



***IMPACT OF URBAN CONSUMERS' FOOD CONSUMPTION PATTERNS  
TOWARDS FOOD WASTE***

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BY

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A project report submitted to faculty of Agriculture, Universiti Putra Malaysia, in fulfilment of the requirement of PPT4999 (final year project) for the award of the degree of Bachelor of Science (Agribusiness)

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**ENDORSEMENT/CERTIFICATION**

This project entitled Impact of Urban Consumers' Food Consumption Patterns towards Food Waste is prepared by Nur Aqilah Binti Juhari and submitted to the Faculty of Agriculture in fulfilment of the requirement of PPT4999 (Final Year Project) for the award of the degree of the Bachelor of Science (Agribusiness).

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## ABSTRACT

Food waste issues in Malaysia was a growing problem especially in urban area. Population in urban area were the major contributor for food waste generated in Malaysia. Almost 70 percent of food waste are generated in urban area. The changes in the lifestyle of people in urban area might have also changes their behaviour in consumption pattern that leads to food waste. This study aims to determine the impact of urban consumer food consumption pattern toward food waste in urban area. A total of 400 respondents was randomly selected in Klang Valley area consist of Kuala Lumpur, Kajang, Serdang, Putrajaya and Seri Kembangan. Quantitative data is collected by survey method consisting of structured questionnaire and the results were analyzed using descriptive analysis, factor analysis, multiple regression analysis and Chi Square Analysis.

The result of the survey through descriptive analysis shows socio-demographic profile of respondents such as gender, age, race, religion, ancestry, district, marital status, education level, occupation and monthly income. Factor analysis have identified three factors that can influence bad behaviour in consumption pattern. These include consumer's attitude towards food waste reduction, subjective norm and perceived behavioural control. The result from multiple regression analysis discovered that there is significant relationship between Consumer's attitudes towards food waste reduction with bad behaviour in consumption pattern and there is significant relationship between perceived behavioural controls with bad behaviour in consumption pattern. Only subjective norm were not significantly related with bad behaviour in consumption pattern. The result from multiple regression analysis also suggested that the most influential factor towards bad behaviour in consumption pattern is perceived behavioural control. In addition, the result from chi-square analysis found that there is

significant association between bad behaviour in consumption pattern and amount of food wastage.



## ABSTRAK

*Isu pembuangan makanan adalah masalah yang semakin membimbangkan di Malaysia terutamanya di kawasan bandar. Populasi di kawasan bandar adalah penyumbang terbesar kepada pembuangan makanan yang dikeluarkan di Malaysia. Hampir 70 peratus sisa makanan yang dihasilkan adalah datangnya dari Kawasan Bandar. Perubahan cara hidup orang di bandar mungkin merubah sikap di dalam pola pemakanan yang menyebabkan makanan dibazir. Kajian ini bertujuan untuk menentukan impak pola pemakanan pengguna di bandar terhadap pembaziran makanan di kawasan bandar. Sebanyak 400 responden telah dipilih secara cluster di kawasan Lembah Klang merangkumi Kuala Lumpur, Kajang, Serdang, Putrajaya dan seri kembangan. Data Kuantitatif dikumpul melalui Kaedah Kaji Selidik yang terdiri daripada soalan berstruktur dan dianalisis menggunakan analisa deskriptif, analisis faktor, analisis regresi berganda dan analisis "Chi-square".*

*Keputusan kajian melalui analisis diskriptif menunjukkan latar belakang socio-demografi responden seperti jantina, umur, kaum, agama, keturunan, status perkahwinan, tahap pendidikan, pekerjaan dan pendapatan bulanan. Analisa faktor telah mengenal pasti tiga faktor yang akan mempengaruhi sikap buruk di dalam pola pemakanan. Ini adalah termasuk sikap pengguna terhadap pengurangan sisa makan, norma subjektif dan kawalan tingkah laku yang dilihat. Keputusan kajian melalui regresi berganda mendapati bahawa terdapat hubungan yang signifikan antara sikap pengguna terhadap pengurangan sisa makanan dengan tingkah laku buruk di dalam pola pemakanan dan terdapat juga hubungan yang signifikan antara kawalan tingkah laku yang dilihat dengan tingkah laku buruk di dalam pola pemakanan. Hanya norma subjektif tidak mempunyai hubungan signifikan dengan tingkahlaku buruk di dalam pola pemakanan. Keputusan kajian dari regressi berganda juga telah mengenal pasti*

