

## Public Awareness and Local Culture That Influence the Engagement of Food Waste Recycling Practice in Malaysia

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Poor food waste management is increasingly becoming a global problem due to its detrimental impact on the environment. People's knowledge, attitudes, and behaviors toward food waste is crucial as they significantly influence sustainable food waste management practices. Cultural norms and cultural differences can also influence attitudes towards food waste which is the reasons for various advancements in both developed and developing nations. Past studies have shown that habits and emotion regarding food waste and their trade-offs were also important determinants of people's intentions to reduce food waste and their food waste behavior. In Malaysia, recycling activities are still uncommon compared to neighboring countries such as Singapore. It is believed that better awareness and knowledge of food waste management among households is the best initial step. However, a lack of innovation and comprehensive strategies to promote this awareness akin to developed countries is a problem in Malaysia resulting in low consciousness to reduce household waste through recycling. Thus, measures to promote awareness and knowledge of food waste management among households is imperative. This paper intends to investigate the factors that influence the engagement of food waste recycling practices in Malaysia. It will suggest guidelines and a new framework which could be useful for designers to comprehend or reflect on their design work with regards to food waste management.

**Keywords:** Food Waste, Promoting Method, Food Recycling, Public Awareness, Local Engagement

### 1. INTRODUCTION

Food waste is becoming a global problem due to its environmental impact. By releasing methane and carbon dioxide gas into the atmosphere, it contributes to global warming and effects food security around the world (Ghafar, 2017). People's knowledge, attitudes, and behaviours towards food waste is crucial as it provides evidence on producing advanced sustainable food system programs.

Cultural context contributes to the variation in reasons. Peoples' reasoning has been the underlying issue in both underdeveloped and developing nations on to why people waste food. in Malaysia, Jereme et al., (2016) claimed that in

comparison to other neighboring countries such as Singapore, recycling initiatives are still uncommon. According to Jarjusey & Chamhuri (2017), people's inadequate awareness about food waste can be the reason for a higher amount of food waste, and the pre-shopping activities could poorly affect the food waste behaviour.

Increasing awareness and knowledge of food waste management among households will be the best initial step, for both the urban and rural societies, to reduce their food waste volume. This is because the issue of treatment of food waste generated in Malaysia could be said to be still extremely limited, like composting or for animal feed. Almost all of the food wastes generated in Malaysia from different sources such as

households, commercial, restaurants food courts and supermarkets and others from beverages industries are disposed in landfills. Moreover, wastage of unconsumed food alone in Malaysia has doubled over the past three years (Jereme et al., 2013).

Culture and perception are closely related because people view and experience themselves and others in the world, as well as events and social and political occurrences, through their own culture. People's backgrounds and upbringing, as well as their religious and political convictions, all contribute to their culture. Our norms affect our understanding and perception of other cultures because they impact our concept of "right" and "wrong". Awareness in reducing household waste through recycling is still low among Malaysians, according to the Solid Waste Management and Public Cleaning Corporations (Ahmad et al, 2021)

Simple understanding of the study is through the following aspects and definitions:

- Food waste refers to food that completes the food supply chain up to the final product, of good quality and fit for consumption, but still doesn't get consumed because it is discarded, whether or not after it is left to spoil or expire.
- Public awareness is everything relating to the awareness, attitudes, behaviors, opinions, and activities that comprise the relations between the general public or lay society as a whole to scientific knowledge and organization.
- The problems here are that 1) The Malaysian law is said still too general and far from satisfactory due to the lack of resources and budgetary constraints. As other country like Australia and California's law mandates recycling as it is part of the state's commitment to divert 75% of the food waste by 2025 and has pledged to recover 20% of edible food waste for human consumption. 2) the low awareness on recycling to reduce household waste among Malaysians as said by the SWCorp Malaysia. It is stated that the recycling rate in Malaysia is 30.67% as of 2020 but this is only as general recycle. It is still unclear on how Malaysia really tackles the food waste issue. It is stated that only landfill and

incineration are the more common methods that are used to dispose food waste that are generally and widely used as it is cost effective and simple. 3) Environmental safety concerns in Malaysia are considered secondary as finding new sites for landfill were nearly exhausted. As such Malaysia need to reduce the dependence on landfills due to the population density rise and finding alternative solutions is difficult to implement. Hence, it is still a big challenge to manage solid waste in Malaysia. The country is targeting on increasing the recycling rate up to 2% per year up to 2025 said by the housing and local government ministry. The MCO implementation was a bright change for the waste issue. It is said that the food waste in the country reduced drastically as most people were at home consume homecooked food or packed food. This was until the MCO was uplifted that the rate of food waste increased right after.

