A STUDY OF THAI MILLENNIALS ATTITUDES AND ADOPTION FACTORS TOWARDS ZERO WASTE PRODUCTS

BY

MISS SINANUN MATEEDULSATIT

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL
FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE PROGRAM IN MARKETING
(INTERNATIONAL PROGRAM)
FACULTY OF COMMERCE AND ACCOUNTANCY
THAMMASAT UNIVERSITY
ACADEMIC YEAR 2018

A STUDY OF THAI MILLENNIALS ATTITUDES AND ADOPTION FACTORS TOWARDS ZERO WASTE PRODUCTS

BY

MISS SINANUN MATEEDULSATIT

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE PROGRAM IN MARKETING (INTERNATIONAL PROGRAM)

FACULTY OF COMMERCE AND ACCOUNTANCY

THAMMASAT UNIVERSITY

ACADEMIC YEAR 2018

THAMMASAT UNIVERSITY
FACULTY OF COMMERCE AND ACCOUNTANCY

INDEPENDENT STUDY

BY

MISS SINANUN MATEEDULSATIT

ENTITLED

A STUDY OF THAI MILLENNIALS ATTITUDES AND ADOPTION FACTORS TOWARDS ZERO WASTE PRODUCTS

was approved as partial fulfillment of the requirements for
the degree of Master of Science Program in Marketing (International Program)

on 13 MAY 2019

Chairman _____
(Associate Professor James E. Nelson, Ph.D.)

Member and Advisor _____
(Professor Malcolm C. Smith, Ph.D)

Dean _____
(Associate Professor Pipop Udorn, Ph.D.)

Independent Study Title	A Study of Thai Millennials Attitudes and Adoption Factors Towards Zero Waste Products
Author Degree	Miss Sinanun Mateedulsatit
Major Field/Faculty/University	Master of Science Program in Marketing (International Program) Faculty of Commerce and Accountancy Thammasat University
Independent Study Advisor	Professor Malcolm C. Smith, Ph.D.
Academic Year	2018

ABSTRACT

Due to the global plastic pollution crisis, there are currently more than 6.9 billion metric tons of plastic waste scattered around the world, both on the land and in the oceans (Parker, 2018). Many countries and companies around the globe are setting their goals to reduce and to eliminate the consumption of single-use plastics.

The "Zero Waste" concept lifestyle is the idea that an individual's way of life can help to mitigate any waste, especially plastic waste, which occurs in daily life. Zero Waste products, on which this study is focused, are an important part of the whole plan to reduce the various types of waste. After many countries, for example France and Australia, and companies such as McDonald's and Bacardi (Rosane, 2018), pledged to ban single-use plastics, the global demand for Zero Waste products has been continuously increasing.

This research used both quantitative research for the empirical results and qualitative research to determine the interrelated factors that might have an influence on Zero Waste products. The aim of this study is to understand the attitudes and as well as identify adoption factors of Thai Millennials (Thai people born between 1981-1998) towards Zero Waste products. The data were collected mainly from in-depth interviews and a survey questionnaire in which the sampling method was non-probability sampling. The research was completed with 331 respondents, both Adopters and Non-Adopters.

For the research analysis, all data were analyzed by using the Statistical Package for the Social Sciences (SPSS). This research was finalized within a five-month period from December 1st, 2018 to April 4th, 2019.

The research results showed that environmental consciousness and self-realisation have a strong impact for Adopters rather than their personal matters which Non-Adopters have set as their top priority. Both groups of respondents also show that there were some influences from social influences and government policy towards their adoption decision. Both Adopters and Non-Adopters are also interested in the benefits they would receive versus the sacrifices they would have to make when adopting Zero Waste products.

Key words: Zero Waste, Zero Waste products, Adopters, Non-Adopters

ACKNOWLEDGEMENTS

Above all, I would like to show my sincere gratitude towards my highly supportive advisor, Professor Malcolm C. Smith, Ph.D., for his consistent support and constructive feedback throughout this project. I truly appreciate all his inputs, comments, and encouragement.

Furthermore, I would like to thank all of my supporters, family, friends, questionnaire respondents, and those who extended a helping hand towards the completion of this study, especially Bean from M30 with her advice and comments regarding the questionnaire survey.

Miss Sinanun Mateedulsatit

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

1.1 Introduction

At the beginning of 2018, a pilot whale was found dead in the southern region of Thailand with 85 pieces of plastic rubbish weighing around 8 kilograms in its body (BBC, 2018). This incident captured the attention of Thai society in terms of the seriousness of plastic waste and the crisis that it has become. According to the Ellen MacArthur Foundation and McKinsey & Company (2016), there will be more plastics than fish (by weight) in the ocean by 2050. The Ocean Conservancy (2017) reported that Thailand is one of the biggest contributors of ocean waste and that Thailand ranks fifth on the world's list of global contributors of waste (Ocean Conservancy, 2017). Approximately 11.47 million metric tons of ocean waste is generated in Thailand, with 80% of it originating from landfills leaking into the ocean due to waste mismanagement. Moreover, up to 58% of ocean waste has been found to be plastic (see Appendix A), most of which comprises single-use plastics such as bottles, straws, lids, bags, and food containers (School Team, 2017). Furthermore, research has shown that only 9% of the world's plastic has ever been recycled (GAIA/Zero Waste Europe, 2018). Therefore, the practice of reducing and reusing plastic could help to ensure a better future for the environment. This is where the Zero Waste concept can be effectively implemented.

Due to problems of waste, some people have started to change their lifestyles in response to these concerns by using Zero Waste products instead of disposable plastic products, as Zero Waste is a concept that can alleviate the waste problem in the society (Zaman, 2015). The goal of Zero Waste is to redesign and to change the lifestyles of the consumers, particularly in terms of their habits, by reducing the volume as well as the toxicity of waste, especially plastic waste, in landfills, incinerators, and the oceans. Although there is a wide range of Zero Waste products that exist as alternatives for the reduction of waste, the context of this study will focus only on reusable straws, cups, bottles, utensils, and canvas tote bags. Based on the available knowledge, there exists no study concerning the market size, sales volume or

the market growth directly associated with Zero Waste products or sustainable products. However, there is some information available about individual products, which are discussed further in the literature review.

At the moment, there are many campaigns that have been launched by the government and the private sector to combat plastic pollution and reduce the use of plastic (Thai PBS, 2018). However, Thai people still find it difficult to minimize the use of plastic in their daily lives, even though they are aware of the negative impacts of plastic on the environment (Euromonitor International, 2018). Nevertheless, the movement to reduce plastic use is ongoing, and changes can be seen in many places. For example, some coffee shops and alternative product stores that sell eco-friendly products and Zero Waste products are providing reusable or Zero Waste products for customers. At coffee shops in Bangkok, sit-in glasses and reusable straws are being provided more often than they were in the past. This movement has gradually become more widespread and encourages people to make changes in their daily lives. The growth in Zero Waste products consumption is obvious, yet academic research studies on this subject matter are not available in Thailand.

This research is conducted on this contemporary topic in applied marketing under the area of marketing knowledge in Thai society. The study particularly examines Thai Millennials' attitudes towards waste problems and Zero Waste products as well as their level of knowledge about the subject. It also explores the decisions made in terms of the purchase and adoption process among Thai Millennials with regard to Zero Waste products. The researcher is hopeful that this study will facilitate a better understanding of Zero Waste products among consumers in Thai society.

1.2 Objectives

Objective 1: To determine the effect of the marketing mix on the attitude and adoption decision of Adopters and Non-Adopters towards Zero Waste products.

a. Product
b. Price
c. Place
d. Promotion

Objective 2: To determine the effect of demographics on the attitude and adoption decision of Adopters and Non-Adopters towards Zero Waste products.

a. Gender
b. Age
c. Education level
d. Monthly income

Objective 3: To determine the effect of psychographics on the attitude and adoption decision of Adopters and Non-Adopters towards Zero Waste products.

a. Personal interests
b. Leisure activities
c. Responsibility to society and environment
d. Personal opinions, beliefs, and values
e. Awareness of environmental issues
f. Health concerns (microplastics in food and air)

Objective 4: To determine the effect of other social influences on the attitude and adoption decision of Adopters and Non-Adopters.

a. Government sector actions
b. Private sector (companies and organizations) actions
c. Peer and social influencer actions

Objective 5: To make recommendations concerning how to encourage Non-Adopter Millennials to adopt Zero Waste products.

a. To determine the ideal marketing mix (product, price, place, promotion)
b. To identify the actions of other parties involved with the adoption
c. To identify the actions or policies of other sectors (the government and private companies) involved with the adoption

1.3 Definitions

1. Zero Waste – This involves the concept of combating and mitigating the effects of the waste problems in society. The goal of Zero Waste is to redesign and to change the lifestyles of the consumers, particularly in terms of their practices to reduce the volume as well as toxicity of waste (Fernquest, 2017), especially plastic waste in landfills, incinerators, and the oceans.

2. Zero Waste products – These are the products that are used as an alternative to single-use products. In the context of this study, these products are restricted to reusable straws, cups, bottles, utensils, and canvas tote bags. See Appendix B for the list of Zero Waste products included in this study.

CHAPTER 2
REVIEW OF LITERATURE

2.1 Plastic waste crisis in Thailand and the world

Plastic has widely been used since the 1950s. Surprisingly, however, only about 9% of it has ever been recycled (Geyer, Jambeck, & Kara, 2017). More than 300 million metric tons of plastic are produced every year, and it is estimated that 9.2 billion metric tons have been produced in total and needs to be managed. In addition, more than 6.9 million metric tons have become waste (Parker, 2018). Among this waste, nearly half of the total eventually enters the oceans, and Thailand is considered to be the fifth largest contributor of ocean waste in the world. According to the Pollution Control Department, Thailand produces 2 million metric tons of plastic waste annually, with 1.5 million metric tons eventually entering the ocean (Piyaporn, 2018). This increases the ocean waste in Thailand, which is estimated to be approximately 11.47 million metric tons. Around 80% of this originates from on-land activities and more than half comprises single-use plastics such as plastic bags, straws, bottles, and food containers (School Team, 2017). Existing research studies show that each day, Thai people are using single-use plastics at an average rate of approximately 1.5 straws and 8 bags per person. At the same time, 4 billion plastic bottles are used per year (Thairath Online, 2018).

Once plastic particles are produced, they can never completely disappear from the Earth. Even after they are disposed of, they come back to us as microplastics spreading throughout the ocean and being absorbed into the fish that we eat, as well as dispersing into the air that we breathe. In the context of Thailand, waste mismanagement is one of the main concerns. The effects of waste mismanagement have led to significant problems. The obvious effects can be observed on the tourist islands, which are reportedly covered by rubbish on the land and the beaches. The death of marine life such as sea turtles and whales (BBC, 2018), which are injured or killed by being exposed to plastic wastes, the huge garbage patches forming in the Gulf of Thailand (Fernquest, 2017), and the expansion of landfill sites that are in need of

management are additional examples of the problem. This review shows that there is also a need for behavioral changes among the Thai people. Personal responsibility in the form of action by Thailand's population must be taken in order to mitigate the waste problems in Thailand.

2.2 Global effort to combat plastic pollution

Plastic pollution is considered one of the most concerning issues, not only for Thailand but all over the world as well. People around the globe have started to implement the policies for reducing and eliminating the consumption of single-use plastics. Many countries have proposed attempts to achieve this goal. The European Commission proposed its plastic strategy for the first time and voted to ban single-use plastics, including plastic plates, utensils, straws, and cups (Meyer, 2018). Australia is another example, which has banned plastic bags since 2011. The ban has successfully eliminated one-third of plastic waste sent to landfills. Many countries have levied taxes on plastic use, such as in Ireland, where the policy has contributed to a drop of 94% in plastic bags consumption since 2002 (Rosenthal, 2008). Many governments have also placed restrictions on the use of disposable plastic products. Similarly, those in the private sector have started to impose bans or plan to take similar actions by 2020. Most western-based companies, particularly in the United States, the United Kingdom and other European countries, have started to call their customers into action. Efforts from independent organizations and individuals have also been apparent. For example, the non-governmental environmental organization Greenpeace has a campaign called "Don't Suck the Life from Our Oceans" (Corr, 2018)(see Appendix C), while environmental campaigner Natalie Fee initiated a successful campaign known as #SwitchTheStick (see Appendix D) and a non-profit organization called 'City to Sea' (City to Sea, 2017).

With regard to Thailand, the government proposed a 20-year national strategy in early 2018 aimed at reducing the use of single-use plastics (Daily News, 2018). Unfortunately, no concrete actions have ever been reported, let alone successful results. Nevertheless, there have been numerous campaigns launched by the private sector as well as environmental organizations. Examples include Central Department

Store and its 'No Bag Day' (Central, 2018) (see appendix E), which reportedly presents an attractive offer to the public by giving their members extra points and discounts when they refuse to use plastic bags. Another example is a campaign launched in November 2018 and continued in 2019, which is 7-Eleven Thailand's celebrity endorsement campaign called 'Reduce a Plastic Bag a Day. Yes, You Can'. The company worked together with the singer of a famous rock band, Athiwara "Toon" Khongmalai, in 2018 and added in the singing group "BNK48" in 2019 to encourage customers in the reduction of the plastic bags used in their stores (see appendix F). The cost savings from this reduction in the use of plastic bags in this campaign are donated to Siriraj Hospital for the purchase of medical equipment (Thaiger, 2019). On the organization side, the environmental organization known as ReReef initiated the campaign #NoPlasticStraw (ReReef, 2018) (see Appendix G), which involves a network of Thai coffee shops. The shops in the network are asked to not give out plastic straws (Songkiet, 2018). These examples demonstrate that many sectors are aware of the issues and are taking steps to resolve them.

2.3 Zero Waste and its product market trend

As previously mentioned in the introduction, Zero Waste is a concept of combating and mitigating the waste problems in society. The definitions for Zero Waste vary depending on the context, but the idea of responding to the waste crisis remains the same. It is a goal, a process, and a way of thinking that can be adopted in many different fields, such as manufacturing sectors, industrial work, and social management. Only in the past few years has Zero Waste become a new lifestyle trend adopted by individuals. Zero Waste products are a part of the overall plan to reduce the waste examined in this study, especially single-use plastics. There are many Zero Waste stores in North America and Europe as this trend is penetrating individual households. Business is rapidly growing for companies producing and selling reusable straws as well as other reusable products. To name a few examples, 'Final Straw' is a collapsible reusable straw business that raised US$1.8 million on Kickstarter.com (FinalStraw, 2018) (see Appendix H) and 'Package Free Shop' (Package Free, 2018) (see Appendix

I) in Brooklyn, New York sells package-free goods and Zero Waste products ranging from reusable straws to natural latex condoms.

Businesses of this type are thriving, especially via online channels. The market for reusable products is expanding, and the reusable water bottle market was estimated to be valued at US$ 7.6 billion at the end of 2016 and is expected to reach US$ 9.9 billion by 2023, expanding at a CAGR of 4.0% (Credence Research Inc., 2018). %. Following the ban on plastic straws announced by companies such as Bacardi and several countries including the United Kingdom, alternatives such as glass and paper straws are in demand. At Etsy.com, the search counts on metal and glass straws rose 205% and 63% respectively, while the search counts on plastic straws plummeted by 11% (Glum, 2018). As a result of such data, it seems apparent that the reusable product market is growing and successful. However, based on all of the available evidence, the author is unaware of any market research on this particular sector nor any Zero Waste products or reusable products. Moreover, most research papers found related to this subject matter are concerned with the industrial and manufacturing fields, and no academic papers about the products for individual lifestyles exist.