*faktor yang paling mempengaruhi tingkah laku buruk di dalam pola pemakanan iaitu kawalan tingkah laku yang dilihat. Tambahan lagi, hasil keputusan dari analisis chi-square mendapati terdapat hubungan yang signifikan antara tingkah laku buruk di dalam pola pemakanan dan jumlah makanan yang dibazir.*



# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the study

#### 1.1.1 Malaysia's Population, Urban Development, and Household's Lifestyle Changes

The total population in Malaysia in fourth quarter of 2017 are 32.3 million. The population increased by 1.3 percent compared to fourth quarter in 2016. While Malaysia's population in total state shows that Selangor has the highest percentage of population in 2017 which amounted 19.9% from 32.3 million follows by Sabah at 12.0 % and Johor at 11.5 % (Department of Statistics Malaysia, 2017).<sup>1</sup>

In 2017, urban population for Malaysia was 76.5 % which amounted to 24.509 million. Urban population of Malaysia increased from 32 % in 1968 to 76.5 % in 2017 growing at an average annual rate of 1.78 %. Meanwhile the rural population was 23.5 % which is 7.791 million (World meters, 2017)<sup>2</sup>. Malaysia are now moving forward to become urban nation as the number of urban population continues to increase to almost 80% in 2017 as recorded and government have constructed a policy which shows government intention to urbanization starting from National Urbanization

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<sup>1</sup> The sources of data is obtained from the website of Department of Statistic Malaysia. Retrieved from [https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=430&bul\\_id=NHRXOUdiTOR0ZjZ0cy90eINUTHFsdz09&menu\\_id=L0pheU43NWJwRWVVSZklWdzQ4TlhUUT09](https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=430&bul_id=NHRXOUdiTOR0ZjZ0cy90eINUTHFsdz09&menu_id=L0pheU43NWJwRWVVSZklWdzQ4TlhUUT09) (accessed 5 April 2018).

<sup>2</sup> The sources of data is obtained from the websites of World meters, 2017. Retrieved from <http://www.worldometers.info/world-population/malaysia-population/> (accessed 6 April 2018).

Policy 1 (NUP 1) that started in 2014 to the latest improvised policy namely National Urbanization Policy 2.

Rapid urban growth has created a new challenges which have been resulted in the need for a more systematic, planned and effective urban planning as well as management towards good urban environment and community wellbeing. NUP 2 is the current policy that help guide and coordinate sustainable urban planning and development emphasize on the balanced development physically, environmentally, socially and economically. This shows that government are intent to have sustainable urban environment in a long term period and striving to become urban nation in the future. For example, in 2025 government have projected a total

of 314 cities in Malaysia will have clear urban boundary, everyone will have access to facilities and amenities within 400 metre radius which indirectly reduce transport movement, offering affordable transport public system and reducing living cost.

Additional to that, the increasing rate of urban population also have encouraged the development of urban area. This development of urban areas have provided the good facilities and services on food delivery to the urban household, such as more restaurants, e-food delivery services, shopping centres, and etc. These developments had contributed a speedy channel for the busy family and other people to enjoy their variety food easily.

In recent decades, females are more willing to participate in the working industry rather than to be a fulltime housewife. The females' working behaviour changed is deal to their education achievement, labour market demand, and etc. This phenomenon shows that the eating behaviour for a household changed from the kitchen to the

restaurant due to the limited time for food preparation. Besides that, the cost of living in urban area sometimes force the workers spend more time in office and they have to sacrifice their family time on work, consequently, dining out also not an extraordinary things for a working parents. This lifestyle changed illustrated that the urban population willing to work hard to gain more income and substitute their kitchen time to the working schedule (Ali & Abdullah, 2012).