- This study aims to find ways to promote public awareness and to improve their engagement with sustainable food waste management practices in Malaysia. It will study and explore ways to improve the public awareness level and the perception on improving the engagement on the food waste management in Malaysia by the influences of surrounding local culture.
- Objectives 1) To explore new ways on promoting the awareness to the community. 2) To search ways to improve the community's perception on food waste and to enhance their general knowledge on it. 3) To find solutions on ways to improve the engagement of people on food waste management.
- Impact of the study are 1) as a guideline for others to help to educate and show on how to engage people and how to encourage others to be more aware on the food waste issue and on how to manage it through recycling practices. 2) Provide promotional means on how to promote to others and to inculcate general awareness. 3) As a perception making to help others to understand the issue more and how surrounding means help to generate better actions.

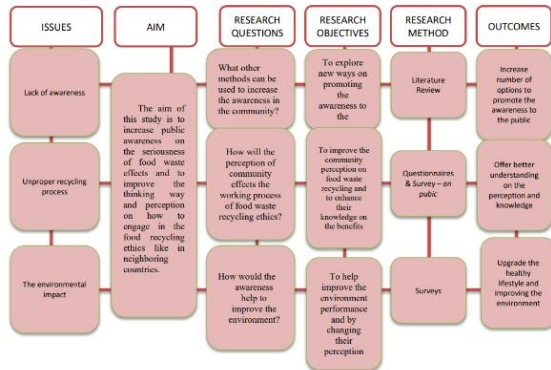


Figure 1: Research Framework

## 2. LITERATURE

The study of human engagement will start by understanding their behaviour, their influences, their environment that influences their actions. To show an awareness to others first, the fundamental of the issue, the effects towards others and environment and relating to their personal ideals will need to be determined and ruled out.

All of this can be affected by the means of understanding from a few perspectives like psychological, environmental, methods used, food components and actions. By understand all those aspects the researcher could grasp an idea on how to tackle the issue and how to engage and encourage others to take this issue seriously and how improvisation could be made. The few sets of categories are human behaviours, engagement, and sustainability.

- **Human behaviour**

It has been an interest in researchers to understand and predict human behaviour. By understanding and measuring cognitive variables, one best achieve prediction and assumption of behaviours. (Holdershaw & Gendall, 2008).

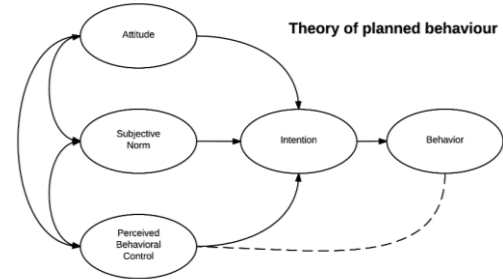


Figure 2: Theory of Planned Behaviour (Source: Wikipedia- planned behaviour)

- **Reasoned actions**

The Theory of Reasoned Action (TRA) suggests that a person's behavior is determined by their intention to perform the behavior and that this intention is, in turn, a function of their attitude toward the behavior and subjective norms (Fishbein & Ajzen, 1975).

- **Cognitive actions**

The term "cognitive" refers to all the processes by which the sensory input is transferred, reduced, elaborated, stored, recovered and used (kreitler & kreitler, 1972).

- **Decision making**

In this theory it is said that consumers make decisions based on expected outcomes of their decisions choice (L,M, 2021) ( M.R, 2020).

