PUBLIC AWARENESS ON SUSTAINABLE TRANSPORTATION; A CASE STUDY IN KUANTAN

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PUBLIC AWARENESS ON SUSTAINABLE TRANSPORTATION; A CASE STUDY IN KUANTAN

MOHAMAD ZULFADHLI BIN CHE HASSIM

A thesis submitted in fulfilment of the requirement for award of the degree of

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JUNE 2016

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This hard work is dedicated to my mother, Azura binti Samsu and my father, Che Hassim bin Saad who love me and support me during my whole journey of education.

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ABSTRACT

Transportation is the one of the important element in living nowadays. Transport can make people easy in order to travel or move from one place to another place. However, if the transportation is not using in proper way it will lead to many problem like congestion and pollution. In Kuantan, the increasing in population caused the increasing in the usage number of transport especially private car and motorcycle. This situation affects the road traffic in Kuantan obviously during peak hour. Other than that, this situation also will cause the high environmental problem due to high fuel consumption by the transport. From the situation the study has been conducted to identify the awareness of people about sustainable transportation and to determine the relationship between the socioeconomic backgrounds towards readiness to switch to sustainable transport. In order to achieve the objective of the study the Chi-square method has been chosen to analyses the data. From the data analysis it is show that environmental awareness of people is high but they still choose not to use the sustainable transport. People seem more comfortable to use private transport than public transport. The results also show that people totally not ready to switch to walking or cycling and to reduce the car usage but they consider using the public transport as an alternative than using motor transport.

ABSTRAK

Pengangkutan adalah salah satu elemen yang penting dalam kehidupan pada masa kini. Pengangkutan boleh membuat manusia mudah untuk bergerak dari satu tempat ke tempat lain. Walaubagaimanapun, jika pengangkutan itu tidak digunakan dengan cara yang betul ia akan membawa kepada banyak masalah seperti kesesakan dan pencemaran. Di Kuantan, pertambahan populasi penduduk menyebabkan pertambahan penggunaan kenderaan persendirian terutamanya kereta dan mtosikal. Keadaan ini menyebabkan kesesakan lalu lintas di Kuantan terutama sekali pada waktu puncak. Selain itu, keadaan ini juga akan menyebabkan masalah pada alam sekitar disebabkan oleh penggunaan bahan api yang tinggi oleh pengangkutan. Disebabkan oleh masalah tersebut kajian telah dijalankan untuk mengenal pasti tahap kesedaran orang ramai mengenai pengangkutan mampan dan untuk menentukan hubungan di antara latar belakang sosioekonomi ke arah kesediaan untuk beralih kepada pengangkutan mampan. Dalam usaha untuk mencapai objektif kajian kaedah Chi-square telah dipilih untuk menganalisis data. Daripada analisis data ia menunjukkan bahawa kesedaran alam sekitar penduduk Kuantan adalah tinggi tetapi mereka masih memilih untuk tidak menggunakan pengangkutan mampan. Mereka lebih selesa untuk menggunakan pengangkutan persendirian berbanding pengangkutan awam. Keputusan juga menunjukkan bahawa mereka sama sekali tidak bersedia untuk beralih ke berjalan atau berbasikal dan untuk mengurangkan penggunaan kereta tetapi mereka mempertimbangkan untuk menggunakan pengangkutan awam sebagai alternatif daripada menggunakan pengangkutan motor.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Sustainable can be defined as concerning a head unit in which retains a viability by utilizing methods in which allow for constant recycling. (Plaut and Shmueli 2000). The urban transportation plays a key role in order to achieve the sustainable development of the city. Transportation is a device that used to move an item from one place to another. The form of transportation including trains, automobile, and two-wheel devices likes bicycle and motorcycle. The efficient urban transportation will lead to the systematic system of urban sustainable development.

Sustainable transportation refers to the broad subject of transport that is sustainable in the senses of social, environment and climate impacts and the ability to, in the global scope, supply the source energy indefinitely. (Plaut and Shmueli 2000). Sustainable transportation will give the less impact to human and the environment by using other transport like trains, bicycle or car sharing. The implementation of sustainable transportation roughly can decrease the traffic congestion and reduce the air pollution. The application of sustainable transport in Malaysia is still far behind compare to the other country in the world.

In the last decade, the level of mobility in the urban area of many countries has increased significantly. This situation has raised the concerns about the increasing card usage and consequent congestion and pollution effect. The rapid developments in Malaysia affect the citizens to increase the usage of motors, private vehicles and other transportation. The actual dynamics associated with transportation, as well as the

necessity to feel the alterations within society as well as life-style behavior of which crank out a range of vacation requirements, trigger a lot of people being quite depending on car traveling. (Anable, 2005).

1.2 PROBLEM STATEMENT

The population of Kuantan district is more than 600,000 people including Malay, Chinese, India, and other race. Kuantan was founded in 1850s and keep expanding until being a state capital of Pahang and the ninth largest city in Malaysia. Rapid development has led to the increasing number of population in Kuantan city.

In Kuantan, the increasing in population caused the increasing in the usage number of transport especially private car and motorcycles. Based on the information from the Department of Road Transport Kuantan the registered number of private transport increase for every year. This situation may affect the road traffic of the Kuantan town. It is obviously during the peak time especially on the morning and late evening. The most important is this situation also will affect the environment of the town due to higher fuel consumption by the transport. As for now, there is no properly standard yet that set about this situation. Due to that reason, this result of study can be used by the local authorities to take the proper actions.

1.3 OBJECTIVE OF STUDY

There are two (2) objectives that need to be fulfilled in this research. The objectives are;

i. To identify the awareness of people about sustainable transportation.
ii. To determine the readiness of people to change to sustainable transportation and reduce car usage.

1.4 SCOPE OF STUDY

The scopes of study are as follow. The location of study is at Kuantan district in Pahang. The data are obtained from questionnaire that distributed to the people in Kuantan district.

1.5 SIGNIFICANCE OF STUDY

The awareness of sustainable transportation is important element in the management of road traffic. Generally, the usage of sustainable transportation can reduce the usage of private transport which can decrease the number of transport used in the road. This basically can be help to avoid and reduce the traffic congestion especially during the peak time.

In addition, this also will help to reduce the pollution issues (air pollution, noise pollution etc.) that always been an attention by the people. With this study the authorities can constructed a systematic system to upgrade the existing system of sustainable transportation that already exist. In the other word, an establishment of the sustainable transportation can be implementing in Kuantan to make it more effective and efficient.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The population of people in Kuantan increase year by year as it as capital of Pahang which make the development grown faster. The increasing number of population led to the increasing number of vehicle usage.

2.2 SUSTAINABLE DEVELOPMENT

Sustainable development is normally displayed schematically with using three circles for each dimension of it includes the environment, economy and society as shown in Figure 2.1. From the Figure 2.1, it can be concluded that all these three aspects are related and important to achieve the sustainability. Due to these the public and private agents cannot be let to behave one dimensionally and in isolation but their actions must consider the interaction between these three dimensions. In order to achieve the sustainability these three aspects need to be balanced. Nowadays, the development processes are linked with fast economic growth, the deterioration of environment and lack of human health conditions. The fast economic growth is linked with low environmental values, lack of housing conditions and energy resources consumption. These development processes affect environment and human health conditions. The reasons for creating sustainability in all aspects of human life are because of these treats.