### **1.1.2 Malaysia's Food Waste**

Food waste can be defined as all edible food materials that are produced for human consumption but are not eaten, whether it is lost or thrown away throughout the food supply stages (Chen et al., 2017). In Malaysia, food waste includes left over and unconsumed food, shown an increase at about 15 % to 20% during festive seasons (Jarjusey & Chamhuri, 2017). Normally household and business outlets like restaurant, resort and hotels dumping over large quantities of food after their daily business activities. For example during wedding, parties, conference and so much more. Malaysian are throwing away up to 930 ton of unconsumed food daily. This is equivalent to throwing away 93 000 kg bags of rice each day (Aruna, 2011). According to Aruna (2011), there are significant food waste happening in urban household and business daily activities, such as wedding, parties' celebration, and etc. In Aruna (2011) study, there are about 930 tonnes of unconsumed food or equivalent to 93 thousand kg bags of rice are throwing every day by Malaysian. This showed an important message on reduction of food waste in order towards a food sovereignty in the future.



Most of the food waste come from household where consumer did not pay attention about the food expired date. People in Malaysia sometimes forget or reluctant to check the date of food stored in their own fridge. In the end, they end up wasting the unconsumed food due to expired date. Even in United Kingdom, approximately half of the food thrown away in households was not used in time due to the consumer behaviour which is reluctant to check their food expired date stored in home refrigerators (Aschemann et al, 2015).

Wastage of unconsumed food alone in Malaysia has doubled over in 2010 to 2013 this does not even include left over food (Jereme et al, 2013). Moreover, consumer in Malaysia also often confused with the food's label. There are many terms used in food labelling to indicate the expired date for example, best before, use by date, use before, consume by and many more. According to Newsome et al. (2014), the difference within the date of labelling terms and its uses has led to huge food loss. This is because consumers and food manufacturers tend to misunderstand the labelling terms which indicates foods product's expired date.

Government has implemented several programs and campaign like MYSavefood with cooperation from Malaysian Agricultural Research and Development Institute (MARDI) to promote the reduction of food loss and food waste. MYSavefood campaign started launching and operated in 2015. It was launched based on save food campaign that was introduced in Berlin, Germany in 2011 (Malaysian Waste 15,000 tonnes of food daily, 2016).

Another campaign is done in 2015 through Solid Waste and Public Cleansing Management Corporation (PPSPPA) partnering with Malaysian Association of Hotels

(MAH) have also embarked on a campaign to reduce wastage, particularly food waste (Campaign to curb food wastage, 2014).

Food waste trends in Malaysia is a worrisome to some extent. There are about 15,000 tonnes of food Malaysians waste every day, about 3,000 tonnes are actually edible and should not be discarded (Jarjusey & Chamhuri, 2017). Food waste makes up approximately 60 % of municipal solid waste but they are still categorised under the general problem of municipal solid waste management (Hassan et al 2001). This soaring rates of food waste gave harmful effects on the economy, environment and society as a whole.

The estimated food waste generated in Malaysia is totalling up to 9 million tonnes per year in 2011 (Jeremy et al, 2011). The number one source of food waste is domestic waste, from the household, second is the wet and night market. Third is waste from the food courts, restaurant and hotels then comes the food and beverage industries. Then food waste generated in shopping mall and hypermarket. Followed by institutions, schools and franchise restaurant.

