UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE AWARENESS AND PRACTICE ON CLIMATE CHANGE AMONG COMMUNITY IN KUALA LUMPUR

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KNOWLEDGE AWARENESS AND PRACTICE ON CLIMATE CHANGE AMONG COMMUNITY IN KUALA LUMPUR

BY

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Thesis submitted in fulfilment of the requirement for the degree of Bachelor Science (Environmental and Occupational Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

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ABSTRACT

KNOWLEDGE AWARENESS AND PRACTICE ON CLIMATE CHANGE AMONG COMMUNITY IN KUALA LUMPUR

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Introduction : Cities are responsible for 75% of world carbon dioxide emission, making it as significant contributor to climate change. Urban population will be the early responders towards the impacts of climate change, therefore it is essential to assess the knowledge, awareness and practice (KAP) of community for framing mitigation activities. Thus, the study intends to identify the level of KAP among community in Kuala Lumpur (KL). **Methodology** : A cross-sectional study via a self-administrated questionnaire was carried out among 232 respondents within the age of 15 years old and above. Simple random sampling was applied to select five out of eleven districts in KL (Bukit Bintang, Cheras, Bandar Tun Razak, Wangsa Maju, Titiwangsa) while convenient sampling was used for recruitment of subjects from community settings. Spearman correlation tests was used to analyze the association between knowledge, awareness and practice scores. Chi Square test was used to identify the association between knowledge and awareness levels with educational status. **Results and Discussion:** The knowledge about climate change among community in Kuala Lumpur was reported to be moderate while the awareness level was very high. The practice of community on climate change was at moderate level. There was positive and weak association between knowledge and awareness ($r = 0.302$) whereas the association between knowledge and practice was also found to be positive and weak ($r = 0.142$). There was positive and weak association between awareness and practice ($r = 0.196$). Educational level had significant association with knowledge and awareness level. The community had some knowledge about the issue, however they did not aware of what actions to be taken to deal with the issue. **Conclusion** : The government needs to disseminate informations about climate change through mass media and social media. Combinations of top down and bottom up approaches are important for the adaptation and mitigation strategies in which both government and community shall cooperate to mitigate climate change impacts.

Keywords : Knowledge, Awareness, Practice, Climate Change, Community

ABSTRAK

PENGETAHUAN, KESEDARAN DAN AMALAN TENTANG PERUBAHAN IKLIM DALAM KALANGAN KOMUNITI DI KUALA LUMPUR

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Pengenalan : 75% daripada pelepasan karbon dioksida dunia berpunca daripada bandar. Hal ini menjadikannya sebagai penyumbang yang penting kepada perubahan iklim. Penduduk bandar merupakan responden awal terhadap kesan perubahan iklim, justeru, penilaian terhadap tahap pengetahuan, kesedaran dan amalan (KAP) masyarakat adalah penting untuk merangka strategi bagi mengurangkan kesan perubahan iklim. Oleh itu, kajian ini bertujuan untuk mengenal pasti tahap pengetahuan, kesedaran dan amalan berkaitan perubahan iklim dalam kalangan masyarakat di Kuala Lumpur (KL). **Metodologi :** Kajian rentas keratan dijalankan melalui borang soal selidik kepada 234 responden yang berusia 15 tahun dan ke atas. Metodologi pensampelan rawak mudah digunakan untuk memilih lima daripada sebelas daerah di KL (Bukit Bintang, Cheras, Bandar Tun Razak, Wangsa Maju, Titiwangsa) manakala pensampelan mudah digunakan untuk memilih subjek dalam kalangan masyarakat. Ujian korelasi Spearman digunakan untuk menganalisis hubungan antara skor pengetahuan, kesedaran dan amalan. Ujian Chi Square digunakan untuk mengenal pasti hubungan antara pengetahuan dan kesedaran dengan status pendidikan. **Keputusan dan Perbincangan :** Pengetahuan mengenai perubahan iklim dalam kalangan komuniti di Kuala Lumpur dilaporkan pada tahap sederhana manakala tahap kesedaran adalah sangat tinggi. Amalan masyarakat terhadap perubahan iklim adalah pada tahap sederhana. Terdapat perhubungan positif dan lemah antara pengetahuan dan kesedaran ($r = 0.302$) manakala perhubungan antara pengetahuan dan amalan juga didapati positif dan lemah ($r = 0.142$). Terdapat hubungan positif dan lemah antara kesedaran dan amalan ($r = 0.196$). Tahap pendidikan mempunyai hubungan yang signifikan dengan tahap pengetahuan dan kesedaran. Meskipun masyarakat mempunyai pengetahuan mengenai isu ini, namun mereka tidak mengetahui apakah tindakan yang perlu diambil untuk menangani isu tersebut. **Kesimpulan :** Kerajaan perlu menyebarkan maklumat tentang perubahan iklim melalui media massa dan media sosial. Kombinasi pendekatan 'top down' dan 'bottom up' adalah penting untuk strategi mitigasi dan adaptasi terhadap perubahan iklim yang mana kerajaan dan pihak komuniti harus bekerjasama mengurangkan impak perubahan iklim.

Kata kunci: Pengetahuan, Kesedaran, Amalan, Perubahan Iklim, Komuniti

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LIST OF ABBREVATIONS

KAP	Knowledge, Awareness and Practice
CC	Climate Change
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
MNRE	Ministry of Natural Resources and Environment
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

Climate change was defined by Intergovernmental Panel on Climate Change (IPCC) as the change in the state of climate that can be identified by changes that persists for an extended period, typically decades or longer (IPCC, 2014). According to Haliza (2011), climate change is a change in the statistical distribution of weather over periods of time that ranges from decades to millions of years. In other words, climate change is the shift in worldwide climate pattern that occur for a long period of time and associated with an increase in global average temperatures. In 2008, The World Health Organization (WHO) held World Health Day with the selection of ''protecting health from climate change'' as the theme. The theme chosen potrayed of the drawbacks of climate change which could threat the security of global public health. Southeast Asia, which consists of Brunei, Myanmar, Cambodia, Indonesia,

Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam, is one of the vulnerable regions to global warming that should not be overlooked (Symon, 2010). In 2006, the total CO_2 emissions of South Asia countries was 1045.95 million tonnes (MT) while the emissions by China and United States were 6103.49 MT and 5975.10 MT respectively (Zhi et al., 2013). Eventhough the emission of CO_2 by Southeast Asia countries were still relatively low compare to China and United States, however this emission should not be disregarded as it shows increasing trend throughout the years. Table 1.1 shows the changes of CO_2 emission by the countries in Southeast Asia between the year of 1990 and 2009, which shows increasing trend.

Table 1.1 : CO_2 emission change in 1990 and 2009

Region	Country	CO_2 emission (tonnes per capita)	
		1990	2009
Southeast Asia	Cambodia	0.05	0.33
	Indonesia	0.81	1.9
	Laos	0.06	0.3
	Malaysia	**3.11**	**7.1**
	Myanmar	0.11	0.23
	Philippines	0.68	0.75
	Singapore	15.41	6.39
	Thailand	1.68	3.95
	Vietnam	0.32	1.65

Source : Zhi et al., 2013

Climate change occured when abundance amount of greenhouse gases like carbon dioxide (CO_2), nitrous oxides (NO_X), methane (CH_4), ozone (O_3) and chlorofluorocarbon (CFCs) are released to the atmosphere. These gases are trapped in Earth's atmosphere, thus forming free radicals which depletes the ozone layer. The depletion of ozone layer causes more ultraviolet (UV) rays to pass through the atmosphere, thus cause Earth to be warmer and lead to phenomena called global warming. Based on IPCC Fifth Assessment Report (2014), it was confirmed that the changes in frequencies and intensities of extreme events like drought, precipitation changes, floods and storms has occurred due to climate change.

1.1.1 Causes of Climate Change

It is widely agreed that our climate is changing, but the perception about the causal factors are quite vary among the general public (Hartter et al., 2018). Some people believe that human activities caused climate change, while other views it as natural phenomena. Climate change could be caused by natural processes, however its contribution are relatively small, whereas human activity is the most notable contributor. IPCC reports stated that human activities is the major cause of climate change. This conclusion from IPCC was further supported by over 12,000 peer-reviewed abstracts on the subjects of 'global warming' and 'global climate change' published between 1991 and 2011, with over 97% of the scientists agreed that humans are causing the changing of our climate (Cook et al., 2013). Human activities

have increased atmospheric carbon dioxide (CO_2) concentrations past 400 ppm, levels unseen for millions of years (Biello, 2015). Matsumoto (2019) emphasized that human socioeconomic activities, particularly the use of fossil fuels lead to climate change. Extensive uses of motor vehicles required fossil fuels to be burned, thus CO_2 are released to the environment. Besides that, high consumption of energy is also associated with the emission of GHGs. The lamps that lightens the homes and other electrical appliances utilized fossil fuel such as natural gas and coal as the primary energy sources. Fuel sources contributes as primary energy input for power generation in our country (Mohamed Syahril et al., 2016). Besides that, highly densed population leads to demands for home buildings as well as the construction of buildings and roads. Thus, natural forests were cut down as the trade to satisfy humans' desires. Natural forest act as carbon storage because it habours plants which absorb CO_2 from atmosphere for the photosynthesis process. However, as deforestation took place, the reservoir for carbon are depleted. In addition, disposal of municipal solid waste (MSW) also represents as the significant contributor to global warming. When MSW is processed in landfills, the organic material is anaerobically decomposed by methanogens, a process which releases methane to the atmosphere (Mingxi et al., 2017). Anthropogenic emissions of non-CO_2 greenhouse gases such as methane also contribute significantly to global warming (Jiang et al., 2018).

1.1.2 Impacts of Climate Change

Climate change is not just the international threat, but is also the regional concern. The occurrence of climate change has no geographical boundaries and Malaysia is not excluded to also experience this phenomenon. In spite of the fact that Malaysia is topographically located outside the Pacific Ring of Fire and is generally free from any extreme disasters such as earthquake, tropical storms and volcanic eruptions, the country however, is still vulnerable to monsoon floods, landslides and severe haze episode. Moreover, extreme events like earthquake, tsunami, storms and heat waves took a heavy toll in Malaysia recently. In 2018, the storm hit Perlis which caused casualties and damage of infrastructures in Kangar, Perlis. Last few years, our county was surprised with earthquake that happened in Ranau, Sabah, which claimed 18 lives of mountain guides and climbers of Mount Kinabalu in 2015. While in 2015, big flood had hit Johor and study proved that extra ordinary heavy downpour as identified as the main cause for the flood (Muhammad Barzani et al., 2006). When a disaster occured, it will subsequently lead to others. For instance, increase in precipitation due to changing in climate will cause flood. When flood happens, it will diminish and wipe out the planting area, thus decrease the crop production. Extreme temperature which lead to drought can also reduce the agricultural yields as the temperature may not be suitable for growth of some plants like paddy, thus the crop will die and lower the yield for rice production. Thus, these devastated events will further cause environmental, economical and social impacts to the population because once disaster strikes, properties or infrastructures will be damaged, national

food security will be compromised and health of the population will be affected. Natural disasters that are caused due to change in climate usually leave the damage bill to the government for recovering cost. The federal government allocated around RM1.7 million for farmers in Penang who were affected by the floods in November 2017 while 2000 farmers received compensation of RM876 per hectare of paddy field. This is in addition to the RM33.4 million that the Penang government paid to people in the state who suffered damage during the flood (The Star Online, 2018).

This phenomena shall be perceived as threats by the human beings because the environmental degradation will give impacts to not just individuals, but the whole community who live in a particular area. The community need to know that their actions of living unsustainably will give unpleasant impacts to the environment. As it is always two way interactions between men and the environment they are living in, human beings must also aware that this environmental degradation, will in turn, give horrible consequences to the community, either in the form of depletion in natural capital or the strikes of natural disasters. Figure 1.1 illustrates the interaction between human activities, the environmental impacts and how the degradation of environment will give consequences back to the people.

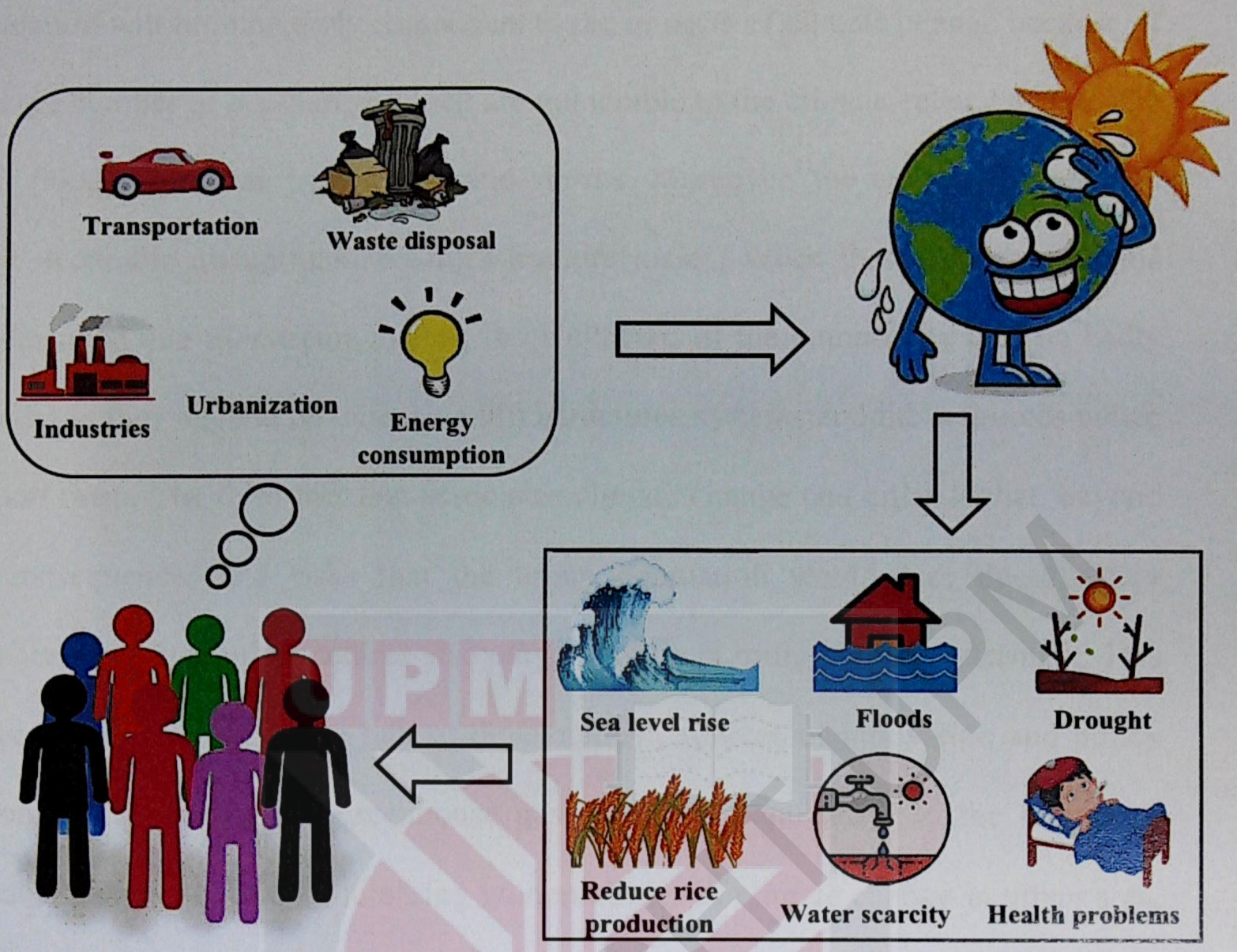

Figure 1.1 Interaction between human and environment

1.1.3 Climate Change and Urban Population

According to United Nation (2011), cities are responsible for 75% of world carbon dioxide emission, making it as significant contributor to climate change. Climate change happens when fossil fuels were burned for electricity, transportation, industrial processes and this things mostly take place in cities. Besides that, urban

population will become early responders to the impacts of climate change because of its large number of population which are vulnerable to the climate-related events like flash floods, droughts, heat waves and storms. Moreover, the extreme events will cause economic disruptions and infrastructure losses. When these support systems are damaged due to extreme events, the wellbeing of the community will be badly affected as they depend on extensive infrastructures systems and the resources which support them. The third fact that associates climate change and cities is that, beyond the consequences and risks that the urban population would face due to their activities, the same urban centres also play vital role in mitigating the aftermath. This is because urban area is the hub of development, sources of innovation and policy responses in reducing the greenhouse gases emission and adapt to the impact of climate change. So, of the increasing vulnerabilities of climate change in urban area, there is also increasing of opportunities which can incubate important strategies and plans in order to combat impacts of climate change within the urban area itself.

In Malaysia, Kuala Lumpur is recognized as the most urbanized area in Malaysia, with 100% urbanization rate (Ministry of Natural Resources and Environment, 2015). Until 2018, Kuala Lumpur city is populated with 1.9 million people as opposed to 1.6 million in 2010 (Department of Statistics Malaysia, 2018). As a growing metropolitan area, Kuala Lumpur has densely populated community and it is where the economic activities happen at high paces, therefore it is not surprising that pollution and environmental problem takes place the most at this area. As it is assured that humans and their activities are the most significance contributors to climate change, therefore, here comes the need for the community to have the

knowledge and awareness on climate change and other environmental issues. General population are supposed to perceive of what happen around them, so they are informed with facts and key issues. The common knowledge on climate change is very important to change the people attitude which will indirectly be reflected on reducing the adverse effect of climate changes (Al Mutairi & Tang, 2017). Furthermore, it is important to raise awareness among the general public in the efforts of managing the impacts of climate change. Awareness-raising enable informed decision-making, play an essential role in increasing adaptation and mitigation capacities of communities, and empower women and men to adopt sustainable lifestyles (UNESCO). This study intended to identify the knowledge, awareness and practice of climate change among the general public of Kuala Lumpur.

1.2 Problem Statement

Asian nations have among the most noteworthy numbers of individuals exposed to the impacts of climate-related hazards and, thus, at most prominent chance of mass death (Busby et al., 2018). Malaysia is one of the Asia's tropical country and it experiences climate of hot humid temperature throughout the year. The geographical location of our country is near to the equator and most parts of the country are surrounded by water bodies, with variable climate as Malaysia experiences hot climate throughout the year with pronounced monsoonal seasons (Zalina et al., 2017). Due to its location, together with the humans' activities, large proportion of Malaysian population is vulnerable to the effects of extreme weather events such as droughts and floods that are associated with climate change. Malaysia has been experiencing more and more severe weather in the last two decades. Figure 1.2 shows the extreme events that were reported in the news.

NEW STRAITS TIMES

Flash floods in Kuala Lumpur

JUNE 19, 2016 @ 9:27PM
BY BERNAMA

File pic: Heavy rain which fell at about 6 pm in the federal capital caused flash floods at three road stretches. Kuala Lumpur Fire and Rescue operation chief Samsol Maarif Saibeni said the road affected by the floods are Jalan Raja Chulan, Jalan Kelapa Muda and Jalan Duta.

Source : News Straits Times, 2016

Malaysia bakal dilanda cuaca ekstrem

KUALA LUMPUR 30 Nov. - Perubahan cuaca dunia serta masalah pemanasan global bakal mendatangkan kepada cuaca ekstrem yang dijangkakan melanda negara bermula tahun hadapan dan berterusan untuk jangka masa lama.

Ini bermakna, Malaysia bakal dilanda cuaca panas terik selain menerima taburan hujan yang tinggi sekali gus boleh menyebut kepada kejadian bencana seperti kemarau dan juga banjir.

Perkara itu turut didedahkan menerusi data diperoleh Jabatan Meteorologi sejak beberapa tahun lalu yang menunjukkan peningkatan ketara secara konsisten setiap

Source : Utusan Malaysia Online, 2018

Figure 1.2 News about extreme events in Malaysia

The causes of extreme events that occur in Malaysia was associated with the anthropogenic activities that took place in the region. This was due to the fact that environmental degradation tends to increase along with the increase of industrial value added. As a developing country, Malaysia is experiencing a shift towards dramatic development and rapid economic growth. Even though the evolution occurs throughout the nation, however, Kuala Lumpur is where development occur the most as it is recognized as the fastest growing metropolitan area. Being the most urbanized city in Malaysia with 100% urbanization rate, Kuala Lumpur could be the contributor to climate change due to the activities that took place here. Table 1.2 shows the urbanization rate of states in Malaysia.