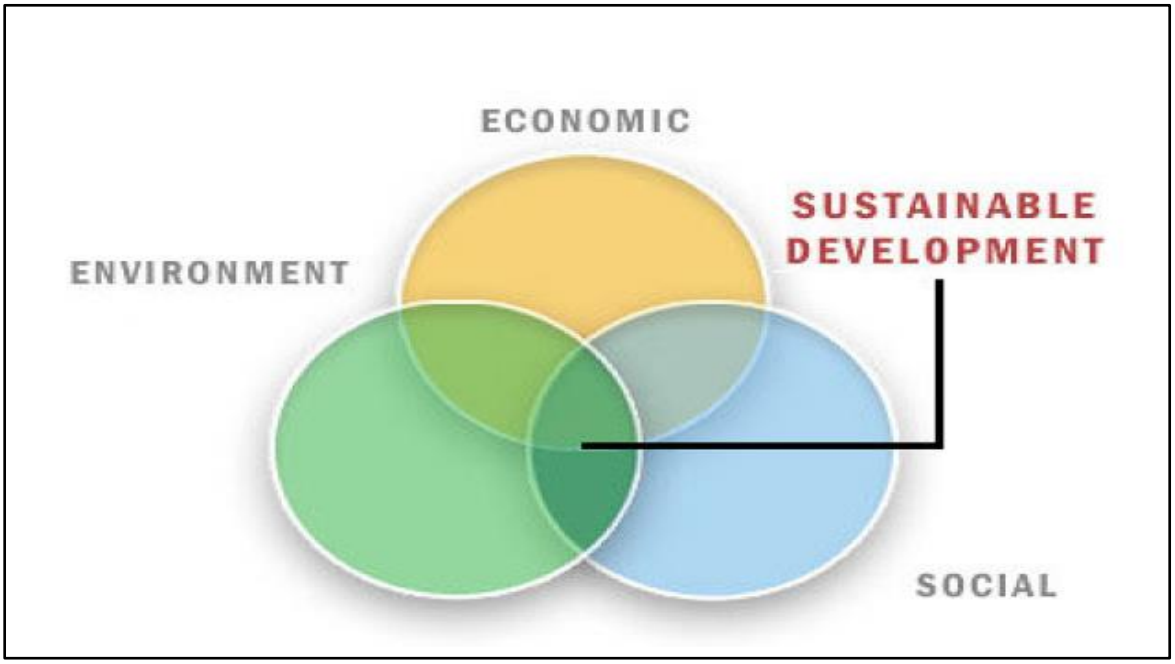

Figure 2.1: Three Dimensional Model of Sustainable Development

2.3 SUSTAINABLE TRANSPORTATION

Sustainability can be defined as the actual achievement associated with continuous transport things to do recognize from the ecological, fiscal and also interpersonal goals with numerous space-based scales of operation. The methods of sustainability are actually implemented and also executed about numerous terrain employs or core of population's task. In countries such as the UK, modal stocks, specifically, how many community transportation driver cruises has become employed to assess the performance and also impression in the community transportation process towards the environment and also neighborhood. Other European nations like France, Austria, Germany, and Switzerland have accepted the Level of Service (LOS), travel desire along with numbers of ridership, as indicators of a sustainable transport system.

2.3.1 Transportation and Environment

Transportation is probably the basic groups throughout the market in which has an effect on both improvements in addition to the environmental disorders. The transportation system, in general, has a bearing on overall economy, local advancement,

in addition to consumption or production designs. Regarding these impacts, it is a main consumer of resources (energy, land) and has possibly dangerous effects such as leading to city sprawl in addition to the environmental polluting of the environment (Plaut and Shmueli 2000).

At the local level, this kind of cost contains disturbance, over-crowding, the actual environment, and traffic damages (Plaut and Shmueli 2000). Most of these costs help make this ‘sustainability’ matter are more essential for environmental safeguard for the regional level. In addition, there is a popular look at that eventually ‘sustainability’ is far more an international when compared with nearby matter (OECD 1996). For example, rising concern about climate change and acid rain are also connected to transportation pollution (Plaut and Shmueli 2000) and sustainability is usually seen as a way to these kinds of global issues. Whenever a good ecological influence is actually over and above this holding capability from the earth then your living is actually confronted. Conversely, when it's further than your holding capacity of one area then that area could become uninhabitable, although existence can more than likely continue on in another place (OECD 1996).

Sustainability is a comprehensive expression to convey the requirement for just a long-term viewpoint in which there's diminished demand about ecological means. Besides, it states the requirement to create modifications inside the behavior of people which have been monetarily and also socially valuable (Newman and Kenworthy 2000). There is a consensus that the current growth structure connected with travel isn't attractive. For example, the rate of the world’s motor vehicle fleet growth, in the developed and in the developing world, is said to be debilitating the social and monetary prosperity. Hence, the life quality, levels of essential flexibility, education, health, access to assets, etc. can be said to be in threat (Akinyemi and Zuidgeest 2000).

2.3.2 Transport and Sustainable Urban Development

The city, as the living space of individuals, guarantees elevated amounts of access to administrations and facilities. While the city bolsters vicinity and social collaborations, it likewise permits the procurement of a range of public transport. On

the other hand, the city has all the possibility to supply an astounding existence with an agreeable, clean, and safe environment. Therefore, the fundamental basis for the sustainable city must be to reproduce the live capable city (Banister 2000).

The ascent in the quantities of vehicles, the advancement of more unpredictable travel designs, which depend on the car, has been seen as one of the significant limitations to the accomplishment of sustainable urban improvement (Banister 2000). The utilization of fossil fuels is typically considered as the pointer of unsustainability of transportation, in light of the fact that both utilization of a non-renewable asset and the contamination is brought on by blazing of fossil fuels. In any case, there are further negative impacts of transportation that make it unsustainable or if nothing else add to unsustainability (OECD 1996). There are key issues to be tended to if transport absorbs the standards of sustainable urban advancement, initially offering reference to the list of EFTE (1994) and Banister (1997) in (Banister, 2000).

Congestion in numerous urban zones has been ascending in its length of time and power, and the seriousness of congestion increments with city size (Banister 2000). Congestion takes the time accessible for another activity (OECD 1996). In fact, it as often as possible results from an inability to coordinate area utilizes and transport planning (ECMT 2000).

Resource depletion is another feature of sustainability issue and as of now transportation is unsustainable regarding asset use. The world's transportation frameworks are totally fuelled by oil, which means more than 99% of transport energy use in 1990 (OECD 1996).

Increasing air pollution influences wellbeing, biology, and diminishes the nature of urban life (Banister 2000). Transportation is a standout amongst the most critical reasons of air pollution emphasized by as many authors (Banister 2000, OECD 1996, ECMT 2000, Newman & Kenworthy 2000). The major worldwide effect of transportation results from arrival of carbon dioxide into the air, a practically unavoidable outcome of the smoldering of fossil fuels (OECD 1996). Therefore, air quality is breaking down in numerous urban areas, with quick development in the car

stocks through the expansion of utilized and new vehicles with poor environmental execution (ECMT 2000).

Traffic noise affects all city life and transport has been characterized as the fundamental cause of environmental noise (Banister 2000). In household reviews, noise as often as possible positions top of the natural issues of worry (ECMT 2000).

Road safety is a noteworthy worry in urban areas and somewhere else (Banister 2000). Death and harm from accidents are the most essential issue in making transport frameworks more sustainable (ECMT 2000).

Utilization of space by traffic makes the movement of the motorist easy, but lessens the openness of others as transport courses get to be obstructions, as stopped vehicles structure hindrances for walkers, cyclists and those with disabilities. Traffic dominations in urban regions resulted by the car dependency (Banister 2000). Car proprietorship definitely requires urban area utilization notwithstanding when the auto is not moving; hence lessening the opportunities for other land uses (Petersen 2002).

As a result, land-use and transport arrangements are required to advance the most effective utilization of urban space that will lessen the measure of extra land which can be dispensed to development (Banister 2000). That will build the utilization of environment well-disposed transport modes which can decrease contamination, noise, congestion, and so on if the aim is to accomplish a sustainable transport system.

2.4 POPULATION AND SAMPLE

Behind all statistical methods of data analysis the basic idea is to create inference about a population by studying the sample picked from the population. A population is a complete collection of measurements, outcomes, items or even persons beneath examine. Generally, population has two types that are tangible population and conceptual population. A sample is a subset of the population that is observed. The figure 2.1 shows the illustrated of the population and sample. It shows sample are come

from the population. Population is the total number of certain thing. The sample is the value that will present the total number of population.