2.4 Zero Waste movement in Thailand

A number of places in Thailand have already adopted the concept of Zero Waste. The very earliest examples include academic institutions such as Roong Aroon School, NIST International School, and Chulalongkorn University, which aim to reduce waste in their institutions, especially single-use plastic (Molstad, Heyer, Martine, & Sardi, 2018). While Roong Aroon School has had an integrated resources management system within the school since 2004, NIST and Chulalongkorn more recently started their Zero Waste programs in 2017. Not only schools are taking action, but also coffee shops and hotels have gradually switched from disposable straws to reusable straws in their business operations.

Other examples of approaches used by Thai Millennials are Zero Waste shops in Bangkok and in Phuket. ‘Refill Station’ is the first Zero Waste refill store ever opened in Thailand, offering reusable products and bulk products for customers to refill their containers (Tun-atiruj, 2018) (see Appendix J). ‘ZeroMoment’ is a recent Zero

Waste store with the idea of bulk sales, allowing customers to buy their products with no fixed weight limit (BLT Bangkok, 2018) (see Appendix K). The store offers a wide range of products from shampoo to pasta. In terms of online channels, there are many individual sellers and producers of reusable straws and other reusable products, for example cloth menstrual pads and beeswax food wrap (Thaitrakulpanich, 2018). As previously mentioned, 'ReReef' is another example of an online reusable product store, similar to 'Package Free Shop' with its rather limited range of products. With regard to the customers, Thai people have shown their concerns about plastic waste problems as well as their interest in adopting the Zero Waste approach. The actual number of Thai people adopting Zero Waste products remains unclear. However, an obvious interest has become noticeable as the number of shops and relevant businesses that have reportedly recently opened has grown.

2.5 Millennials, Thai customers, and the environment

Global Millennials currently account for roughly 1.8 billion people around the world, which is one-fourth of the world's present population (Tilford, 2018). The Millennials generation is the largest population group, exceeding both Baby Boomers and Generation X. From the US national survey conducted by the MIT AgeLab, it was found that Millennials believe they are more environmentally conscious than the older generations (Coughlin, 2018). However, another survey from the Shelton Group found that Millennials have turned out to be the generation that recycles less than older generations and think that the global problems are too large for one individual to solve (Shelton Group, 2017). The Millennials, therefore, rely on the companies that create a positive influence on the world instead of taking action by themselves.

According to the desk research, there has been no extensive study or research concerning what exactly the opinions of Thai Millennials currently are with regard to Thailand's environmental issues. Fortunately, there is a report mentioning that 64% of Thai people try to take positive steps to improve the environment in their everyday lives (Euromonitor International, 2018). In contrast, many still find it difficult to apply their environmentally friendly intentions and attitudes into actual daily life practices. There is a need for more investigation to be conducted on the factors that

influence Thai Millennials' attitudes and actions towards environmentally friendly intentions. Finally, there was an article mentioning the impact of 'guilty messages' and showing the benefits of "environmentally friendly" lifestyles. The latter appears to be a more effective approach to encourage people to reduce their plastic consumption compared to the 'guilty messages'' (Economic & Science Research Council, 2007). As the researcher sees the necessity of reevaluating this statement due to the fact that the article was published a decade ago, this study will aim to identify the factors that influence people to adopt greener lifestyles in order to confirm this idea.

2.6 Summary

Plastic pollution is a major problem affecting every living organism around the globe. Many countries and companies are putting significant effort into reducing the plastic wastes produced by individuals each year, which are consequently disposed of into our world. The Zero Waste concept offers a resolution to this problem by reducing the volume of waste in our lives. Zero Waste products are reusable alternatives to plastic-based products. While the Zero Waste concept is already well-known in Western countries, the concept is not yet widely known in Thailand nor is it well understood by Thai people. The adoption of this type of goods is therefore limited to only a few groups of people. Regarding the problems of plastic waste, they are recognized by Thai people in general through the news. Serious campaigns promoting the actions that can help to reduce the use of single-use plastic remain low in numbers. To the best of this researcher's knowledge, there has been no research nor studies carried out on Zero Waste products, let alone on customers' insightful information focusing on the attitudes of Thai Millennials towards this matter. As the researcher managed to identify the gaps, this study has the purpose of bridging the gaps by providing missing data as well as building upon the body of knowledge on this subject. Thus, it is hoped that the present research can help to enhance readers' understanding of Thai Millennials attitudes and adoption factors towards Zero Waste products.

2.7 Academic Theory Implication

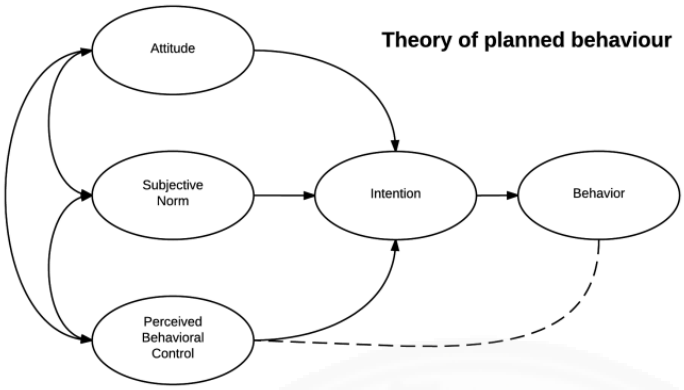


Figure 2.1 Theory of planned behavior by Ajzen

This study will use the 'Theory of Planned Behavior' (Ajzen, 1991), (see Figure 1) for its model and the 'Consumer Adoption Process' in order to study the factors that influence customers' attitudes. These factors affect the behavior intention towards Zero Waste products. The factors influencing the adoption intention towards Zero Waste products will also be explored together with these theories. The independent variables comprise customer demographics (such as education level, income, area of residence, etc.) and psychographics (such as personal interests and leisure activities, awareness of environmental issues, heath concerns, etc.), social influence (the government and the private sector's actions and peers and society's influences), and product characteristics (such as prices, mobility and features, etc.). To fit the model, the subjective norm of the Theory of Planned Behavior is expected to be a social influence. Perceived Behavioral Control involves psychographics. The dependent variables comprise the attitudes of respondents towards Zero Waste products and customer adoption intentions towards Zero Waste products.

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

This research was conducted using two methods: exploratory research (secondary data and in-depth interviews) and descriptive research (a questionnaire).

3.1 Exploratory Research

The exploratory research was conducted in order to define the concept of "Zero Waste" and to categorize Zero Waste products as well as address its current trend in Thai society. This research has also explored Thai Millennials' attitudes towards Zero Waste products with the purpose of understanding their attitude triggers and the barriers to adopting these types of products. Information from both secondary data and in-depths interviews was used to develop the questionnaire.

3.1.1 Secondary data

Secondary data was collected from certain open sources including websites, online articles, news and academic reports in order to help the researcher gain a better understanding of the concept of Zero Waste and alternative products. This data provided a broader perspective about the current situation of waste problems worldwide and particularly in Thailand, as well as how adopting Zero Waste products will result in positive impacts on the situation. The current actions of governmental and public institutions on the waste problems were also explored as they can help demonstrate how critical the waste problem is in Thailand. Above all, the data obtained was used as supporting data for the report. The collection of secondary data was conducted in order to achieve Objective 1, Objective 2, Objective 3, Objective 4, and Objective 5.

3.1.2 In-depth interviews

The aim of the in-depth interviews was to collect insightful information about individual perspectives towards Zero Waste products, and they were conducted with 12 respondents (Adopters and Non-Adopters). The time used in the in-depth interviews was between 20 to 30 minutes per respondent. The in-depth interviews

were conducted in order to achieve the Objective 1, Objective 2, Objective 3, and Objective 4.

3.2 Descriptive Research

The descriptive research was based on the information collected from the exploratory research, and the information obtained was used to develop the questionnaire. The questionnaire was made available online on the Survemonkey.com website and was completed by 384 respondents, which included 214 Adopters and 170 Non-Adopters. The time for completion was estimated at 10 minutes. The quantitative data from the questionnaire were interpreted and analyzed in order to identify the factors that influence the adoption of Zero Waste products, as well as the triggers and barriers to adoption. This data was applicable to Objective 1, Objective 2, Objective 3, Objective 4, and Objective 5. The independent variables are the demographic and psychographic data of respondents, the product characteristics, and the social influences. The dependent variables are the attitudes of the Adopters and Non-Adopters towards Zero Waste products and their adoption intention of Zero Waste products. The details of each variable are shown in Figure 2:

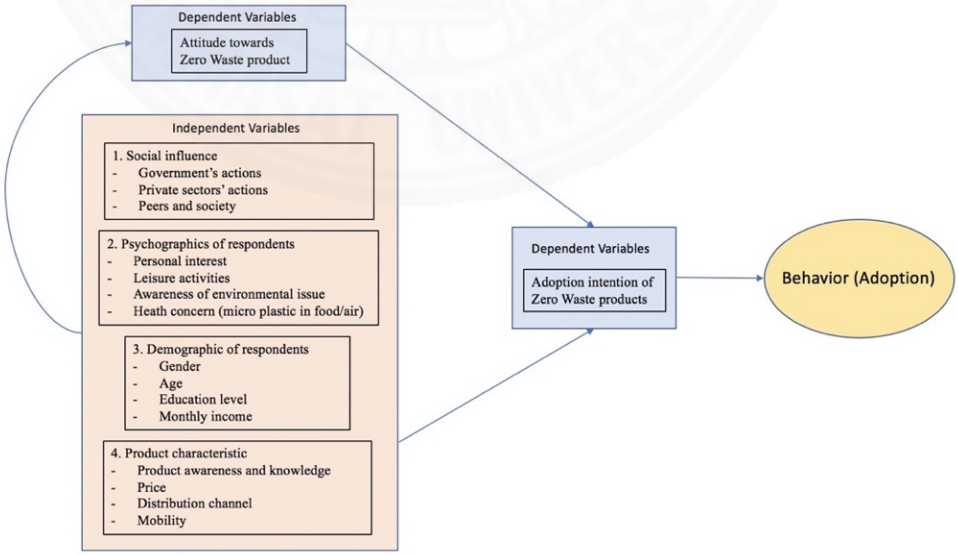


Figure 3.1 Diagram of dependent variables and independent variables

3.3 Sampling procedure

The sampling for both the qualitative and quantitative research was conducted with two types of Millennials, Adopters and Non-Adopters, based on the definitions seen in Table 3.1. The respondents of the interviews and the questionnaire were selected using a non-probability convenience sampling method. Personal contacts and referral sampling were used to acquire the respondents.

Table 3.1 Description of Adopter and Non-Adopter respondents

Type	Description
Adopters	People who adopted at least one of the listed Zero Waste products in their daily life during the past three months. The examples of Zero Waste products in this research are reusable straws, utensils, cups, bottles, and bags.
Non-Adopters	People who did not adopt any Zero Waste products into their daily life during the past three months, including both rejecters and non-rejecters.

- **In-depth interviews**

The in-depth interviews were conducted though phone calls for respondents in other provinces, while face-to-face interviews were carried out at coffee shops in Bangkok, mostly in the Sukhumvit area. The list of questions used for in-depth interviews of Adopters and Non-Adopters is shown in Appendix L.

- **Questionnaire**

The questionnaire was an online survey on the SurveyMonkey.com platform. The pilot test was launched at the end of January 2019, followed by the launch of the questionnaire in February. The questionnaire was distributed via social network channels such as LINE, Facebook, Twitter, and e-mail. The researcher contacted the owners of Zero Waste shops in Bangkok (for example, Refill Station and ZeroMoment Refillery) and other provinces to ask them to distribute the questionnaire on their Facebook pages. A copy of questionnaire is shown in Appendix M.

The sample size of both in-depth interviews and questionnaire is described in Table 3.2.

Table 3.2 Sample size of in-depth interviews and survey questionnaire

Methodology	Data Collection Method	Pilot Study	Sample Size	Detail
1.Qualitative	In-depth Interviews	-	12 people	10 Adopters 2 Non-Adopters
2.Quantitative	Survey questionnaire	10 people	384 people	214 Adopters and 170 Non-Adopters

3.4 Sampling selection

Thai Millennials (people who were born between 1981 and 1996) were used as target respondents in both the interviews and questionnaire. The sample was divided into two groups: Adopters and Non-Adopters, who live in Bangkok, the vicinity of Bangkok, or some major provinces. Their income levels vary between low, middle and high income earners. This was done is to identify whether income levels have any impact on the decision to adopt Zero Waste products. This research focuses specifically on the Millennial generation because they have voiced more concerns about environment protection than the older generations, according to the MIT AgeLab's US nationwide survey. Globally, Millennials outnumber the other two previous generations, namely Baby Boomers and Generation X (Economic & Science Research Council, 2007). Consequently, they have become the world's largest population group. According to the UN Population Division, Millennials account for up to 30% of the overall population in Thailand (gogoingkorn, 2017) (see Appendix N).

3.5 Data Analysis

As the key findings were collected from in-depth interviews, the findings obtained were used as a guideline to develop the questionnaire for the descriptive research. In terms of the questionnaire, the data results were analyzed using the Statistical Package for the Social Sciences (SPSS). The statistical methods that were used in this research include the calculation of means and frequencies, regression and correlation, factor and cluster analysis, Pearson's Chi-Squared test and Analysis of Variance (ANOVAs) to determine the differences between variables.

CHAPTER 4
DATA RESULTS

4.1 In-depth Interviews

For the demographic data of the in-depth interviews respondents, there were 10 Adopters: two females aged 23 who live in Shanghai and in Taiwan, one female aged 25, one female aged 26, one female aged 28, one female aged 29, one female aged 33, one male aged 28, and two males aged 32. There were 2 Non-Adopters: one female aged 35 and one male aged 31. Other than the two female respondents who live in other countries, all of the respondents are living in Bangkok.

From the in-depth interviews, there were interesting key findings regarding Zero Waste Adopters' and Non-Adopters' Zero Waste adoption decisions and their awareness of the problem of plastic and its effects.

For Adopters, it was found that the common reason for their Zero Waste adoption is their self-realization regarding the usage of plastic in their daily life. "I used to order delivery lunchboxes for months. When I stopped ordering those lunchboxes, I saw how many empty plastic lunchboxes were at my house. After that, I started to cook for myself and use a reusable lunchbox instead," said one respondent. While most Adopters gain their self-realization from their daily routine, some Adopters' reason to adopt is the viral news on the death of marine animals from ocean plastic pollution, which then leads to their self-realization. The self-realization of Adopters is a consequence of having awareness and knowledge about plastic pollution.