Table 1.2. : Urbanization rates by states

Years / States	2000	2005	2010
	Percentage (%)		
Johor	65.2	66.5	71.9
Kedah	39.3	39.8	64.6
Kelantan	34.2	33.4	42.4
Melaka	67.2	70.6	86.5
Negeri Sembilan	53.4	56.3	66.5
Pahang	42.0	43.5	50.5
Perak	58.7	59.3	69.7
Perlis	34.3	35.1	51.4
Pulau Pinang	80.1	79.8	90.8
Sabah	48.0	49.8	54.0
Sarawak	48.1	49.5	53.8
Selangor	87.6	88.4	91.4
Terengganu	48.7	49.8	59.1
Kuala Lumpur	**100.0**	**100.0**	**100.0**
Labuan	77.7	77.6	82.3
Putrajaya	-	-	100.0
Malaysia	62.0	63.0	71.0

Source : Ministry of Natural Resources and Environment, 2015

Since in the mid 1970's, warming has increase at the rate of 0.15^{0}C every decade because of the rapid urbanization that contribute to heat waves phenomenon in urban areas in which it becomes a serious problem in conjuction with global warming (Oke, 1987; Nakagawa, 1996; Rizwan et.al, 2008; Haliza, 2015). High pace of urbanization means more people are staying at a particular setting, with high consumption rate of resources, and so that of the increases in environmental problems. Bhudiarta et al., (2012) reported the generation of municipal solid waste in Kuala Lumpur, which is 2,000 tonnes per day with generation of 1.2 kg/person in a day. The problems with huge amount of solid waste being disposed is that, the wastes will be settled down either in landfill or incinerators, and both ways of disposal will release greenhouse gases like methane and CO_2, contributing to global warming and climate change. Apart from that, the increasing energy consumption also give rise to climate change because the generation of electricity to our houses and industries required fossil fuels to be burned, releasing CO_2 to the environment. Mohamed Syahril et al., (2016) described that electrical power generation in Malaysia significantly depends on three major fossil fuel sources; coal, fuel-oil, natural gas. The increasing demand of energy consumption by the residentials reflects of the increasing amount of CO2 been released from time to time. Table 1.3 shows the final electricity consumption in Malaysia residential.

Table 1.3 : Electricity Consumption in Malaysia Residential

Year	Final Electricity Consumption in Malaysia Residential (ktoe)
2002	1161
2003	1248
2004	1319
2005	1395
2006	1514
2007	1598
2008	1668
2009	1792
2010	1937
2011	1974
2012	2126
2013	2262
2014	2346
2015	2435
2016	2678

Source : Ministry of Natural Resources and Environment, 2015

From the data shown, it can be seen that the development gives impacts to environment as human activities become the sources of pollutants that contribute to global warming and climate change.

Even though the scientific consensus agreed that human activities are the main culprit of climate change, however this environmental issue is remain unknown and unnoticed by the general public. However, people accept that the planet is getting hotter with a degree of certainty, but often resist the idea that human-induced behaviors are changing the climate on the planet (Perkins et al., 2018). The controversion of climate change in Malaysia is still somehow silenced, regardless of the impacts that can clearly be seen, such as more frequent flooding. The temperature and sea level are gradually rising, however Malaysians community do not link these phenomena to climate change, and few seem do not know about the problem at all (New Straits Times, 2018). Becken et al., (2013) described that the local people had heard about climate change, but did not know exactly what it meant and they had not paid much attention to it. The efforts on reducing climate change impacts would be meaningless if the community have little or no knowledge and awareness of what is happening around them and how do they act on it. Even if the policy makers were to implement any laws or policies as their efforts to reduce climate change impacts, they still need the public to be the main driven forces to ensure that the strategies a success.

Several studies were conducted to assess the public awareness and perception of climate change in various parts of the world. However, to date, there is still less studies been done regarding climate change in Malaysia, specifically on assessing the knowledge, awareness and practice among community. The previous studies regarding climate change in Malaysia were mostly dedicated on discussion about the impacts of climate change (Kuok, 2019), with less attention on examining public's

views about the problem. Tangang et al. (2012) stated that knowledge gap in the science of climate change over Malaysia and the surrounding region remains wide. There was a study on public awareness and perception conducted, however it focused on the community who lived by the coastal regions in Malaysia, which were affected by changes in sea level and flooding incidences. It is stated by Zalina et al., (2017) that public knowledge about global climate and its related environmental problems have attained little attention globally.

1.3 Study Justification

Urban population has increased from 160 million to about 3 billion in just 100 years, and it is expected to increase to about 5 billion by 2025 (Kolokotsa et al., 2009). Therefore, the research nowadays are likely to focus on the environmental issue and its relation with the rapid urbanization growth as well as the industrial activities that take place in urban areas which tend to change the natural pattern and trend of the temperature in the urban area (Haliza, 2015). According to Ilham (2012), urbanization that took place in Kuala Lumpur to some extent plays a quite significant role in changing the urban air temperature patterns. It is reasonable to conduct the environmental study for a developing country like Malaysia because of its motivation for economic growth causes the environment to be degrading.

To the best of researcher's knowledge, the study on assessing the knowledge, awareness and practice is still less pronounced in Malaysia, thus this study intends to discover what the public understands about climate change, are they aware about it, and how do they react about the issue. Efforts from the government to reduce the impacts of climate change will not be successful if we do not know what is the level of understanding and awareness among community regarding this issue. Without drastic action today, adapting to these impacts in the future will be more difficult. Even though research have been done among the community in Sabak Bernam, Malaysia, however the study focuses among the general community who live in coastal regions. This study, for instances, tries to fill in the gap to identify public's knowledge, awareness and practices in urban area. This is because urban areas are

major sources of greenhouse gas (GHG) emissions that cause global warming and the people who are living there would be the potential contributors through their activities. Impact of climate change is more pronounced in urban areas due to the high concentration of populations, infrastructure, assets and economy.

Besides that, the findings of this study can be used by the relevant authorities in developing policies or to plan future strategies in enhancing public awareness and knowledge as well as their practices towards reducing the impacts of humans' activities on climate change. Failing in taking the public value and views into the account on sustainably development and climate risk management will results in improper decisions (Nisbet & Myers, 2007). This is because community participation pose the greatest impact on reducing the climate change aftermath. Hiwasaki et al., (2014) emphasized that, following the 2004 tsunami in the Indian Ocean, local knowledge helped communities to survive the aftermath. Therefore, public's knowledge, awareness and practices need to be assessed in order to know what level their understanding and sensitivity are about climate change phenomena. By knowing this, the government may come out with specific planned events, campaigns and may attempt to disseminate infomations through mass media to raise public's knowledge and awareness. Besides that, upon knowing the public practices, we may have general overview either the public are living sustainably or the other way round.

The outcome of studies on climate change done in Malaysia is representative to a certain extent of other tropical countries, bearing in mind that climate is a very highly variable phenomenon (Norzaida et al., 2017). The knowledge derived out of the research done could be disseminated and shared with communities of similar

climate conditions. Public awareness approach, knowledge sharing activities with the public, as well as mitigation efforts the general public could participate in, are all common things Malaysia and other countries could share. To date, limited work on public awareness of climate change has been done globally. Thus, it is important that countries sharing similar climate conditions and also similar demographic make-up to consolidate and share their findings. As we know, climate change is happening, and the effect from it could be devastating, so it is the time that we put our efforts together and share our concern.

1.4 Conceptual Framework

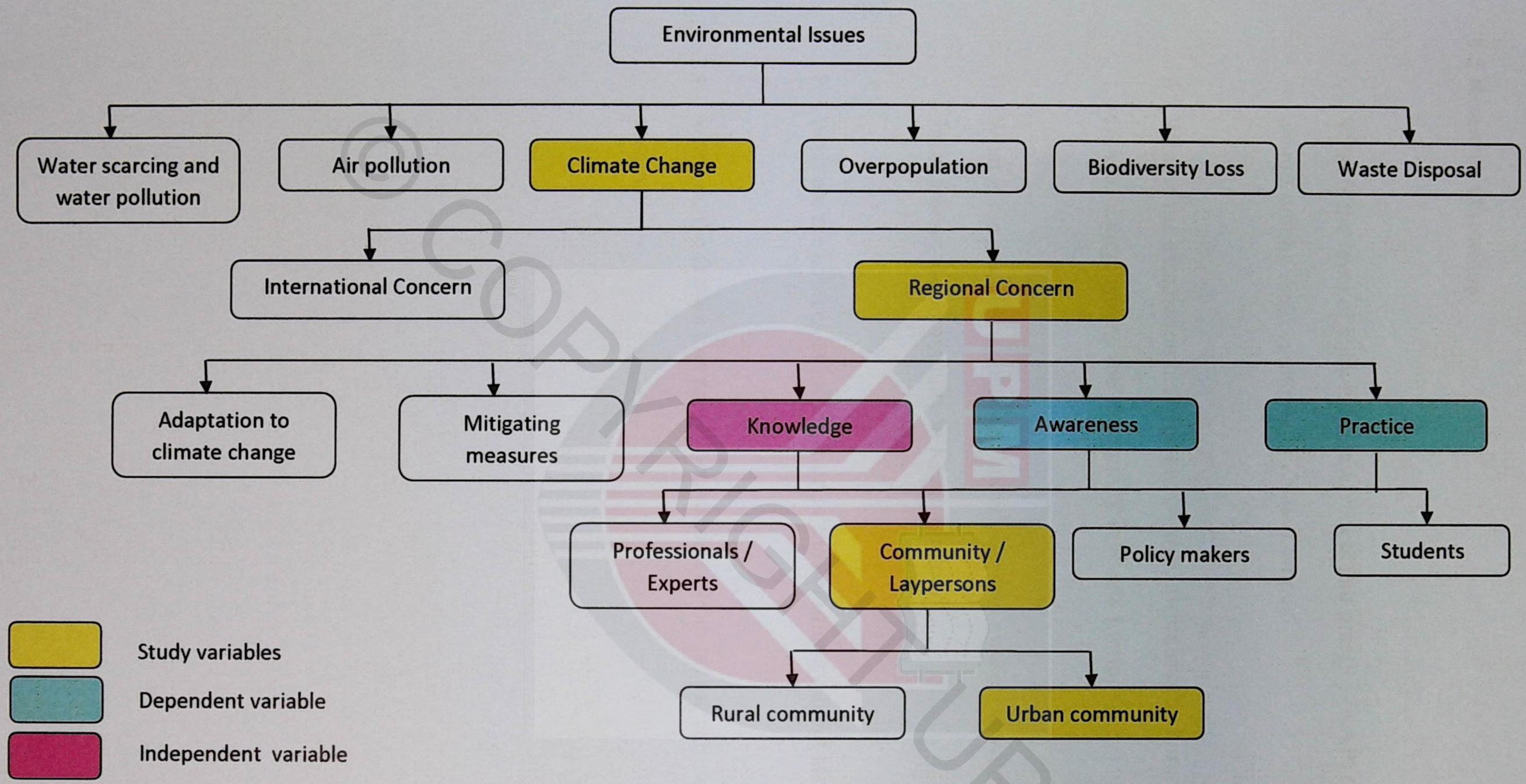

Figure 1.4 : Conceptual Framework

1.5 Research Questions

i. What is the level of knowledge, awareness and practice (KAP) on climate change among the community in Kuala Lumpur?

ii. What is the association between knowledge, awareness and practice on climate change among the community in Kuala Lumpur?

iii. What is the association between knowledge and awareness with educational level among the community in Kuala Lumpur?

iv. What are the sources of information of the community about climate change?

v. What are the factors that prevent community from taking actions on climate change?

1.6 Study Hypothesis

i. There is significant association between knowledge and awareness on climate change among the community in Kuala Lumpur.

ii. There is significant association between knowledge and practice on climate change among the community in Kuala Lumpur.

iii. There is significant association between awareness and practice on climate change among the community in Kuala Lumpur.

iv. There is significant association between educational level with knowledge and awareness on level.

1.7 Research objectives

1.7.1 General Objective :

To determine the knowledge, awareness and practice (KAP) on climate change among general community in Kuala Lumpur.

1.7.2 Specific objectives:

i. To determine the distribution of socio-demographic factors among the community in Kuala Lumpur.

ii. To determine the level of knowledge, awareness and practice on climate change among the community in Kuala Lumpur.

iii. To identify the association between knowledge, awareness, practice on climate change among the community in Kuala Lumpur.

iv. To identify the association between knowledge and awareness with educational level among the community in Kuala Lumpur.

v. To determine the sources of information about climate change.

vi. To identify the factors that prevent community from taking actions on climate change

1.8 Definition of Terms

1.8.1 Conceptual Definition

- Climate Change :

  The state of climate that can be identified by changes that persists for an extended period, typically decades or longer (IPCC, 2014).

- Knowledge :

  It is what people know about the environment, key relationships leading to environmental impacts, an appreciation of the whole systems and collective responsibilities necessary for sustainable development (Mostafa, 2007).

- Awareness :

  Awareness is defined as a belief, stance and the degree of concern an individual holds towards the environment (Mat Said et al., 2003).

- Practice :

  Practice is the observable actions of an individual in response to a stimulus.

  This is something that deals with the concrete, with actions.

- Community :

  A social system with people living together in relationship with one another who share services and facilities, has a common psychological identity with a common communication network, share the same interest, needs, values and functions. (Isidiho & Sabran, 2016).

1.5.2 Operational Definition

- Climate Change :

  A change in global or regional climate patterns and it is contributed mainly due to the increased levels of atmospheric carbon dioxide released from human activities. Climate change is manifested by the increase in world's temperature, sea level rises, extreme weathers and water scarcity.

- Knowledge :

  It was evaluated by using self-administered questionnaire consist of questions on causes and impacts of climate change. Yes and no questions were then be translated into low, moderate and high knowledge level.

- Awareness :

  It was evaluated by using self-administered questionnaire consist of questions on the awareness and concern of regarding climate change issue. 4

scales of Likert-type questions were then be translated into very high awareness, high awareness, moderate awareness and low awareness.

- Practice :

  It was evaluated by using self-administered questionnaire consist of questions on sustainable activities that the community shall practice to reduce the impacts of climate change. 4 scales of Likert-type questions were then be translated into poor, moderate and good level.

- Community :

  The selection of the community was based on their age which is 15 years old and above and lived in Kuala Lumpur for at least one year. According to Ministry of Youth and Sports Malaysia, youth age starts from 15 years old and youths are considered to be matured enough to acknowledge about the issues happening around them.

CHAPTER 2

LITERATURE REVIEW

2.1 Climate Change

Climate change is the gradual change in the Earth's climate and physical geography that comes along with increases in Earth's temperature (Eugene, 2018). For the past two decades, the global temperature has continue to increase and reach new level every year (Orimoloye et al., 2019). High emissions of greenhouse gases (GHGs) like CO_2, methane, ozone and nitrous oxides has caused the Earth to be warmer as these gases trapped heat in the atmosphere, lead to phenomenon called global warming.

Extreme weather has become more common as the result of rising in greenhouse gases that heat our world faster than it has been before (Woodward, 2019). Barbera et al., (2018) pointed out that CO_2 and methane as the two most significant greenhouse gases. Yue and Gao (2018) reported that natural systems such as earthquakes, volcanoes, forest fires, oceans and wetlands global may become the contributor of GHG emissions. Many people have not agreed with the fact that

climate change is significantly associated with anthropogenic activities, including the current president of the United States of America (Perkins et al., 2018). However, IPCC (2013) described that increasing concentrations of GHGs and global warming are mainly contributed by human activities. In addition, the report stated that GHG emissions from usage of fossil fuel and land use by humans as the main causes of global warming. Khetrapal (2018) emphasized that climate change was associated with human activities such as industrial activities, burning of fuels and forests clearance.

2.2 Climate Change and Community

Scientists predicted that the frequency and magnitude of extreme events like heat waves, monsoon and cyclones may be increasing every year. While scientists believed that more intense and frequent weather events will occur each year, no one can say which particular communities will be struck in any given year. It may be that, in coming decades, more and more communities will have to deal with an extreme event that they had never before experienced (Lejano, 2019). The change in weather patterns, sea level rises, occurrence of extreme climate-related events are the evidences of climate change (IPCC, 2014). However, people generally accept that the Earth is getting hotter at some degrees, but often disregard the fact that human-induced practices caused the changing of climate (Perkins et al., 2018). World Health Organization stated that climate change impact are catastrophic that it caused the loss of 150,000 human lives globally. Climate change has extremely damaged the whole

world, particularly South Asian countries because general communities in this region are considered highly vulnerable to impacts of climate change whilst their awareness to adapt and mitigate these impacts is very low (Hussain et al., 2018). Archie et al., (2018) described that climate change impacts associated to vulnerabilities of economic activities, communities, and infrastructure. Hiwasaki et al., (2014) emphasized that, following the 2004 tsunami in the Indian Ocean, local knowledge helped communities to survive the aftermath.

2.3 Climate Change and Cities

Urban areas have many linkages with climate change. Urban centers are drivers of global warming because it is where industries, waste disposal, transportation, households and many of the emitters of greenhouse gases (GHG) concentrated. Besides that, cities or urban areas could be affected by climate change impacts in which many human lives are threaten due to highly dense population in urban area. Wamsler et al., (2013) stated that many cities are at risk as climate change hold a serious threat towards sustainable urban development. By 2030, the number of people living in cities will increase from 4 billion to 6 billion (United Nations, 2016). Sims et al., (2017) described that high GHG emission and extensive consumption of energy took place the most in cities. Furthermore, the rapid urbanization, growth in urban economic assets, extensive infrastructure and services make cities also particularly vulnerable to climate change (Geneletti & Zardo, 2016; IPCC, 2012). While urban areas are hotspots for climate risks, they are also the

sources of options to increase our capacity to cope with climate hazards. Cities are sources of responses adapting to climate change because initiatives, policies and actions aimed at reducing emission will usually starts to be implemented in cities. Despite of being the greatest contributor for GHG emission, cities are the ideal framework for implementing low-carbon policies (Zhifu et al., 2015) and adaptation strategies through a strategic planning process shared with citizens and local stakeholders (Geels, 2011). Cities play significant role in developing and implementing climate change strategies because they are located at the interface of local action and national and international level climate change adaptation and mitigation commitments (Heidrich et al., 2016). Climate change phenomenon drived the urban leaders to formulate comprehensive actions to adapt for more frequent and vigorous hazard (Dzul & Ranjith, 2013). Picketts et al., (2013) stated that the planning for climate adaptation is well suited to local levels of governments as general citizens can participate in creating the targeted adaptation strategies that address the important regional impacts, and these strategies will provide tangible benefits to local residents.

2.4 Impacts of Climate Change to Malaysia

Malaysia is also experiencing adverse effects of climate change that lead to impacts on water resources, food supply, coastal zone, public health, human settlement and others and necessitate national and international responses to face climate change (Begum & Pereira, 2011). A study done by Kuok (2018) identified

that annual mean temperature, occurrences of extreme weather events and mean sea level in Malaysia are rising while rainfall shows variability. A notable attention was garnered after the capital city of Kuala Lumpur (KL) was described as getting hotter by 0.6 °C per decade, which is the world's highest value so far reported for the urban heat island effects until 2005 (Ramakreshnan et al., 2018). The latest regional climate downscaling study indicates that, depending on the emission scenario, the mean surface temperature over Malaysia would increase by 3-5°C by the end of the 21st century (Tangang et. al, 2012). As the atmosphere warms, evaporation and humidity increases thus lead to heavy rainfall and increase the frequency of heavy rainstorms. Recently in September 2018, a storm lashed through several villages and residential areas in Perlis causing damage to 56 houses and several public facilities (New Straits Times, 2018). Changing in climate can also gives impact on sea level rise and coastal flooding in our country. Sea level change over Malaysia has been studied and according to Ali et al. (2012), sea level around the Peninsular Malaysia coastlines will rise with the range of 0.066 m to 0.141 m in 2040 and 0.253 m to 0.517 m in 2100. Besides that, flood is also one of the extreme events due to climate change. The unexpected tsunami which first time hitted our country in December 2004, the big floods of 2006 which mostly affected the population in Johor and most recently in 2014, the floods in Kelantan are among the most devastating events to hit Malaysia. Climate change does not only results in devastated extreme events that threaten people's lives and cause causalities, but it also expected to compromise people's health if no significant mitigation and adaptation measures been put into place. Increasing in temperature will favours the growth of various pathogenic agents

like viruses and bacteria, thus lead to higher incidence of infectious diseases such as dengue and foodborne illnesss.

2.5 Knowledge, Awareness and Practice

Becken et al., (2013) described that the local people had heard about climate change, but did not know exactly what it meant and they had not paid much attention to it.. Al Mutairi and Tang (2017) stated that the way in which either people or communities responded to the climate change depends mainly on the perceptions and knowledge. Knowledge of climate change is a necessary precursor for people to adapt appropriately (Md Iqbal et al.,2016). Few studies are done across the world to assess the level of knowledge among various populations. A study conducted in Bangladesh revealed that the knowledge level about climate change was average but the perception and awareness of climate change related events and its impact on health was high among the community (Md Iqbal et. al, 2016). While the other study carried out among the community who live by the coastal regions in Malaysia found that the knowledge level of respondents on climate change is little, however most of them were aware of the changes in their surroundings (Norzaida et al.,2017). In China, Al Mutairi and Tang (2017) concluded that the community showed moderate knowledge and understanding about climate change issue causes, impacts and suggested solutions. Knowledge and confidence in one's own knowledge of climate change was investigated among experts, journalists, politicians, and laypersons in Sweden. Findings showed that the highest level of knowledge are presented by the

experts, followed by journalists, politicians, and laypersons (Sundblad et al., 2009). General knowledge of climate changes of most were not in the line of scientific observation and were limited to temperature increase or CO2 emission (Perez et al., 2010). Lower levels of education were reflected in the level of environmental knowledge (Sharifah, et al., 2005). A research executed among American public showed that women convey greater assessed scientific knowledge of climate change than men do (Mc Cright., 2010).