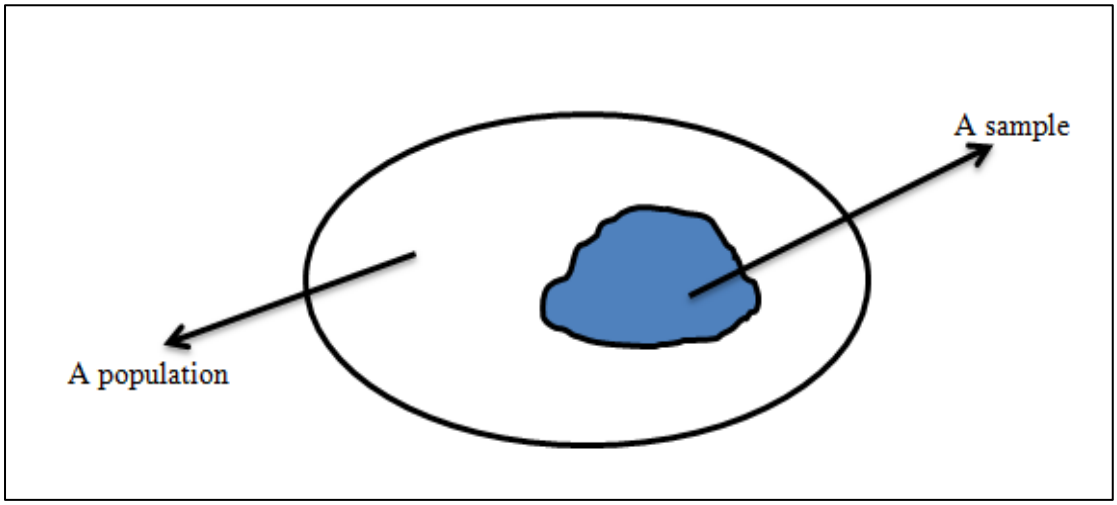

Figure 2.2: Illustrates of population and sample

2.4.1 Sample Size

Sample size is the amount of observation in a sample (Evans et al 2000). A sample size is always a positive number. It is normally denoted by capital 'n'. In any research study determination the sample size to be selected is an important step. In order to choose the sample size it can be depends on statistical considerations and non-statistical considerations. The statistical considerations would include the desired accurate on the appraisal regarding prevalence along with the anticipated prevalence regarding eye complications within school little ones. The non-statistical concerns might include availability of methods, manpower, funds, integrity and trying frame. To determine the proper sample sizes there are three requirements need to be specified. The requirements are;

i. The precision level
ii. The confidence level
iii. Degree of variability

2.4.2 The Precision Level

The precision level also known as sampling error. Sampling error are caused by the observing the sample rather than by seeing the whole population. Usually, a biased sampling procedure is the most frequent cause of sampling error. The ways to reduce the sampling error is by the use the proper and unbiased sampling and by using large number of sample size. Figure 2.2 shows the sampling error illustrations. It shows that when the same size of population but different number sample size it will affect the sampling error. The bigger the sample size the smaller the sampling error.

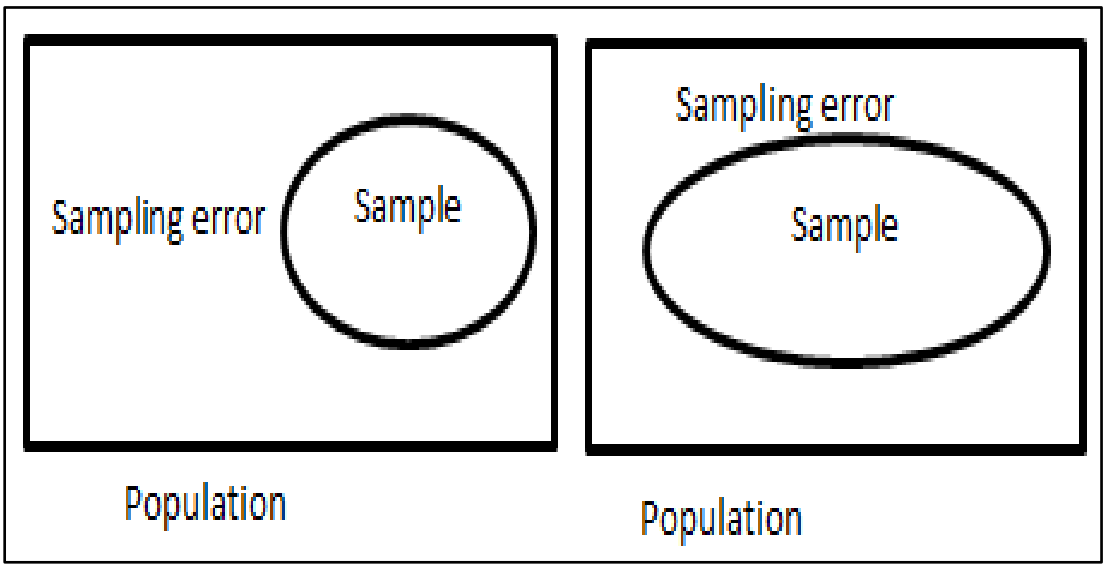

Figure 2.3 Sampling Error Illustrations

2.4.3 The Confidence Level

A confidence level refers to the percentage of feasible sample which can be expected to include the true population parameter. Confidence interval is the statistical measure of the amount of occasions outside of 100 which outcomes can be expected for being in a specified selection. In simple word it can be say that, a confidence interval of 95% the result of an action will probably meet expectations 95% of time.

2.4.4 Degree of Variability

The degree of variability varies considerably depending on the target population and attributes under consideration. The higher sample size is needed to get an optimum level of precision if the population is more heterogeneous. Variability is a dispersion or spread. There are four regularly used of variability which is the range, interquartile range, standard deviation and variance.

2.4.5 Type of Sample

In the statistical approach there are four types of sampling which is random sampling, systematic sampling, stratified sampling and cluster sampling.

i. The random sampling is each data is numbered and then the data is selected using chance or random method. Each data has an equal chance to be selected.
ii. Systematic sampling is each data is numbered and the first data selected randomly.
iii. In stratified sampling the population is divided into groups according to some characteristic that is important to the study, and then the sample is selected from each group using random or systematic sampling.
iv. In cluster sampling the population is divided into groups or clusters, and then some of those clusters are randomly selected and all members from those selected clusters are chosen. Cluster sampling can reduce cost and time.

2.5 CHI-SQUARE TEST

A chi-square test also referred as X^2 test. It is any statistical hypothesis test in which the sampling distribution of the test statistic is a chi-square distribution when the null hypothesis is true. Chi-squared tests are frequently built from a sum of squared errors, or through the variance sample. A chi-squared test then can be used to reject the null hypothesis that the data are independent. A chi-square test likewise considered is a test in which this is asymptotically valid, which imply that the sampling distribution (if

the null hypothesis is true) can be made to approximate a chi-square distribution as nearly as desired by making the sample size larger. The chi-square test is utilized to figure out if there is a significant difference between the expected frequencies and the observed frequencies in one or more classifications.

As state by (Mary L, 2013) the Chi-square test is a non-parametric statistic, also called a distribution free test. Non-parametric tests should be used when any one of the following conditions relates to the data:

i. The level of measurement of all the variables is nominal or ordinal.
ii. The sample sizes of the study groups are unequal; for the χ^2 the groups may be of equal size or unequal size whereas some parametric tests require groups of equal or approximately equal size.
iii. The original data were measured at an interval or ratio level, but violate one of the following assumptions of a parametric test:
    a. The distribution of the data was seriously skewed (parametric tests assume approximately normal distribution of the dependent variable), and thus the researcher must use a distribution free statistic rather than a parametric statistic.
    b. The data violate the assumptions of equal variance or homoscedasticity.
    c. For any of a number of reasons (1) the continuous data were collapsed into a small number of categories, and thus the data are no longer intervals or ratio.

2.5.1 Develop the Hypothesis

In order to conduct the chi-square analysis, the first step that needs to be carry is state the hypothesis. For the entire statistical test it is prior to define the null and alternative hypothesis. The null hypothesis (H_o) is what is assumed to be true until there is evidence to go against it. The alternative hypothesis (H_a) is what is assumed that the variables are related but the relationship is necessarily causal, in the sense that one variable cause the other

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Generally, methodology is the precise, hypothetical examination of the strategies connected to a field of study, or the hypothetical investigation of the group of techniques and standards connected with a branch of information. It typically, incorporates ideas, for example, worldview, hypothetical model, stages and quantitative or subjective strategies (Ishak, 2005). In this chapter the point is to deliver an arrangement of arranging by stream keeping in mind the end goal to guarantee the study run easily.