- **Local culture**

Local culture is defined as a set of basic rules that govern the behaviour of a given group's members. These fundamental norms are underlying assumptions that influence how members of a group make decisions and act (S. Fredlin, 2015).

- **Engagement**

Engagement refers to a spectrum of interactions that are suitable for all parties involved, whereas community refers to a collection of individuals who share a shared area. It could be anything from providing basic information to assisting with community activities. Community engagement that is well-managed will have a significant impact

on the progress (Herefordshire Council, 2015).

- **Laws**  
The institutional culture and setting in each jurisdiction influence and are influenced by the combination of policies, incentives, regulation, capacity building, and institutional perceptions at various levels.(Tjandraatmadja, G ,2019).
- **Balance**  
The balance of nature (also known as ecological balance) is a theory that proposes that ecological systems are usually in a stable equilibrium or homeostasis (Wikipedia, 2022).
- **Food**  
Given the critical importance of food to both basic survival and cultural interaction, a “theory of food” (analogous to theory of mind) may represent another complex network essential for normal cognition (Jones, 2007).
- **Recycling**  
The principle of recycling comes after “reduce and reuse”. It promotes environmental sustainability by removing the raw material input and redirecting waste output in the economic system. (Troschinetz and Mihelcic, 2009; Varotto and Spagnolli, 2017).
- **Sustainability**  
Sustainability is described as the combined consideration of economic, environmental, and social factors (Mak, T.M, 2020).
- **Food waste recycling**  
To address such a global issue, a well-established theory is indispensable to illustrate determinants in bettering sustainable food management to assist in related decision-making processes (Mak, T.M et al, 2020).
- **Waste management**  
It is founded on to the expectation that waste management is to prevent waste

that causing harm to human health and to the environment (Tudor et al., 2008).

- **Awareness**  
To achieve the desired result, efficient communication tactics are required for generating awareness (Awareness campaign 2015).

### 3. METHODOLOGY

This research is designed to study and analyse the public awareness and perception towards food waste recycling practices in Malaysia. In order to achieve the aim and objectives of the study, there are several measures in relation to the variable of analysis. The variables are 1) New ways on promoting the awareness to the community. 2) Improvisation of community’s perception on food waste to enhance their general knowledge on it. 3) Ways to improvise the engagement of people on food waste management.

A quantitative research approach is mainly used for this study. It was chosen to accurately quantify and analyze the level of awareness and perception among Malaysians on the rising food waste issue in the country. (Perimeter 1: Awareness level on issues, Perimeter 2: Preferences on how to engage public and promote awareness, Perimeter 3: Opinions on how to improve). Closed-ended and open-ended questionnaires were to gain the intended data. They were distributed online to the public through social media platforms. The use of Google Form as the questionnaire method was generated. A part of the research adopted a qualitative approach as observations and short interviews were done at a visitation site company that mainly manages food waste. Lastly, the data collected were analyzed to achieve the objective of the research. Cross tabulation method was used to analyze the data and to generate the statistics from the survey done. By the statistics, it was much easier to compare the results and to identify the trends selected by the community. Comparisons were done to produce the best means of action. It shows that majority were aware of the current food waste issues but rather not aware of the methods involved to reduce them. The surrounding environment or people’s involvement and the regulations play a big part in influencing one’s behavioral choices and actions taken. The survey helps to achieve the research objectives that were

guided by the interview information and the literature review done.

- **Research through literature analysis**  
As a starting point, the author identifies the component which would benefit from food waste management, as well as how it impacted society and the environment. The purpose of this step is to formulate and define the research questions. As the intention of the study is to explore on ways to improve and promote the food waste management, literature analysis as a basis to enhance data collection process in order to Identify the current state of performance in each of the topic areas under consideration.
- **Case study**



Figure 3: MAEKO logo  
(Source: MAEKO website)

#### Locality of case study (where to observe)

The case study selected was a company that is manages food waste by composting it using machine that they created. It has the similar concept on reducing food waste and to achieve zero food waste that similarly implemented in this research. The company is Mentari Alam Eko (M) Sdn Bhd (MAEKO) which is located in Banda Kinrara Puchong Malaysia.