Some Adopters mentioned their adoption as a habit that they formed while studying abroad where the country in which they studied has strict policies on waste management and plastic pollution. "I had to pay 5 to 10 pence per plastic bag if I wanted to use it. Even though it was not that high in price, paying for it every time when grocery shopping was a pain," said one respondent who used to study abroad in the United Kingdom. Therefore, law enforcement is the adoption factor for some Adopters who used to live abroad. Charging an extra fee on plastic bags and restrictions on waste

sorting are common waste restrictions in a number of countries that can lead to changes in people's behavior.

While convenience in carrying Zero Waste products is not major factor for Adopters to adopt Zero Waste products, Non-Adopters see it as important factor for their adoption decision. Based on this factor, it can be seen that some Non-Adopters are self-prioritized towards personal matters more than having environmental concerns. "I do not drive a car to work but use public transport, so it was very heavy and inconvenient to carry reusable products around," said one respondent. Many of the respondents are government officials and public company employees. Most of them use public transport to commute to work; therefore, having products that are suitable to their daily life and convenient to carry is an important key point.

The level of awareness of plastic pollution is not excessively low with Non-Adopter respondents. However, they still do not adopt Zero Waste products in their daily life. One of the reasons might be that they do not see any benefits that they have received from the adoption other than the inconvenience and the hardship they experienced. "I didn't know that there is an in-store discount if one brings a personal tumbler," said one respondent, and another respondent said, "I think the discount is too small compared to the inconvenience and hardship when I have to carry the reusable tumbler or cup around." The increase in promotions about in-store discounts can be a trigger to demonstrate to Non-Adopters the benefits they can receive from the adoption.

4.2 Descriptive Research

4.2.1 Demographics of all respondents

There were 495 questionnaires that were completed, of which 401 respondents passed the screening process. The completion rate of the questionnaire was 77% with a typical time spent of 7 minutes. The questionnaire data from the 331 respondents who continued until completing the demographic section, which included 187 Adopters and 144 Non-Adopters, shows that there were more female respondents (81.90%) than male respondents (9.10%) and LGBTQ respondents (9.10%). From the comparison of Adopters and Non-Adopters, there were greatly more female Adopters (86.60%) than male Adopters (4.80%), as shown in Table 4.1, while for Non-Adopters,

there was a higher proportion of male respondents (14.60%) than that found in Adopters (4.80%). This indicates that Adopters tend to be female rather than male.

Table 4.1 Demographics of Respondents

	Adopters		Non-Adopters		Total	
Gender	**N**	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
Male	9	4.80%	21	14.60%	30	9.10%
Female	162	86.60%	109	75.70%	271	81.90%
LGBTQ	16	8.60%	14	9.70%	30	9.10%
Total	187	100.00%	144	100.00%	331	100.00%

As for the overall demographics of the respondents, they have an education level of lower than high school (0.30%), high school (2.70%), bachelor's degree (73.10%), and master's degree (23.90%). The personal income per month of the respondents is less than 20,000 THB/month (41.70%), 20,001 - 40,000 THB/month (36.30%), 40,001 - 60,000 THB/month (11.50%), 60,001 - 80,000 THB/month (5.40%), and more than 80,000 THB/month (5.10%). As for their occupations, they work as government officials (8.50%), corporate employees (42.30%), students (30.20%), business owners (6.60%), freelancers (8.20%), and other occupations (4.20%). Most of the respondents live in Bangkok and vicinity (80.70%) while the others live in other provinces or other countries (19.30%). (see Appendix O)

4.2.2 Plastic usage of all respondents

The findings regarding the results of the plastic usage from all respondents, both Adopters and Non-Adopters, show that the majority of the Non-Adopters use plastic bags (51.10%), plastic bottles (61.20%), and plastic straws (59.40%) from five to more than 20 times per week. When compared to the Adopters, the number of plastic products used five to more than 20 times a week by the Non-Adopters is higher than the plastic usage of five to more than 20 times of the Adopters. These results are shown in Table 4.2.

Table 4.2 Plastic Usage of Respondents

In the past week, how often did you accept plastic bags from store?	Adopters		Non-Adopters		Total	
	N	Percentage	N	Percentage	N	Percentage
less than 5	145	67.80%	83	48.80%	228	59.40%
5-10 times	55	25.70%	60	35.30%	115	29.90%
11-15 times	9	4.20%	14	8.20%	23	6.00%
16-20 times	3	1.40%	5	2.90%	8	2.10%
more than 20 times	2	0.90%	8	4.70%	10	2.60%
Total	214	100.00%	170	100.00%	384	100.00%
In the past week, how often did you purchase drinks in plastic bottles?	**Adopters**		**Non-Adopters**		**Total**	
	N	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
less than 5	131	61.20%	66	38.80%	197	51.30%
5-10 times	64	29.90%	68	40.00%	132	34.40%
11-15 times	11	5.10%	19	11.20%	30	7.80%
16-20 times	3	1.40%	4	2.40%	7	1.80%
more than 20 times	5	2.30%	13	7.60%	18	4.70%
Total	214	100.00%	170	100.00%	384	100.00%
In the past week, how often did you purchase a drink in plastic cups?	**Adopters**		**Non-Adopters**		**Total**	
	N	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
less than 5 times	157	73.40%	107	62.90%	264	68.80%
5-10 times	50	23.40%	50	29.40%	100	26.00%
11-15 times	6	2.80%	5	2.90%	11	2.90%
16-20 times	1	0.50%	2	1.20%	3	0.80%
More than 20 times	0	0.00%	6	3.50%	6	1.60%
Total	214	100.00%	170	100.00%	384	100.00%
In the past week, how often did you use plastic straws?	**Adopters**		**Non-Adopters**		**Total**	
	N	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
less than 5 times	121	56.50%	69	40.60%	190	49.50%
5-10 times	74	34.60%	71	41.80%	145	37.80%
11-15 times	15	7.00%	16	9.40%	31	8.10%
16-20 times	3	1.40%	6	3.50%	9	2.30%
more than 20 times	1	0.50%	8	4.70%	9	2.30%
Total	214	100.00%	170	100.00%	384	100.00%

4.2.3 Key Results of Adopters

Zero Waste products usage

The findings in Table 4.3 : Zero Waste products usage of Adopters shows that a reusable bag is the item most commonly used by the Adopters (94.40%), while reusable straws has the least number of users among the Adopters (24.60%).

Moreover, 27.70% of the Adopters use other Zero Waste products or reusable products other than those mentioned in this study.

Table 4.3 Zero Waste Product Usage

Zero Waste products Usage	Percentage (N)	Total
Do you use reuse bottle?	82.10% (170)	207
Do you use reuse tumbler?	79.5% (163)	205
Do you use reuse straw?	24.6% (49)	199
Do you use reuse bag?	94.4% (186)	197
Do you use other Zero Waste or reuse products?	27.7% (52)	188

Product characteristics

The findings show the results of the product characteristics affecting the Adopters' decisions regarding Zero Waste products adoption related to Objective 1. Adopters express their agreement on the characteristics of each product differently depending on their usage. Firstly, regarding the results of reusable bottle characteristics shown in the top-two boxes of the 5-point rating level of agreement scale (Agree and Strongly Agree) in Table 4.4, the characteristics of a reusable bottle that its users agreed affect their adoption decision the most are 'Variety in design' (92.30%, mean = 4.30) and 'Long lifetime' (92.30%, mean = 4.39).

Table 4.4 Reusable Bottle Characteristics Frequencies and Top-Two Boxes Result

Reusable Bottle Characteristics	N	Percentage	Mean
Variety in material.	122	72.20%	3.8246
Variety in design	156	92.30%	4.2982
Low price	54	32.00%	3.0994
Light weight	82	48.50%	3.4912
Long lifetime	156	92.30%	4.386
Easy to carry/wash/storage	93	55.00%	3.6667
Total	169	100.00%	

Secondly, regarding the results of the reusable cup characteristics shown in the top-two boxes of the 5-point rating level of agreement scale (Agree and Strongly Agree) in Table 4.5, the top two characteristics of a reusable cup that its users agreed affect their adoption decision the most are similarly ‘Long lifetime’ (92.90%, mean = 4.42) and ‘Variety in design’ (90.40%, mean = 4.31).

Table 4.5 Reusable Cup Characteristics Frequencies and Top-Two Boxes Result

Reusable Cup Characteristics	N	Percentage	Mean
Variety in material.	109	69.90%	3.828
Variety in design	141	90.40%	4.3057
Low price	54	34.60%	3.1783
Light weight	80	51.30%	3.5478
Long lifetime	145	92.90%	4.4204
Easy to carry/wash/storage	87	55.80%	3.6497
Total	156	100.00%	

Thirdly, regarding the results of the reusable straw characteristics shown in the top-two boxes of the 5-point rating level of agreement scale (Agree and Strongly Agree) in Table 4.6, the top two characteristics of a reusable straw that its users agreed affect their adoption decision the most are ‘Long lifetime’ (89.10%, mean = 4.33) and ‘Light weight’ (80.40%, mean = 4.17).

Table 4.6 Reusable Straw Characteristics Frequencies and Top-Two Boxes Result

Reusable Straw Characteristics	N	Percentage	Mean
Variety in material.	26	56.50%	3.6458
Variety in design	18	39.10%	3.3333
Low price	22	47.80%	3.4167
Light weight	37	80.40%	4.1667
Long lifetime	41	89.10%	4.3333
Easy to carry/wash/storage	36	78.30%	4.1458
Total	46	100.00%	

Lastly, regarding the results of the reusable bag characteristics shown in the top-two boxes of the 5-point rating level of agreement scale (Agree and Strongly Agree) in Table 4.7, the top three characteristics of a reusable bag that its users agreed affect their adoption decision the most are ‘Easy to carry/wash/store’ (92.90%, mean =

4.51), ‘Long lifetime’ (92.90%, mean = 4.41), and ‘Light weight’ (92.40%, mean = 4.43).

Table 4.7 Reusable Bag Characteristics Frequencies and Top-Two Boxes Result

Reusable Bag Characteristics	N	Percentage	Mean
Variety in material	132	71.70%	3.9194
Variety in design	163	88.60%	4.414
Low price	108	58.70%	3.6828
Light weight	170	92.40%	4.4301
Big size	125	67.90%	3.7957
Long lifetime	171	92.90%	4.414
Easy to carry/wash/storage	171	92.90%	4.5108
Total	184	100.00%	

Psychographics of Adopters

Based on the findings from the in-depth interviews, Adopters have their knowledge and awareness on the basis of environmental problems and their effects. With regard to Objective 3, these five influential factors were used to quantify which of them have affected the Adopters’ adoption decision the most. The top-two boxes (Agree and Strongly Agree) from the 5-point rating scale were used to find the top most influential problems. As shown in Table 4.8, the most influential factor is ‘The death of animals due to plastic’ (96.30%, mean = 4.69), while the next most influential factor is ‘Plastic pollution’ (95.70%, mean = 4.59). Nevertheless, the results of the top-two boxes for the percentage from each factor are higher than 85% with their mean being higher than 4. This shows that the following influential factors about environment problems have highly affected the Adopters’ decisions.

Table 4.8 Environmental Problems Frequencies and Top-Two Boxes Result

Influential factors	N	Percentage	Mean
Waste problem in Thailand	165	88.20%	4.2926
Plastic pollution	179	95.70%	4.5851
The death of animal due to plastic	180	96.30%	4.6915
Lifespan of plastic	167	89.30%	4.4628
Micro-pollution	161	86.10%	4.3883
Total	188	100.00%	

The following statements are the samples of Adopters awareness or self-realization regarding their actions related to plastic waste and the effects of environmental problems. The results shown in Table 11 are the top-two boxes (Agree and Strongly Agree) from the 5-point rating scale of agreement on how much each problem affected their Zero Waste product adoption. The top two statements regarding the problems that influenced the Adopters' decisions the most are 'I felt bad for the death and injury of animals from plastic waste' (94.10%, mean = 4.55) and 'I want to reduce the waste I produce' (93.60%, mean = 4.46) from the total of 188 respondents who answered this question.

Table 4.9 Personal Statements Frequencies and Top-Two Boxes Result

Statements	N	Percentage	Mean
I do waste sorting at home	93	49.50%	3.484
I want to reduce the waste I produced	176	93.60%	4.4574
I was bored throwing away the same thing all the time	133	70.70%	3.9149
I felt guilty towards the environment	165	87.80%	4.367
Using Zero Waste products become my habit since my time spending abroad	82	43.60%	3.1809
I felt bad for the death and injured animals from plastic waste	177	94.10%	4.5532
I have health concern towards using synthetic product containers	148	78.70%	4.1809
I realized how much plastic wastes I have produced in a day	161	85.60%	4.3191
Total	188	100.00%	

Social Influences (Other People)

From the in-depth interviews, the researcher has listed several social influences which affected Adopters' Zero Waste products adoption decisions. Other individuals and the government sector as well as private sector actions are said to be the influential factors for their adoption. These factors were used to quantify which of them are the most influential factors among Adopters regarding their adoption. The results of the top-two boxes (Agree and Strongly Agree) from the 5-point rating scale of agreement in Table 4.10 of other individuals as influential factors show that 'Friends and colleagues' (83.10%, mean = 3.69) is the most influential factor. Nevertheless, the mean of each factor is similar and not higher than 4.

Table 4.10 Social Influences Frequencies and Top-Two Boxes Result

Influential factors	N	Percentage	Mean
Family members and relatives	106	74.60%	3.5532
Friends and colleagues	118	83.10%	3.6862
Celebrities	67	47.20%	3.1436
Blogger and social influencers	62	43.70%	3.0691
Total	142	100.00%	

As displayed in Table 4.11, the results from the findings show the effect of other social influences such as the government sector and the private sector's actions towards Adopters' adoption decision. The top-two boxes (Agree and Strongly Agree) from the 5-point rating scale of agreement were used to find the top most influential social influences. The most influential factor of their adoption decision is 'In-store discounts' (88.90%, mean = 4.20). In contrast, the 'Government's campaign on plastic usage reduction' (17%, mean = 2.35) has the lowest percentage and lowest mean.

Table 4.11 Social Influences Frequencies and Top-Two Boxes Result

Influential factors	N	Percentage	Mean
Government's campaign on plastic usage reduction	29	17.00%	2.3457
Private sector's campaign on plastic usage reduction	139	81.30%	3.9415
In-store discounts (e.g. Starbucks and local café)	152	88.90%	4.2021
School/organization education about waste management and plastic pollution	86	50.30%	3.3989
Company's encouragement about plastic reduction and Zero Waste products adoption	118	69.00%	3.7394
Total	171	100.00%	

4.2.4 Key Results of Non-Adopters

In this study, Non-Adopters are the respondents who currently do not adopt Zero Waste products in their everyday life. The questionnaire asked respondents to answer with their own opinion whether they considered themselves as Adopters of Zero Waste products, and 170 respondents answered that they do not consider themselves to be Zero Waste products Adopters. The researcher also asked respondents in the questionnaire about their awareness and knowledge of plastic pollution, the death

of animals due to plastic, and the Zero Waste concept or products, and this data are shown in Table 4.12.