Variation was found in the level of public awareness of climate change in Asia with Japan, the most developed nation in this region, showed the highest level of awareness while the nations with least awareness are Pakistan and Indonesia (Muhammad Mehedi et al., 2015). Archie et al., (2018) conducted surveys regarding climate change awareness among the community of New Zealand, in which the finding identified that there was awareness about the potential threats of climate change, but there was a lack of urgency and priority when it comes to taking action. Given minimal news attention to the climate change issue during the first half of the 1980s, it is not surprising that a survey conducted in 1986 reported of only 39 percent of the public reported having "heard or read anything about the greenhouse effect (Nisbet & Myers, 2007). According to Ahmad et al., (2012), large number of people do not understand environmental problems or they are not aware of environmental issues. The findings demonstrate a high degree of awareness and concern regarding climate change issues among the corporate managers surveyed in Malaysia (Begum & Pereira, 2015). The awareness level was quite high with 95.2% of respondents sensed that climate change is happening (Norzaida et al., 2017).

Climate change has a significant impact on the well-being of all individuals concerned, however many are not aware of it (Zalina et al., 2015). Amarnanth and Tripathi (2017) suggested that though farmers are aware of long-term changes in climatic factors such as temperature and rainfall, they are unable to perceive these changes as climate change. A study was done to assess the level of environmental awareness among Malaysians and its finding shows that awareness on climate change gets the least attention compare to other environmental issues like water pollution, air pollution and waste (Neo et al., 2015). Fortunately, there has been a significant rise in awareness worldwide about climate change (Hallegatte, 2009). Deficiency of environmental awareness to overwhelming environmental problems, urbanizations, industrialization, deforestation, rising global temperature and degradation biodiversity impedes the achievements of policy makers' efforts to encounter the environmental stresses (Keles, 2012). People with high level of awareness about climate change vulnerability are more likely to act towards reducing the impact of climate change (Muhammad Mehedi, et. al, 2015).

Climate change is intertwined with human practice, how we handle the world, how we sustain our natural resources will have an impact on our future climate (Norzaida et al., 2017). Participation in environmental activities had a positive influence on knowledge (Sharifah, et al., 2005). Some people may choose not to adopt sustainable consumption practices such as involvement in recycling activities because they feel that they do not know enough about recycling (Sharifah et al., 2005).

CHAPTER 3

METHODOLOGY

This chapter explains the method and instrument used in the research. The study design, duration, population and methods used for respondents selections are also be explained.

3.1 Study design

This study was a cross sectional study which aimed to determine the knowledge, awareness and practice among the general community of Kuala Lumpur regarding climate change issue. This study was started on January 2019 till April 2019 which took 4 months of duration.

3.2 Study location

The study was carried out in Kuala Lumpur city (Figure 3.1). Kuala Lumpur is located in Peninsular Malaysia and it is the capital nation of Malaysia, with 1.9 million of population in 2018 (Department of Statistics Malaysia, 2018). Kuala Lumpur forms the core of the nation's most populous urban region and is well known for its rapid transformation and dramatic development.

Figure 3.1 : Map of Kuala Lumpur

Source : Google Photo, https://pngimage.net/kuala-lumpur-map-png-2/

There are 11 districts in Kuala Lumpur which are Bukit Bintang, Titiwangsa, Setiawangsa, Wangsa Maju, Batu, Kepong, Segambut, Lembah Pantai, Seputeh, Bandar Tun Razak and Cheras (Lim et. al, 2017). From eleven (11) districts in Kuala Lumpur, five (5) districts were chosen including Bukit Bintang, Titiwangsa, Wangsa Maju, Kepong and Cheras. For each district, the researcher selected a few public places which become the focal points of the community and this includes at the supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals (Lim et al., 2017).

3.3 Sampling Method

For selection of the districts, simple random sampling was used by using fish bowl techniques. List of districts in KL was put in the bowl and researcher randomly selected five of them. Researcher did not choose to select all eleven districts in Kuala Lumpur due to time constraint and the time frame for completing the study was to be considered. Kuala Lumpur covered an area of 244 km of Peninsular Malaysia (Illyani & Azizan, 2011) and to reach the respondents from all districts would be time consuming. After choosing the five districts as for representing Kuala Lumpur area, the researcher further choose a number of public places which become the focal points of the community and there were at the supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals (Lim et.al, 2017). The selection of these public places were done through convenience sampling and questionnaires will be

given to the public who were visiting these places. For respondents recruitement, convenient sampling was also used as this study involved a large area and to randomize the community seemed to be less possible. Figure 3.2 shows the study locations and sampling method of the study.

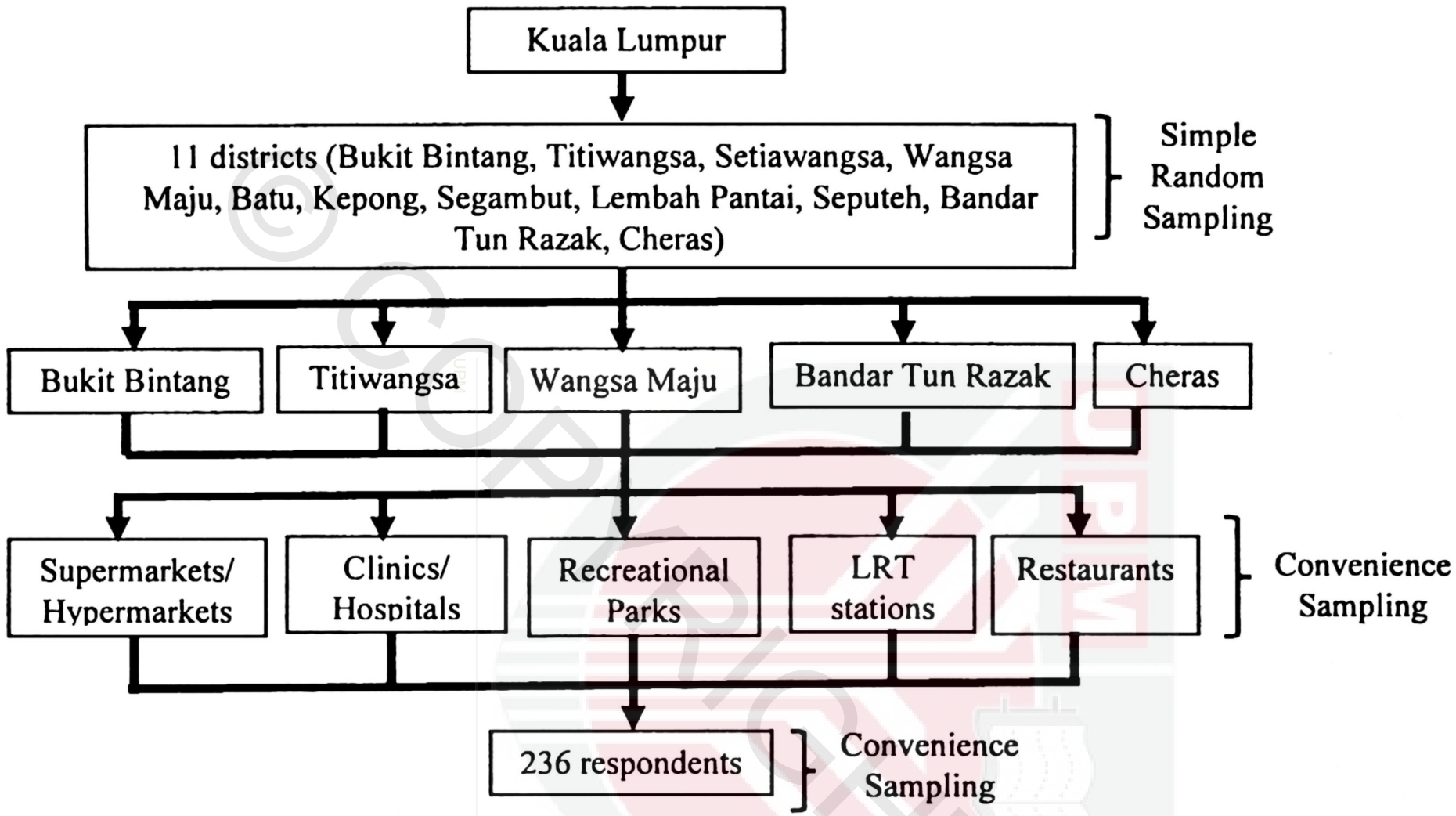

Figure 3.2 : Study locations and sampling method

3.3.1 Selection of study area

Out of eleven (11) districts in Kuala Lumpur, five (5) districts were chosen by simple random sampling. The five districts included Bukit Bintang, Titiwangsa, Wangsa Maju, Bandar Tun Razak and Cheras. For each district, few public places were selected and this includes at the supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals (Lim et.al, 2017). The selection of these public places (supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals) for each district was chosen through convenience sampling.

3.3.2 Selection of study population

For the selection of the respondents, the respondents were purposively chosen through convenience sampling. As the data collection involved five (5) public places (supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals) in every five (5) districts (Bukit Bintang, Titiwangsa, Wangsa Maju, Segambut and Cheras), thus each public place had about ten (10) questionnaires been distributed to the respondents. For instance, 10 questionnaires were distributed at supermarket in Bukit Bintang, the other ten (10) were handed out at a restaurant in Bukit Bintang and this also applied to the other selected districts as well. This was to ensure that the number of respondents were equally distributed among all selected districts.

3.4 Sampling Frame

The sampling frame was the local community who visited or passed-by the selected public places (supermarkets, restaurants, recreational park, LRT stations and clinics/hospitals) at selected district (Bukit Bintang, Titiwangsa, Wangsa Maju, Segambut and Cheras) in Kuala Lumpur.

3.5 Sampling Unit

The general community who fulfilled the inclusive criteria and who were willing to participate in the study were selected as the sampling unit. The inclusion criteria for the sampling units are as follows :

I. Inclusion criteria

1. The community age 15 and above (Taghizadeh et al., 2012).
2. The community who live in Kuala Lumpur for at least 1 year (Taghizadeh et al., 2012).

3.6 Sample Size

For sample size calculation, the sample size formula of proportion for one group was used. (Lemeshow et al., 1990).

$$n = \frac{z^2_{1-\alpha/2} - P(1-P)}{d^2} \qquad \text{Eq 3.1}$$

Where:

n = Sample size

$z^2_{1-\alpha/2}$ = Standard errors associated with confidence interval = 1.96

P = Prevalence of estimated proportion

d = Desired precision

The percentage of prevalence was taken as 83.3 % which presented the prevalence of public knowledge about climate change among the community in Sabak Bernam coastal areas (Norzaida et al., 2017). Therefore, by computing the prevalence of public knowledge on climate change, the sample size was calculated with 95% confident interval (1.96 of standard error) and 0.05 of desired precision.

$$n = \frac{(1.96)^2\ (0.83)\ (1-0.83)}{0.05^2}$$

$$n = 213.7$$

$$\approx 214 \text{ community}$$

Taking into consideration of any dropouts or missing data during collection, 10% from the total sample size calculated was added (Bartlett et. al, 2001). Therefore, the total sample size for this study was 236 participants.

3.7 Study Instrumentation

3.7.1 Questionnaire

A self administered questionnaire in bilingual, Malay and English was used during the data collection. The questionnaire consist of five sections with the details as follows :

Part A : Socio-demographic Characteristics

In this section, there were total of 9 questions asked including gender, ethnicity, age, family income, education level, marital status, occupation, years of living in Kuala Lumpur as well as the household size.

Part B : Knowledge on Climate Change

There are 15 questions asked to identify the respondents' knowledge about climate change. The questions covered the facts about climate change, its causes and its potential impacts. The questionnaires were adopted and modified from Yale University's "Six Americas" survey. The previous study also used similar questionnaire, for instance, a study done by Skeele and Okano (2014) which examined the knowledge and perceptions of public on climate change in

Commonwealth of the Northern Mariana Islands (CNMI). This part was designed as a simple-tick pattern with 'yes', 'no' and 'not sure' as the answer options.

Part C : Awareness on Climate Change

The questions for this section were also adopted and modified according to suitability to this study from Yale University's "Six Americas" survey. There were 13 questions in this part and examples of the questions asked were; 'Climate change and global warming are really happening now' and 'what I do on daily basis may contribute to climate change problems'. For questions 1 to 12, Likert - type scale from 1 (strongly disagree) to 4 (strongly agree) was used to indicate respondents' level of agreement to each statement.

For question 13, respondents were required to answer from what sources they have heard about climate change/ global warming. This question is to identify where people most likely get their information about climate change, which in turn, make them aware about the issue.

Part D : Practice on Climate Change

The questions from this part were adopted and modified from World Health Organization (WHO) Revised Baseline KAP Report. 12 questions were asked to evaluate the participants' practice which may help to reduce the impacts of climate change. The respondents were asked to rate the frequency of sustainable practices

through Likert - type scale from 1 (never), 2 (seldom), 3 (frequent) amd 4 (always). Example of statements in this section were; "I practice car pooling" and ''I practice recycling''.

Part E : Recommendation on Mitigating Climate Change

Section E is an open ended questions for community's recommendations.

3.8 Procedure of Data Collection

The data collection process started prior to the approval by Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (UPM). The data collection involved the general community of Kuala Lumpur who were purposively selected and were willing to participate in the study. Before the questionnaire was given out, the respondents were asked first if they are the residents of Kuala Lumpur. This is to avoid the possibility that the respondents encountered are not Kuala Lumpur residents, but they were probably be around for working or visiting the city. Most of the respondents, especially the teenagers were also first asked for their age. This is to ensure that all of the respondents fulfill the inclusion criteria. Before the questionnaires were distributed, the respondents were briefed about the study purpose and they were also be given with both oral and written consent form. The respondents who fulfilled the inclusion criteria and agreed to participate were also being instructed on how to fill in the questionnaires and they were also regularly reminded by researcher to honestly answer the questions. Besides that, interview session were also conducted to some of the respondents, particularly the elderly and the ones who are illiterate, which were interested to participate in the study but refused to fill in the questionnaire by themselves. Researcher then took the initiative to read the questions as if it was an interview session and helped them to fill in the questionnaire. Token of appreciation was given to each of the respondent and the questionnaires were being collected. The data collection took four (4) consecutive weeks to be completed.

3.9 Data analysis

3.9.1 Descriptive Statistics

Descriptive tests were used for analyzing sociodemographic informations, knowledge, awareness and practice levels among the respondents.

Data analysis was done by using ''Statistical Package for Social Sciences (SPSS)'' Version 22.0. The scoring method for each knowledge, awareness and practice part are as follows :

1. Knowledge scoring method

   Right answer : 1 point

   Wrong / Not Sure answers : 0 point

   The overall scores were counted and translated in categorical form, comprised of 3 levels which were ; low, moderate and high knowledge. Possible scores, ranged between 0 to 15 points. A mean score and standard deviation of the group were used to classify subject into 3 levels as follow (Ajit, 2010):

Knowledge Level	Scores
Good level	score > Mean + S.D
Moderate level	score = Mean +/- S.D
Low level	score < Mean - S.D

2. Awareness scoring method

The questions on awareness on climate change consisted of 12 Likert-Scale type of questions, thus the following scoring criteria was followed :

Strongly Agree answer : 4 points

Agree answer : 3 points

Disagree answer : 2 points

Strongly Disagree answer : 1 point

For this part, the range of possible scores were between 12 to 48 points. The obtained scores of each participant was counted and divided with the maximum scores, which is 48 and then multiplied by 100%. The percentage represented the final score and classified into 4 quartiles of (0-25% ; 26-50% ; 51-75% and 76-100%). The awareness level of the subjects were classified according to their scores as follows (Nagra, 2010):

Awareness Level	Quartile range (scores)
Low level	0-25%
Moderate level	26-50%
High level	51-75%
Very high level	76-100%

3. Practice scoring method

There were 12 Likert-Scale type questions on practices on climate, thus the following scoring criteria was followed :

Always answer : 4 points

Frequent answer : 3 points

Seldom answer : 2 points

Never answer : 1 point

The obtained scores were counted and translated in categorical form, comprised of 2 groups which were ; good and poor. Possible scores, ranged between 12 to 48 points. A mean score and standard deviation of the group were used to classify subject into 2 levels as follow (Ajit, 2010):

Practice Level	Scores
Good level	score > Mean + S.D
Moderate level	score = Mean +/- S.D
Poor level	score < Mean - S.D

In addition, descriptive tests were also used to determine the sources of information about climate change as well as the factor that prevent community from taking actions on climate change.

3.9.2 Analytical Statistics

Spearman correlation tests was used to analyze the association between knowledge, awareness and practice scores. Spearman correlation was used as the data for both continuous data were not normally distributed. Besides that, Chi Square test were used to identify the association between knowledge and awareness level with educational status. Chi square test was preferred to analyze the association between two categorical data.

3.10 Quality Control

The questionnaires used were adopted from Yale University's "Six Americas" survey and World Health Organization (WHO) Revised Baseline KAP Report. The previous study also used similar questionnaire, for instance, a study done by Skeele and Okano (2014) which examined the knowledge and perceptions of public on climate change in Commonwealth of the Northern Mariana Islands (CNMI). Before the data collection was conducted, pre-test was executed over 10% of sample size to test the internal reliability and consistency as well as to remove any problems before the main survey. The pre-test was conducted among 24 general community in Kajang, Selangor as for representing the ten percent of 236 total respondents. The respondents who participated in the pre-test were not included in the main survey. The questionnaire was then analyzed in Statistical Package for Social Sciences (SPSS) Version 22.0 and reliability test was been done. The Cronbach's alpha value was 0.74 which indicated that the reliability of the questionnaire was acceptable. Bryman and Cramer (2005) stated that, Cronbach alpha value of 0.7 or more was acceptable for reliability test of the questionnaire.

3.11 Ethical Consideration

Ethical approval was obtained from Ethics Committee Universiti Putra Malaysia (JKEUPM-2018-363). Recruitement of the respondents was based on voluntary basis, in which the respondents could either agree or not

agree to participate in the study. For those who volunteered to participate and fulfilled the inclusive criteria, they were asked to give their written permission through the consent form. The respondents were also assured that the privacy and confidentiality of their personal information remained secured.

CHAPTER 4

RESULTS

This chapter reported the descriptive and analytical statistics on sociodemographic information, knowledge, awareness and practice. For descriptive statistics, information on sociodemographic, level of knowledge about climate change, awareness about the issue and the community current practice were presented. There were also descriptive finding on the sources of information about climate change as well as the recommendations from community. Whereas for analytical findings, the results on association between knowledge, awareness and practice were shown as well as the association between KAP with age and educational status.

The study were supposed to recruit 236 respondents as for representing the sample size. However, only 232 questionnaires were analysed due to incomplete and missing data in the rest 4 questionnaires, thus made the response rate to be 98%.

4.1 Socio-demographic Characteristics

Socio-demographic characteristics of the respondents consist of informations on gender, age, family income, educational level, years of living in Kuala Lumpur, marital status, occupation and household size.

In terms of gender, the respondents comprised of 123 females (53%) and 109 males (47%). For ethnicity, the dominant race was Malay with 188 participants (81%). Majority of the respondents were within the age range between 25 to 40 years old with 102 participants (44.0%).

In terms of family income, 34 repondents (14.7%) reported of less than RM1000 of monthly income, while 53 respondents (22.8%) had income of more than RM5000 per month.

For educational level, it was divided into 2 categories, which were low education and high education. The respondents who received no education, had primary education as well as secondary education, they were classified as having low education. Whereas the ones who received tertiary education (diploma or matriculations, Bachelor's Degree, Master's Degree and PhD), they were perceived as having high education. According to the results of this study, 78 respondents (33.6%) had low education., while 154 respondents (66.4%) acquired high education.

Many of the respondents, n=82 (35.3%) have lived in Kuala Lumpur all their lives. 1 respondent (0.4%) reported of living in KL for 41-50 years.

Next, for marital status, majority were single which comprised of 141 (60.8%), the other 89 respondents (38.4%) were married and 2 (0.9%) were divorced.

With regards of occupation, most of the respondents (40.9%) were employed in private sector, and 2 respondents (0.9%) were retiree.

Table 4.1 shows the socio-demographic information of the respondents.