**Table 1.1: Food Waste Generated in Malaysia In 2014**

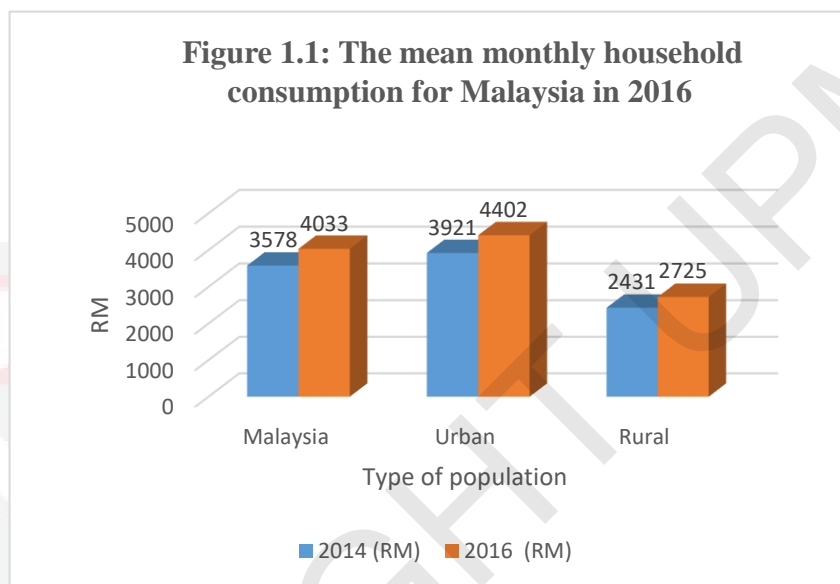
Sources of food	Generation rate of food waste	
	Ton/day	Ton/year
Household	8,745	3,192,404
Wet and night market	5,592	2,040,929
Food court/restaurant	5,319	1,941,608
Hotels	1,568	572,284
Food and beverage industries	854	311,564
Shopping malls	298	108,678
Hypermarket	291	106,288
Institutions	55	26,962
Schools	45	21,808
Fast food/ chain shops	25	808
Total	22 793	8 331 589

Source: Jeremy et al (2016)

### **1.1.3 Malaysia's Household Consumption Pattern**

Household consumption expenditure is the expenditure for private consumption on goods and services during reference period. The average monthly household consumption for Malaysia displaying an increased rate from Rm 3578 in 2014 to Rm 4 033 in 2016. It grew at 6 percent per annum at nominal value. Annual growth rate is 3.9 percent for the same period in terms of real value. The average monthly household consumption expenditure in urban showed an increasing of 5.8 percent yearly from RM 3921 to Rm 4 402, meanwhile rural also increased at 5.7 percent annually from

RM 2431 to RM 2725 in 2014 to 2016. The Malaysia's average monthly household consumption in 2016 can be seen clearly in Figure 1.1.



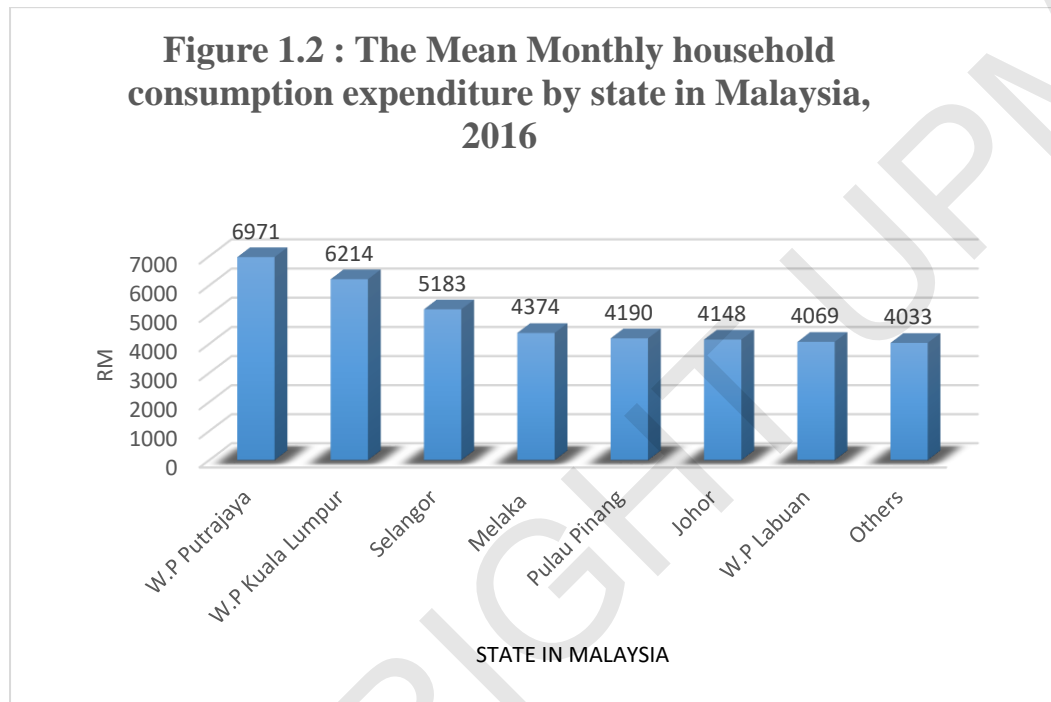
**Figure 1.1: Malaysia's average monthly household consumption in 2014 and 2016**