Table 4.12 Non-Adopters Environmental Problems Awarenes

Have you ever seen any news or articles or video clips about plastic pollution?	N	Percentage
Yes	136	93.20%
No	10	6.80%
Total	146	100.00%
Have you ever seen any news or articles or video clips about the death of animal due to plastic?	**N**	**Percentage**
Yes	142	97.30%
No	4	2.70%
Total	146	100.00%
Have you ever seen any news or articles or video clips about Zero Waste concept or Zero Waste products?	**N**	**Percentage**
Yes	109	74.70%
No	37	25.30%
Total	146	100.00%

Zero Waste products Adoption Intention

The findings regarding the adoption intention of Non-Adopters are shown in Table 4.13. The results show that 57.50% of the respondents who answered this question indicated the top-two boxes of the 5-point rating scale of likelihood (Likely and Very Likely) on the adoption intention of Zero Waste products.

Table 4.13 Adoption Intention

Adoption intention of Zero Waste product	N	Percentage
Very Not Likely, Not Likely, Neutral	62	42.50%
Likely, Very Likely	84	57.50%
Total	146	100.00%

Product Characteristics

The questionnaire findings show the effect of the product characteristics towards not adopting Zero Waste products, which is related to Objective 1. From the 5-point rating scale of agreement, the top-two boxes (Agree and Strongly Agree) of the product characteristics show that ‘Inconvenient to carry around’ (82.20%,

mean = 3.89) is the most influential factor affecting their decision to not adopt Zero Waste products. These findings are shown in Table 4.14.

Table 4.14 Product Characteristics Frequencies and Top-Two Boxes Result

Effect of product characteristics on not to adopt Zero Waste products	N	Percentage	Mean
Unreasonable price	60	46.50%	3.2192
Heavy weight	63	48.80%	3.2671
Too big or too long product size	66	51.20%	3.3562
Inconvenience to carry around	106	82.20%	3.8904
Hard to find where to buy the products	79	61.20%	3.5342
Total	129	100.00%	

Psychographics

As for the psychographic effects on the adoption intention of the respondents, the researcher has listed 14 statements/opinions of Non-Adopters that were gathered from the in-depth interviews, which are related to Objective 3. As shown in Table 4.15, the results of top-two boxes from the 5-point rating scale of agreement (Agree and Strongly Agree) on the effect of the following statements on adoption intention are shown in Table 16. First, 'I always forget to bring my own Zero Waste products' (85.70%, mean = 4.0342) is the most influential statement as quantified by the respondents. The next most highly rated influential statements are, 'I am too lazy to carry Zero Waste products around' (63.90%, mean = 3.51) and 'Even if I use Zero Waste products, there are still many people using single-use products' (53.40%, mean = 3.25), respectively.

Table 4.15 Psychographics Frequencies and Top-Two Boxes Result

Effect of personal statement/belief/opinion on not to adopt Zero Waste products	N	Percentage	Mean
I am too lazy to carry Zero Waste products around	85	63.90%	3.5137
Adopting Zero Waste products make my life more difficult	34	25.60%	2.8699
I always forget to bring my own Zero Waste products	114	85.70%	4.0342
I do not product that much plastic waste	26	19.50%	2.5548
I do not want to be different from others by using Zero Waste products	7	5.30%	1.7877
I do not want to change my usual habits by using Zero Waste products	12	9.00%	2.0548
Even if I use Zero Waste products, there are still many people using single-use products	71	53.40%	3.2466
I do not think using Zero Waste products will make any change	8	6.00%	1.8356
It is a burden to carry Zero Waste products around	37	27.80%	2.9452
It is the job of government or big corporates to take action about plastic pollution, not individuals	35	26.30%	2.5137
I think the plastic problem is not affecting my life	5	3.80%	1.5616
I use only things that can be recycle	40	30.10%	3.0548
Even though I use plastic products, there are people recycling these plastic products anyway	37	27.80%	2.8425
I do not think plastic pollution is that serious, people just unreasonably hype over it	3	2.30%	1.5137
Total	133	100.00%	

Social Influences (Other people)

The findings show to what degree respondents agree on the effect of social influences or other people on their adoption intention, which is related to Objective 4. As shown in Table 4.16, ‘There is lack of serious and effective government actions towards plastic pollution’ (92.80%, mean = 4.30) is the most influential statement of social influences on their adoption intention.

Table 4.16 Social Influences Frequencies and Top-Two Boxes Result

Effect of social influences on not to adopt Zero Waste products	N	Percentage	Mean
None of my friends use Zero Waste products	29	21.00%	2.4178
There is a lack of serious and effective government actions towards plastic pollution	128	92.80%	4.295
Stores provide single-use plastic all the time, so I just accepted them	94	68.10%	3.6986

Ideal Action on Plastic Pollutions and Zero Waste Products

There are many actions regarding plastic pollution and Zero Waste products that take place in other countries. The researcher has listed seven ideal actions towards the problems, which are related to Objective 5. In Table 4.17, the results show the top-two boxes of the 5-point rating scale of likelihood of influence (Likely and Very Likely) on the respondents' adoption intention if the following actions were to take place in Thailand. These actions were rated in order to quantify which of them are the most influential actions. The findings show that 'More special promotions for Zero Waste product users' (85.10%, mean = 4.24), which involves the benefits of Zero Waste products, is the action that respondents rated the highest. The next influential action is concerned with the products, 'Offering different kinds of Zero Waste products that are more convenient to carry around' (83.70%, mean = 4.10), while the third most influential action is related to the actions of the private sector, 'Collecting an extra fee on single-use plastics' (80.90%, mean = 4.18).

Table 4.17 New Actions Adoption Intention

Adoption intention on new actions towards plastic pollution and Zero Waste products	N	Percentage	Mean
Offering different kinds of Zero Waste products that are more convenient to carry around (e.g. collapsible straws, cups, bottles)	118	83.70%	4.0685
Legal restrictions or bans on single-use plastic (e.g. ban on single-use plastic bags and straws)	100	70.90%	3.8699
Collecting an extra fee on single-use plastic (e.g. 3-5THB per plastic bags at convenience stores and supermarkets)	114	80.90%	4.1781
Increasing the availability of Zero Waste products (e.g. sale point at supermarket)	110	78.00%	4.1469
Having celebrity as a presenter promoting the problem of plastic pollution	44	31.20%	2.875
More special promotions for Zero Waste products users	120	85.10%	4.2431
Government or related organizations providing more knowledge about plastic pollution and Zero Waste products	83	58.90%	3.6759
Total	141	100.00%	

4.2.5 Factor and Cluster Analysis of Non-Adopters

Table 4.18 Non-Adopters Factor Analysis's Rotated Component Matrix

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
I'm too lazy to carry Zero Waste products around	0.139	0.834	0.099	0.105
Adopting Zero Waste products makes my life more difficult	0.121	0.806	-0.043	0.036
I always forget to bring my own Zero Waste products	-0.052	0.668	0.154	-0.048
I do not produce that much plastic waste	0.3	0.054	-0.02	0.672
I do not want to be different from others by using Zero Waste products	0.703	0.068	0.022	0.047
I do not want to change my usual habits by using Zero Waste products	0.712	0.312	0.065	0.079
Even if I use Zero Waste products, there are still many people using single-use products	0.051	-0.006	0.764	0.105
I do not think using Zero Waste products will make any change	0.598	-0.044	0.413	0.03
It is a burden to carry Zero Waste products around	0.237	0.825	-0.059	0.061
It is the job of government or big companies to take action about plastic pollution, not individuals	0.204	0.158	0.723	-0.123
I think the plastic problem is not affecting my life	0.78	0.113	0.19	0.017
I use only things that can be recycle	-0.098	0.051	0.179	0.824
Even though I use plastic products, there are people recycling these plastic products anyway	0.268	0.027	0.676	0.317
I do not think plastic pollution is that serious, people just unreasonably hype over it	0.821	0.073	0.168	0.115

The psychographics of the respondents (personal statements/opinions) were used in the Factor Analysis to group the psychographics of the respondents that correlate with each other as a group of factors. As shown in Table 4.18, there are four groups of factors which are 'Do not see problems and do not care', 'Self-prioritize', Not my problem or my job to care', and 'Already did my part'.

Hierarchical Cluster and K-means Cluster Analysis were used with the four factors to group respondents into segmentation. From the findings shown in Table 4.18 and Table 4.19, Non-Adopters can be grouped into three segments with the given names as follows: 'Self-Prioritizers' for the 57 respondents who prioritize oneself before

environmental or social problems, ‘Burden Pushers’ for the 54 respondents who see all the plastic pollution problems as not their responsibility, and ‘Ignorants’ for the 35 respondents who do not realize or recognize the problems of plastic pollution nor care about its effects.

Table 4.19 Non-Adopters Cluster Analysis's Final Cluster Centers

Final Cluster Centers			
	Cluster		
	1	2	3
Do not see problem and no care	-0.37711	-0.51185	1.40386
Self-prioritize	0.0164	0.08992	-0.16545
Not my problem or my job to care	-0.77894	0.79911	0.03566
Already did my part	-0.43413	0.34083	0.18116

Table 4.20 Non-Adopters Clusters Analysis's Number of Cases in Each Cluster

Number of Cases in each Cluster		
Cluster	1	57
	2	54
	3	35
Valid		146
Missing system		255

4.2.6 Segmentation Description

As mentioned, Respondents were divided into three segments, namely Self-Prioritizers, Burden Pushers, and Ignorants by the psychographics of Non-Adopters (personal statements/opinions). These findings are described as follows:

Demographics

The results of the demographic findings of each segment (gender, personal monthly income, education level, occupation, and area of residence) when analyzed with Pearson’s Chi-Squared Test (see Appendix P) show that they have no significant difference with p-value greater than 0.05. However, the data shows that ‘More than 20% of cells in this sub-table have expected cell counts less than 5. Chi-square results may be invalid. The minimum expected cell count in this sub-table is less than one. Chi-square results may be invalid.’

The demographic data crossed with the segments is shown as the following (see Appendix Q):

Self-Prioritizers have a higher proportion of males (21.10%) and LGBTQ (14%) than the other groups. They are mainly government officials and students who have graduated with a master's degree and have a personal income per month of less than 20,000 THB and live in Bangkok.

Burden Pushers are mostly business owners and freelancers who have graduated with a bachelor's degree and have a personal income per month of approximately 60,000 – 80,000 THB. They mainly live in Bangkok, but there is a larger proportion of people who live in other provinces or countries than found in the other groups.

Ignorants are mostly females holding a bachelor's degree who work as corporate employees with a personal income per month of around 20,000 – 40,000 THB and live in Bangkok.

Adoption Intention

The adoption intention was significantly different among the three segments ($F(2,143) = 3.44$, $p < .05$), according to Analysis of Variance (ANOVA) (see Appendix R).

From Tamhane's T2 Multiple Comparison (see Appendix S), it can be seen that the Ignorants segment is significantly different from the Self-Prioritizers and Burden Pushers while the Self-Prioritizers and Burden Pushers are not significantly different from each other.

With the comparison of mean, Self-Prioritizers ($M_{Self\text{-}Prioritizers} = 3.77$) has the highest adoption intention mean score compared with the Burden Pushers ($M_{BurdenPushers} = 3.76$) and Ignorants ($M_{Ignorants} = 3.26$).

Effect of product characteristics to not adopt Zero Waste products of product characteristics to not adopt Zero Waste products

The Burden Pushers segment rated that all product characteristics have affected their decision to not adopt Zero Waste products more than the Self-Prioritizers and Ignorants, as shown in Appendix T. At the same time, all three segments rated 'Inconvenient to carry' as the most influential characteristic of Zero Waste products

with the following results: Burden Pushers (84.30%), Self-Prioritizers (82.40%), and Ignorants (77.80%).

The Pearson Chi-Squared (X^2) Test shown in Appendix X indicates that the product characteristics are not significantly different among the segments, X^2 (10, N = 129) = 8.854, p = .546 > .05. (see Appendix U)

Effect of psychographics (personal statements/opinions) to not adopt Zero Waste products

As seen in Appendix V, the statement that all three segments agreed to the most is 'I always forget to bring my own Zero Waste products', with the results as: Burden Pushers (96.30%), Self-Prioritizers (84.80%), and Ignorants (69.70%).

The effect of psychographics (personal statements/opinions) to not adopt Zero Waste products are significantly different between the segments as shown in Appendix W: Pearson Chi-Squared (X^2) Test, X^2 (28, N = 133) = 105.627, p = .000 < .05.

Effect of social influences (other people) to not adopt Zero Waste products

From the results of the top-two boxes from the 5-point- rating scale of agreement on the effect of social influences (other people) on adoption intention in Appendix X, 'There is a lack of serious and effective government actions towards plastic pollution' was rated by all segments as the highest among the other factors with the following results: Ignorants (100%), Burden Pushers (92.50%), and Self-Prioritizers (88.70%). Nevertheless, Burden Pushers also had a higher tendency to rate 'Stores provide single-use plastic all the time, so I just accept them' than the Self-Prioritizers and Ignorants.

The effect of social influences (other people) to not adopt Zero Waste products are not significantly different among the segments according to Pearson's Chi-Squared (X^2) Test as seen in Appendix Y, X^2 (6, N = 138) = 5.384 p = .496 > .05.

New Actions Taking Place

The results shown in Appendix Z are the top-two boxes from the 5-point rating scale of likelihood on the effect of new actions on Zero Waste products adoption intention. Burden Pushers tend to have highest intention to adopt with 'More special promotions for Zero Waste products users' (94.20%) than Self-Prioritizers

(86%) and Ignorants (68.80%). At the same time, Self-Prioritizers and Ignorants tended to have their highest intention to adopt with 'Offering different kinds of Zero Waste products that are more convenient to carry around' and 'Collecting an extra fee on single-use plastic' than other new actions.

The intention to adopt Zero Waste products is not significantly different among the segments according to the Pearson's Chi-Squared (X^2) Test from Appendix AA, X^2 (12, N = 141) = 8.655 p = .732 > .05.

4.3 Relationships between Variables

4.3.1 Adopters and Non-Adopters

Overall, the demographic data of the respondents are statistically significant between the Adopters and Non-Adopters, with reference to Appendix BB, (F(5, 325) = 2.802, p = .017 < .05), which is related to Objective 2. However, the only demographic that is statistically significant in the Coefficients table is personal income per month, with p = .014 < .05.

4.3.2 Non-Adopters

The researcher explored the relationship between each of the psychographics (independent variables) and the adoption intention (dependent variable) in separate regression analyses. The results, as shown in Appendix CC, indicate that 10 of independent variables are statistically significant with p < .05, while the results of the Regression Analysis of product characteristics, which are independent variables, and adoption intention, which is the dependent variable, reveals that all of the product characteristics are not statistically significant (see Appendix DD). Nevertheless, the Regression Analysis results, as shown in Appendix EE, indicates that the independent variable (social influence) is strongly related to the dependent variable (adoption intention). As shown in Appendix FF, 'None of my friends use Zero Waste products' is the only variable that is statistically significant.

CHAPTER 5
SUMMARY AND CONCLUSIONS

5.1 Adopters

From the results of this research, it can be concluded that not every Adopter adopted every Zero Waste product that was mentioned in this study in their daily life. The well-adopted products are reusable bags and reusable bottles, which are the basic products used by people due to the promotions and campaigns from several sectors, with a minor role from the government sector and more recently from major corporations.