Table 4.1 : Socio-demographic Characteristics of Respondents

Socio-demographic Characteristics	Number (n)	Percentage (%)	Mean (SD)	Min-Max
Gender				
Male	109	47.0		
Female	123	53.0		
Ethnicity				
Malay	188	81.0		
Chinese	21	9.1		
Indian	19	8.2		
Others	4	1.7		
Age				
15-24 years old	83	35.8		
25-40 years old	102	44.0		
41-60 years old	39	16.8		
Above 60	8	3.4		
Family Income				
Less than RM1000	34	14.7		
RM1000-RM2000	50	21.6		
RM2001-RM3000	33	14.2		
RM3001-RM4000	40	17.2		
RM4001-RM5000	22	9.5		
Above RM5000	53	22.8		

Educational Level		
Low education (no education, primary education and secondary education)	78	33.6
High education (diploma or matriculations, Bachelor's Degree, Masters and PhD)	154	66.4
Years of living in KL		
1-5 years	58	25.0
6-10 years	37	15.9
11-20 years	48	20.7
21-30 years	0	0
31-40 years	6	2.6
41-50 years	1	0.4
All my life	82	35.3
Marital status		
Single	141	60.8
Married	89	38.4
Divorced	2	0.9
Occupation		
Government sector	20	8.6
Private sector	95	40.9
Self-employed	41	17.7

Retiree	2	0.9		
Not employed	16	6.9		
Student	58	25.0		
Household size			4.25	1-12

4.2 Level of Knowledge on Climate Change

15 questions were asked to identify the respondents' knowledge about climate change. For every correct answer, 1 point was obtained while for any wrong and not sure answer, 0 point was given. The total score was translated to score level and classified into 3 levels (low, moderate and high knowledge). The possible scores were 0-15 points. Mean score for knowledge was 10.97 while standard deviation obtained was 2.654 and these values were used to classify subjects into 3 knowledge levels as follows (Ajit, 2010) :

Low level : score of 0 - 7

Moderate level : score between 8 - 14

High level : score of more than 14

Table 4.2 showed the result on knowledge level of community on climate change. 23 (9.9%) of respondents had low knowledge, majority 197 (84.9%) had moderate knowledge while only 12 (5.2%) were reported with high knowledge.

Table 4.2 Level of knowledge on climate change among urban community

Knowledge level	Number (n)	Percentage (%)
Low	23	9.9
Moderate	197	84.9
High	12	5.2

(N=232)

The following figures show the detailed findings on percentage of answers of knowledge about climate change among the respondents. The informations could give us the sight to what extent the general community knew about climate change.

Question 1: Global warming is caused by the increasing concentration of carbon dioxide, and other greenhouse gases in the atmosphere.

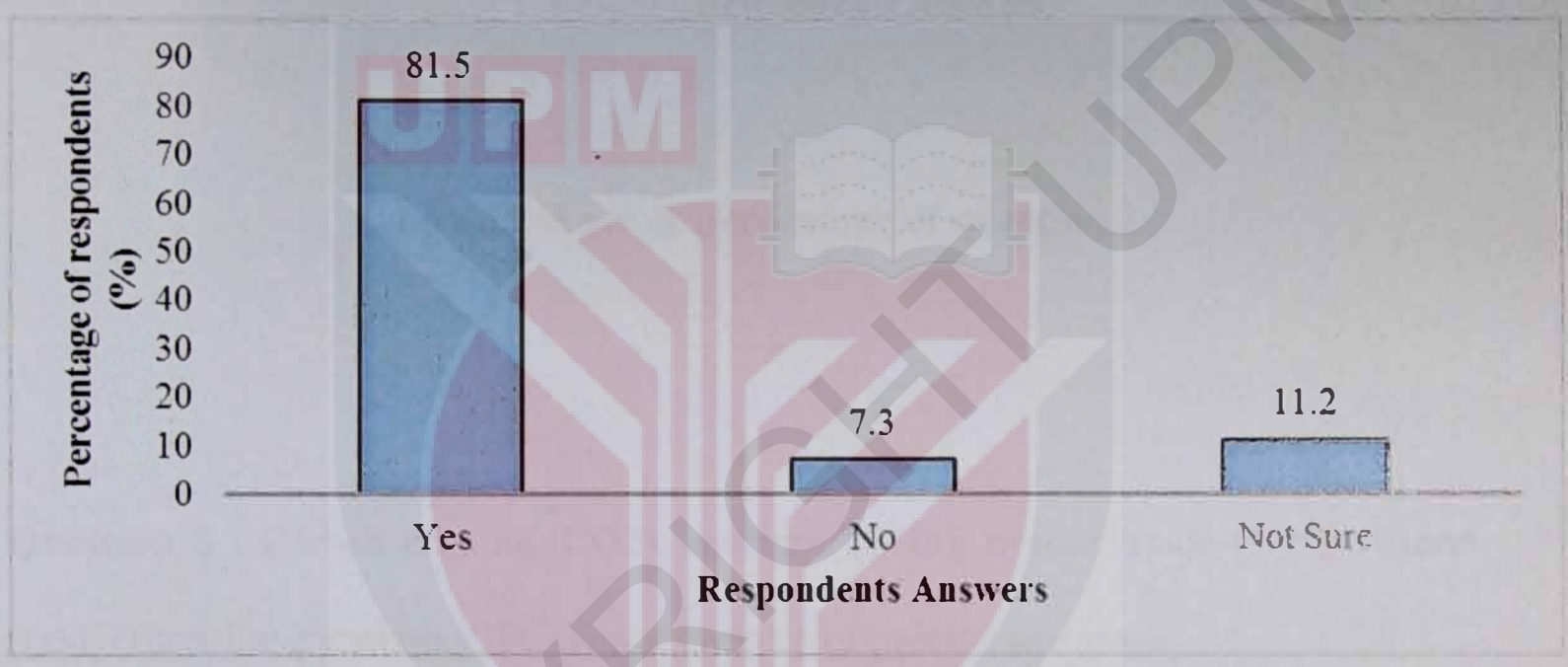

Figure 4.1 Answer percentage of question 1

Question 2 : Global warming and climate change are the same thing

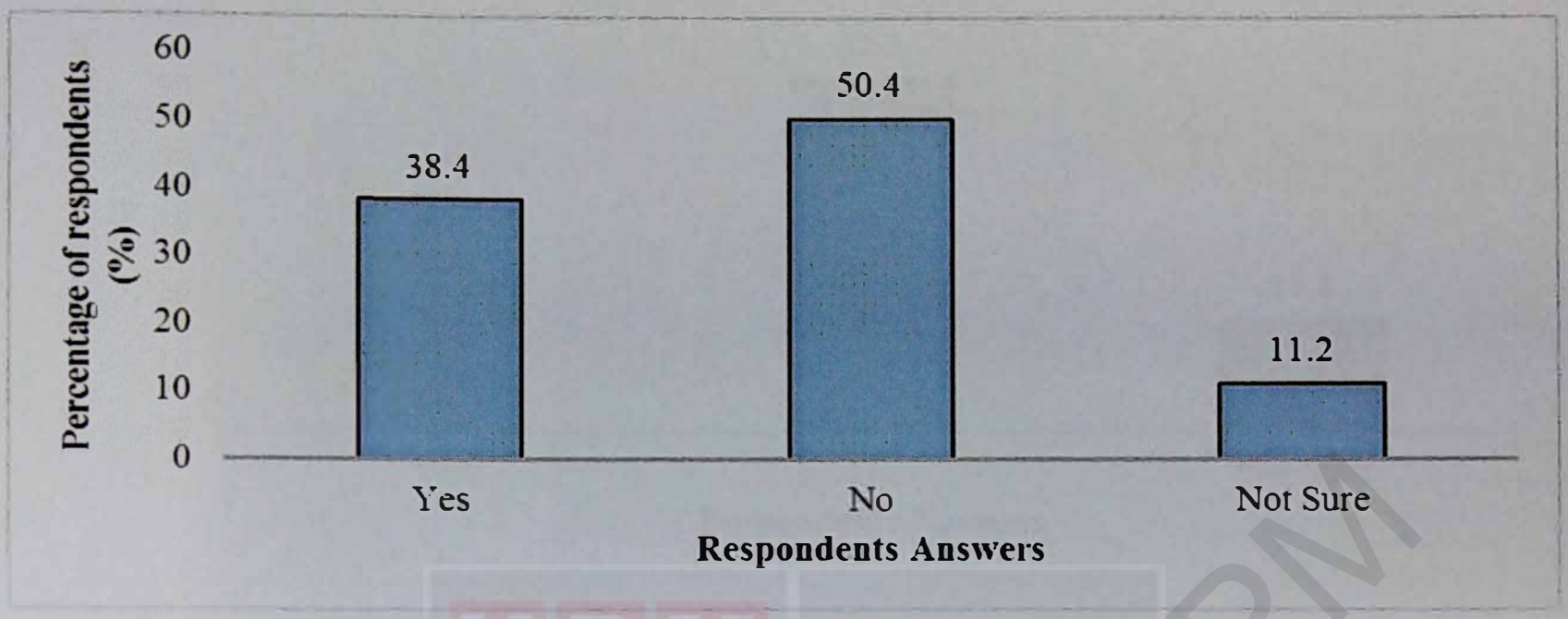

Figure 4.2 Answer percentage of question 2

Question 3 : Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), ozone (O3), chlorofluorocarbon (CFCs) are examples of greenhouse gases

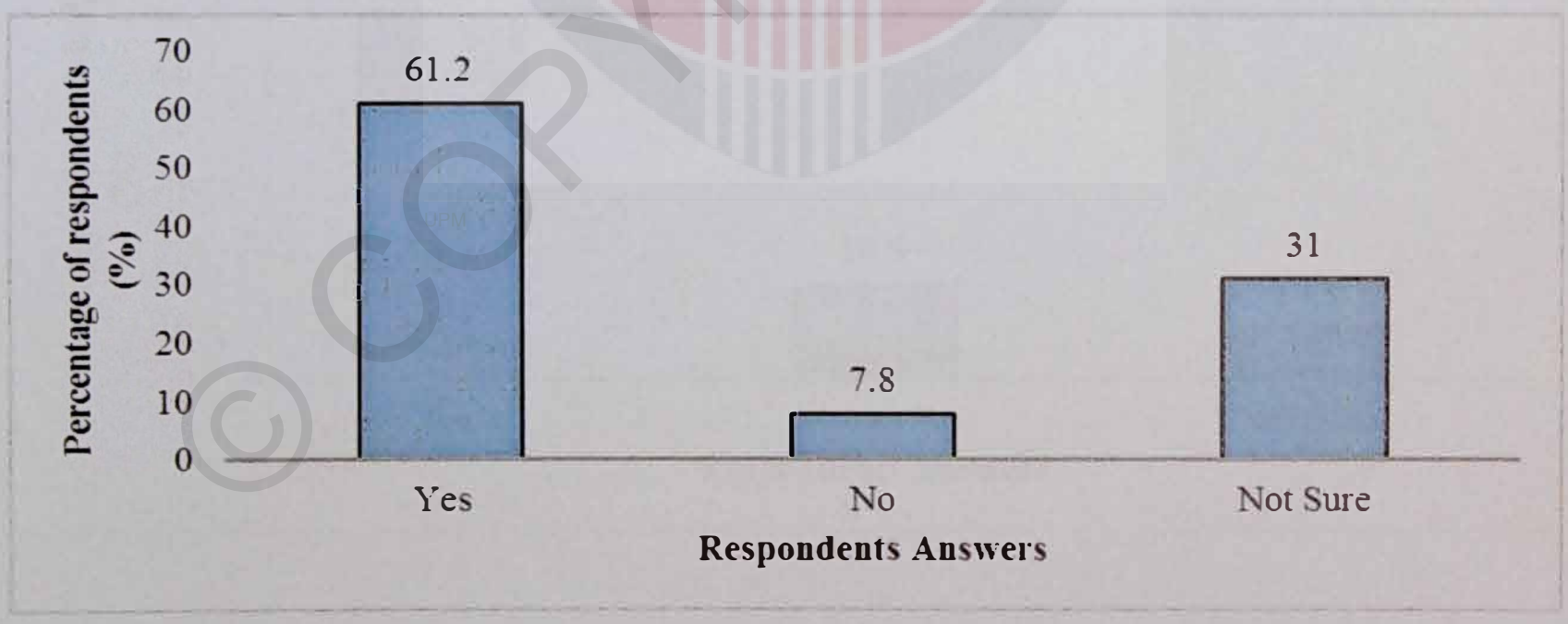

Figure 4.3 Answer percentage of question 3

Question 4 : Agricultural activities can cause global warming and climate change

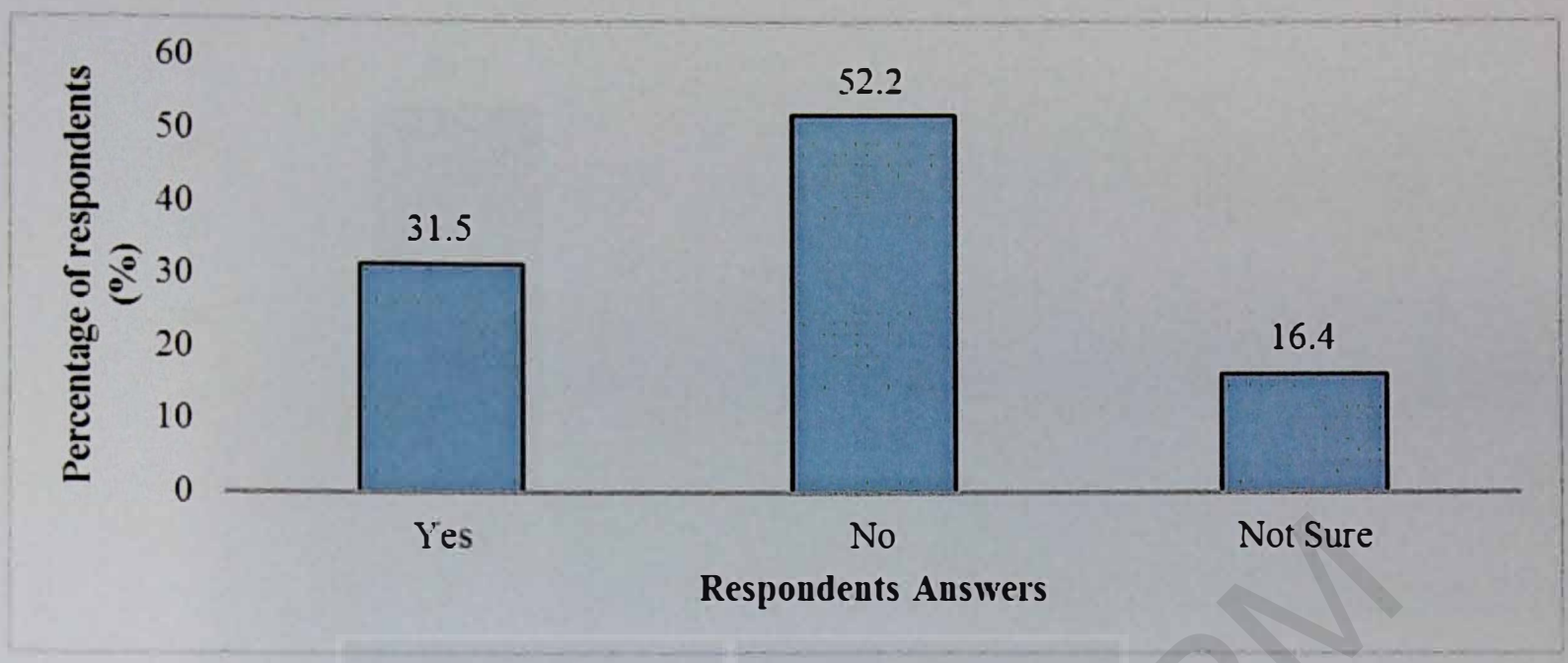

Figure 4.4 Answer percentage of question 4

Question 5 : High use of energy / electrical energy can cause global warming and climate change