Figure 4: MAEKO composting machine  
(Source: MAEKO website)



Figure 5: MAEKO location on map  
(Source: GoogleMap - MAEKO)

#### Dialogues from people at case study (what to observe)

There was a simple interview session done while the researcher was at the case study facility. It was an interview session with the workers of MAEKO Mr Fadzli, Ms Fairuz and also with two of the CO-Founders Ms Mae Ooi and Ms Chelsea. They were kind enough to share some of their insight on the matter of food waste and how to engage public on increasing the awareness level. They also shared and promote what they do and how they do it to the researcher. Maybe in future a collaborating work between the researcher and MAEKO could be made possible.

#### 4. FINDING

Aims to determine the level of awareness of the public community of Malaysia on food waste issues and the perception of the engagement of food waste management practices that could be improved. It can be classified as below:

##### Literature Review

Surrounding environment and culture influences the human behaviour, perceptions, and engagement also on how behaviour effects actions.

##### Case Study (MAEKO)

Observations on how they approach the public on the awareness of food waste and insights on ideas and how to grasp others' attention.

##### Questionnaire and Survey

It can be seen that the majority are still unaware on the management methods of food waste and also the lack of regulations is also part of the reason. Other countries that have implemented a law on food waste management can be used as examples. Promotional means and considerations by public Ideas and suggestions to improve the current state.

- **Case Study**

Mentari Alam Eko Sdn Bhd (MAEKO) was chosen as case study of this research. It is under the address of 192, Jln LP 7/4, Kinrara Uptown, 43300 Seri Kembangan, Selangor. It was chosen because it is one of the companies in Malaysia that manages food waste as well as educate others on the awareness. The company has a goal of achieving zero food waste and they are slowly expanding to all around Malaysia. The facility there are mainly on manufacturing machines, client meet ups and the worker's base. Below are some of the pictures taken during the visit at MAEKO.



Figure 6: MAEKO HQ Office Building



Figure 7: MAEKO promotional lorry



Figure 8: MAEKO storage & interior



Figure 9: MAEKO compost machine

- It was found that MAEKO does have a way to promote awareness to public. Using their promotional lorry to be brought at events held by others and to

do demonstration to educate public on how to manage food waste like recycle or composting that can even be done in each home through daily basis. The machines they developed can be sold to any who are interested. They provided simple instructions and the operational means are simple for anyone to do. The composting product that MAEKO produced can be sold to others and become a part of their own profit. It also helps to nurture the plants they have using their own compost produced. Thus, they not only achieve in zero food waste but also helps educate the public and also helps to maintain a healthy environment.



Figure 10: MAEKO lorry at event



Figure 11: MAEKO at event

- **Interview**

A short interview session was done with people at Mentari Alam Eko Sdn Bhd MAEKO Seri Kembangan during the visit on 17/12/2021 Friday 10.30am. The people who were interviewed was Ms Mae Ooi, Ms Chelsea, Ms Fairuz and En Fadzli. Two of them are actually the founder of MAEKO that they were generous enough to share some of their insight to contribute in this research. As an early start as enters the facility, the researcher was greeted by Ms Fairuz and En Fadzli. Both of them gave a simple and brief insights on their work environment, what they tried to

encourage among the community, what they promote, how they are conducted, how long are the process of composting food waste as a main recycle act that they try to emphasise and other relevant information.



Figure 12: Researcher with two Co-Founders



Figure 13: Researcher with Ms Fairuz

- **Questionnaires Survey**

Surveys were done and results are measured, analysed and recorded. Through the observations done it can be found the awareness rate on food waste handling among the community of Malaysia is still lacking. It can be seen that many are aware on the arising issue of food waste but not many who really takes actions on the issue. The data from the survey done was collected via GoogleForm itself as it has a feature on tabulating the results. As it eases the process, results were shown directly, clearly and can be analyse accordingly. The survey lasted for an approximate less than 2 weeks with number of respondents 250. It was done according the objectives of the research that was tried to achieved.

- **Survey Collection**

This method gathers all the information and contributes to all the objectives that this study tried to grasp. It is concluded that the community responses vary to the aspects that was questioned and all the various answers helps in giving better insight on what the community really need and want.