3.2 RESEARCH FRAMEWORK

This study is taking place in six months period; however, to ensure the data collection smooth and properly done, a research framework has been created as shown in Figure 3.1. Firstly, the problem has been identified. Then, from problem identification data collection method will be defined. In this study, Kuantan district has been selected as the area of study. The data will be collected only in this area. After the problem has been identified then the data collection will be obtained by using the questionnaire that will be distributed. Then, the data will be analyzed according to the objective of the study to ensure the study objective is consistent. Based on result of data analysis, discussion of each analysis will be made either it meets the objective of the study. Then, from the discussion, a conclusion can be made based on each objective. Lastly, the recommendation will be stated for the improvement.

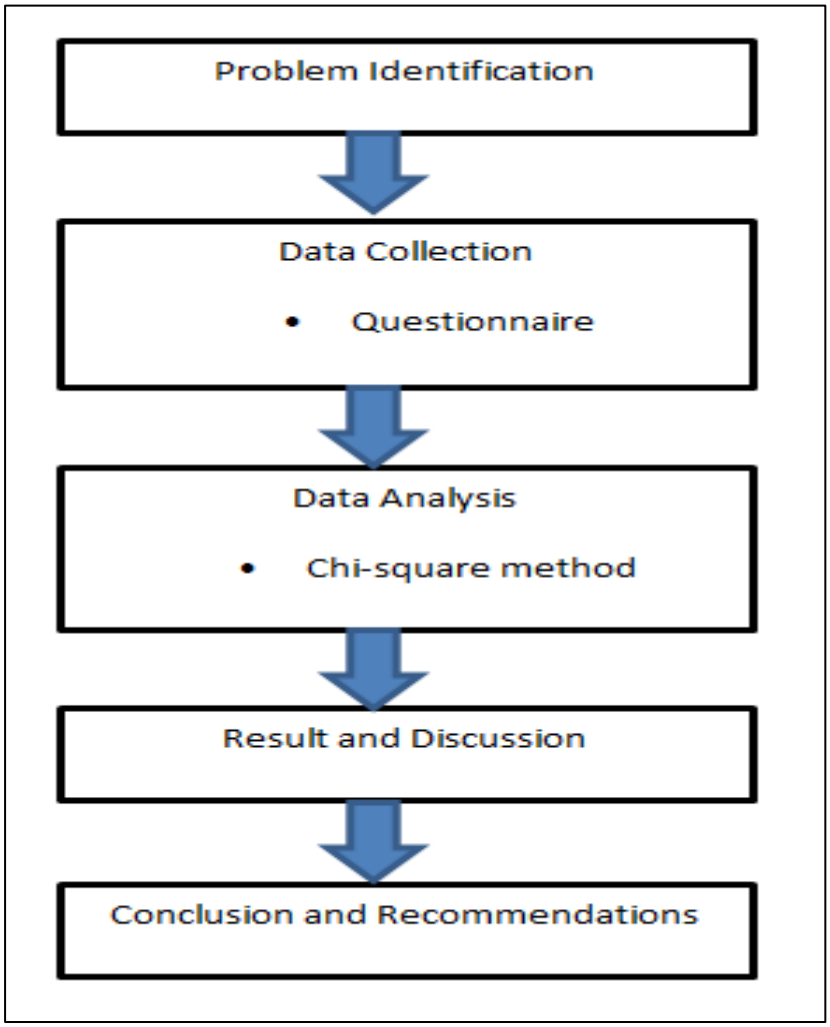

Figure 3.1: Data Collection Framework

3.2.1 Data Collection

For this survey the total number of 385 respondents should be selected. A sample representing the total population of Kuantan district by using a random sampling method. Selected sample were calculated based on the total population which is 607778 peoples, with 95% confidence interval, and 5% of the margin error. But due to the lack of time and cost to approach the total 385 respondents, the number of 100 respondents was been selected. This selection of sample size actually is enough to be analyzed as stated on the book "Research Methods for Business: A Skill Building Approach" on page 296 write by Uma Sekaran. It is stated that sample size that larger than 30 and less than 500 are appropriate for most research.

3.2.2 Development of Questionnaire

The question in the questionnaire was made based on finding from the reading of the journals and books. The content also comes from the previous research that has some suitable idea to be used. The questionnaire has been design in such a way that is easy to be understand by the respondents. There are 20 total number of question in the questionnaire. The questionnaire was structured to have three sections which are;

Section A: General information

Section B: Awareness and perspective about sustainable transportation

Section C: Readiness to use sustainable transportation and reduce car usage

3.2.3 Data Analysis

The data collection will be separated into two parts. For objective one it will be analyzed by using Microsoft excel. The graph and table will be tabulated based on the data collected. Result from the graph or table will be discussed. The result of the second objective will be analyzed by using the Chi-square method. The Chi-square test is applied when there are two category variables from a single population. This is used to determine whether there is a significant association between the two variables. The data will be tabulated into the table and the chi-square value will be calculated. The calculated chi-square value then will be compared to the critical chi-square value to look if there is any relationship between the variable. After that, the result will be discussed. The formula to calculate the data has been shown in the chapter 2 of this study.

CHAPTER 4

RESULT AND DISCUSSION

4.1 AWARENESS OF PEOPLE ABOUT SUSTAINABLE TRANSPORTATION

Social and environmental are the aspect that is important to develop the sustainable transportation in some place. The important had been discusses in chapter 2 of this study. For this chapter, the data collection will be analyses based on the result that has been collected from the questionnaire. In social part it will include the mod choice to travel by people, the perspective on using public transport or walking and cycling, the perspective on safety, perspective of people on congestion and perspective on economic value. For environmental awareness the data is about the comparison by using public transport or private transport can cause pollution and knowledge about cause of the environmental problem. The data has been demographic in graph to shows the frequency of the respondents answer.

4.1.1 Mode choice to travel by people

In this study public has been asked method they use or prefer to travel to some place whether near or far. Figure 4.1 shows people from both gender (male and female) tend to use private transport rather than public transport. There are 38 male and 30 female choose to use private transport while 7 male and 22 female choose to use public transport. Not more than five people chose walking / cycling as their method to travel. More male gender chooses to use private transport rather than public transport. In term of use public transport female is higher than male. From this result it shows that male less considers to use the sustainable transport compare to female. Male like to use private transport most because private transport seem as status symbol to them which

can increase their masculinity. This statement can be support by previous study from (Hiscock et al, 2002) that says cars seen to give status and social value such as masculinity, competence and skills. This result also show that female more prefer private transport than public transport but the percentages that use public transport also high which can be say that they also prefer to use public transport.

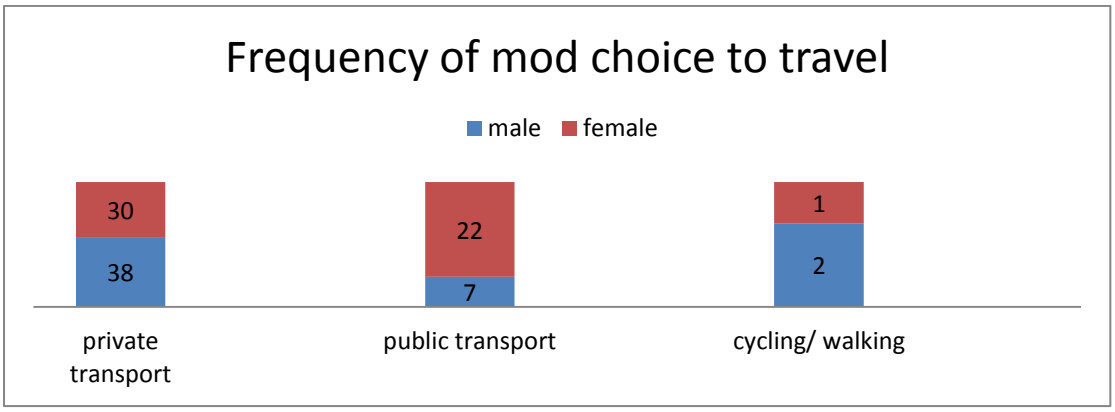

Figure 4.1: Method use to travel by people

4.1.2 Perspective on using sustainable transport

Figure 4.2 shows 18 male and 33 female agree it is convenience to use public transport while 20 male and 29 female disagree it is convenience to use public transport. For using the cycling and walking 41 male and 49 female disagree it is convenience. There are only six male and four female agree it is convenience to cycling or walking. The data shows that female think it is convenience to use public transport compare to male. Female is seen more flexible compare to male which is they more comfortable and practical to use the public transport. It is said that majority of public transport users are significantly women (Abraham, 1995). For the part cycling/walking both gender not consider that method as convenience. From this result it is can be said that people normally not prefer to walk or cycling to go to some place because of some reason. In Malaysia walk or cycle is not a suitable option because the distance between the buildings is far between each other. For district Kuantan especially there is no proper pedestrian walk or cycling lane in the road. In this case people surely not comfortable to consider cycling or walking as their method to travel.