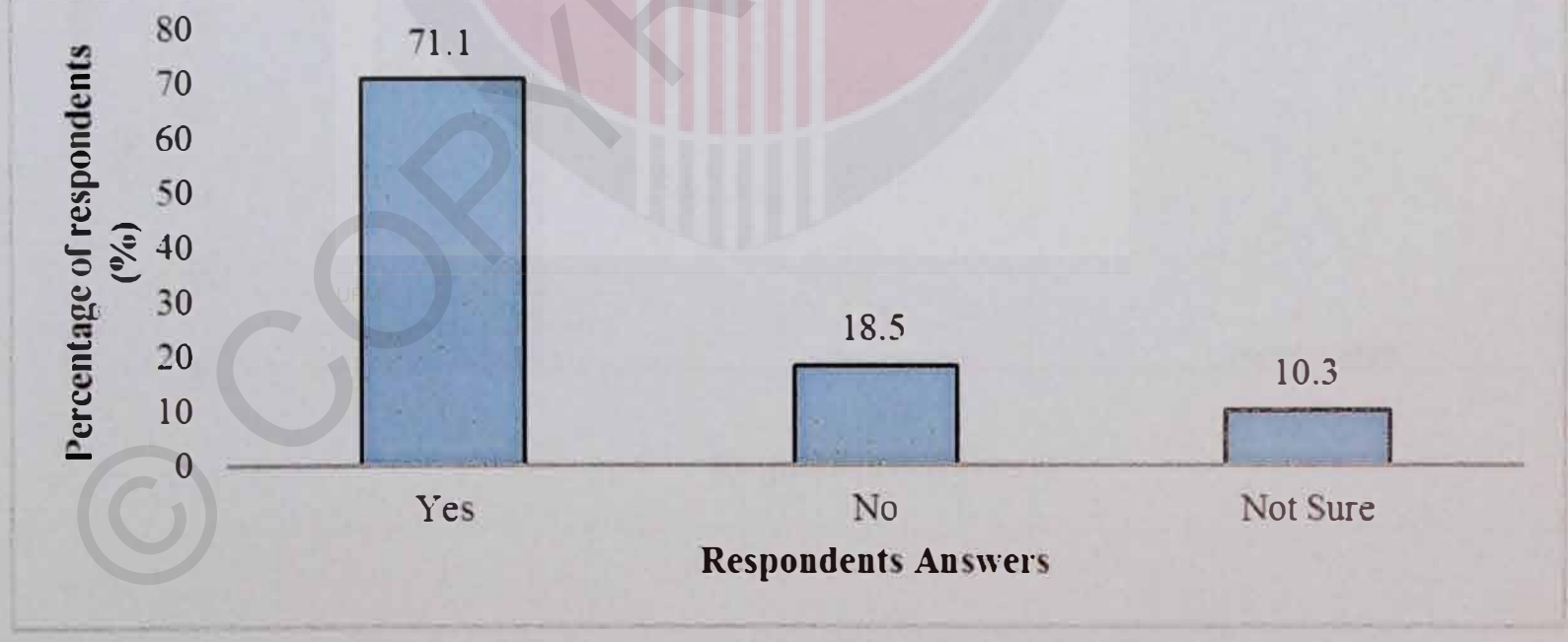

Figure 4.5 Answer percentage of question 5

Question 6 : Industrial activities can cause global warming and climate change

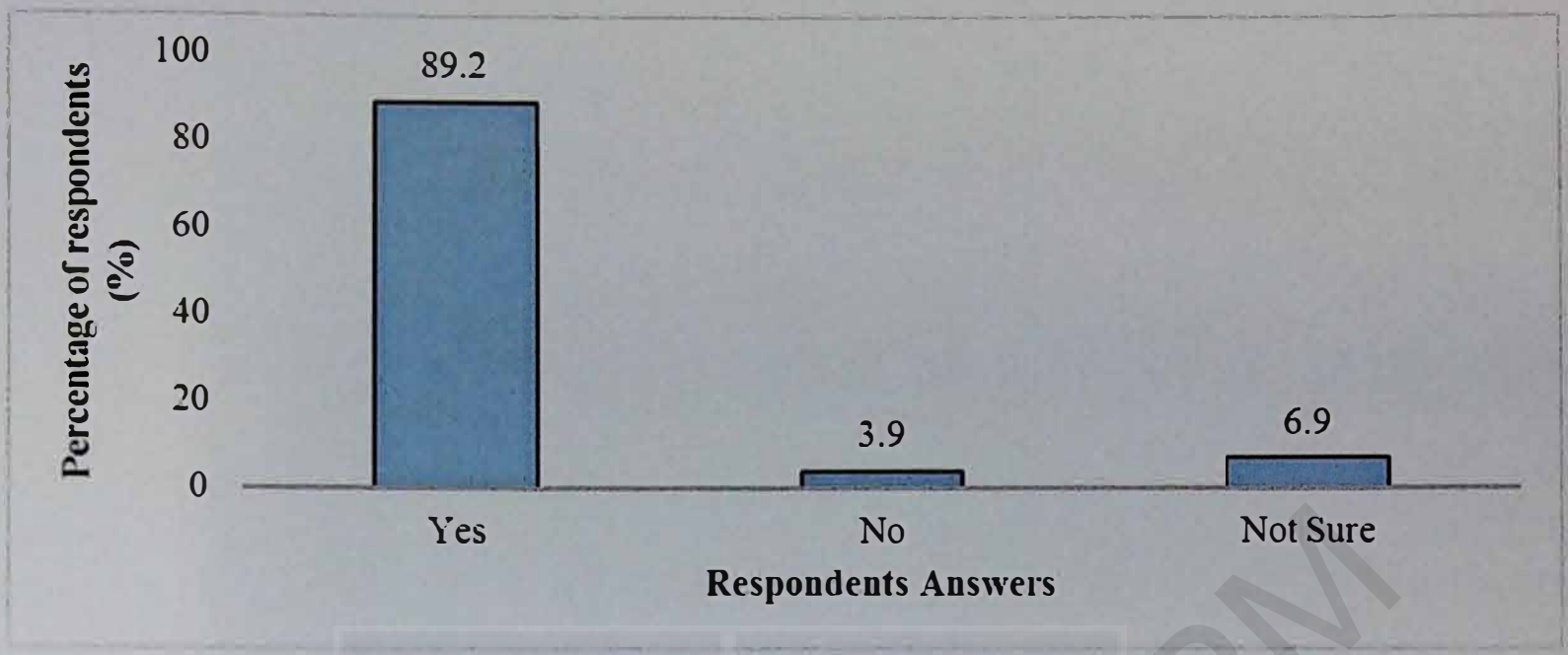

Figure 4.6 Answer percentage of question 6

Question 7 : Waste burning activity can cause global warming and climate change

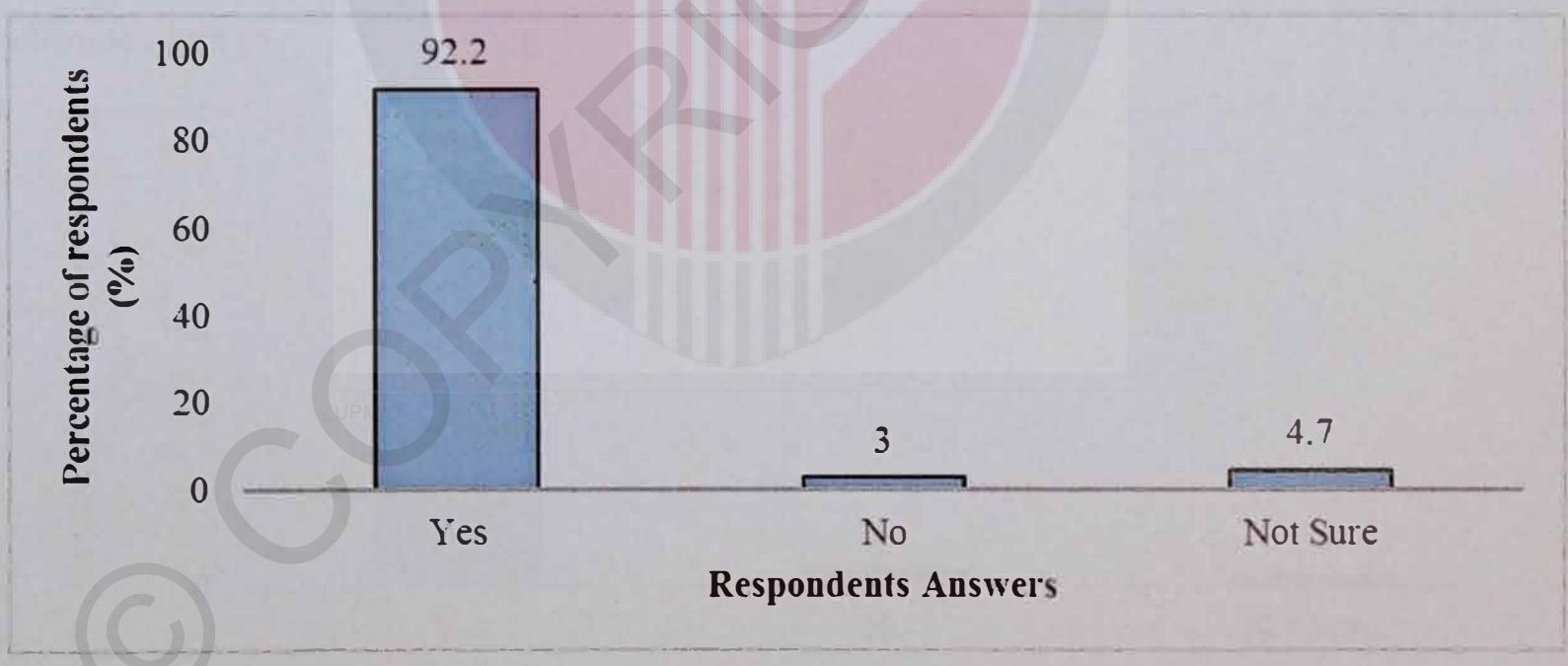

Figure 4.7 Answer percentage of question 7

Question 8 : Traffic / motor vehicles can cause global warming and climate change

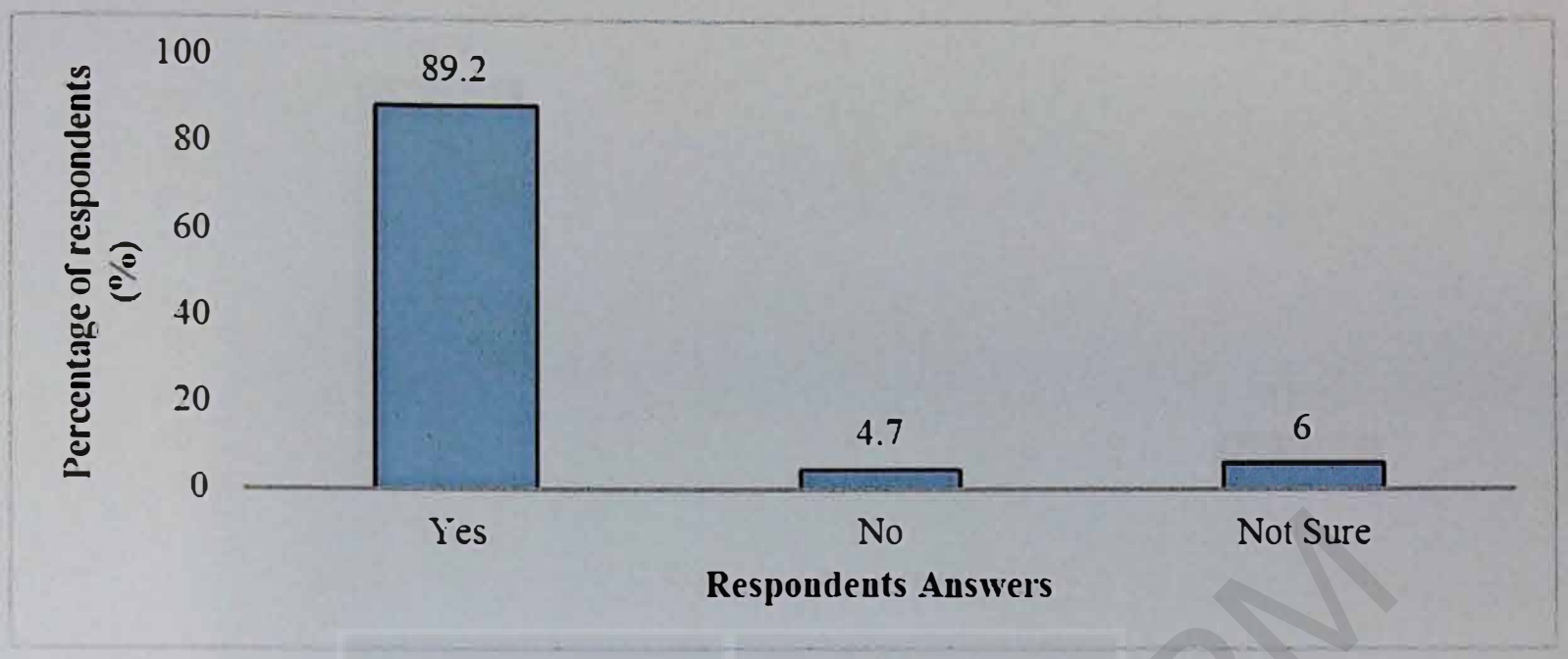

Figure 4.8 Answer percentage of question 8

Question 9 : Deforestation (cutting down forest) can cause global warming and climate change