The results from the questionnaire also show that each Zero Waste product has different criteria in terms of the effect of its adoption. However, the common characteristic and criterion that is most important in every product that affected the adoption decision is the long lifetime of the product. Adopters tend to adopt Zero Waste products due to their repeat-use capability and long lifetime for usage as this is usually accomplished automatically with reusable products.

The objectives of this research were to quantify the effects of various factors that may influence the Zero Waste products adoption. From the findings on the effect of social influences, it can be concluded that close acquaintances such as family members, relatives, friends, and colleagues have more impact on the Adopters' adoption than the media influencers. This seems to indicate that, as the respondents are of Asian background, this is due to belonging to a collective society. However, with the results of each factor's mean, which are similarly equal, it can also be concluded that the adoption of Zero Waste products may not be influenced by other people at all but result from the personal decision of the Adopters instead.

Nevertheless, the latter conclusion regarding the effect of social influences can also be supported by the findings related to the effect of psychographic factors towards Zero Waste products adoption. These results show that the environmental consciousness of Adopters has a strong impact on their adoption. Additionally, the self-realization concept from the in-depth interviews was also quantified with the

questionnaire, where almost all of the Adopters rated that they felt bad for the death and injury of animals and want to reduce the waste that they produce. Therefore, it can be said that personal opinions or acknowledgement have more impact on Zero Waste products adoption than the influences from other individuals or influencers. Moreover, the benefits from the adoption are also important as Adopters tend to favor in-store discounts as the reward campaign from the private sector as well.

5.2 Non-Adopters

Regarding the overall conclusions of the Non-Adopters, in spite of their decision to not adopt Zero Waste products yet, they are aware of and know about the plastic pollution problem. They are mostly people who have set their first priority as their personal matters rather than being concerned or caring about the environmental problems. Even with the various results from each segment of the Self-Prioritizers, Burden Pushers, Ignorants, their answers for the factors which affected their adoption intention are the same, which is that the inconvenience of product mobility has a high impact on their adoption decision. It also indicates that friends or close acquaintances have a significant effect on Non-Adopters' adoption decisions. It can be concluded that the socialization has an effect on Non-Adopters' decisions. Moreover, the results also show a similarity between Adopters and Non-Adopters. This may be due to the collective culture of Asian respondents which may have an effect on their decision as well. Moreover, they seem to need more effective action from the government as one of the incentives for them to make a decision or action towards Zero Waste products. Not only the incentive action from the government is needed, but also the benefits of being an adopter should be emphasized more to the Non-Adopters by all related sectors. Doing so may show them what they could gain compared to the inconvenience or the hardship they perceive they have to experience by adopting Zero Waste products.

5.3 Recommendations

Self-Prioritizers and Burden Pushers are the two segments that have a high level of intention to adopt Zero Waste products. These two are the segments with a

larger proportion of Non-Adopters, and the factors that most affect their intention to adopt are those that are easily resolved. ‘Inconvenient to carry’ can be overcome by offering different kinds of Zero Waste products, such as collapsible products which is easier to carry around. This action can also solve the problem of both segments regarding their forgetfulness to bring the products with them (e.g. collapsible straws that have a hanger which can be attached to their keychain or bags). The quantitative results of Non-Adopters show similar information with the outdated articles in the literature review. The interest in knowing more about the benefits of being an adopter is needed and the promotion of benefits should be increased in order to provide education to the Non-Adopters. Therefore, it seems that any persuasive actions that show the benefit of having an environmentally friendly lifestyle will have more effective on people’s decisions than pushing a message of guilt.

5.4 Limitation of Research

There were several limitations during the conducting of this research study. The sample size was limited in both the qualitative and quantitative research, which may impact the findings. The sampling method that the researcher used was non-probability convenience sampling. The duration that the questionnaire responses were gathered was two weeks, during February 19, 2019 to March 3, 2019. Also, the distribution of the questionnaire was based on social media platforms such as Twitter, Line, and Facebook. These may have an impact on the similarity in the profiles of the respondents, especially respondents who are females aged around 26 - 28 years old, which was the largest group of respondents. With the small sampling size, this may also have had an impact on the accuracy of the results as the samples may not closely represent the whole population of Thai Millennials.

REFERENCES

7-Eleven Thailand. (2019, April 1). Retrieved from https://www.facebook.com/watch/?v=333709983944987

7-Eleven Thailand. (2019, April 1). Retrieved from Facebook: https://www.facebook.com/7ElevenThailand/photos/a.578361005534350/2181865035183931/?type=3&theater

Ajzen, I. (1991, December). The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 50(2), 179-211.

BBC. (2018, June 2). Interviews the Vet Team Help Saving Pilot Whale's Life. Retrieved November 2018, from BBC New: https://www.bbc.com/thai/thailand-44346034

BLT Bangkok. (2018, December 6). Get your containers ready, and come shop at ZeroMoment Refillery. Retrieved December 7 2018, from BLT Bangkok: http://bltbangkok.com/article/info/44/896

Central. (2018, April 23). CENTRAL / ZEN EVERY DAY'S NO BAG DAY. Retrieved December 2 2018, from Zen: http://www.zen.co.th/every-days-no-bag-day/

City to Sea. (2017). #SwitchtheStick. Retrieved December 2 2017, from City to Sea: https://www.citytosea.org.uk/switchthestick/?fbclid=IwAR1F2BnnLRqr0f5Tod6Vj-Xv5HANPbWVTQ2hxCLPp9CTB06aeMGWPtTO3mg

Claessens, M. (2018, February 4). FACTORS INFLUENCING THE ADOPTION PROCESS. Retrieved November 30 2018, from Marketing-Insider: https://marketing-insider.eu/factors-influencing-the-adoption-process/

Cohen, E., & Pepper , M. (2018, April 24). Final Straw, the world's first collapsible, reusable straw. Retrieved December 20 2018, from Kickstarter: https://www.kickstarter.com/projects/finalstraw/finalstraw-the-worlds-first-collapsible-reusable-s

Corr, A. (2018, July 31). This Campaign Shows How Your Plastic Straws Suck the Life Out of Ocean Animals. Retrieved December 1 2018, from ADWEEK:

https://www.adweek.com/creativity/this-campaign-shows-how-your-plastic-straws-suck-the-life-out-of-ocean-animals/

Coughlin, J. (2018, May 5). Greener Than You: Boomers, Gen X & Millennials Score Themselves On The Environment. Retrieved December 2 2018, from Forbes: https://www.forbes.com/sites/josephcoughlin/2018/05/05/greener-than-you-boomers-gen-x-millennials-score-themselves-on-the-environment/#c3c267f4d8b4

Credence Research Inc. (2018, April 24). Reusable Water Bottles Market is Expected to Hit US$ 9.9 Billion By 2023. Retrieved December 2 2018, from Credence Reserach: https://globenewswire.com/news-release/2018/04/24/1486185/0/en/Reusable-Water-Bottles-Market-is-Expected-to-Hit-US-9-9-Billion-By-2023-Credence-Research.html

Daily News. (2018, July 18). D-Day for reducing for environment. Retrieved December 2 2018, from MSN News: https://www.msn.com/th-th/news/national/%E0%B8%94%E0%B8%B5%E0%B9%80%E0%B8%94%E0%B8%A2%E0%B9%8C%E0%B8%97%E0%B8%B3%E0%B8%84%E0%B8%A7%E0%B8%B2%E0%B8%A1%E0%B8%94%E0%B8%B5%E0%B8%94%E0%B9%89%E0%B8%A7%E0%B8%A2%E0%B8%AB%E0%B8%B1%E0%B8%A7%E0%B9%83%E0%B8%88-%E0%B8%

Economic & Science Research Council. (2007, June 16). Recycling Is Not Enough; We Need To Consume Less, Experts Urge. Retrieved December 4 2018, from ScienceDaily: https://www.sciencedaily.com/releases/2007/06/070615075506.htm

Ellen MacArthur Foundation and McKinsey & Company. (2016, January 19). The New Plastics Economy — Rethinking the future of plastics. Retrieved October 7 2018, from Ellen MacArthur Foundation: https://www.ellenmacarthurfoundation.org/assets/downloads/EllenMacArthurFoundation_TheNewPlasticsEconomy_Pages.pdf

Euromonitor International. (2018, Janruary 30). Consumer Lifestyles in Thailand. Retrieved October 4 2018, from Passport: http://ezproxy.library.tu.ac.th:2108/portal/analysis/tab

Fernquest, J. (2017, April 10). Garbage islands: Another discovered in Gulf of Thailand. Retrieved December 1 2018, from Bangkok Post: https://www.bangkokpost.com/learning/advanced/1230374/garbage-islands-another-discovered-in-gulf-of-thailand

FinalStraw. (2018, April 20). FinalStraw | The Original Collapsible Straw. Retrieved December 3 2018, from FinalStraw: https://finalstraw.com/?campaign=1402999130&adgroup=59347607510&loc=1012728&kw=final%20straw&gclid=CjwKCAiAjNjgBRAgEiwAGLlf2q_G32sP_tYs-f5SW3EyCMcrKYjYVC2cI-7d3HzKEeZpAbHsa_bQlhoCwwAQAvD_BwE

GAIA/Zero Waste Europe. (2018, January 22). Recycle is Not Enough: It's time to rethink how to solve the plastic waste crisis. Retrieved December 2018, from Global Alliance of Incinerator Alternatives: http://www.no-burn.org/wp-content/uploads/Recycling-is-Not-Enough-UPDATE.pdf

Geyer, R., Jambeck, J. R., & Kara, L. L. (2017, July 19). Production, use, and fate of all plastic ever made. Science Advances.

Glum, J. (2018, July 27). Meet the Reusable Straw Sellers Cashing In on the Plastic Backlash. Retrieved December 5 2018, from Money: http://time.com/money/5347336/reusable-straw-sellers-plastic-bans/

gogoingkorn. (2017, January 27). Millennials the major force of e-commerce. Retrieved December 4 2018, from Thanawat: https://thanawat.co/2017/01/27/thai-millennials-shoppers/

Kamer, F. (2018, November 21). Final Straw: The Last Straw You'll ever Need. Retrieved December 6 2018, from Futurism: https://futurism.com/gift-guide/final-straw-gift-guide

Kanchanakij, B. (2018, December 4). ZeroMoment Refillery: Sorry, this shop is package free. Retrieved December 4 2018, from A Day Managize: https://adaymagazine.com/zeromoment-refillery/

Manopavit, P. (2017, May 16). 6 Plastics that you say bye. Retrieved November 28 2018, from Green World: https://greenworld.or.th/green_issue/%E0%B8%9E%E0%B8%A5%E0%B8%B2%E0%B8%AA%E0%B8%95%E0%B8%B4%E0%B8%81-

6-%E0%B8%AD%E0%B8%A2%E0%B9%88%E0%B8%B2%E0%B8%87%E0%B8%97%E0%B8%B5%E0%B9%88%E0%B8%8A%E0%B8%B5%E0%B8%A7%E0%B8%B4%E0%B8%95%E0%B8%99/

Meyer, D. (2018, May 28). Plastic Pollution: Single-Use Straws Maybe Banned Across Europe. Retrieved November 23 2018, from Fortune: http://fortune.com/2018/05/28/eu-plastic-straw-ban-environment/

Molstad, E. P., Heyer, K. P., Martine, K., & Sardi, P. (2018, February). Reducing Single-Use Plastic in a Thai School Community: A Sociocultural Investigation in Bangkok, Thailand. Retrieved December 4 2018, from Worcester Polytechnic Institute | Digital WPI: https://digitalcommons.wpi.edu/cgi/viewcontent.cgi?article=1205&context=iqp-all

Ocean Conservancy. (2017, April). Stemming the Tide: Land-based strategies for a plastic- free ocean. Retrieved September 29 2018, from Ocean Conservancy: https://oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf

Package Free. (2018). Package Free Shop. Retrieved December 1 2018, from Package Free Shop: https://packagefreeshop.com/

Parker, L. (2018, June). We Made Plastic. We Depend on It. Now. We're Drowning in it. Retrieved December 3 2018, from National Geographic: https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/

Piyaporn, W. (2018, May 6). Special Report: Alarm raises as Thailand drowns in Plastic trash. Retrieved December 3 2018, from The Nation: http://www.nationmultimedia.com/detail/national/30344702

Plastic Oceans. (2018). Facts about plastic. Retrieved December 3 2018, from Plastic Oceans: https://plasticoceans.org/the-facts/

ReReef. (2018, January 11). ReReef | Green Cafe Network. Retrieved December 2 2018, from ReReef | Facebook.com: https://www.facebook.com/Re4Reef/photos/a.1832268433752055/1883488878630010/?type=3&theater

Resources and Environmental Department, Roong Aroon School. (2015). Integrated Resources Management System. Retrieved December 4 2018, from Roong Aroon School: http://www.roong-aroon.ac.th/?page_id=6543

Rosane, O. (2018, July 13). Bacardi and Lonely Whale to Remove 1 Billion Plastic Straws to Ensure #TheFutureDoesntSuck. Retrieved December 8 2018, from EcoWatch: https://www.ecowatch.com/bacardi-lonely-whale-plastic-straws-2586276075.html

Rosenthal, E. (2008, January 31). By 'bagging it', Ireland rids itself of a plastic nuisance. Retrieved December 5 2018, from The New York Times: https://www.nytimes.com/2008/01/31/world/europe/31iht-bags.4.9650382.html

School Team. (2017, July 6). Waste Problem in Thailand. Retrieved November 24 2018, from School of Change Maker: https://www.schoolofchangemakers.com/knowledge/11678

Shelton Group. (2017, September 20). PR Newswire. Retrieved 3 December, from Survey: Millennials Less Likely to Recycle, But More Likely to Buy From Companies that Go Green: https://www.prnewswire.com/news-releases/survey-millennials-less-likely-to-recycle-but-more-likely-to-buy-from-companies-that-go-green-300522713.html

Songkiet, P. (2018, March 29). Plastic Straw, Sir? Retrieved October 30 2018, from The Standard: https://thestandard.co/no-plastic-straw/

Thai PBS. (2018, June 5). 20 Ministries Kick Off the Use of Plastic Bags and Foams Containers. Retrieved October 7 2018, from Thai PBS: https://news.thaipbs.or.th/content/272605

Thaiger, T. (2019, February 12). 169 million plastic bags left unused at Thai 7-Elevens in just two months. Retrieved from The Nation: http://www.nationmultimedia.com/detail/national/30363999

Thairath Online. (2018, June 5). Shock! Environmental Issue, Downtown people use plastic bags 80 bags/days. Retrieved November 20 2018, from Thairath Online: https://www.thairath.co.th/content/1299856

Thaitrakulpanich, A. (2018, June 13). How to Start Using Less Plastic in Bankok Right Now. Retrieved November 26 2018, from Khaosod English:

http://www.khaosodenglish.com/life/shopping/2018/06/13/how-to-start-using-less-plastic-in-bangkok-right-now/

Tilford, C. (2018, June 6). The millennial moment - in charts. Retrieved December 2 2018, from Financial Times: https://www.ft.com/content/f81ac17a-68ae-11e8-b6eb-4acfcfb08c11