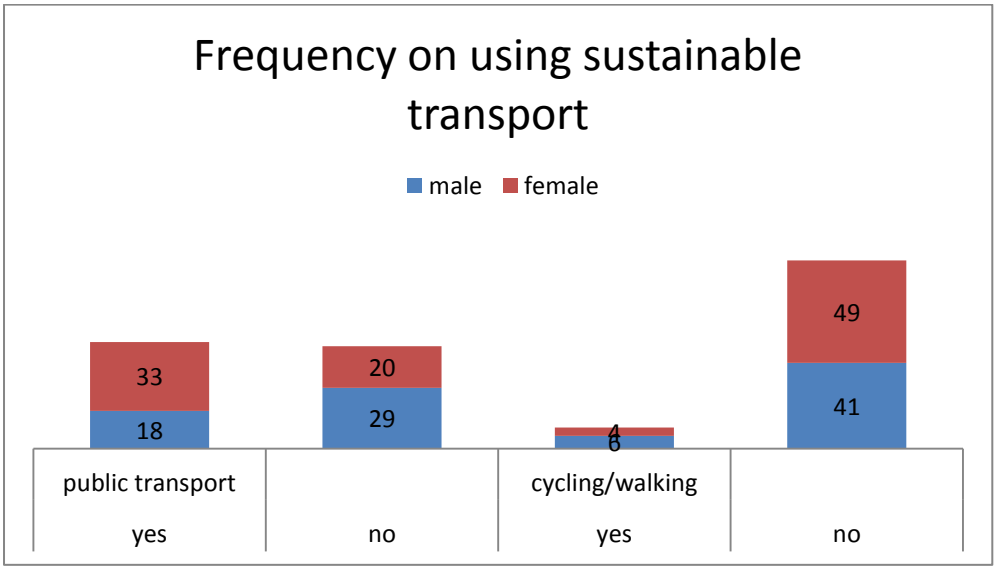

Figure 4.2: Frequency on using sustainable transport

4.1.3 Perspective on safety

Safety is the important measure to avoid problem in one thing that everyone do. For this study respondent were asked their perspective about which method of travel more safety to use which is using private transport or public transport. Figure 4.3 shows eight male choose public transport is safety and 39 male choose private transport is safety. For the female 10 choose using public transport is safety and 43 choose using private transport is safety. From the data collected it is show people think that using private transport safer than using public transport. Both gender (male and female) vote that using private transport safer than using public transport. This situation shows that people more confident to drive themselves rather than drive by other people. What we can see now is people worried to use public transport due to many case that happen like accident because of sleepy driver, driver that rape passengers and any other reason. This is make people tend to drive their private transport rather than using public transport. The other study also stated that car is seen as something that provides security from unwanted people an event compared to public transport (Hiscock et al, 2002). From this it shows that the result is aligned with the previous study.

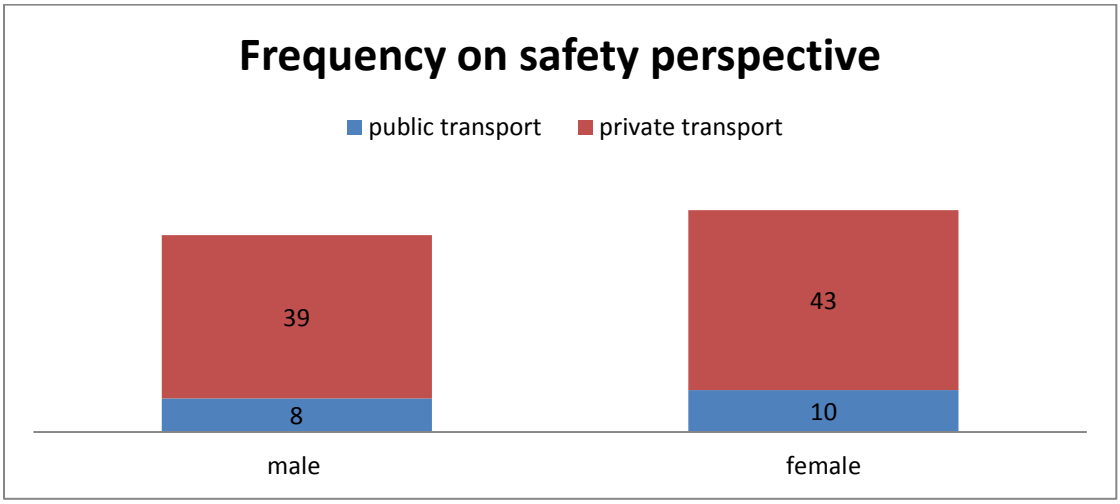

Figure 4.3: Frequency on safety perspective

4.1.4 Perspective on congestion

Normally people do not like the most to face the traffic congestion. People will find a way to avoid the congestion. In this section respondents were asked their opinion that using private transport can cause high congestion and using public transport will reduce the traffic congestion. Figure 4.4 shows 38 male agree using public transport can reduce congestion while 9 people disagree. For female 46 agree while 7 disagree that public transport can reduce congestion. By using the private transport can reduce congestion 21 male agrees and 26 disagree. For female 38 agree while 15 disagree with the statement. Based on the data, for question using public transport can reduce traffic congestion more than 50% male and female vote agree that public transport can reduce the traffic congestion. For the question using private transport can cause high congestion more female agree while more male disagree. These results shows that female agree with both conditions while male only agree with one condition. From this it shows that male think that by using private transport there is no effect of congestion maybe because male is the most people who use the car and motorcycle. So they stand with opinion there is no effect on using private transport but they believe that using public transport can reduce the traffic congestion.

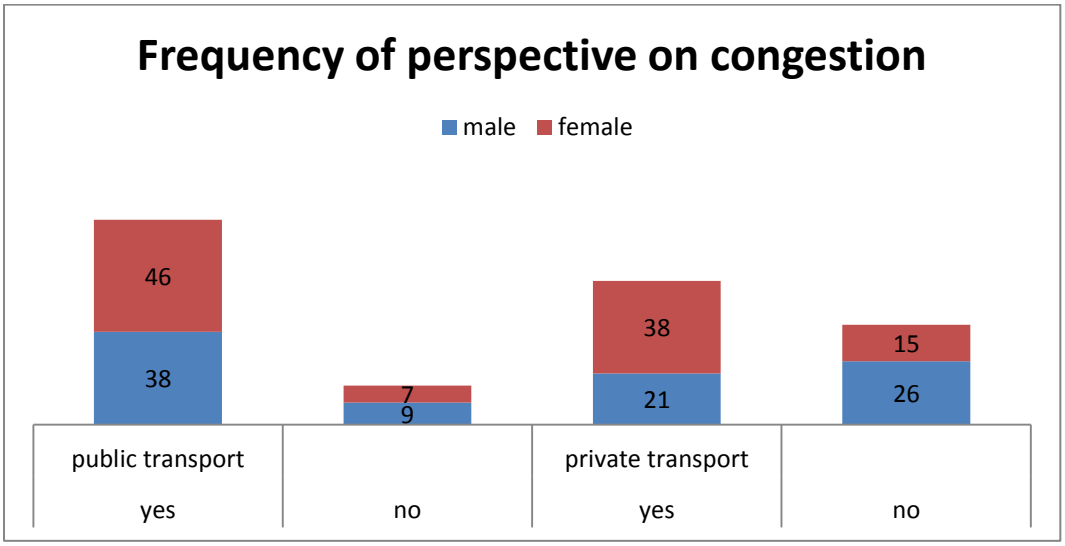

Figure 4.4: Perspective on congestion

4.1.5 Perspective on economical aspect

For this section respondents had been asked about their perspective by using public transport or private transport is more economical. This section will identify the perspective of people based on marital status. Figure 4.5 shows 20 single respondent and 25 married respondents agree it is economical to use private transport. By using public transport 38 single respondents and 17 married respondents agree it is economical. The result shows that single person think use public transport is more economical than using private transport while married person is vice versa. Single person thinks that use public transport more economical especially when travel by using highway. They do not need to consider the charge for fuel and toll. Normally the single person is a student or people who newly start to work so their economy status is not too stable yet. Different with married person they maybe think that use private is more economical especially married person who have the children. The cost they need to consider when using public transport is higher rather than they use private transport. At the same time there are also married people who think public transport is economical compare to private transport this is because they already old and tired to travel by drive personal transport.