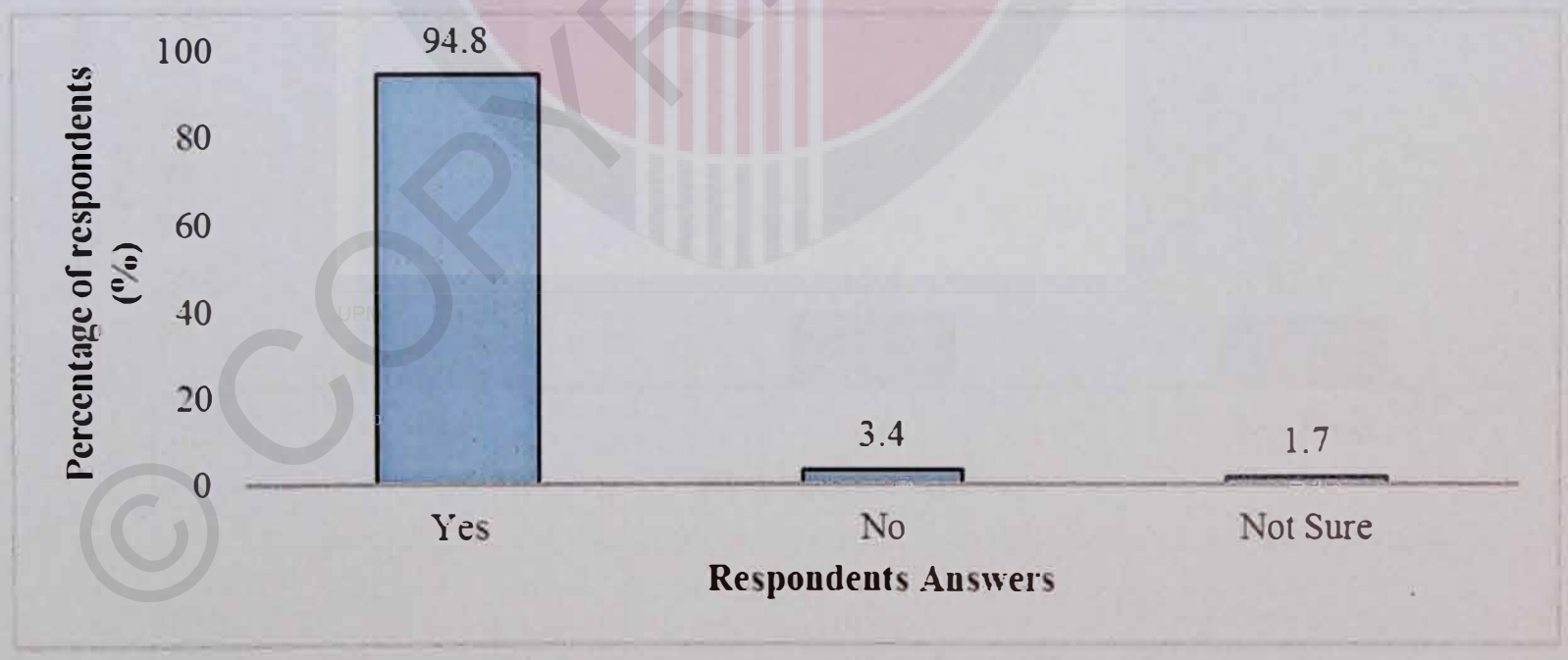

Figure 4.9 Answer percentage of question 9

Question 10 : Climate change can reduce crop yield

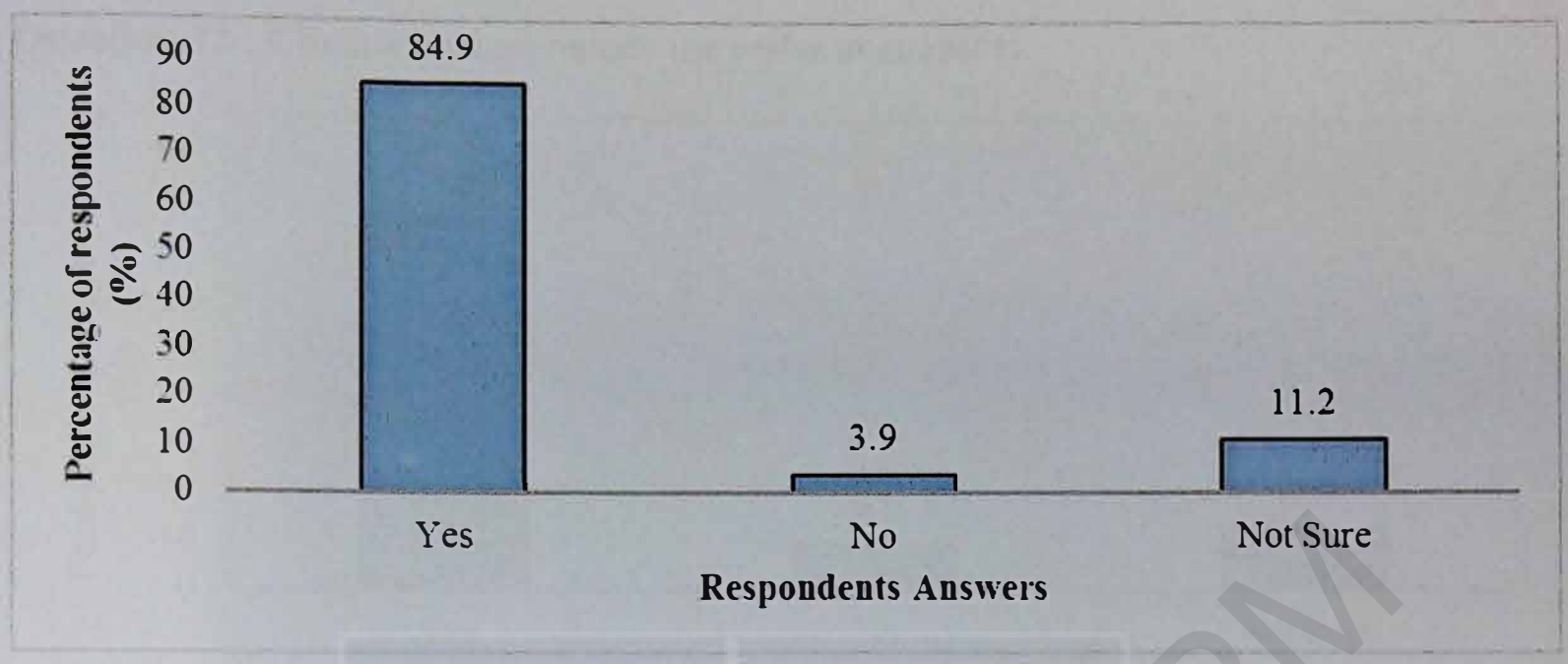

Figure 4.10 Answer percentage of question 10

Question 11 : Climate change can decrease food supplies

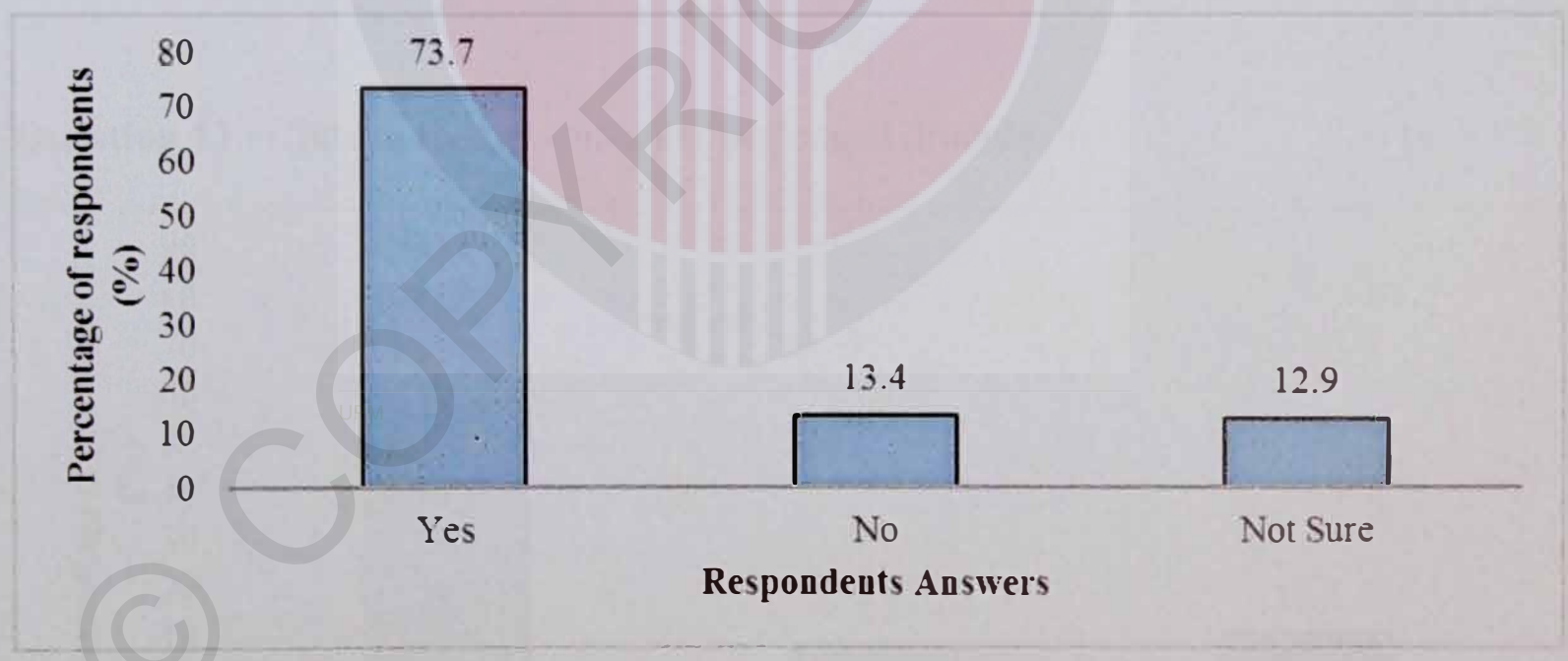

Figure 4.11 Answer percentage of question 11

Question 12 : Climate change reduce the water availability

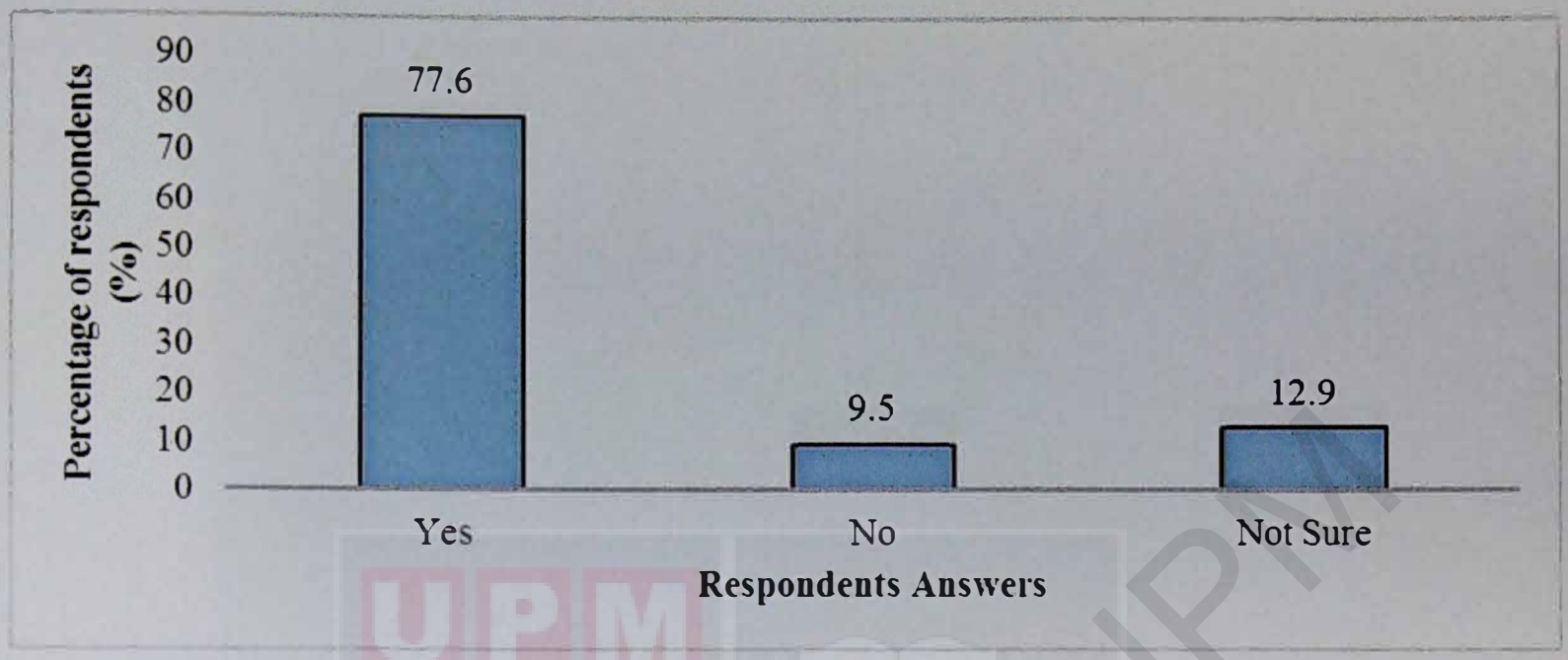

Figure 4.12 Answer percentage of question 12

Question 13 : Climate change can cause prolonged drought

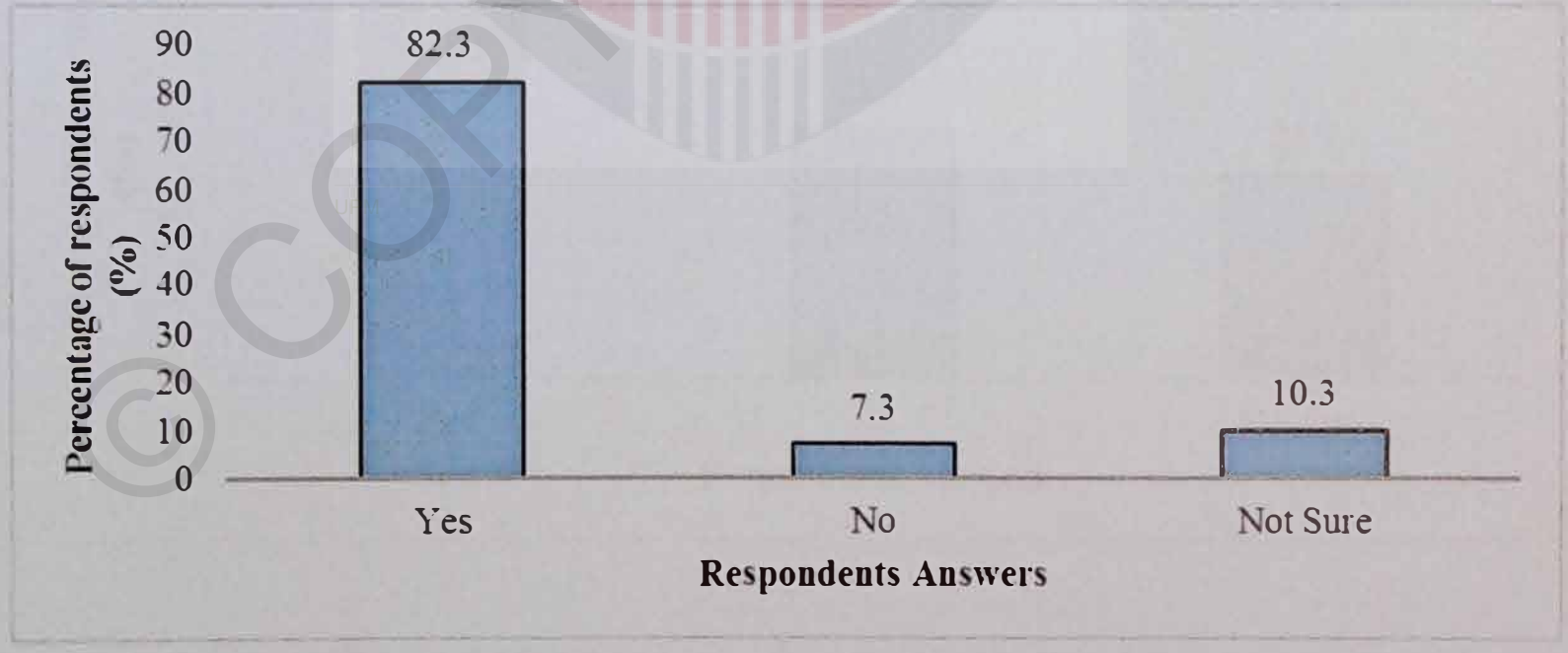

Figure 4.13 Answer percentage of question 13

Question 14 : Climate change can cause flood

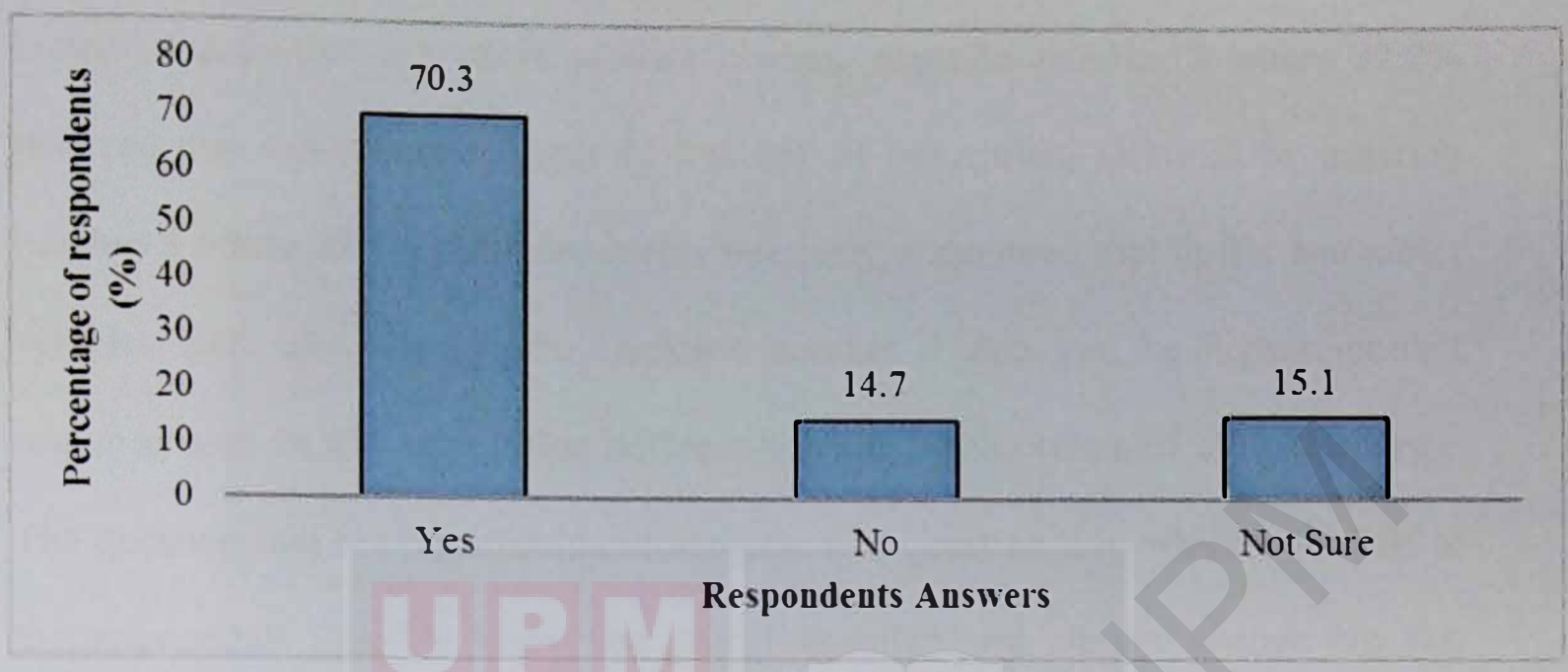

Figure 4.14 Answer percentage of question 14

Question 15 : Climate change can increase the cases of dengue

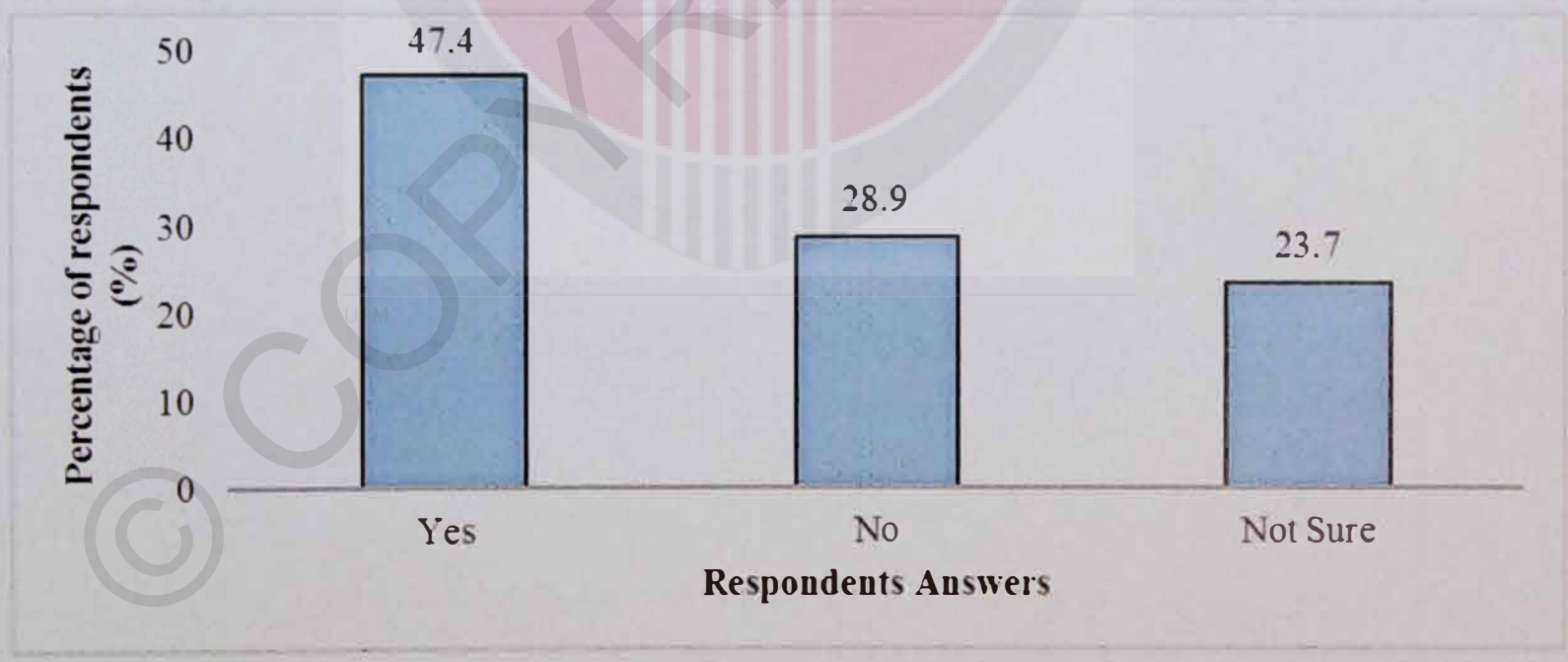

Figure 4.15 Answer percentage of question 15

From the results, it was found that the questions with the highest score were question number 6 in which 89.2% of the sampled population perceived that industrial activities can cause climate change, question number 7 where 92.2% believed that waste burning activity was one of the causes, followed by question number 8 where 89.2% the respondents relatively understood that traffic and motor vehicles were also the culprit. Question number 9 also got the highest correct response with 94.8% agreed that deforestation can be the cause of climate change. The question that the respondents scored less was question 2 in which only half of the respondents (50.4%) knew that global warming and climate change are two different things. The next question that the respondents scored the least was question 4 where only 31.5% understood that agricultural activities could contribute to climate change as well. The other question that the respondents scored less is question 15 in which only 47.7% knew that climate change can cause dengue cases to increase, while the rest did not know about dengue as one of the impact of climate change.

4.3 Level of Awareness on Climate Change

For awareness part, the concern of the respondents about climate change were assessed in which they could either agree or disagree with the statements given in the questionnaires. There were 12 questions for this part. For strongly agree answer, 4 points were given, while the score for agree answer is 3, followed by disagree answer with score of 2 and lastly, 1 point for strongly disagree answer. Possible scores were 12-48. The obtained scores of each participant was counted and divided with the maximum scores and then multiplied by 100%. The percentage represented the final score and classified into 4 quartiles of (0-25% ; 26-50% ; 51-75% and 76-100%). The awareness level of the subjects were classified according to their scores as follows (Nagra, 2010):

Low level : score of 0-25%

Moderate level : score of 26-50%

High level : score of 51-75%

Very high level : score of 76-100%

Table 4.3 showed the result on awareness level of community on climate change. None of the respondents had low awareness, 12 (5.2%) had moderate awareness while 80 (34.5%) were reported with high awareness and majority which were 140 (60.3%) had very high awareness.

Table 4.3 Level of awareness on climate change among urban community

Awareness level	Number (n)	Percentage (%)
Low	0	0
Moderate	12	5.2
High	80	34.5
Very High	140	60.3

(N=232)

Table 4.4 shows the detailed findings on percentage of answers of awareness about climate change among the respondents.

Table 4.4 Awareness on Climate Change

No	Questions	n (%)			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1	I have heard about 'climate change'	93 (40.1%)	115 (49.6%)	12 (5.2%)	12 (5.2%)
2	I have heard about 'global warming'	101 (43.5%)	107 (46.1%)	12 (5.2%)	12 (5.2%)
3	Climate change and global warming are really happening now	104 (44.8%)	109 (47.0%)	12 (5.2%)	7 (3.0%)
4	The main factor of climate change is because of human activities	115 (49.6%)	92 (39.7%)	17 (7.3%)	8 (3.4%)
5	Climate change and global warming are important issues for me	98 (42.2%)	115 (49.6%)	9 (3.9%)	10 (4.3%)
6	The weather is warmer now than it has ever been before	128 (55.2%)	94 (40.5%)	4 (1.7%)	6 (2.6%)
7	Occurence of floods, landslides, storm and earthquakes are frequently happening in Malaysia	84 (36.2%)	94 (40.5%)	42 (18.1%)	12 (5.2%)
8	The occurence of floods, landslides, storm and earthquakes in Malaysia are	71 (30.6%)	103 (44.4%)	40 (17.2%)	18 (7.8%)

	evidences of climate change				
9	Climate change are likely to be catastrophic to humans and environment	95 (40.9%)	116 (50.0%)	15 (6.5%)	6 (2.6%)
10	Climate change can affect people's health	103 (44.4%)	110 (47.4%)	9 (3.9%)	10 (4.3%)
11	What I do on daily basis may contribute to climate change problems	54 (23.3%)	96 (41.4%)	58 (25.0%)	24 (10.3%)
12	We need to change our behaviour to reduce the impact of climate change	114 (49.1%)	95 (40.9%)	12 (5.2%)	11 (4.7%)

Based on the results shown in the table above, there were some statements in which most of the respondents mostly agreed with. For instance, question number 6 in which 55.2 % were strongly agreed that the Earth now is warmer than it has been before. However, 2.6% of the respondents strongly objected the statement and they did not perceive the Earth temperature has now becoming warmer. The next question that the respondents largely agree with was question 4 where 49.1% most aware that human activities are the main factor of climate change. Besides that, 49.1% of respondents mostly agreed with the statement in question 12 that we need to change behavior to reduce the impact of climate change.

Nevertheless, there were also few issues that the respondents felt not agreed with. In question 11, there were 10.3% of respondents who strongly disagreed with

the fact that what they do on daily basis may contribute to climate change, with another 25% answered as disagreed. Regardless of the high knowledge that most respondents acquired, the result still showed that more than 35% respondents did not aware that their daily activities can contribute to climate change. Apart from that, most of the sampled population did not aware that the occurrence of floods, landslides, storm and earthquakes happened more frequent that it has been before in our country. In question 7, 42 people (18.1%) answered 'disagree' while 12 respondents (5.2%) answered 'strongly disagree' for the question. Last but not least, for question number 8, there were 40 respondents (17.2%) who strongly disagreed and the other 18 (7.8%) disagreed. This shows that 25% people failed to perceive the reality that the occurence of floods, landslides, storm and earthquakes in Malaysia are evidences of climate change.

4.4 Level of Practice on Climate Change

There were 12 questions asked to discover the current practice of sample population on lessening the causes climate change via human activities. The respondents were given with 'never', 'seldom', 'frequent' and 'always' as answer choices to indicate of the frequencies of their sustainable practices. The scores of 1, 2, 3 and 4 were given respectively. With possible scores of 12-48, the total points were translated to score level and classified into 3 levels (poor, moderate and good practice). Mean score for practice was 33.03 while standard deviation obtained was 5.754 and these values were used to classify subjects into 3 practice levels as follows (Ajit, 2010):

Poor level : score of 12 - 26

Moderate level : score between 27 - 39

Good level : score of 40 - 48

Table 4.5 showed the result on practice level of community on climate change. 28 (12.1%) of respondents had poor practice, majority 174 (75.0%) had moderate practice while only 30 (12.9%) were reported with good practice.

Table 4.5 Level of practice on climate change among urban community

Practice level	Number (n)	Percentage (%)
Poor	28	12.1
Moderate	174	75.0
High	30	12.9

(N=232)

Table 4.6 shows the detailed findings on percentage of answers of practice about climate change among the respondents.

Table 4.6 Practice on Climate Change

No	Questions	n (%)			
		Never	Seldom	Frequent	Always
1	I will turn the lights off when it is not in use	6 (2.6%)	14 (6.0%)	71 (30.6%)	141 (60.8%)
2	I will turn the fans off when it is not in use	5 (2.2%)	32 (13.8%)	56 (24.1%)	139 (59.9%)
3	I practice recycling	21 (9.1%)	110 (47.4%)	64 (27.6%)	37 (15.9%)
4	I reuse things rather than purchasing new items	20 (8.6%)	104 (44.8%)	80 (34.5%)	28 (12.1%)
5	If I have reused items that still can be used, I will give/ donate it to others instead of discarding it	13 (5.6%)	50 (21.6%)	115 (49.6%)	54 (23.3%)
6	I practice car pooling	40 (17.2%)	92 (39.7%)	56 (24.1%)	44 (19.0%)
7	I walk / cycle more frequently rather than driving car	34 (14.7%)	92 (39.7%)	52 (22.4%)	54 (23.3%)
8	I take bus/ comuter/ LRT/ MRT more frequent rather than driving	31 (13.4%)	82 (35.3%)	44 (19.0%)	75 (32.3%)
9	I use fluorescent/energy saving light bulbs	39 (16.8%)	57 (24.6%)	76 (32.8%)	60 (25.9%)
10	I choose to use fans mostly in home rather than air conditioner	9 (3.9%)	51 (22.0%)	81 (34.9%)	91 (39.2%)
11	I choose to use fans mostly in my workplace rather than air conditioner	62 (26.7%)	79 (34.1%)	49 (21.1%)	42 (18.1%)
12	I plant trees at home	59 (25.4%)	65 (28.0%)	56 (24.1%)	52 (22.4%)

Based on the results potrayed in Table 4.4.1, there were 110 respondents (47.4%) seldomly practiced recycling and only 37 respondents (15.9%) always recycled. When the respondents were asked about taking the public transport like bus, comuter, LRT and MRT rather than driving, 82 people (35.3%) answered 'seldom' whereas 75 people (32.3%) answered 'always'. Besides that, 62 respondents (26.7%) declared that they never use fans at the workplace, instead they were using air conditioner whereas the other 79 people (34.1%) reported that they also seldomly use fans at the workplace.

4.5 Association Between Knowledge, Awareness and Practice on Climate Change

Spearman correlation test was used to analyze the association between knowledge and awareness, knowledge and practice as well as association between awareness and practice among community. From the results tabulated in Table 4.7, knowledge and awareness level showed a positive and moderate relations (r = 0.302) and the association were proven to be significant (p = 0.028). Next, for the association between knowledge and practice, it showed positive and weak relations (r = 0.142) with significant association (p=0.03). While for the association between awareness and practice, positive and weak relation (r = 0.196) were found and the association reported to be significant (p=0.003).

Table 4.7 : Association between Knowledge, Awareness and Practice

	Awareness		*Practice*	
	Correlation coefficient, r	p-value	Correlation coefficient, r	p-value
Knowledge	0.302	0.028*	0.142	0.03
Awareness	-	-	0.196	0.003

*significant p value at <0.05, (n=232)

4.6 Association between the KAP levels on Sociodemographic Factors

Chi square test was used to find the association between KAP levels with sociodemographic factors. In terms of knowledge, there were no significant differences found across age group, gender, race, family income, marital status, occupation, and years of living. But, significant differences ($p = 0.028$) was found between knowledge and educational level. While in terms of awareness, there were no significant differences found across age group, gender, race, family income, marital status and occupation. However, there was significance differences found across educational level ($p=0.004$) and years of living in Kuala Lumpur ($p=0.004$). With regards to practices levels, none of the sociodemographic backgrounds had significant association with practice.

As for association between educational level and knowledge, Pearson Chi - Square statistics was reported to be 7.15 and the degree of freedom was 2. However, 16.7% of the expected cell frequencies had value of less than 5. From Table 4.8 presented below, it was shown that most of the respondents with low education and high education scored moderate level of knowledge. However, there were small percentage (7.8%) of highly educated respondents who scored high knowledge level. None of the respondents with low educational level were reported with high knowledge. The results of this analysis was tabulated in Table 4.8.