Tops Thailand. (2018, October 15). Tops Thailand Cover Photo. Retrieved December 2 2018, from Tops Thailand | Facebook.com: https://www.facebook.com/TopsThailand/photos/a.381925371835155/2284135274947479/?type=3&theater

Tun-atiruj, C. (2018, February 27). The humble refill store looking in curb Bangkok's wasteful habits. Retrieved November 28 2018, from BK Magazine Online: https://bk.asia-city.com/city-living/news/interview-bangkok-refill-station

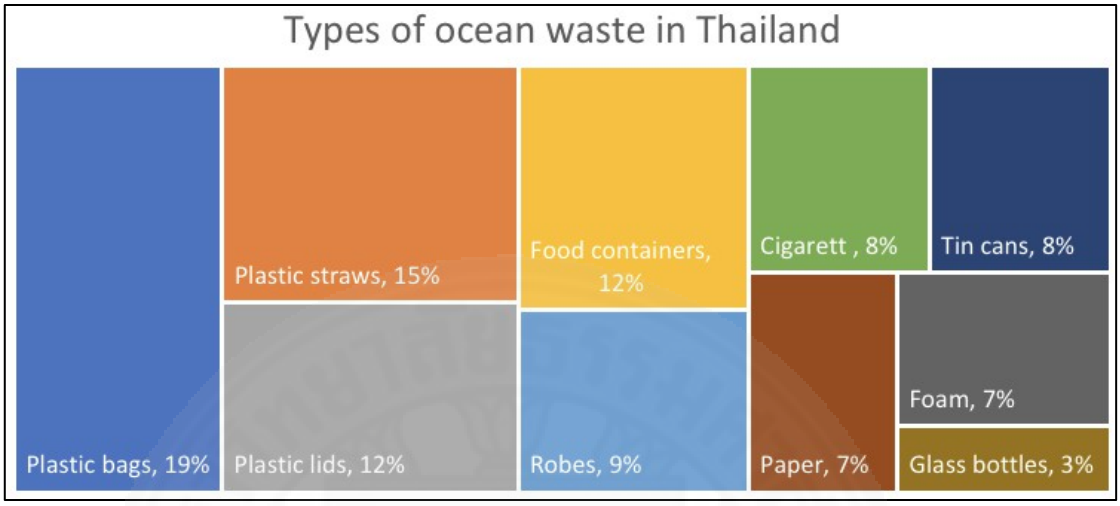
Zaman, A. U. (2015). A comprehensive review of the development of zero waste management: lessons learned and guidelines. Journal of Cleaner Production, Vol 91, 12.

ZeroMoment Refillery. (2018, November 6). ZeroMoment Refillery. Retrieved December 5 2018, from ZeroMoment Refillery | Facebook.com: https://www.facebook.com/zeromomentrefillery/

APPENDICES

APPENDIX A

TYPES OF OCEAN WASTE IN THAILAND



(School Team, 2017)

APPENDIX B

ZERO WASTE PRODUCTS

Reusable bottle
(Package Free, 2018)

Cup/Tumbler
(Package Free, 2018)

Reusable straw
(Manopavit, 2017)

Canvas tote bag
(Package Free, 2018)

APPENDIX C

"DON'T SUCK THE LIFE FROM OUR OCEAN" CAMPAIGN BY GREENPEACE CANADA

(Corr, 2018)

APPENDIX D

#SWITCHTHESTICK CAMPAIGN

(City to Sea, 2017)

Youtube VDO: https://www.youtube.com/watch?v=znBlZSMtHCo
Website: http://www.switchthestick.org/

APPENDIX E

‘NO BAG DAY’ CAMPAIGN FROM CENTRAL GROUP

1. Central department store ‘No Bag Day’ (Central, 2018)

2. Tops Market’s ‘No Plastic Bag Day’ (Tops Thailand, 2018)

APPENDIX F

TOON ATHIWARA AND BNK48 FOR 7-ELEVEN ENDORSEMENT CAMPAIGN

(7-Eleven Thailand, 2019)

Advertisement: https://www.facebook.com/watch/?v=333709983944987

APPENDIX G

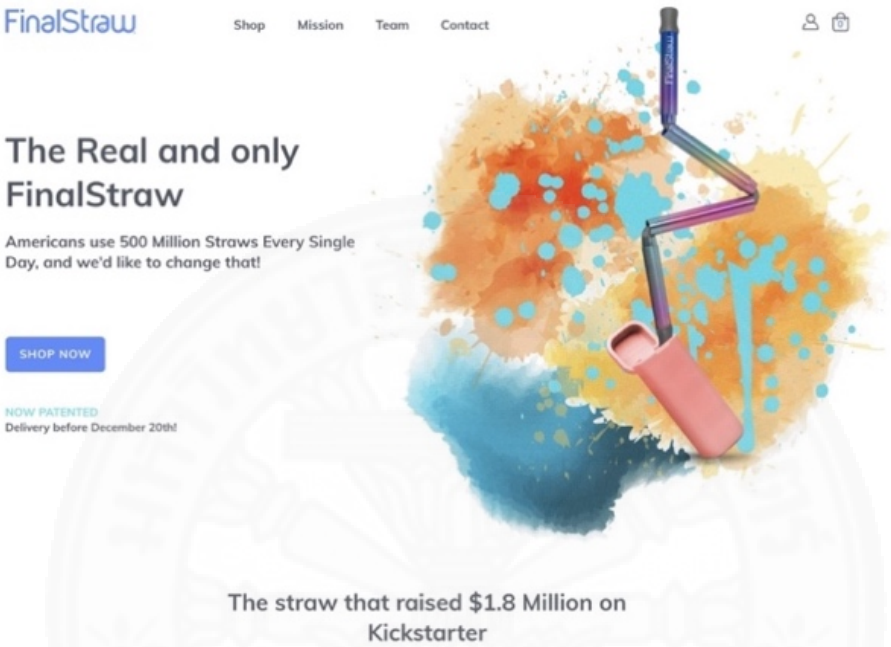
#NOPLASTICSTRAW CAMPAIGN BY REREEF

(ReReef, 2018)

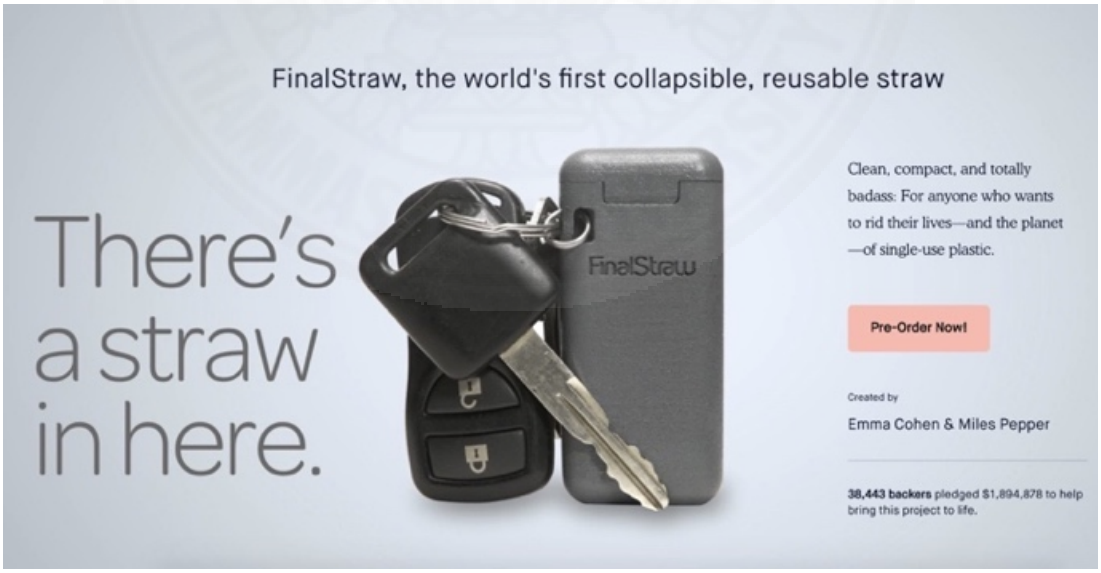
APPENDIX H

FINAL STRAW

1. Final Straw website (FinalStraw, 2018)



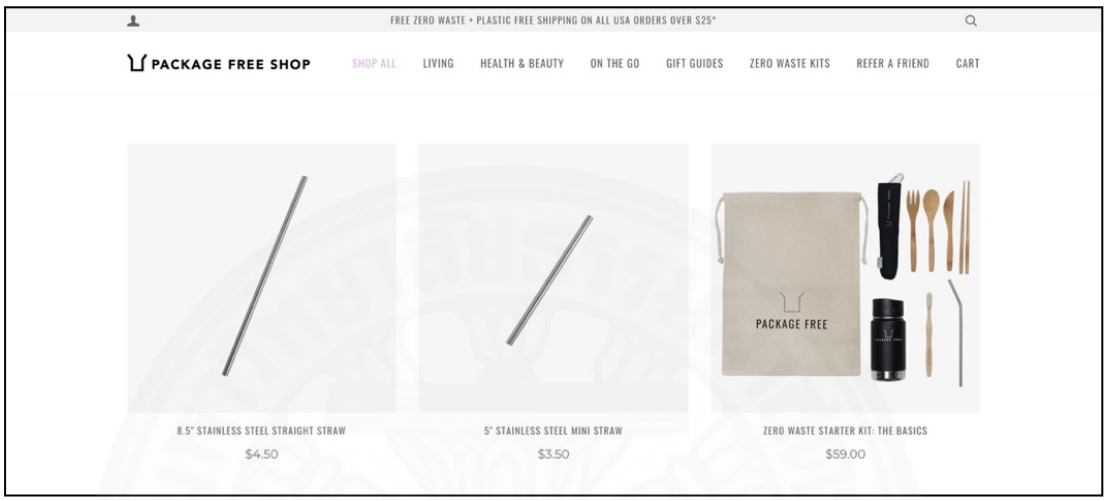
2. Kickstarter.com FinalStraw (Cohen & Pepper , 2018)



APPENDIX I

PACKAGE FREE SHOP WEBSITE

(Package Free, 2018)



APPENDIX J

REFILL STATION SHOP

(Tun-atiruj, 2018)

APPENDIX K

ZEROMOMENT REFILLERY SHOP

(ZeroMoment Refillery, 2018)

APPENDIX L

SAMPLE QUESTIONS OF ADOPTERS AND NON-ADOPTERS IN-DEPTH INTERVIEWS

1. Do you use any Zero Waste products?
2. What product are you using right now?
3. Why are you not using other Zero Waste products?
4. How often do you carry these products around?
5. How long have you adopt these products?
6. what are the reason for you to adopt these products?
7. How do you start adopting these products?
8. What do you feel when you adopt/use these products?
9. In your opinion, do you think adopting/using Zero Waste products have impact on anything?
10. Have you ever read any news or articles about plastic waste problems?
11. Have you ever seen any video clips about plastic waste problems?
12. What kind of video clip have you seen?
13. How do you feel when you read the articles or see the video clips?
14. Have you ever try to encourage other people to adopt Zero Waste product? Why?
15.Why do you think other people are not adopting Zero Waste product yet?
16. What do you think would influence/encourage these people to adopt Zero Waste product?
17. Do you think any actions/regulations from government and private sectors would have impact on adoption of Zero Waste product?
18. Do you think what kind of actions/regulations would lead to adoption of Zero Waste product?

<u>Non-Adopters in-depth interview questions</u>

1.Are you using any Zero Waste products?
2.Why not?
3.Do you know Zero Waste products or reusable products?
4.Do you have them at home at least?
5.What is the reason for you not to carry them around?

6. Have you ever read any news or articles about plastic waste problems?

7.Have you ever seen any video clips about plastic waste problems?

8.What do think about those viral content?

9.Do you think it help people think of using reusable products? Why not?

10.What do you think will make people adopt these things?

11.If things that you mentioned happen, are you going to adopt?

APPENDIX M

QUESTIONNAIRE SAMPLE

Screening

1) Are you born in the year between 1981-1996?
   - □ Yes (continue #2)
   - □ No (Ending page)

   ---------- End of screening question ----------

Behavioral

2) In the past week, how often did you accept plastic bags from stores (e.g. 7-11, street shops, or supermarket)?
   - □ Less than 5 times
   - □ 5-10 times
   - □ 11-15 times
   - □ 16-20 times
   - □ More than 20 times
3) In the past week, how often did you purchase drinks in a plastic bottle (e.g. water, juice, or soft drinks)?
   - □ Less than 5 times
   - □ 5-10times
   - □ 11-15 times
   - □ 16-20 times
   - □ More than 20 times
4) In the past week, how often did you purchase a drink in plastic cups (e.g. coffee, tea, soft drinks, juice, or blended drinks)?
   - □ Less than 5 times
   - □ 5-10 times
   - □ 11-15 times
   - □ 16-20 times
   - □ More than 20 times
5) In the past week, how often did you use plastic straws?
   - □ Less than 5 times
   - □ 5-10 times
   - □ 11-15 times
   - □ 16-20 times
   - □ More than 20 times

Zero Waste is the concept of combating and mitigating waste problems in society. The goal of Zero Waste is to redesign and to change the lifestyle of the consumers, particularly in terms of their practice to reduce the volume as well as toxicity of waste, especially plastic waste in landfills, incinerators, and the ocean.

Zero Waste products are products that are reusable and used as alternatives to single-use products. In the context of this study, the products are restricted to reusable straws, cups, bottles, utensils, and canvas tote bags.

6) Do you consider yourself as a Zero Waste product user/an adopter who uses/carries Zero Waste products (or reusable products) around 5 days/week in the past 5 months?
   - ☐ Yes (Section A: ADOPTER PART #7)
   - ☐ No (Section B: NON-ADOPTER PART #20)

7) How long have you been adopting Zero Waste products? (in months)
   Fill in the blank

Factor influence: Section A

8) Do you use reusable bottles?
   - ☐ Yes (continue to #9)
   - ☐ No (skip to #10)

9) How much do you agree with the following statements about the characteristics of reusable bottles affecting your decision toward its adoption? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Reusable bottles offer variety in material.					
Reusable bottles offer variety in design.					
Reusable bottles have a low price.					
Reusable bottles are light-weight					
Reusable bottles have a long lifetime					
Reusable bottles are easy to carry/wash/storage					

10) Do you use reusable cups/tumblers?
   - ☐ Yes (continue to #11)
   - ☐ No (skip to #12)

11) How much do you agree with the following statements about the characteristics of reusable cups/tumblers affecting your decision toward its adoption? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Reusable cups offer variety in material.					
Reusable cups offer variety in design.					
Reusable cups have a low price.					
Reusable cups are light-weight					
Reusable cups have a long lifetime					
Reusable cups are easy to carry/wash/storage.					