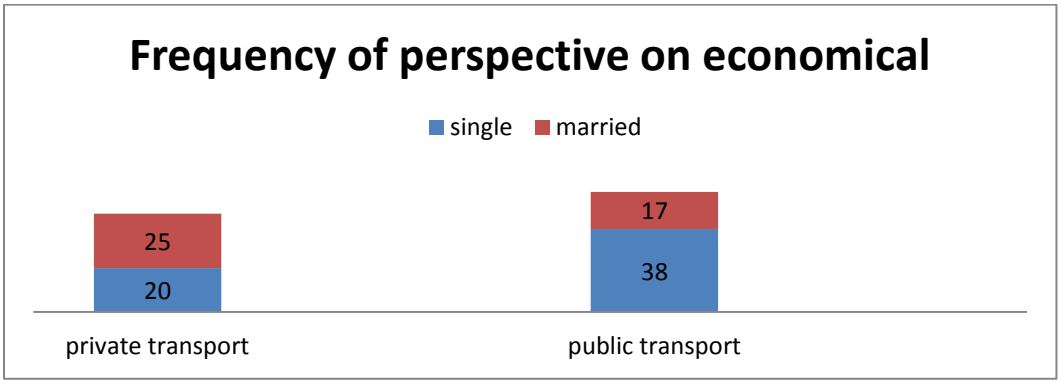

Figure 4.5: Perspective on economical

4.1.6 Awareness on effect of private and public transport to environment

Respondent had been asking about their perspective on using public transport and private transport in term of causing the pollution. Table 4.1 shows for male 31 agree while 16 disagree that using public transport can reduce pollution and by using private transport can increase pollution 28 agree while 19 disagree. For female 39 agree while 14 disagree that using public transport can reduce pollution and by using private transport can increase pollution 36 agree while 17 disagree with the statement. Most of male and female agree that using public transport can reduce the pollution and most of them also agree that using private transport can increase the pollution. Even though they agree with the statement but the usage of private transport is still high compared to the usage of public transport.

Table 4.1: Number of people agrees and disagrees on statement

	Using public transport can reduce pollution		Using private transport can increase pollution	
	Yes	No	Yes	No
Male	31	16	28	19
Female	39	14	36	17

Table 4.2 shows the opinions of respondent regarding the effect of motor vehicles on environment issues. The answer from majority of the respondents when they were asked about their knowledge on this subject indicates that they know about air pollution, greenhouse, ozone depletion, acid rain and sound pollution. The data shows by using motor vehicles 84% vote can cause air pollution, 21% vote can cause greenhouse, 30% vote can cause ozone depletion, 16% vote can cause acid rain and 73% vote can cause sound pollution. This result shows that majority of the respondent aware on the impact of motor vehicles towards the environment. They agreed that motor vehicles contributed greatly towards environmental issue mentioned. The result also consistent with other several studies conducted. Information about the negative environment effect of car usage can raise awareness, this awareness usually insufficient to change behavior (Anable, 2005) and (Hagman, 2003). So the awareness only can be raised but to change the behavior is depend on the person.

Table 4.2: Problem cause by motor transport

Problem cause by motor vehicles	**Total**	**Percentages**
Air Pollution	84	84 %
Greenhouse	21	21 %
Ozone Depletion	30	30 %
Acid Rain	16	16 %
Sound Pollution	73	73 %

4.2 RELATIONSHIP BETWEEN THE SOCIOECONOMIC BACKGROUNDS TOWARDS READINESS TO SWITCH TO SUSTAINABLE TRANSPORT

To achieve the second objective of this study the analysis of the variable from the data collected by the questionnaire distribution has been analyses. The first part of the subtopic will shows the car ownership and driving licensed holder based on gender. This part also will show the emotions and perceptions of people towards car. The result of the data has been tabulated into the table. The data then will be discussed and will be related to the second part of the subtopic. The second part of the analysis by using the chi-

square method is done. For this study the variables are readiness to switch to sustainable transport and readiness to reduce the car usage. The analyses are done to analyze if there are any relationship between gender, status and marital status with the readiness to use public transport and readiness to reduce car usage. The result has been discussed into three parts for this subtopic. The parts are including;

i. Relationship between ages and readiness to switch to sustainable transport
ii. Relationship between status and readiness to switch to sustainable transport
iii. Relationship between marital statuses to switch to sustainable transport.

For each subtopic the data has been analyzed briefly step by step. The data that has been analyses will be discussed based on the result and it will be visualized by using graph or table.

4.2.1 Car ownership and driving licenses holder based on gender and age

Table 4.3 shows the car own by person based on gender and age while table 4.3.1 shows the driving licensed own by person also based on gender and age. These numbers show that virtually every person own their personal car and have their own driving license. Some person does not own their personal car but they have their own license. In this case normally people who own personal transport automatically will use their personal transport rather than public transport. People that do not own a car but had driving licenses also tend to use private transport by rent or lent from their friends. This is normally happen for people in age 19-25 who still study. This situation different with female which is when they do not own the car normally they will use the public transport to travel.

Table 4.3: Number of people own personal car

Age/Gender	Male		Female		Total
	Yes	No	Yes	No	
<22	2	4	2	5	13
23-29	10	2	13	1	26
30-39	10	2	12	3	27
40-49	9	3	7	3	22
>50	4	1	2	5	12
Total	47		53		100

Table 4.3.1: Number of people own driving licensed

Age/Gender	Male		Female		Total
	Yes	No	Yes	No	
<22	6	0	5	2	13
23-29	11	1	13	1	26
30-39	12	0	12	3	27
40-49	10	2	8	2	22
>50	4	1	3	4	12
Total	47		53		100

One interview with car owner and non-car owners in Scotland conducted by (Hiscock et al, 2002) to investigate the psycho-social benefit to people that seem to originate from their cars. From the interview they found that a car is seen as something that provides security from unwanted people and events, as well providing specialty for its reliability, convenience, and capability to provide access to more destinations than public transport. From the current study, respondent has been asked how they felt while driving cars. Table 4.3.2 shows the percentages of respondent when they have been ask about their emotions when driving a car. Positive feedback has been provided by the majority of the respondents. They were considering driving a car as practical, safety and relaxing. There are only few respondents vote for the negative feedback which is

stressful, tiring and troublesome to self. The result shows that people feel more comfortable to driving their own car than use public transport.

Table 4.3.2: Percentages of various emotions felt when driving a car

Statements	Total	Percentages (%)
Practical	31	31
Safety	45	45
Relaxing	57	57
Stressful	9	9
Tiring	11	11
Troublesome to self	7	7

4.2.2 Relationship between gender and readiness to switch to sustainable transport

Table 4.4 shows the data for two variables which is gender and willingness to switch to sustainable transport. The data is tabulated in form of frequency and percentages. Based on the table male has average value of 3.13 while female has average value of 3.30 which means both are lies in region 3. It shows that their willingness to switch to sustainable transport is on 'normal' region. These two variables were taken from same set of sample where the total number of sample is 100. The relationship between these two variables has been test using the Chi-square test.