Table 4.8 Association between Educational Level and Knowledge

		Level of Knowledge			
		Low	Moderate	High	p-value
Educational level	Low education	10 (12.8%)	68 (87.2%)	0 (0%)	0.028*
	High education	13 (8.4%)	129 (83.8%)	12 (7.8%)	

N = 232, Chi – square test *significant at $p < 0.05$

Next, for association between educational level and awareness, the Pearson Chi - Square statistics was 10.827 and the degree of freedom was 2. However, 16.7% of the expected cell frequencies had value of less than 5. From Table 4.9, it was shown that the respondents with high education had very high awareness about climate change, n = 104 (67.5%). While for low education group, most of them had high awareness, n = 38 (48.7%).

Table 4.9 Association between Educational Level and Awareness

		Level of Awareness			
		Moderate	High	Very High	p-value
Educational level	High education	8 (5.2%)	42 (27.3%)	104 (67.5%)	*0.004
	Low education	4 (5.1%)	38 (48.7)%	36 (46.2%)	

N = 232, Chi – square test *significant at p < 0.05

4.7 Sources of information on Climate Change

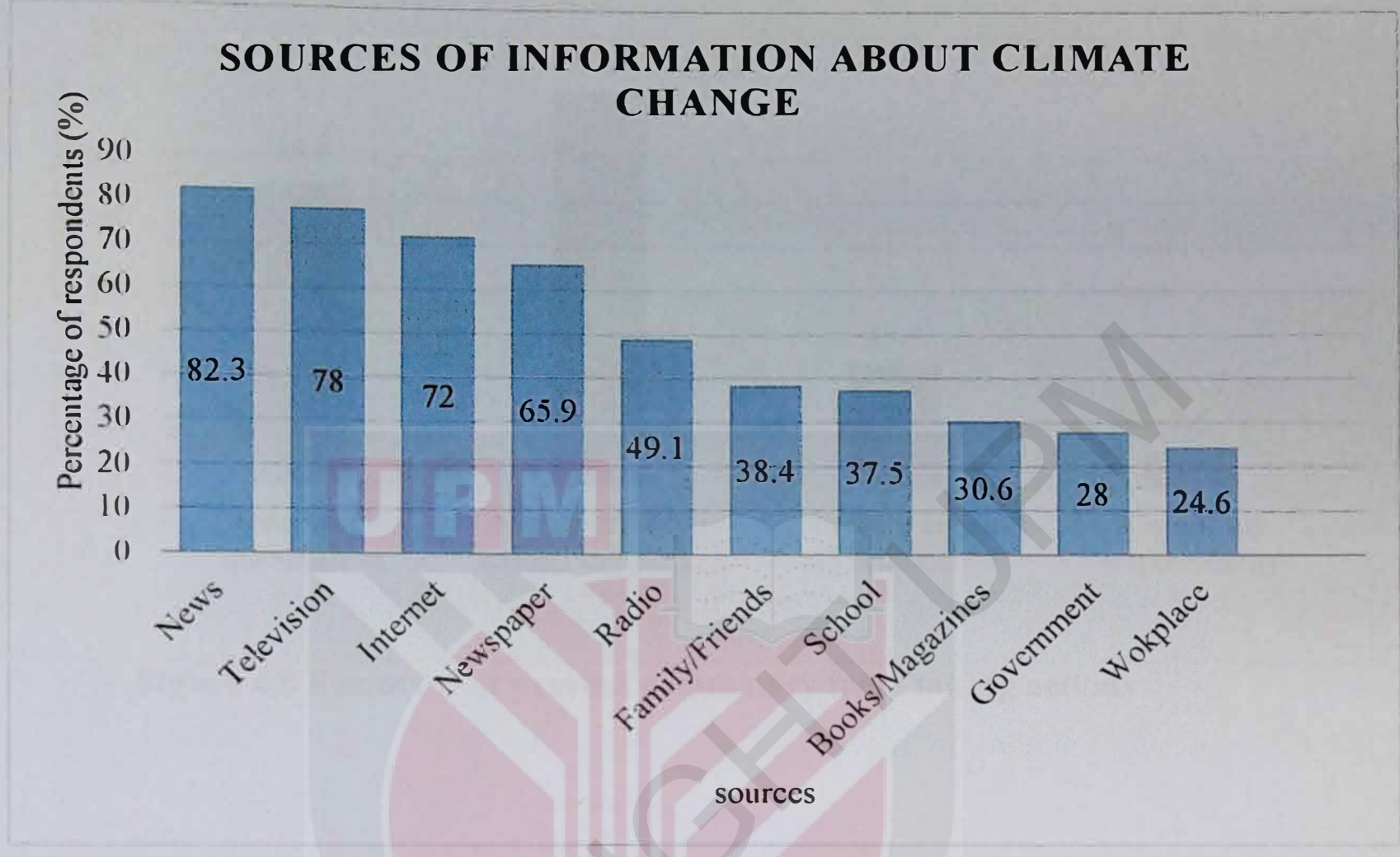

Figure 4.7 : Sources of information about climate change

As in the bar charts above, the most common media which the community acquired informations about climate change were from news (82.3%), television (78%) and from the internet (72%). While the least reported source of information were from workplace (24.6%), government (28%) and books/magazines (30.6%).

4.8 Factors that prevent community from taking actions on climate change

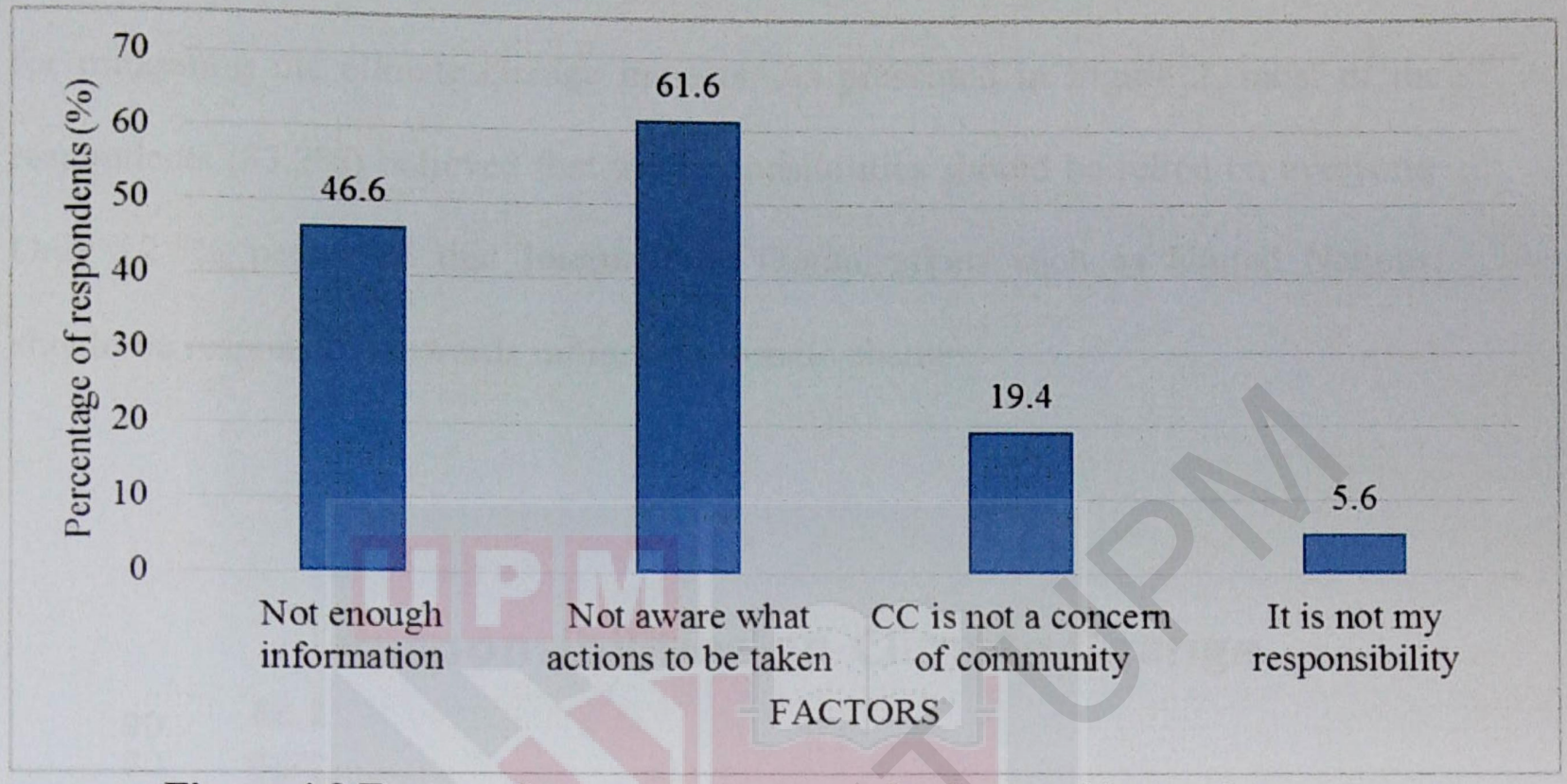

Figure 4.8 Factors that prevent community from taking actions

According to Figure 4.8, most respondents (61.6%) claimed that they were not aware of what actions to be taken to reduce climate change. 46.6% reported that they were no enough information about climate change that come to their knowledge. In addition, there were also individuals who felt that climate change is not a concern of community, and that made up of 19.4% respondents. Next, 5.6% did not perceive that mitigating climate change as their responsibilities.

4.9 Responsibilities on climate change

The survey asked for the respondents' opinion on who should be responsible for mitigating the climate change impacts. As presented in Figure 2, most of the respondents (83.2%) believed that the responsibilities should be relied on everyone. Only 12.5% perceived that International Organizations such as United Nations, should be responsible towards mitigating climate change.

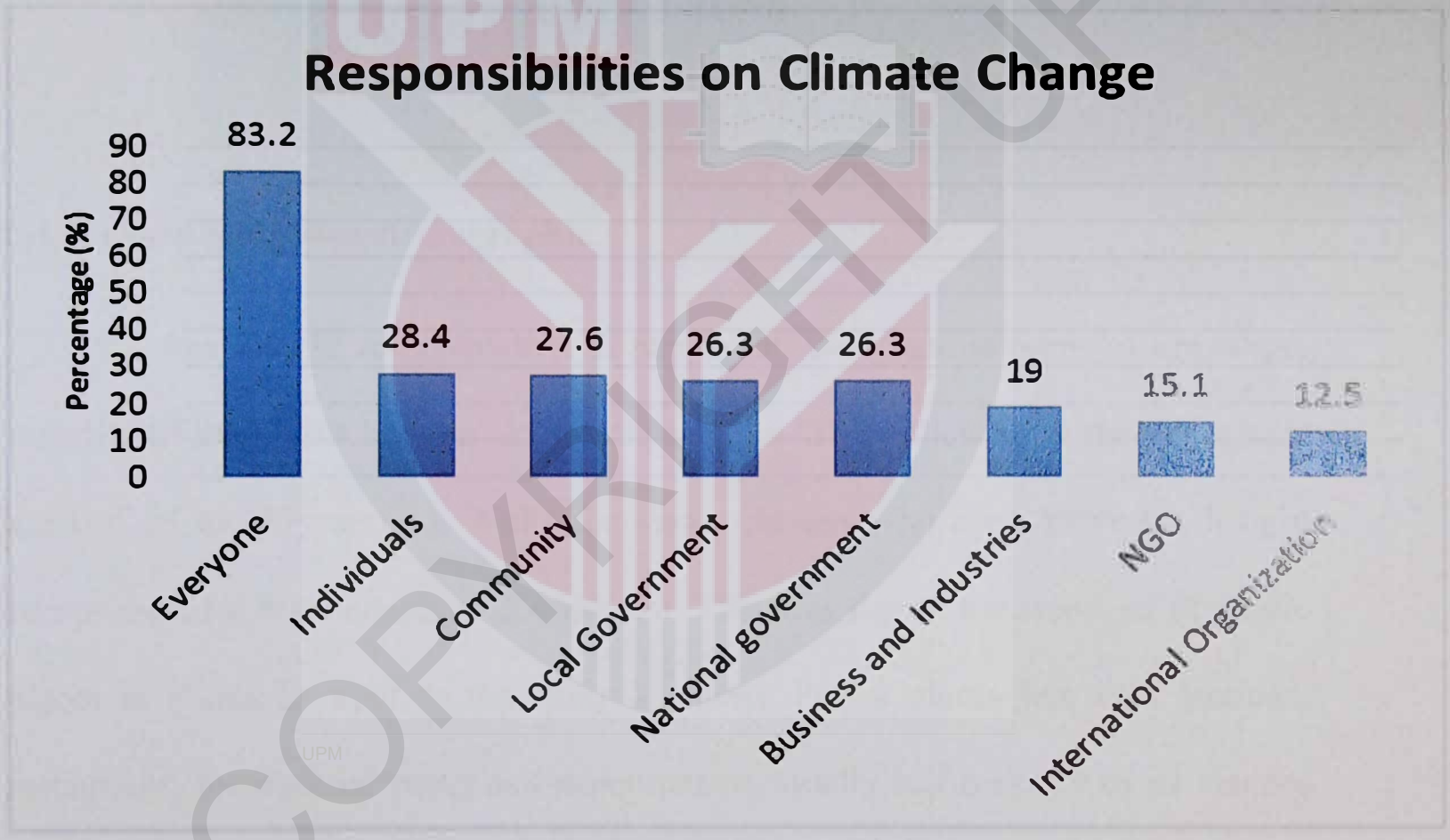

Figure 4.9 : Responsibilities of Climate Change Mitigation

CHAPTER 5

DISCUSSIONS

5.1. Respondents Sociodemographic

A total of 232 respondents took part in this study and in terms of age range, majority of them falls between 25 to 40 years old. This followed by the youngsters aged of 15 to 24 years old. While for senior citizens who aged above 60, it only comprised of 8 respondents or 3.4 percent. This was due to the selection of public places in Kuala Lumpur as the study locations. Public places like LRT stations, restaurants, recreational parks and supermarkets usually had majority of its visitors young persons and early adults. Majority of younger generation tend to travel to an urban destination like Kuala Lumpur because the centre city offered entertainment and various social activities, while the older generation mostly favours the places or environment which are more relaxing and less crowded (Ahmad Fitri Amir et al., 2015). Among all of the participants, more than half of them received high education, with diploma or matriculations at least. The growing number of higher

institutions in the city provide more opportunities and accessibilities for the community to receive tertiary education. Majority of the respondents worked in private sector (40.9%) and 25% of them were students. There were also some of them who were not employed and that comprised of 6.9%. The ones who were not employed were usually housewives and the elderly. Kuala Lumpur is a hub of development with service sectors and business as its main economic activities. Thus, that explained of why most of the respondents occupational background was from the private sector.

5.2 Knowledge, Awareness and Practice on Climate Change

5.2.1 Level of Knowledge

From the present survey, it was found that 84.9% of the respondents had moderate knowledge and only 5.2% possessed high knowledge. Based on the survey, the community reported that there was not enough information being disseminated to the public. The public wanted to know more however, the informations about climate change did not reach to their acknowledgement. The finding of this study is similar with the previous study that was being done among the community at selected regions in China, in which the general public showed moderate level of knowledge and understanding towards climate change issues (Mutairi & Tang, 2017). However, the result of our study was different with the one conducted among people of urban area in Pakistan, in which it showed only half of the respondents (55.3%) have knowledge about climate change (Muhammad Qadeer et al., 2016). While the community survey in Bangladesh revealed that 54.2% of the respondents had some knowledge about CC and the rest did not (Kabir et al., 2016). The difference in level of knowledge across countries are believed to be due to socioeconomic status of the community, varying degrees of accessibilities to information and the education system among nations.

In this study, only 47.7% respondents had knowledge that climate change can cause dengue cases to increase, while the rest did not know about dengue as one of the impact of climate change. Orimoloye et al., (2019) stated that better knowledge

about the linkage between climate change and weather-related illness is essential because it can aid strategies to reduce the vulnerability.

5.2.2 Level of Awareness

In terms of awareness, nearly all (94.8%) respondents fall between the levels of high and very high awareness while there was none of the respondents scored low awareness. This is because most of the respondents generally manifested a positive agreement to the scale items used in the survey to assess their awareness level. Similar observations have been reported in a study done in India, where general urban population were aware about climate change and human activities as significant causes (Pandve et al., 2011). Similarly, Al Buloshi & Ramadan (2015) reported that the awareness among public in Muscat, Oman is fairly high. Another study done in Kedah, Terengganu and Johor which investigated the climate change awareness among coastal community in Malaysia also showed consistent result where the respondents acquired a high mean score for their awareness toward climate change (Hayrol, 2015).

Based on the present survey, it was found that the repondents aware that human activities can cause climate change with 49.1% respondents agreed with the statement. However, when the subsequent question stated that what they do on daily basis can contribute to climate change, more than 35% respondents denied the statement. This finding showed that the community realized about human as the causal of climate change, however they did not realize that they were the part of it. It could be assumed that the general community perceived that the 'humans' that cause

changing in climate were the people of business and industries, instead of them as general public. Similar finding was found by in which the people lacked of awareness of their role as the contributor to climate change (Ogbeide & Ele, 2015). For this present study, it was also described that the respondents were less aware that the occurences of climate-related events were happening more frequently that it has been before in our country. The result contradicted with the study done by Sulistyawati et al., (2018) in Yogyakarta, Indonesia, where the people were more aware that floods, landslides and heat waves that striked were related to climate change.

5.2.3 Level of Practice

Our finding on identifying the practice level found that the community had moderate practice towards climate change. This is because based on the survey, the respondents expressed that they did not aware of what actions to do in order to deal with climate change issue. A study on assessing climate change and environmental awareness conducted among villagers community in Philippines showed similar that the respondents moderately practicing the mitigating actions of climate change (Lesley & Lalevie, 2019). The same finding by Arbaat et al., (2013) where the practice level on environment among students were also still at moderate level.

5.3 Association between Knowledge, Awareness and Practice

Significant association between knowledge and awareness on climate change was found in this study. The result was similar with previous research done in Ghana, Africa where there was positive and weak correlation between knowledge and awareness on climate change (Awusi & Asare, 2016). Aminrad et al., (2013) stated that people who are knowledgeable about environment and its associated issues, they will become more aware about the environment.

In this present study, there was also significant relationship found between knowledge and practice level and this result was in line with similar discovery by Arbaat et al., (2013) where there was significant relationship between environmental knowledge with the practices. State of one's knowledge about an issue is associated with their practices (Aminrad et al., 2013). Eventhough association was found between knowledge and practice, but the correlation was weak and this finding was very similar to the study of Jamilah et al., (2015) in which weak relationship was found between students' level of knowledge and sustainable environment practicesOn top of that, Arbaat et al., (2013) stated that there was a significant correlation between awareness and practices towards the environment, while our present study also presented similar result. The level of awareness was translated into the tendecy of engaging with sustainable practices.

5.4 Association between Educational Level with Knowledge and Awareness

From this study, educational level is the factor that associated with the level of knowledge and awareness about climate change. In terms of knowledge, the findings revealed that respondents with both low and high education mostly acquired moderate level of knowledge. This was due to the fact that most of the respondents claimed that they were not enough informations about climate change. Besides that, they also reported that they did not aware of what actions to be taken to address the issue. However, there were small percentage of those with higher education (12.7%) who possessed high knowledge about climate change. Our finding was supported by a study done in Bangladesh in which people of higher educational level acquired more knowledge about climate change (Kabir et al., 2016). According to Quijano et al., (2018), level of education is the key determinant of knowledge. The respondents with higher intellectual level might reflect of their interest towards environmental knowledge and current information especially when it is associated with their life. For example, they may do research and get informations about the extreme events that occured, which will in turn, made them eventually understood on how such climate related events associated with environmental degradation. Therefore, this reflects of their high knowledge. As in our study, the respondents who were considered as low education were those who obtained no education, received primary and secondary school and this group with lower education had less knowledge about climate change as compared to the higher ones. Therefore, our study suggests that environmental education should be strengthened in the school curriculum to increase the knowledge about climate change and its adaptation measures. Education is an

essential element of the community response towards climate change. It helps people to understand about climate change causes, motivate them to change unsustainable practices towards environmental friendly- behavior and help them to adapt with the impacts.

Furthermore, the result also found educational level as a significant factor which related to awareness level and such finding was similar to those of Korkmaz (2018), Lee et al., (2015) and Pandve et al., (2011). All these studies reported that educational status play significant role towards the climate change awareness.