12) Do you use reusable straws?
   - ☐ Yes (continue to #13)
   - ☐ No (skip to #14)

13) How much do you agree with the following statements about the characteristics of reusable straws affecting your decision toward its adoption? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Reusable straws offer variety in material.					
Reusable straws offer variety in design.					
Reusable straws have a low price.					
Reusable straws are light-weight					
Reusable straws have a long lifetime					
Reusable straws are easy to carry/wash/storage					

14) Do you carry a tote bag around?
- ☐ Yes (continue to #15)
- ☐ No (skip to #16)
- ☐

15) How much do you agree with the following statements about the characteristics of tote bags affecting your decision toward its adoption? 1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Tote bags offer variety in material.					
Tote bags offer variety in design.					
Tote bags have a low price.					
Tote bags are light-weight					
Tote bags offer large size.					
Tote bags have a long lifetime.					
Tote bags are easy to carry/wash/storage					

16) Do you carry/use other Zero Waste product(s)?
- ☐ Yes, please specify_____ (continue to #17)
- ☐ No (continue to #17)

17) Based on your opinion, how much influence did each of the following individuals' actions have on your decision toward Zero Waste products adoption? (1 = No influence, 2 = Very little influence, 3 = Neutral, 4 = Some influence, and 5 = A lot of influence)

	1	2	3	4	5
Family members and relatives use Zero Waste products and encourage me to use					
Friends and colleagues use Zero Waste products and encourage me to use					
Celebrities use Zero Waste products and encourage other people to use					
Bloggers or social influencers use Zero Waste products and encourage other people to use					

18) Based on your opinion, how much influence did each of the following actions have on your decision toward Zero Waste products adoption? (1 = No influence, 2 = Very little influence, 3 = Neutral, 4 = Some influence, and 5 = A lot of influence)

	1	2	3	4	5
Government's campaign on plastic usage reduction					
Private sector's campaign on plastic usage reduction (e.g. Tops supermarket's No bag day, member rewards, discount coupon)					
In-store discounts (e.g. Starbucks and local café)					
School/organization education about waste management and plastic pollution					
Company's encouragement about plastic reduction and Zero Waste products adoption					

19) Based on your opinion, how much do you agree that the following factors affected your decision toward adopting Zero Waste products? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Waste problem in Thailand					
Plastic pollution (e.g. garbage patch)					
Death of animals from plastic (e.g. seabird and marine lives)					
Lifespan of plastic (e.g. plastic bags have 450 years of degradation)					
Microplastics pollution (e.g. microplastics in seafood or in the air)					

20) Base on your opinion, how much of each affected your decision to use Zero Waste products? (1 = Strongly Disagree and 5 = Strongly Agree) (skip to demographic section)

	1	2	3	4	5
I do waste sorting at home					
I want to reduce the waste I produced					
I was bored throwing away the same thing all the time					
I felt guilty toward the environment					
Using Zero Waste products become my habit since my time spending abroad					
I felt bad for the death and injured animals from plastic waste					
I have health concern toward using synthetic product containers					
I realized how much plastic wastes I have produced in a day					

Section B (NON-ADOPTER PART)

21) Have you ever seen any news or articles or video clips about plastic pollution?
- ☐ Yes
- ☐ No

22) Have you ever seen any news or articles or video clips about Zero Waste/Zero Waste products?
- ☐ Yes
- ☐ No

23) How likely are you to adopt Zero Waste products? Please rate 5-points scale of interest. (1 = Very not likely and 5 = Very likely)

1	2	3	4	5

24) Based on your opinion, how much do you agree or disagree that the following characteristics affected your decision to not adopt Zero Waste products? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
Unreasonable price					
Heavy weight					
Too big or too long product size					
Inconvenience to carry around					
Hard to find where to buy the products					
Lack of beneficial product promotion					

25) Based on your opinion, how much do you agree or disagree about the following statements? (1 = Strongly Disagree and 5 = Strongly Agree)

	1	2	3	4	5
None of my friends use Zero Waste products					
There is a lack of serious and effective government actions towards plastic pollution					
Stores provide single-used plastic all the time, so I just accepted them					
I'm too lazy to carry Zero Waste products around					
Adopting Zero Waste products makes my life more difficult					
I always forget to bring my own Zero Waste products					
I do not produce that much plastic waste					
I do not want to be different from others by using Zero Waste products					
I do not want to change my usual habits by using Zero Waste products					
Even if I use Zero Waste products, there are still many people using single-used products					
I do not think using Zero Waste products will make any change					
It is a burden to carry Zero Waste products around					
It is the job of government or big companies to take action about plastic pollution, not individuals					
I think the plastic problem is not affecting my life					
I use only things that can be recycle					
Even though I use plastic products, there are people recycling these plastic products anyway					
I do not think plastic pollution is that serious, people just unreasonably hype over it					

26) If the following actions take place, how likely are you to adopt Zero Waste products? (1 = Not likely and 5 = Likely)

	1	2	3	4	5
Offering different kinds of Zero Waste products that are more convenient to carry around (e.g. collapsible straws, cups, bottles)					
Legal restrictions or bans on single-used plastic (e.g. ban on single-used plastic bags and straws)					
Collecting an extra fee on single-used plastic (e.g. 5 Baht per plastic bags at convenience stores and supermarket)					
Increasing the availability of Zero Waste products (e.g. sale point at supermarket)					
Having a celebrity as a presenter promoting the problem of plastic pollution (e.g. well-known singer to promote the campaign)					
More special promotions for Zero Waste products users (e.g. more in-store discount or more rewards)					
Government or related organizations providing more knowledge about plastic pollution and Zero Waste products					

Demographic

The information in this section will be used for classification purposes only and no individual data will be reported.

27) Gender
- □ Male
- □ Female
- □ LGBTQ+

28) How old are you?
- □ Drop down choice

29) Personal monthly income
- □ Less than 20,000 THB/month
- □ 20,001 – 40,000 THB/month
- □ 40,001 – 60,000 THB/month
- □ 60,001 – 80,000 THB/month
- □ More than 80,000 THB/month

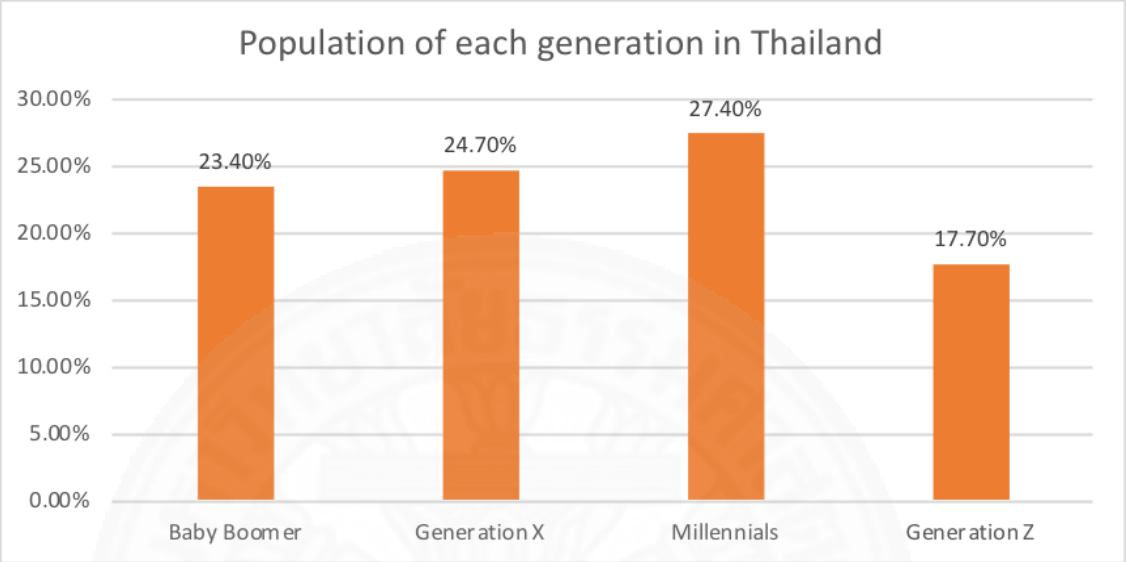
30) Education level
- □ Less than high school
- □ High school
- □ Diploma
- □ Bachelor’s degree
- □ Master’s degree
- □ Doctor of Philosophy (PhD.)

31) Occupation
- Government officer
- Private company employee
- Student
- Business owner
- Freelance
- Other, please specific _____

32) Living area
- Bangkok and vicinity
- Other provinces, please specific _____
- Other countries, please specific _____

APPENDIX N

POPULATION OF EACH GENERTION IN THAILAND



APPENDIX O

RESPONDENTS DEMOGRAPHIC PROFILE

	Adopters		Non-Adopters		Total	
Personal income (monthly)	**N**	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
Less than 20,000THB/Month	81	43.30%	57	39.60%	138	41.70%
20,001 - 40,000 THB/Month	74	39.60%	46	31.90%	120	36.30%
40,001 - 60,000 THB/Month	20	10.70%	18	12.50%	38	11.50%
60,001 - 80,000 THB/Month	8	4.30%	10	6.90%	18	5.40%
More than 80,000 THB/Month	4	2.10%	13	9.00%	17	5.10%
Total	187	100.00%	144	100.00%	331	100.00%
	Adopters		**Non-Adopters**		**Total**	
Education level	**N**	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
Lower than high school	1	0.50%	0	0.00%	1	0.30%
High school	7	3.70%	2	1.40%	9	2.70%
Diploma	0	0.00%	0	0.00%	0	0.00%
Bachelor's degree	136	72.70%	106	73.60%	242	73.10%
Master's degree	43	23.00%	36	25.00%	79	23.90%
Doctor of Philosophy (Ph.D.)	0	0.00%	0	0.00%	0	0.00%
Total	187	100.00%	144	100.00%	331	100.00%
	Adopters		**Non-Adopters**		**Total**	
Occupation	**N**	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
Government officer	19	10.20%	9	6.30%	28	8.50%
Private company employee	78	41.70%	62	43.10%	140	42.30%
Student	62	33.20%	38	26.40%	100	30.20%
Business owner (family busines	7	3.70%	15	10.40%	22	6.60%
Freelance	13	7.00%	14	9.70%	27	8.20%
Others	8	4.30%	6	4.20%	14	4.20%
Total	187	100.00%	144	100.00%	331	100.00%
	Adopters		**Non-Adopters**		**Total**	
Living area	**N**	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
Bangkok and vicinity	152	81.30%	115	79.90%	267	80.70%
Other provinces or countries	35	18.70%	29	20.10%	64	19.30%
Total	187	100.00%	144	100.00%	331	100.00%

APPENDIX P

A PEARSON CHI-SQUARE TEST OF NON-ADOPTERS DEMOGRAPHICS

A Pearson Chi-Square Tests

Gender	Chi-square	6.998
	df	4
	Sig.	0.136
Personal income	Chi-square	4.806
	df	8
	Sig.	.778[a]
Education level	Chi-square	3.432
	df	4
	Sig.	.488[a,b]
Occupation	Chi-square	14.054
	df	10
	Sig.	.171[a]
Living area	Chi-square	0.059
	df	2
	Sig.	0.971

Results are based on nonempty rows and columns in each innermost subtable.
a. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
b. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

APPENDIX Q

DATA OF NON-ADOPTERS CLUSTER DEMGRAPHICS

		Self-Prioritizer	Burden Pusher	Ignorant	Total
		Percentage (N)	Percentage (N)	Percentage (N)	Percentage (N)
Gender	Male	12 (21.1%)	4 (7.7%)	5 (14.3%)	21 (14.6)_
	Female	37 (64.9%)	45 (86.5%)	27 (77.1%)	109 (75.7%)
	LGBTQ	8 (14%)	3 (5.8%)	3 (8.6%)	14 (9.7%)
Personal income	less than 20,000 THB/Month	27 (47.4%)	18 (34.6%)	12 (34.3%)	57 (39.6%)
	20,001 - 40,000 THB/Month	16 (28.1%)	17 (32.7%)	13 (37.1%)	46 (31.9%)
	40,001 - 60,000 THB/Month	7 (12.3%)	6 (11.5%)	5 (14.3%)	18 (12.5%)
	60,001 - 80,000 THB/Month	2 (3.5%)	6 (11.5%)	2 (5.7%)	10 (6.9%)
	more than 80,000 THB/Month	5 (8.8%)	5 (9.6%)	3 (8.6%)	13 (9%)
Education level	High school	0.00%	1 (1.9%)	1 (2.9%)	2 (1.4%)
	Diploma	0.00%	0.00%	0.00%	0.00%
	Bachelor's degree	39 (68.4%)	40 (76.9%)	27 (77.1%)	106 (73.6%)
	Master's degree	18 (31.6%)	11 (21.2%)	7 (20%)	36 (25%)
	Doctor of Philosophy (Ph.D.)	0.00%	0.00%	0.00%	0.00%
Occupation	Government officer	6 (10.5%)	2 (3.8%)	1 (2.9%)	9 (6.3%)
	Corporate employee	20 (35.1%)	23 (44.2%)	19 (54.3%)	62 (43.1%)
	Student	18 (31.6%)	12 (23.1%)	8 (22.9%)	38 (26.4%)
	Business owner (family business)	4 (7%)	8 (15.4%)	3 (8.6%)	15 (10.4%)
	Freelance	4 (7%)	7 (13.5%)	3 (8.6%)	14 (9.7%)
	Others	5 (8.8%)	0.00%	1 (2.9%)	6 (4.2%)
Living area	Bangkok and visinity	46 (80.7%)	41 (78.8%)	28 (80%)	115 (79.9%)
	Other provinces and countries	11 (19.3%)	11 (21.2%)	7 (20%)	29 (20.1%)

APPENDIX R

ANOVAS OF ADOPTION INTENTION AND THREE CLUSTERS

How likely are you to adopt Zero Waste products?					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.888	2	3.444	4.801	0.01
Within Groups	102.591	143	0.717		
Total	109.479	145			

APPENDIX S

TAMHANE'S T2 TEST AND DESCRIPTION OF THREE CLUSTERS

Multiple Comparisons

Dependent Variable: How likely are you to adopt Zero Waste products?

	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tamhane's T2	Self-Prioritizers	Burden Pushers	0.01267	0.16396	1.000	-0.385	0.4103
		Ignorants	.51479*	0.18009	0.016	0.0758	0.9538
	Burden Pushers	Self-Prioritizers	-0.01267	0.16396	1.000	-0.4103	0.385
		Ignorants	.50212*	0.17093	0.013	0.0845	0.9197
	Ignorants	Self-Prioritizers	-.51479*	0.18009	0.016	-0.9538	-0.0758
		Burden Pushers	-.50212*	0.17093	0.013	-0.9197	-0.0845

*. The mean difference is significant at the 0.05 level.