Table 4.4: Gender and willingness to switch to sustainable transport

	Range									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Male	7	58	8	47	10	48	16	43	6	46
Female	5	42	9	53	11	52	21	57	7	54

Chi-square test:

H_0: Gender of respondent effect on readiness to change to sustainable transport

H_a: Gender of respondent do not effect on readiness to change to sustainable transport

	Gender and willigness to use public transport					
	1	2	3	4	5	
Male	7 *5.64*	8 *7.99*	10 *9.87*	16 *17.39*	6 *6.11*	47
Female	5 *6.36*	9 *9.01*	11 *11.13*	21 *19.61*	7 *6.89*	53
	12	17	21	37	13	100

$\chi^2 = 0.835$

For degree of freedom (df) = 4, and confident level (α) = 0.05

df \ p	0.995	0.975	0.9	0.5	0.1	0.05	0.025	0.01	0.005	df
1	.000	.000	0.016	0.455	2.706	3.841	5.024	6.635	7.879	1
2	0.010	0.051	0.211	1.386	4.605	5.991	7.378	9.210	10.597	2
3	0.072	0.216	0.584	2.366	6.251	7.815	9.348	11.345	12.838	3
4	0.207	0.484	1.064	3.357	7.779	9.488	11.143	13.277	14.860	4
5	0.412	0.831	1.610	4.351	9.236	11.070	12.832	15.086	16.750	5

Critical χ^2 0.05= 9.488

From the calculation, the chi-square value is less than the critical chi-square value. This show that the value does not lies on the rejected region and the null hypothesis is not rejected. This means that gender of the respondents affect the readiness to change to sustainable transport. It shows that female is more ready than male to switch to sustainable transport. This result is same with other previous study by (Curtis and Perkins, 2006) that say female are more ready to use the sustainable transport compare to the male.

4.2.3 Relationship between status and readiness to switch to sustainable transport

Table 4.5 shows the data for two variables which is status and willingness to switch to sustainable transport. The data is tabulated in form of frequency and percentages. Based on the table student has average value of 3.09, worker has average value of 2.74 and non-worker has average value of 2.77. This shows that student lies in

region 3 which is 'normal' to switch to sustainable transport while worker and non-worker lies in region 2 which is 'not ready' to switch to sustainable transport. These two variables were taken from same set of sample where the total number of sample is 100. The relationship between these two variables has been test using the Chi-square test.

Table 4.5: Status and willingness to switch to sustainable transport

	Range									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Student	5	33	7	24	7	30	8	38	6	50
Worker	8	53	18	62	13	57	10	48	5	42
Non-worker	2	14	4	14	3	13	3	14	1	8

Chi-square test:

H_0: Status of respondent effect on readiness to change to sustainable transport

H_a: Status of respondent do not effect on readiness to change to sustainable transport

	Status and willingness to use public transport					
	1	2	3	4	5	
Student	5 *4.95*	7 *9.57*	7 *7.59*	8 *6.93*	6 *3.96*	33
Worker	8 *8.10*	18 *15.66*	13 *12.42*	10 *11.34*	5 *6.48*	54
Non-worker	2 *1.95*	4 *3.77*	3 *2.99*	3 *2.73*	1 *1.56*	13
	15	29	23	21	12	100

$\chi^2 = 3.070$

For degree of freedom (df) = 8, and confident level (α) = 0.05

	p value											
df	0.25	0.2	0.15	0.1	0.05	0.025	0.02	0.01	0.005	0.0025	0.001	0.0005
	25%	20%	15%	10%	5%	2.5%	2%	1%	0.05%	0.025%	0.01%	0.005%
1	1.32	1.64	2.07	2.71	3.84	5.02	5.41	6.63	7.88	9.14	10.83	12.12
2	2.77	3.22	3.79	4.61	5.99	7.38	7.82	9.21	10.6	11.98	13.82	15.2
3	4.11	4.64	5.32	6.25	7.81	9.35	9.84	11.34	12.84	14.32	16.27	17.73
4	5.39	5.59	6.74	7.78	9.49	11.14	11.67	13.23	14.86	16.42	18.47	20
5	6.63	7.29	8.12	9.24	11.07	12.83	13.33	15.09	16.75	18.39	20.51	22.11
6	7.84	8.56	9.45	10.64	12.53	14.45	15.03	16.81	13.55	20.25	22.46	24.1
7	9.04	5.8	10.75	12.02	14.07	16.01	16.62	18.48	20.28	22.04	24.32	26.02
8	10.22	11.03	12.03	13.36	15.51	17.53	18.17	20.09	21.95	23.77	26.12	27.87
9	11.39	12.24	13.29	14.68	16.92	19.02	19.63	21.67	23.59	25.46	27.83	29.67
10	12.55	13.44	14.53	15.99	18.31	20.48	21.16	23.21	25.19	27.11	29.59	31.42

Critical χ^2 0.05= 15.51

From the calculation, the chi-square value is less than the critical chi-square value. This show that the value does not lies on the rejected region and the null hypothesis is not rejected. This means that status of the respondents affect the readiness to change to sustainable transport. The result shows frequency of the workers that not ready to switch to sustainable transport is high. This situation can be caused by the needed of their work. Normally people need to travel or move from one place to another during their work. So it is not too convenience to use public transport compare to the private transport.

4.2.4 Relationship between marital status and readiness to switch to sustainable transport

Table 4.6 shows the data for two variables which is marital status and willingness to switch to sustainable transport. The data is tabulated in form of frequency and percentages. Based on the table single respondent has average value of 3.02 so it lies in region 3 that is ‘normal’ to switch to sustainable transport. The average value for married respondent is 2.81 so it lies in region 2 that is ‘not ready’ to switch to sustainable transport. These two variables were taken from same set of sample where the total number of sample is 100. The relationship between these two variables has been test using the Chi-square test.

Table 4.6: Marital status and willingness to switch to sustainable transport

	Range									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Single	6	63	8	68	12	48	11	52	5	38
Married	10	37	17	32	13	52	10	48	8	62

Chi-square test:

H_0: Marital status of respondent effect on readiness to change to sustainable transport

H_a: Marital status of respondent do not effect on readiness to change to sustainable transport

	Marital status and willingness to use public transport					
	1	2	3	4	5	
Single	6 *6.72*	8 *10.50*	12 *10.50*	11 *8.82*	5 *5.46*	42
Married	10 *9.28*	17 *14.50*	13 *14.50*	10 *12.18*	8 *7.54*	58
	16	25	25	21	13	100

$\chi^2 = 2.525$

For degree of freedom (df) = 4, and confident level (α) = 0.05

df \ p	0.995	0.975	0.9	0.5	0.1	0.05	0.025	0.01	0.005	df
1	.000	.000	0.016	0.455	2.706	3.841	5.024	6.635	7.879	1
2	0.010	0.051	0.211	1.386	4.605	5.991	7.378	9.210	10.597	2
3	0.072	0.216	0.584	2.366	6.251	7.815	9.348	11.345	12.838	3
4	0.207	0.484	1.064	3.357	7.779	9.488	11.143	13.277	14.860	4
5	0.412	0.831	1.610	4.351	9.236	11.070	12.832	15.086	16.750	5

Critical χ^2 0.05= 9.488

From the calculation, the chi-square value is less than the critical chi-square value. This show that the value does not lies on the rejected region and the null hypothesis is not rejected. This means that marital status of the respondents affect the

readiness to change to sustainable transport. It shows that most of the married respondent not ready to use the public transport compare to the single respondent. In this case, single person seem ready to switch to sustainable transport. The reason the married person unready is because of their commitment to the family. This is especially the married person that has a child. It is not convenience to use public transport to travel with their family compare to use the private transport.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

The study of sustainable transportation is still low range in Malaysia. In order to achieve the implementation of sustainable transportation in short period is really hard but something should be done in order to achieve it. Let take the longer time to achieve rather than just wait and no action taken. From time to time the study should be improved. This is to make sure that the sustainable transport can be fully implemented in Malaysia.

