalah mudah bagi saya untuk menghasilkan baja dalam pertanian kerana Saya tahu sisa makanan boleh dikitar semula*					
5	I knew I could recycling food waste at home and produce fertilizer for farming on a small scale./ *Saya tahu saya boleh mengitar semula sisa makanan dirumah dan menghasilkan baja untuk pertanian secara kecil-kecilan.*					

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6	It is easy for me to try produce fertilizer for agriculture at home using recycling food waste. / *Adalah mudah untuk Saya cuba menghasilkan baja untuk pertanian dirumah menggunakan sisa makanan yang dikitar semula.*					

THANK YOU FOR YOUR CO-OPERATION

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