Source: Department of Statistics Malaysia<sup>3</sup>

In 2016, Wilayah Persekutuan Putrajaya (W.P.Putrajaya) recorded the highest-average monthly household consumption expenditure which is RM 6,971 followed by W.P.Kuala Lumpur at RM 6, 214, Selangor at RM 5,183, Melaka at RM 4,374, Pulau Pinang at RM 4,190, Johor at RM 4,148 and W.P Labuan about RM 4,069). However, the other states' monthly household consumption expenditure were recorded at below RM 4,033 (average of total Malaysian consumption expenditure). All states recorded

<sup>3</sup> Department of Statistics Malaysia, 2017  
[https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=323&bul\\_id=WnZvZWNVeDYxKzJjZ3RIUVVYU2s2Zz09&menu\\_id=amVoWU54UT10a21NWmdhMjFMMWcyZz09](https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=323&bul_id=WnZvZWNVeDYxKzJjZ3RIUVVYU2s2Zz09&menu_id=amVoWU54UT10a21NWmdhMjFMMWcyZz09)  
 (accessed 10 October 2017)

an increase in the average monthly household consumption expenditure (Figure 1.2). Most of the states that are recorded as the highest average monthly household consumption are coming from urban area and cities.



**Figure 1.2: The Mean Monthly household consumption expenditure by state in Malaysia, 2016**

Source: Department of Statistics Malaysia.<sup>4</sup>

#### **1.1.4 Government's Food Waste Management Policy**

The National policy on Municipal solid waste management was generally recognized as the National Strategic plan (NSP) (Ghafar, 2017). This policy is one of the government initiatives to curb the food waste issues in Malaysia. This is because food waste makes up to 60 % on the municipal solid waste generated in Malaysia (Hassan

<sup>4</sup> Department of Statistics Malaysia, 2017

([https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=323&bul\\_id=WnZvZWNVeDYxKzJjZ3RIUVVYU2s2Zz09&menu\\_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz090](https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=323&bul_id=WnZvZWNVeDYxKzJjZ3RIUVVYU2s2Zz09&menu_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz090)).

(accessed 10 October 2017)

et al, 2011). National Strategic plan was constructed in 2002 and implemented in 2005. This policy key strategies is through their viable waste management. The sustainable waste management of this policy adopt the 3Rs concept which stands for reduce, reuse and recycle. This concept were done with the help of the proper technologies, equipment and facilities thus providing a viable and inclusive solid waste management service.

The first objectives of waste management implemented under this National Strategic plan are to reduce waste. This is done by efficient management of food waste resources at the stage of raw material usage, production, distribution, marketing and consumption (Ghafar,2017). Then, the second objective was to increase the number of sanitary landfill that are not polluting the environment and also hygienic (Ghafar, 2017). Furthermore, it also aim to reuse product and material (Ghafar, 2017). In addition, the objective is to recycle the reusable amount of waste that can still be used during source and waste collection separation stages. (Ghafar,2017). According to Moh & Manaf (2014), the last objective is to implement intermediary management of waste and generate the value of waste.

The strategies formulated in this National Strategic plan in order to help solve the food waste issues in Malaysia are through government support on data collection, setting up regulations and providing incentives. Then minimize the source of food waste. As a result, when sources of food waste decrease, the amount of food waste also decreased, which also indicates less food waste to manage. Government has provided centralized Food Waste Treatment Facilities to efficiently dispose the food waste generated in Malaysia. Last but not least, the strategies on constructing appropriate

final disposal to minimize the impact of food waste in Malaysia. For example is the sanitary landfill to dump the food waste that could not be treated in a proper ways.