As a brief summary of the entire result, it can be concluded that for the case study and interview session held, MAEKO shared insights on how they engage awareness to public like from children at school, campaigns done in malls, commercial areas & events. Promoting through online and educate others on how to manage & recycle food waste became one of their methods. Through the survey done, it is found that majority of the community who had responded to the questionnaires were aware on the issues we faced. However, the downfall is that majority also still lacking knowledge on how to manage the situation. By the survey done also, the public have given their opinion on how to engage the public and shared their preferred methods that could be used to guide others. It is seen and to justify that everyone should take the responsibility on managing the food waste in the country to achieve a much healthier sustainable and safe environment for all.

## **5. DISCUSSION**

The potential to promote, educate and guide awareness to public can be achieved if certain criteria or ways of doing are properly done. In this study, among the conclusion was that awareness should be amplified to increase engagement of food waste management among the community and also that surrounding factors strongly influenced choices of actions. This research is to study the awareness level of the public on food waste management practices and their perceptions of engaging it. It also shows the findings on how human behaviours are influenced by the surrounding means like regulations and cultural trends. All study objectives were achieved. Data collected through the survey shows the perception of the public on the food waste practices and through the literature that the understanding on surrounding environments influences the human behavioural that creating actions. It all leads to an understanding on how to promote awareness that causes further

engagement and how that local culture with surrounding means could influence the public.

## **6. CONCLUSION:**

### **Achievements from research objectives**

#### **Objective 1: To explore new ways on promoting the awareness to the community.**

It was found that awareness can be widely spread and promoted in a lot of ways. Some of the ways are through events or programs in commercial spaces or at school. This can be done by educating the public on the awareness regarding the food waste issue and also guide them on how it can be reduced or what methods can be used to improve issues like recycling. Other than that, the means of social media are a key factor to help spread awareness in a wider range as nowadays social media is one of the main promotional and a trend that everyone is currently using to get information.

#### **Objective 2: To search on methods to change the community's perception on food waste and to enhance their general knowledge on it.**

Regarding people's perception, it comes back to their own believes and the surrounding environment that influences their actions and behaviours. It also depends on the fact that if the local culture and surrounding helps to encourage the community more on managing food waste, it could become an interest for the community. Enforcing laws could help on making sure that everyone takes the food waste issue seriously. By having such law also ensures that the food waste issue could be controlled and eventually be solved. By using other countries like Japan and New Zealand as guidance and example as they have implemented such laws would be beneficial. The government should play the part on encouraging the community by having more educational programs and events that could spark interest for the community to enhance their perception on food waste and also educate them better on the matter.

#### **Objective 3: To find solutions on ways to improve the engagement of people on food waste management.**

Education is one of the main solutions to improve the engagement of people on food waste management. As how when enough and proper education or demonstration have been done, it will surely increase the people's knowledge. After

education are shared, people will start to engage in the process and activities as well. For an individual, when the surround environment promotes the engagement and when others are doing it, they will tend to follow and to take the same actions as it influenced them to do so. Other than that, by providing facilities and events also could help enhance public's actions to engage on managing and reducing food waste. The act of recycling food waste should start from homes that it will eventually become a new habit for everyone to do in their daily lives. Lastly, those managing bodies and governmental units should encourage more on food waste handling and promote or highlight it frequently to public through media or adds to make sure everyone takes this matter seriously thus encouraging them to engage in food waste recycling more.

### Recommendation

As a conclusion, architecture can help improve the current food waste issue and also help in the process of food waste recycling practices. Through the means of facilities and spaces to allow promotional acts to happen and also to allow events and programs to be held to spread awareness to the community. Other than that, the means of visualisation on a structural element could help in further educate and highlight things regarding the food waste to the general public. The facilities provided in a n architectural space could also help to provide a space that could cater for the food waste recycling activities. If composting food waste is one of the methods used, the fertilizers produced could either be sell or to be used for nurturing the greeneries and natural landscape that are available in an architectural setting. The outcomes however not only reduce energy but also can be a source of income.

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