5.2 PUBLIC AWARENESS ON SUSTAINABLE TRANSPORT

From the analysis it can be conclude that people in Kuantan are aware on sustainable transportation in term of environmental. They know that by using motor transport can give a high impact on earth and environment compare to use sustainable transport. Even they know about the impact but they still want to use private transport rather than using public transport. In addition, even them aware about the sustainable transportation but they still have a bad perspective on using sustainable transportation. In comparison by gender it shows that female are more aware on sustainable transport compare to male.

5.3 READINESS TO SWITCH TO SUSTAINABLE TRANSPORT

In term of readiness it is show that people in Kuantan is not ready to change to sustainable transportation. Some of them only ready to using public transport. The most

people who are ready to use the public transport seen to be a female while male is in highest rate that is not ready to reduce the car usage and use the public transport.

The result also shows that people who are work totally not ready to change to sustainable transport while student seem to be ready to use sustainable transport as their alternatives rather than use private transport. For the marital status married people are not ready to switch to sustainable transport compare to single person.

In conclusion, based on gender it is show that female are more aware on sustainable transportation and more ready to switch to sustainable transport compare than male. Based on status it shows that student is more ready to switch to sustainable transport compare to worker and non-worker. For the marital status it shows that single person is more ready to switch to sustainable transport compare to married person.

5.4 RECOMMENDATION

The recommendations for this study are as follow. Firstly, in order to get the more precise and accurate value of the chi-square, increase the number of the sample size. Secondly, try to use other method in analysis data than compare with the previous data to look if there are significant between the data. Next, the questionnaire that will be distributed should be understood by the respondent to make sure the answer they given is satisfied. Lastly, this study conducted just focus on socioeconomic background which is gender, status and marital status. For the further study, it could be improve by including the age range, salary of respondents and level of educations.

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APPENDIX A

Put a check (√) to your corresponding answer.

Part A (General information)

1- Gender:
□ Male □ Female

2- What is your age group?
□ <22 □ 23 to 29 □ 30 to 39
□ 40 to 49 □ >50

3- Are you a
□ Student □ Worker □ Non worker

4- Marital status
□ Single □ Married

5- Did you own any personal car?
□ Yes □ No

6- Did you own driving licensed?
□ Yes □ No

Part B (Awareness about sustainable transportation)

7- Which method recently you use to go to some place?
□ Private car □ Public transport
□ Cycling/Walking

8- Do you prefer to use public transport sometime to go to some place?
□ Yes □ No

9- Do you think it is convenient to cycling or walking to go to some place?
□ Yes □ No

10- Which is more safety to use?
□ Private transport □ Public transport

11- Do you think by using public transport traffic congestion can be reduce?
□ Yes □ No

12- Do you think using a private transport will cause high traffic congestion?
□ Yes □ No

13- In your opinion which method is more economical to use?
□ Public transport □ Private transport

14- Do you think by using public transport can reduce pollution?
□ Yes □ No

15- Do you think by using a car can increase the pollution?
□ Yes □ No

16- In your opinion did motor vehicles can cause this environmental problem? (You can tick more than one).
□ Air pollution □ Acid rain
□ Greenhouse □ Sound pollution □ Ozone depletion

Part C (Readiness to use sustainable transportation)

17- What do you feel when driving a car? (You can tick more than one).
□ Practical
□ Safety
□ Relaxing
□ Stressful
□ Tiring
□ Troublesome to self

18- Do you willing to walking /cycling rather than use motor transport?
□ Yes □ No

Rate the following statement.
Indicator;
1-extremely not ready,
2
3
4
5-extremely ready

19- Do you ready to use the public transport?
□ 1 □2 □3 □4 □5

20- Do you ready to reduce the car usage?
□ 1 □2 □3 □4 □5

Thank you for your time and support.

APPENDIX B

Tandakan (√) pada jawapan anda.

Bahagian A (Informasi diri)

1- Jantina:
□ Lelaki □ Perempuan

2- Apakah kumpulan umur anda?
□ <22 □ 23 - 29 □ 30 - 39
□ 40 - 49 □ >50

3- Anda adalah seorang
□ Pelajar □ Pekerja □ Tidak bekerja

4- Status perkahwinan
□ Bujang □ Berkahwin

5- Adakah anda mempunyai kereta sendiri?
□ Ya □ Tidak

6- Adakah anda mempunyai lessen memandu?
□ Ya □ Tidak

Bahagian B (Kesedaran mengenai pengangkutan mampan)

7- Apakah cara yang anda gunakan untuk bergerak ke sesuatu tempat?
□ Kenderaan sendiri □ Kenderaan awam
□ Berbasikal/Berjalan

8- Adakah anda akan menggunakan kenderaan awam sekali sekala untuk ke sesuatu tempat?
□ Ya □ Tidak

9- Adakah anda rasa selesa berbasikal atau berjalan untuk ke sesuatu tempat?
□ Ya □ Tidak

10- Manakah lebih selamat untuk digunakan?

□ Kenderaan sendiri □ Kenderaan awam

11- Adakah anda rasa dengan menggunakan kenderaan awam dapat mengurangkan kesesakan lalu lintas?
□ Ya □ Tidak

12- Adakah anda rasa dengan menggunakan kenderaan sendiri boleh meningkatkan kesesakan lalu lintas?
□ Ya □ Tidak

13- Pada pandangan anda cara manakah lebih ekonomi untuk digunakan?
□ Kenderaan sendiri □ Kenderaan awam

14- Adakah anda rasa penggunaan kenderaan awam boleh mengurangkan pencemaran?
□ Ya □ Tidak

15-Adakah anda rasa penggunaan kenderaan sendiri akan meningkatkan pencemaran?
□ Ya □ Tidak

16- Pada pandangan anda adakah kenderaan bermotor boleh memberi alam sekitar masalah ini?(Boleh tanda lebih dari satu).
□ Pencemaran udara □ Hujan asid
□ Kesan rumah hijau □ Pencemaran bunyi □ Penipisan ozon

Part C (Kesediaan untuk menggunakan pengangkutan mampan)

17- Apakah yang anda rasa ketika memandu kereta? (Boleh tanda lebih dari satu).
□ Praktikal
□ Selamat
□ Rileks/Santai
□ Tekanan
□ Memenatkan
□ Menyusahkan diri

18- Adakah anda rela berbasikal/berjalan daripaa menggunakan kenderaan bermotor untuk ke sesuatu tempat?
□ Ya □ Tidak

Nilaikan kenyataan di bawah.
Petunjuk;
1-Sangat tidak bersedi,
2
3
4
5-Sangat bersedia

19- Adakah anda bersedia untuk menggunakan kenderaan awam?
□ 1 □2 □3 □4 □5

20- Adakah anda bersedia untuk mengurangkan penggunaan kereta?
□ 1 □2 □3 □4 □5

Terima kasih atas kesudian menjawab.

APPENDIX C

	p value											
df	0.25	0.2	0.15	0.1	0.05	0.025	0.02	0.01	0.005	0.0025	0.001	0.0005
	25%	20%	15%	10%	5%	2.5%	2%	1%	0.05%	0.025%	0.01%	0.005%
1	1.32	1.64	2.07	2.71	3.84	5.02	5.41	6.63	7.88	9.14	10.83	12.12
2	2.77	3.22	3.79	4.61	5.99	7.38	7.82	9.21	10.6	11.98	13.82	15.2
3	4.11	4.64	5.32	6.25	7.81	9.35	9.84	11.34	12.84	14.32	16.27	17.73
4	5.39	5.59	6.74	7.78	9.49	11.14	11.67	13.23	14.86	16.42	18.47	20
5	6.63	7.29	8.12	9.24	11.07	12.83	13.33	15.09	16.75	18.39	20.51	22.11
6	7.84	8.56	9.45	10.64	12.53	14.45	15.03	16.81	13.55	20.25	22.46	24.1
7	9.04	5.8	10.75	12.02	14.07	16.01	16.62	18.48	20.28	22.04	24.32	26.02
8	10.22	11.03	12.03	13.36	15.51	17.53	18.17	20.09	21.95	23.77	26.12	27.87
9	11.39	12.24	13.29	14.68	16.92	19.02	19.63	21.67	23.59	25.46	27.83	29.67
10	12.55	13.44	14.53	15.99	18.31	20.48	21.16	23.21	25.19	27.11	29.59	31.42