Descriptives

How likely are you to adopt Zero Waste products?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Self-Prioritizers	57	3.7719	0.92616	0.12267	3.5262	4.0177	1.00	5.00
Burden Pushers	54	3.7593	0.79941	0.10879	3.5411	3.9775	2.00	5.00
Ignorants	35	3.2571	0.78	0.13184	2.9892	3.5251	1.00	5.00
Total	146	3.6438	0.86893	0.07191	3.5017	3.786	1.00	5.00

APPENDIX T

DATA OF NON-ADOPTERS CLUSTERS FOR PRODUCT CHARACTERISTICS

Product Characteristics	Self-Prioritizers	Burden Pushers	Ignorants	Total
	N (Percentage)	N (Percentage)	N (Percentage)	N (Percentage)
Unreasonable price	19 (37.3%)	28 (54.9%)	13 (48.1%)	60 (46.5%)
Heavy weight	25 (49%)	27 (52.9%)	11 (40.7%)	63 (48.8%)
Too big or too long product size	22 (43.1%)	33 (64.7%)	11 (40.7%)	66 (51.2%)
Inconvenience to carry around	42 (82.4%)	43 (84.3%)	21 (77.8%)	106 (82.2%)
Hard to find where to buy the products	28 (54.9%)	34 (66.7%)	17 (63%)	79 (61.2%)
Total	51 (100%)	51 (100%)	27 (100%)	129 (100%)

APPENDIX U

A PEARSON CHI-SQUARE (X2) TEST OF PRODUCT CHARACTERISTICS

A Pearson Chi-Square Tests

Product Characteristics	Chi-square	8.854
	df	10
	Sig.	.546[a,b]

Results are based on nonempty rows and columns in each innermost subtable.
*. The Chi-square statistic is significant at the .05 level.
b. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
c. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

APPENDIX V

DATA OF NON-ADOPTERS CLUSTERS FOR PSYCHOGRAPHIC FACTORS

Personal Statements/Opinions	Self-Prioritizers	Burden Pushers	Ignorants	Total
	N (Percentage)	N (Percentage)	N (Percentage)	N (Percentage)
I am too lazy to carry Zero Waste products around	31 (67.4%)	31 (57.4%)	23 (69.7%)	85 (63.9%)
Adopting Zero Waste products make my life more difficult	16 (34.8%)	9 (16.7%)	9 (27.3%)	34 (25.6%)
I always forget to bring my own Zero Waste products	39 (84.8%)	52 (96.3%)	23 (69.7%)	114 (85.7%)
I do not product that much plastic waste	4 (8.7%)	12 (22.2%)	10 (30.3%)	26 (19.5%)
I do not want to be different from others by using Zero Waste products	1 (2.2%)	0	6 (18.2%)	7 (5.3%)
I do not want to change my usual habits by using Zero Waste products	1 (2.2%)	2 (3.7%)	9 (27.3%)	12 (9%)
Even if I use Zero Waste products, there are still many people using single-use products	13 (28.3%)	41 (75.9%)	17 (51.5%)	71 (53.4%)
I do not think using Zero Waste products will make any change	0.00%	3 (5.6%)	5 (15.2%)	8 (6%)
It is a burden to carry Zero Waste products around	14 (34.8%)	10 (18.5%)	11 (33.3%)	37 (27.8%)
It is the job of government or big corporate to take action about plastic pollution, not individuals	3 (6.5%)	22 (40.7%)	10 (30.3%)	35 (26.3%)
I think the plastic problem is not affecting my life	0	0	5 (15.2%)	5 (3.8%)
I use only things that can be recycle	5 (10.9%)	27 (50%)	8 (24.2%)	40 (30.1%)
Even though I use plastic products, there are people recycling these plastic products anyway	2 (4.3%)	21 (38.9%)	14 (42.4%)	37 (27.8%)
I do not think plastic pollution is that serious, people just unreasonably hype over it	0	0	3 (9.1%)	3 (2.3%)
Total	46 (100%)	54 (100%)	33 (100%)	133 (100%)

APPENDIX W

A PEARSON CHI-SQUARE (X2) TEST OF PSYCHOGRAPHIC FACTORS

A Pearson Chi-Square Tests

Personal Statements/Opinions	Chi-square	105.627
	df	28
	Sig.	.000[a,b,*]

Results are based on nonempty rows and columns in each innermost subtable.
*. The Chi-square statistic is significant at the .05 level.
b. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
c. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

APPENDIX X

DATA OF NON-ADOPTERS CLUSTERS FOR SOCIAL INFLUENCES (OTHER PEOPLE)

Social Influences	Self-Prioritizers N (Percentage)	Burden Pushers N (Percentage)	Ignorants N (Percentage)	Total N (Percentage)
None of my friends use Zero Waste products	7 (13.2%)	13 (24.5%)	9 (28.1%)	29 (21%)
There is a lack of serious and effective government actions towards plastic pollution	47 (88.7%)	49 (92.5%)	32 (100%)	128 (92.8%)
Stores provide single-use plastic all the time, so I just accepted them	36 (67.9%)	40 (75.5%)	18 (56.3%)	94 (68.1%)
Total	53 (100%)	53 (100%)	32 (100%)	138 (100%)

APPENDIX Y

A PEARSON CHI-SQUARE (X2) TEST OF SOCIAL INFLUENCES (OTHER PEOPLE)

A Pearson Chi-Square Tests

Social Influences (Other People)	Chi-square	5.384
	df	6
	Sig.	.496[a,b]

Results are based on nonempty rows and columns in each innermost subtable.
*. The Chi-square statistic is significant at the .05 level.
b. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
c. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

APPENDIX Z

DATA OF NON-ADOPTERS CLUSTERS FOR NEW ACTIONS

New Actions	Self-Prioritizers	Burden Pushers	Ignorants	Total
	N (Percentage)	N (Percentage)	N (Percentage)	N (Percentage)
Offering different kinds of Zero Waste products that are more convenient to carry around (e.g. collapsible straws, cups, bottles)	50 (87.7%)	43 (82.7%)	25 (78.1%)	118 (83.7%)
Legal restrictions or bans on single-use plastic (e.g. ban on single-use plastic bags and straws)	42 (73.7%)	38 (73.1%)	20 (62.5%)	100 (70.9%)
Collecting an extra fee on single-use plastic (e.g. 3-5THB per plastic bags at convenience stores and supermarkets)	50 (87.7%)	39 (75%)	25 (78.1%)	114 (80.9%)
Increasing the availability of Zero Waste products (e.g. sale point at supermarket)	47 (82.5%)	39 (75%)	24 (75%)	110 (78%)
Having celebrity as a presenter promoting the problem of plastic pollution	11 (19.3%)	19 (36.5%)	14 (43.8%)	44 (31.2%)
More special promotions for Zero Waste products users	49 (86%)	49 (94.2%)	22 (68.8%)	120 (85.1%)
Government or related organizations providing more knowledge about plastic pollution and Zero Waste products	30 (52.6%)	34 (65.4%)	19 (59.4%)	83 (58.9%)
Total	57 (100%)	52 (100%)	32 (100%)	141 (100%)

APPENDIX AA

A PEARSON CHI-SQUARE (X2) TEST OF NEW ACTIONS

A Pearson Chi-Square Tests

New Actions	Chi-square	8.655
	df	12
	Sig.	.732[a,b]

Results are based on nonempty rows and columns in each innermost subtable.
*. The Chi-square statistic is significant at the .05 level.
b. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.
c. The minimum expected cell count in this subtable is less than one. Chi-square results may be invalid.

APPENDIX BB

REGRESSION ANALYSIS OF ADOPTERS AND NON-ADOPTERS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.203[a]	0.041	0.027	0.48987

a. Predictors: (Constant), Living area, Occupation, Gender, Education level, Personal income

ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.362	5	0.672	2.802	.017[b]
	Residual	77.992	325	0.24		
	Total	81.353	330			

a. Dependent Variable: Are you Zero Waste adopter or not?
b. Predictors: (Constant), Living area, Occupation, Gender, Education level, Personal income

Coefficients[a]

	Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.318	0.254		5.196	0
	Gender	-0.102	0.064	-0.088	-1.599	0.111
	Personal income	0.065	0.026	0.144	2.477	0.014
	Education level	0.031	0.048	0.037	0.65	0.516
	Occupation	0.045	0.024	0.103	1.87	0.062
	Living area	-0.061	0.069	-0.049	-0.883	0.378

a. Dependent Variable: Are you Zero Waste adopter or not?

APPENDIX CC

REGRESSION ANALYSIS OF NON-ADOPTERS

I do not think plastic pollution is that serious, people just unreasonably hype over it[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.336[a]	0.113	0.107	0.82132

a. Predictors: (Constant), I do not think plastic pollution is that serious, people just unreasonably

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	12.341	1	12.341	18.295	.000[b]
	Residual	97.138	144	0.675		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I do not think plastic pollution is that serious, people just unreasonably

Coefficients[a]

Model		nstandardized Coefficien		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.222	0.151		27.892	0.0000
	I do not thi	-0.382	0.089	-0.336	-4.277	0.0000

a. Dependent Variable: How likely are you to adopt Zero Waste products?

Adopting Zero Waste products makes my life more difficult[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	.244[a]	0.06	0.053	0.84549

a. Predictors: (Constant), Adopting Zero Waste products makes my life more difficult

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	6.54	1	6.54	9.149	.003[b]
	Residual	102.939	144	0.715		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), Adopting Zero Waste products makes my life more difficult

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.296	0.227		18.945	0.0
	Adopting Z	-0.227	0.075	-0.244	-3.025	0.003

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I do not want to be different from others by using Zero Waste products[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.251[a]	0.063	0.056	0.84413

a. Predictors: (Constant), I do not want to be different from others by using Zero Waste products

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	6.871	1	6.871	9.643	.002[b]
	Residual	102.608	144	0.713		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I do not want to be different from others by using Zero Waste products

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.098	0.162		25.28	0
	I do not wa	-0.254	0.082	-0.251	-3.105	0.002

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I do not think using Zero Waste products will make any change[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.256[a]	0.066	0.059	0.84288

a. Predictors: (Constant), I do not think using Zero Waste products will make any change

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	7.175	1	7.175	10.1	.002[b]
	Residual	102.304	144	0.71		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I do not think using Zero Waste products will make any change

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.075	0.153		26.712	0
	I do not thi	-0.235	0.074	-0.256	-3.178	0.002

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I'm too lazy to carry Zero Waste products around[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	.320[a]	0.103	0.096	0.82596

a. Predictors: (Constant), I'm too lazy to carry Zero Waste products around

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	11.242	1	11.242	16.479	.000[b]
	Residual	98.238	144	0.682		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I'm too lazy to carry Zero Waste products around

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.536	0.23		19.712	0.00
	I'm too lazy	-0.254	0.063	-0.32	-4.059	0.00

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I do not produce that much plastic waste[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	.223[a]	0.05	0.043	0.84998

a. Predictors: (Constant), I do not produce that much plastic waste

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	5.445	1	5.445	7.537	.007[b]
	Residual	104.034	144	0.722		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I do not produce that much plastic waste

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.121	0.188		21.977	0.00
	I do not pro	-0.187	0.068	-0.223	-2.745	0.01

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I think the plastic problem is not affecting my life[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.283[a]	0.08	0.074	0.83632

a. Predictors: (Constant), I think the plastic problem is not affecting my life

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	8.761	1	8.761	12.526	.001[b]
	Residual	100.718	144	0.699		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), I think the plastic problem is not affecting my life

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.154	0.16		25.962	0
	I think the	-0.327	0.092	-0.283	-3.539	0.001

a. Dependent Variable: How likely are you to adopt Zero Waste products?

Even though I use plastic products, there are people recycling these plastic products anyway[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.237[a]	0.056	0.05	0.84712

a. Predictors: (Constant), Even though I use plastic products, there are people recycling these plastic products anyway

ANOVA[a]

Model		Sum of Squ	df	Mean Squar	F	Sig.
1	Regression	6.143	1	6.143	8.56	.004[b]
	Residual	103.336	144	0.718		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), Even though I use plastic products, there are people recycling these plastic products anyway

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.263	0.223		19.117	0.00
	Even thoug	-0.218	0.074	-0.237	-2.926	0.004

a. Dependent Variable: How likely are you to adopt Zero Waste products?

I do not want to change my usual habits by using Zero Waste products[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.374[a]	0.14	0.134	0.80864

a. Predictors: (Constant), I do not want to change my usual habits by using Zero Waste products

ANOVA[a]

Model		Sum of Squ	df	Mean Squa	F	Sig.
1	Regression	15.317	1	15.317	23.424	.000[b]
	Residual	94.162	144	0.654		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?

b. Predictors: (Constant), I do not want to change my usual habits by using Zero Waste products

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.373	0.165		26.521	0.00
	I do not wa	-0.355	0.073	-0.374	-4.84	0.00

a. Dependent Variable: How likely are you to adopt Zero Waste products?

It is a burden to carry Zero Waste products around[b]

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the Estimat
1	.306[a]	0.094	0.087	0.83005

a. Predictors: (Constant), It is a burden to carry Zero Waste products around

ANOVA[a]

Model		Sum of Squ	df	Mean Squa	F	Sig.
1	Regression	10.265	1	10.265	14.898	.000[b]
	Residual	99.215	144	0.689		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?

b. Predictors: (Constant), It is a burden to carry Zero Waste products around

Coefficients[a]

Model		Unstandardized Coeffic		Standardize	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.443	0.218		20.375	0.00
	It is a burde	-0.271	0.07	-0.306	-3.86	0.00

a. Dependent Variable: How likely are you to adopt Zero Waste products?

APPENDIX DD

REGRESSION ANALYSIS OF NON-ADOPTERS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.200[a]	0.04	0.006	0.86653

a. Predictors: (Constant), Hard to find where to buy the products, Heavy weight, Unreasonable price, Inconvenience to carry around, Too big or too long product size

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.358	5	0.872	1.161	.332[b]
	Residual	105.122	140	0.751		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?

b. Predictors: (Constant), Hard to find where to buy the products, Heavy weight, Unreasonable price, Inconvenience to carry around, Too big or too long product size

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.36	0.393		11.105	0
Unreasonable price		-0.132	0.09	-0.136	-1.466	0.145
Heavy weight		-0.044	0.114	-0.045	-0.381	0.704
Too big or too long product size		0.103	0.107	0.117	0.969	0.334
Inconvenience to carry around		-0.063	0.088	-0.075	-0.724	0.471
Hard to find where to buy the products		-0.07	0.065	-0.095	-1.084	0.28

a. Dependent Variable: How likely are you to adopt Zero Waste products?

APPENDIX EE

REGRESSION ANALYSIS OF NON-ADOPTERS AND SOCIAL INFLUENCES

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.264[a]	0.07	0.05	0.84682

a. Predictors: (Constant), Stores provide single-use plastic all the time, so I just accepted them, There is a lack of serious and effective government actions towards plastic pollution, None of my friends use Zero Waste products

ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.65	3	2.55	3.556	.016[b]
	Residual	101.829	142	0.717		
	Total	109.479	145			

a. Dependent Variable: How likely are you to adopt Zero Waste products?
b. Predictors: (Constant), Stores provide single-use plastic all the time, so I just accepted them, There is a lack of serious and effective government actions towards plastic pollution, None of my friends use Zero Waste products

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.624	0.378		12.226	0
	None of my friends use Zero Waste products	-0.158	0.066	-0.198	-2.385	0.018
	There is a lack of serious and effective government actions towards plastic pollution	-0.067	0.071	-0.077	-0.939	0.349
	Stores provide single-use plastic all the time, so I just accepted them	-0.084	0.068	-0.102	-1.235	0.219

a. Dependent Variable: How likely are you to adopt Zero Waste products?

BIOGRAPHY

Name	Miss Sinanun Mateedulsatit
Date of Birth	July 17, 1992
Educational Attainment	2014: Bachelor of Arts British and American Studies (International Program), Thammasat University