Although, government in Malaysia have carried out this policy in 2005, the food waste issues were still there and not completely solved. Innovative strategies for proper management of the food wastes are still very limited and under-developed. A strategic plan particularly focused on food waste management is crucial thus creating possible solution to resolve the challenge of the entire waste management in Malaysia is still a long way to go.

## 1.2 Problem statement

Nowadays, food is less valuable to people because it is been easy to access, so people did not think twice to dump the food whether it is still edible or not. In Malaysia, the urban population have become the major contributor to more than 70 percent of the total waste generated (Sumisha, 2017).

Based on the mean monthly household consumption expenditure by state in Malaysia in 2016 based on figure 1.2 shows that most of the urban states have the highest purchasing power. Highest purchasing power from people in urban areas enables urban population to easily access food facilities and services for example restaurant and online food services like food panda to obtain food thus increasing the amount of food waste that are discard off.

The urban population in Malaysia is now 76.5 % from the total population. This large amount of population have encourage rapid development and in need of extension of food system especially in urban area. When there is rapid development in urban area, the population will continue to increase as people will come to the cities due to job opportunity and living here thus it will generate higher demand of food in urban area. There will be an increased number of food shop and restaurants in urban area. This urban area will then have to compete by giving discounts and doing sales thus making people to purchase more. This impulse purchase will leads to more food waste generated especially in urban area. Due to special offers attracting consumer to buy more than they need, consumers tend to over purchase food (Story & French, 2004).



In addition to that, many consumers do not have the proper storage for their bulk purchase leading to the food going bad and hence contributing to high volumes of food waste (Chandon & Wansisk, 2012).

Even though government have taken an initiative to increase the awareness of society to reduce the food waste in urban area, for example like MySave food campaign. The impact of this campaign on the food waste reduction is still unknown. On the other hand, most of the consumers have responded they are not aware of any campaign that has been organized by government to curb this menace (Fatoumata & Nurshamliza, 2017).

In the nutshell, the Malaysia's food waste is still need more effort to reduce especially in the urban areas. The increasing food waste culture in urban society as a warning clock to the government as well as society towards food sovereignty. However, the society was not noticed the effort has been done by the government on food waste reduction. Perhaps, the awareness of food waste management is the first step for the urban society to deduct their food waste volumes.

### **1.3 Objectives of the study**

In this study, the general objective is to determine the impact of urban consumer food consumption pattern toward food waste in urban area.

To be more specific, this study also:

1. to examine the factors related to the urban consumers' consumption pattern;
2. to investigate the most influential factors towards bad behaviour in consumer's consumption pattern ; and
3. to investigate the association between bad behaviour in consumption pattern and food waste.

### **1.4 Significant of the study**

This study attempted to examine about the factors affecting the food waste in Malaysia's urban area. By identifying this factors through this study, eventually it will help government to plan new policy especially targeted to urbanization area as urban area are the largest contributors of food waste in Malaysia. In addition, policy makers can also examine which independent variable influencing consumer in urban area that leads to food waste.

No doubt, there are so many good policies regarding management of food waste that Malaysia could learn and adapt through policy implemented in other country for example like Japan and Taiwan, however all this policy could not efficiently work in Malaysia if government did not look at the factors that leads to food waste in Malaysia from Malaysian point of view. This is where this study will plays its role. In hope to

give more information to public and government regarding factors that stimulates the changes of food waste trends in Malaysia particularly in urban area.

Moreover, the data collected from this study hopefully will raise consumer awareness towards their pattern of consumption food, to let consumer understand that the major sources of food waste comes from the household. Not only that, through this paper hopefully Malaysian know the alarming facts that Malaysia's food waste is so large despite there were some Malaysian who suffers malnutrition because they do not have food to eat especially in rural areas. Furthermore, to help the food waste campaign that runs by government to have better exposure to public through this research.

Last but not least, hopefully through this study it can set a benchmark for future researchers to get more information regarding food waste issue. This paper might also be used as reference for future researcher.

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