5.5 Sources of information

This study presented that the most popular source where the community acquired informations was from news, television and Internet with the percentage of 82.3%, 78.0% and 72% repectively. As per the survey conducted by among the community in Belize, Central America, the study also reported that 66.5% of the respondents perceived that television as the most effective channel in order to get informations about climate change. Similar finding was found in the previous study by Bojovic (2014) on assessing climate change awareness among the citizens of Macedonia where 67% of the respondents gained information through television and 71% preferred Internet the most. Meanwhile the study finding in Indonesia by Sulistyawati et al., (2018) found that more than half of the respondents (53.54%) claimed that family was their favourite source of information while only 15.16% had chosen Internet to obtain informations. These differences were assumed to be due to the accessibility to the technologies as well as the lifestyle between regions. As for in some parts of the country, some people still hold to family values regardless of today's digital era in which some other people depends on Internet or technologies to seek for informations. But as in our country Malaysia, the accessibilities to the Internet is easy, with affordable price rate offered by the telecommunication companies. According to Malaysian Communications and Multimedia Commision (2018), the Internet users in Malaysia had increased from 76.9% in 2016 to 87.4% in 2018. Whereas conventional media like televisions and news were still favoured by most community across regions because of its high degree of trustworthy and credibility.

5.6 Factors that prevent community from taking actions on climate change

From the result of this study, most of the community claimed that the reasons of their inaction towards climate change were mainly due to lack of information and they did not aware of what actions to be taken. This result was supported by a study from Nepal which came out with similar outcome, in which despite of community awareness on climate change, they were still uncertain on the adaptation and mitigation strategies implemented by the government (Devkota & Phuyal, 2017). According to Japan- Caribbean Climate Change Project (2016), they also reported of similar finding as in our study. Through its KAP Study on Climate Change Report, it was found that the community had not take actions because 46% of them claimed that there were not enough information and 40.4% said that they were not aware on what to do with the problems. 6% stated that climate change should not be the community's concern and the rest felt that it was not their responsibilities. Even though there were still a number of respondents who perceived that climate change issue was not supposed to be the public concern and some thought that it was not under their responsibilities, however the percentage was still relatively smaller. In general, the community still considered about the environmental issue but its probably due to less information been disseminated, thus the ignorance subsisted. This showed that the government should sensitize the public on climate change issues. They should also publicize those plans and programmes related to climate change via all possible channels so informations will reach to the community.

5.7 Conclusion

From the present study, it can be concluded that the community had very high awareness towards climate change issue. However, their knowledge about the problems was on moderate level, and so that of the practice level. This shows that eventhough the community had some knowledge and aware that climate change is happening, they had no idea on what actions to be taken due to lack of informations received.

There were association between knowledge, awareness and practice on climate change. Besides that, there were significant relationship found between knowledge and awareness level with educational level. People with higher education possessed more knowledge and concern towards climate change issue compared to the ones with lower education. However, educational level is not associated with the practice on climate change. This shows that highly educated people do not necessarily exercise sustainable practices.

The community also perceive conventional medias like television and news as reliable sources of information about climate change. On top of that, disseminating informations through social media platforms is one of the ways to communicate with the community about the issues. The community also believed that duties on mitigating climate change impacts is everyone's responsibilities.

5.8 Recommendation

It is undeniable that the government had come out with list of efforts to mitigate the impacts of climate change, be it through policies enforcement, formal and informal education as well as awareness programmes. However, those informations did not reach to the community knowledge. Therefore, the efforts on mitigating climate change impact must be done with the combination of both top down and bottom-up approaches to ensure that any policies or programmes on climate change that are done government will be a success. Any provisions or efforts being implemented by the government should include the community participation because they are the largest driving forces that could made small efforts become big and effective when it is done collectively. This study suggested that the government could focus on giving informations to the public about climate change through conventional medias such as the news, televisions and radio. On top of that, Internet is another powerful sources of information where awareness campaigns or non formal education could be spread through social medias. This study also recommended that environmental education should be strengthened in the school curriculum to increase the knowledge about climate change and its adaptation measures.

In addition, the study suggests that further studies to be conducted which included all districts in Kuala Lumpur, thus the result will represent the whole community of the city. Future studies should also strive to assess the level of KAP among the communities of other urban areas in Malaysia. In addition, because some of the chi-square analyses had cells where expected values were less than 5, therefore

the results should be cautiously interpreted, even when statistically significant, and a larger, more representative study of knowledge, awareness and practice among community in urban areas are needed to validate study findings.

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APPENDICES

ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS
(JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Knowledge, Awareness and Practice on Climate Change Among Community in Kuala Lumpur**
Study Site	:	**Kuala Lumpur**
JKEUPM Ref No.	:	**JKEUPM-2018-363**
Researcher	:	**Naimah bt M Fadzir**
Supervisor	:	**Assoc Prof. Dr. Haliza Abdul Rahman**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 29/10/2018
2. Respondent Information Sheet & Consent (Malay), Version 2 dated 3/1/2019
3. Proposal (English), Version 2 dated 3/1/2019
4. Questionnaires/ Interviews (English), Version 2 dated 3/1/2019
5. Curriculum Vitae of:
    a. Assoc Prof. Dr. Haliza Abdul Rahman

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

[X] Approved

[X] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is **VALID UNTIL 10 JANUARY 2020**

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form 3.2).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM.

JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG 2.4: PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1.TAJUK KAJIAN

'KNOWLEDGE, AWARENESS AND PRACTICE ON CLIMATE CHANGE AMONG COMMUNITY IN KUALA LUMPUR'

2. PENGENALAN

Anda dialu-alukan untuk meyertai kajian ini. Penglibatan anda adalah secara sukarela. Kajian ini dijalankan dengan tujuan untuk menilai tahap pengetahuan, kesedaran dan praktis berkaitan perubahan iklim dalam kalangan komuniti.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Responden perlu menjawab boring soal selidik yang telah disediakan oleh penyelidik bagi mendapatkan maklumat berkaitan dengan kajian ini.

4. SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

Individu yang berumur kurang dari 15 tahun dan individu yang bukan warganegara Malaysia tidak digalakkan untuk menyertai kajian ini.

5. APAKAH FAEDAH MENYERTAI KAJIAN INI?

a)KEPADA ANDA SEBAGAI PESERTA?

Maklumat daripada kajian ini akan menentukan tahap pengetahuan, kesedaran serta praktis anda terhadap isu perubahan iklim. Keputusan atau maklumat yang diperoleh boleh dijadikan sumber kepada kerajaan atau pembuat polisi dalam menentukan langkah-langkah untuk membendung masalah perubahan iklim dan kesannya terhadap komuniti.

b) KEPADA PENYELIDIK?

Bagi membantu penyelidik memutuskan tahap pengetahuan, kesedaran dan praktis berkaitan perubahan iklim dalam kalangan komuniti. Seterusnya, maklumat dan data daripada kajian ini boleh digunakan sebagai rujukan untuk mereka yang berminat untuk membuat kajian lanjutan yang berkaitan dengan tajuk kajian ini di bawah bidang kesihatan persekitaran.

6. ADAKAH IA BERISIKO?

Tiada risiko ysng dijangkakan untuk mengambil bahagian dalam kajian ini.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Ya, maklumat yang akan kami peroleh dari kajian ini akan kekal sulit dan data anda tidak akan didedahkan. Ini adalah bagi tujuan penyelidikan semata-mata.

8. SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?

Jika anda mempunyai sebarang soalan tambahan, anda boleh menghubungi penyelia bagi penyelidikan ini, Prof Madya Dr Haliza Abdul Rahman, di talian 03-89472643 dan emel dr.haliza@upm.edu.my atau menghubungi penyelidik, Naimah bt M Fadzir di 011 11448421 dan emel naimahfadzir@gmail.com

Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

9. PERSETUJUAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya.

I setuju/tidak bersetuju untuk imei/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

*potong yang tidak berkenaan

Tandatangan .....
(*Responden*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada responden ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

Tarikh/Date : ☐ ID No : ☐

BORANG KAJI SELIDIK/QUESTIONNAIRES

TAJUK KAJIAN/ RESEARCH TITLE :

'KNOWLEDGE, AWARENESS AND PRACTICE ON CLIMATE CHANGE AMONG COMMUNITY IN KUALA LUMPUR'

NAMA PENGKAJI / RESEARCHER NAME :

NAIMAH BT M. FADZIR

Borang kaji selidik ini mengandungi 5 bahagian :

This questionnaires consist of 5 sections:

1.	Bahagian / *Section* A:	Socio-demografik / *Socio-demographic*
2.	Bahagian / *Section* B:	Pengetahuan Tentang Perubahan Iklim/ *Knowledge on Climate Change*
3.	Bahagian / *Section* C:	Kesedaran Tentang Perubahan Iklim/ *Awareness on Climate Change*
4.	Bahagian / *Section* D:	Pengetahuan Tentang Perubahan Iklim/ *Practice on Climate Change*
5.	Bahagian / *Section* E:	Cadangan / *Recommendations*

Perubahan iklim boleh memberi kesan buruk kepada komuniti setempat. Kesan pemanasan global seperti bencana alam akan melibatkan keselamatan dan kesejahteraan manusia. Oleh itu, kajian ini adalah bertujun untuk menilai tahap pengetahuan dan respon masyarakat terhadap isu perubahan iklim. Justeru, anda dialu-alukan untuk meyertai kajian ini. Penglibatan anda adalah secara sukarela. Semua data yang diperoleh melalui borang soal selidik ini akan digunakan bagi tujuan pembelajaran sahaja dan maklumat responden akan dirahsiakan. Terima kasih atas kerjasama.

Saya..... No Kad Pengenalan. .....
beralamat.....
..... dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan ini. Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan. Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Tandatangan .....
(*Responden*)

Tandatangan .....
(*Saksi*)

Tarikh :.....

Nama :.....

No. K/P: .....

BAHAGIAN A : MAKLUMAT SOSIODEMOGRAFIK

PART A: RESPONDENT SOCIO-DEMOGRAPHIC BACKGROUND

Sila tandakan (/) pada kotak jawapan.

Please tick (/) in the answer choice box.

1. Jantina / *Gender* : Lelaki/ *Male* ☐ Perempuan /*Female* ☐

2. Bangsa / *Race* : Melayu / *Malay* ☐ Cina / *Chinese* ☐

India / *Indian* ☐ Lain-lain / *Others* ☐

3. Umur / *Age* : _____ tahun / *years old*

4. Pendapatan keluarga / *Family Income* :

Kurang/ *Less than* RM1000 ☐ RM 3001-RM 4000 ☐

RM1000 – RM2000 ☐ RM4001 – RM5000 ☐

RM2001 – RM3000 ☐ Lebih/ *More than* RM5000 ☐

5. Tahap pendidikan tertinggi / *Highest Educational level* :

Sekolah Rendah / *Primary school* ☐

Sekolah Menengah / *Secondary school* ☐

Diploma / Matriculation *Diploma /Matrikulasi* ☐

Ijazah Sarjana Muda/ *Bachelor's Degree* ☐

Ijazah Sarjana/ *Master's Degree* ☐

PhD ☐

6. Sudah berapa lamakah anda menetap di Kuala Lumpur?
For how long have you lived in Kuala Lumpur?

Kurang daripada 1 tahun / *Less than one 1 year* ☐

1 hingga 5 tahun / *1 to 5 years* ☐

6 hingga 10 tahun/ *6 to 10 years* ☐

11 hingga 20 tahun/ *11 to 20 years old* ☐

21 hingga 30 tahun/ *21 to 30 years old* ☐

31 hingga 40 tahun/ *31 to 40 years* ☐

41 hingga 50 tahun/ *41 to 50 years old* ☐

All my life/ Seumur hidup ☐

7. Status Perkahwinan / *Marital Status* :

Bujang / Single ☐

Sudah berkahwin / Married ☐

Bercerai / Divorced ☐

8. **Pekerjaan / *Occupation* :**

Sektor kerajaan / Government sector ☐

Sektor swasta / Private Sector ☐

Bekerja sendiri /Self-employed ☐

Pesara / Retiree ☐

Tidak bekerja /Not employed ☐

Pelajar / Student ☐

9. **Bilangan Isi Rumah / *Household size* :** _____ (e.g. 2 orang / *person*)

BAHAGIAN B : PENGETAHUAN TENTANG PERUBAHAN IKLIM

PART B: KNOWLEDGE ON CLIMATE CHANGE

Sila tandakan (/) di bahagian jawapan yang disediakan.

Please tick (/) in the answer choice space provided.

No.	Soalan / Questions	Ya *Yes*	Tidak *No*	*Tidak Pasti/ Not Sure*
1.	Pemanasan global adalah disebabkan oleh pelepasan gas karbon dioksida dan gas rumah hijau yang lain di atmosfera. *Global warming is caused by* the increasing concentration of carbon dioxide, and other greenhouse gases in the atmosphere.			
2.	Pemanasan global dan perubahan iklim adalah perkara yang sama *Global warming and climate change are the same thing*			
3.	Karbon dioksida (CO_2), metana (CH_4), nitrous oksida (N_2O), ozone (O_3), klorofluorokarbon (CFCs) merupakan contoh-contoh gas rumah hijau. *Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), chlorofluorocarbon (CFCs) are examples of greenhouse gases.*			
4.	Aktiviti pertanian boleh menyebabkan pemanasan global dan perubahan iklim. *Agricultural activities can cause global warming and climate change.*			
5.	Penggunaan tenaga / elektrik yang tinggi boleh menyebabkan pemanasan global dan perubahan iklim. *High use of energy / electrical energy can cause global warming and climate change.*			
6.	Aktiviti perindustrian boleh menyebabkan pemanasan global dan perubahan iklim. *Industrial activities can cause global warming and climate change.*			
7.	Aktiviti pembakaran sampah boleh menyebabkan pemanasan global dan perubahan iklim. *Waste burning activity can cause global warming and climate change.*			

8.	Trafik / kenderaan bermotor boleh menyebabkan pemanasan global dan perubahan iklim. *Traffic / motor vehicles can cause global warming and climate change.*			
9.	Penebangan hutan boleh menyebabkan pemanasan global dan perubahan iklim. *Deforestation (cutting down forest) can cause global warming and climate change*			
10.	Perubahan iklim boleh mengurangkan hasil tanaman. *Climate change can reduce crop yield.*			
11.	Perubahan iklim menyebabkan bekalan makanan berkurangan. *Climate change can decrease food supplies.*			
12.	Perubahan iklim menyebabkan bekalan air berkurangan. *Climate change reduce the water availability.*			
13.	Perubahan iklim boleh menyebabkan kemarau yang berpanjangan. *Climate change can cause prolonged drought.*			
14.	Perubahan iklim boleh menyebabkan banjir . *Climate change can cause flood.*			
15.	Perubahan iklim boleh menyebabkan kes denggi meningkat *Climate change can increase the cases of dengue*			

BAHAGIAN C : KESEDARAN TENTANG PERUBAHAN IKLIM

PART C: AWARENESS ON CLIMATE CHANGE

Sila tandakan (/) pada bahagian jawapan yang disediakan.

Please tick (/) in the answer choice space provided.

No.	Soalan / Questions	Scale			
		Sangat tidak setuju/ *Strongly Disagree* (1)	Tidak Setuju/ *Disagree* (2)	Setuju/ *Agree* (3)	Sangat Setuju/ *Strongly Agree* (4)
1.	Saya pernah mendengar tentang 'perubahan iklim' *I have heard about 'climate change'*				
2.	Saya pernah mendengar tentang 'pemanasan global' *I have heard about 'global warming'*				
3.	Perubahan iklim dan pemanasan global benar-benar sedang berlaku *Climate change and global warming are really happening now*				
4.	Faktor utama perubahan iklim adalah disebabkan oleh aktiviti manusia *The main factor of climate change is because of human activities*				
5.	Perubahan iklim dan pemanasan global merupakan isu yang penting bagi saya *Climate change and global warming are important issues for me*				
6.	Cuaca sekarang lebih panas berbanding sebelum ini *The weather is warmer now than it has ever been before*				
7.	Kejadian banjir, tanah runtuh, ribut dan gempa bumi semakin kerap berlaku di Malaysia *Occurence of floods, landslides, storm and earthquakes are frequently happening in Malaysia*				
8.	Kejadian banjir, tanah runtuh, ribut dan gempa bumi yang				

	terjadi di Malaysia adalah disebabkan perubahan iklim *The occurence of floods, landslides, storm and earthquakes in Malaysia are evidences of climate change*				
9.	Perubahan iklim memberi kesan yang teruk kepada manusia dan alam sekitar *Climate change are likely to be catastrophic to humans and environment*				
10.	Perubahan iklim boleh memberi kesan kepada kesihatan manusia *Climate change can affect people's health*				
11.	Apa yang saya lakukan dalam kehidupan seharian menyumbang kepada perubahan iklim *What I do on daily basis may contribute to climate change problems*				
12.	Kita perlu mengubah sikap kita untuk mengurangkan kesan perubahan iklim *We need to change our behaviour to reduce the impact of climate change*				

13. Dari sumber manakah anda pernah mendengar tentang 'perubahan iklim'/ 'pemanasan global' ?
Sila tandakan (/).
Where have you heard about climate change / global warming? ***Please tick (/).***

Berita/ *News*	
Televisyen *Television*	
Surat khabar *Newspaper*	
Buku/ Majalah *Books / Magazines*	
Radio *Radio*	
Kerajaan *Government*	

Keluarga/ Rakan-Rakan *Family/Friends*	
Sekolah *School*	
Tempat Kerja *Workplace*	
Internet *Internet*	
Lain-Lain *Others* (Sila Nyatakan : .....) *(Please State : .....)*	

BAHAGIAN D : PRAKTIS TENTANG PERUBAHAN IKLIM

PART D: PRACTICE ON CLIMATE CHANGE

Sila tandakan (/) di bahagian jawapan yang disediakan

Please tick (/) in the answer choice space provided

No.	Soalan / Questions	Tidak Pernah / *Never* (1)	Jarang / *Seldom* (2)	Kerap / *Frequent* (3)	Sentiasa/ *Always* (4)
1.	Saya akan menutup lampu apabila tidak digunakan *I will turn the lights off when it is not in use*				
2.	Saya akan menutup kipas apabila tidak digunakan *I will turn the fans off when it is not in use*				
3.	Saya melakukan amalan kitar semula *I practice recycling*				
4.	Saya menggunakan barangan terpakai berbanding membeli barangan baru *I reuse things rather than purchasing new items*				
5.	Jika saya mempunyai barangan terpakai yang masih boleh digunakan, saya akan memberikannya / mendermakan kepada orang lain dan tidak terus membuangnya *If I have reused items that still can be used, I will give/ donate it to others instead of discarding it*				
6.	Saya mempraktikkan amalan berkongsi kereta *I practice car pooling*				
7.	Saya lebih kerap berjalan kaki / berbasikal berbanding memandu kereta I walk / cycle more frequently rather than driving car				
8.	Saya lebih kerap menaiki bas/ komuter/ LRT/ MRT berbanding memandu sendiri *I take bus/ comuter/ LRT/ MRT more frequent rather than driving*				

9.	Saya menggunakan lampu fluoresen/ lampu jimat tenaga *I use fluorescent/energy saving light bulbs*				
10.	Saya lebih memilih menggunakan kipas berbanding penghawa dingin di rumah *I choose to use fans mostly in home rather than air conditioner*				
11.	Saya lebih memilih menggunakan kipas berbanding penghawa dingin di tempat kerja *I choose to use fans mostly in my workplace rather than air conditioner*				
12.	Saya menanam pokok di rumah *I plant trees at home*				

PART E : CADANGAN / PART E : RECOMMENDATION

1. Pada pendapat anda, siapakah yang bertanggungjawab terhadap usaha-usaha untuk mengurangkan kesan perubahan iklim?
   In your opinion, the responsibilities on mitigating the impacts of climate change relies on?

Organisasi antarabangsa (e.g : Persatuan Bangsa-Bangsa Bersatu) *International organisation (e.g : United Nation)*	
Kerajaan pusat *National government*	
Kerajaan tempatan (e.g : Majlis Bandaraya) *Local government (e.g : Council City)*	
Bisnes dan industri / *Business and industries*	
Agensi bukan kerajaan (NGO) / *Non-Profit Organization (NGO)*	
Komuniti/ *Community*	
Individu / Individuals	
Semua pihak/ Everyone	

2. Jika anda atau masyarakat sekeliling anda masih belum bertindak untuk mengurangkan kesan perubahan iklim, apakah yang menghalang anda daripada berbuat demikian? **Sila tandakan (/).**

If you or your community has not taken any action to prevent or lessen the impact of climate change, what has prevented you from doing so? ***Please tick (/).***

Maklumat tidak mencukupi *Not enough information*	
Tidak tahu apa tindakan yang perlu dilakukan *Not aware of what actions should be taken*	
Perubahan iklim bukan sesuatu yang patut diberi perhatian oleh masyarakat *Climate change is not a concern of the community*	
Ia bukan tanggungjawab saya *It is not my responsibility*	

3. Sebagai sebahagian daripada komuniti, apakah cadangan anda tentang usaha yang boleh dilakukan untuk mengurangkan perubahan iklim?

As a part of community, what is your recommendation of the efforts that can be done to mitigate climate change?

_____

_____

_____

_____

END OF QUESTIONS. THANK YOU!