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FACTORS THAT CONTRIBUTE TO AIR POLLUTION IN MALAYSIA

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ABSTRACT

In this study, the overall objective used is to identify the factors that contribute to air pollution in Malaysia. The objective chosen was to study further the factors that cause this pollution. The theory used in this study is conceptual. Not only that, the independent variables in this study are divided into 5 which are the open burning activities, industrial fuel burning and processes, transportation emissions, agriculture activities, and cigarettes smoke. While the dependent variable is the factor of air pollution. The type of sample used in this study is non-probability convenience sampling. This study was conducted in Klang Valley, Malaysia, the area that is often associated with this pollution. The total sample in the study was 55 respondents. In addition, the instrument used is a questionnaire to 55 respondents, consisting of 39 women and 16 men through the results of the questionnaire. The questionnaire was given in the form of Google Form which asked the respondents to give their responses or views on the causes of this air pollution. Not only that, the analysis method used in this study is a quantitative method and the findings of the study from the results of the questionnaire of 55 respondents showed that the main cause of air pollution is open burning in large forest areas. While the problem that causes less pollution is that cigarette smoke has nothing to do with the occurrence of air pollution through questionnaires.

PROBLEM STATEMENT

Air pollution has been an ongoing problem in many countries in the Southeast Asia region, and Malaysia is one of the worst affected. Air pollution is a condition in which it involves chemicals or biological substances that cause discomfort, harm to humans and other living organizations as well as damage the environment when it is released into the atmosphere. The substances are suspended in the air and have a negative impact on humans and other living things such as flora and fauna. The particular reason for the circumstance, the released material will enter the human body through the respiratory tract and this will also block the flow of oxygen into the bloodstream. The presence of one or more pollutants and combining them in the atmosphere with a certain quantity over a period can cause an emergency to humans and other living things as well as can disrupt the atmosphere of life. Examples of air pollution gases are carbon dioxide, sulphur dioxide and nitrogen. This air pollution has become a problem issue for Malaysia. This is because air pollution will cause concern to the people and the government in overcoming it.

People should be aware that the problem of air pollution is not one hundred per cent a natural phenomenon, but it is also caused by some irresponsible human attitudes. The composition of the air is almost the same throughout the surface of the earth due to the high mixing capacity of the materials. If it is not addressed immediately it will cause the situation to worsen. In addition, this air pollution has many negative effects on humans and other living things. It has been proven that this air pollution is capable of causing diseases to humans. This is because air pollution can be considered a contributor to asthma, lung disease due to shortness of breath and skin cancer. Moreover, this air pollution can restrict the daily routine life of human beings. For instance, when the air experiences high Air Pollution Index (API) conditions, it will cause many schools, business operations, and sales services had to close. They are required to stay at home to prevent illness from coming. In addition, this pollution is also capable of affecting plants and animals. For plants, the process of photosynthesis or the process of making important food is blocked due to polluted gases such as chlorophyll, carbon dioxide and solar energy.

When there is the air pollution of substances such as nitrogen dioxide, carbon monoxide will damage crops. As for animals, when there is pollution on plants, then the animals cannot get enough food because plants and animals are interdependent to get food. According to *Sinar Harian*, in 2019 Malaysia has achieved the highest position because it recorded a high Air Pollution Index (API) compared to other countries. The Management Agency has made a statement that one of the causes is based on wildfires by one country which causes its negative effects to affect other countries. The wildfire has caused severe air pollution that can cause conditions such as haze. Therefore, this air pollution needs to be addressed immediately until it persists which can result in death. One of the actions that can be taken is introducing comprehensive legislation. As an example, the government should apply the appropriate punishment on individuals who commit this pollution with a maximum compound rate. The aim is to make the public aware of the environment. Therefore, this study aims to identify the factors that contribute to air pollution in Malaysia.

RESEARCH QUESTION

The overall research question for the study is as follows:

1) What are the factors that contribute to air pollution in Malaysia?

The specific research questions for the study are as follows:

1) Does the open burning activity contribute to air pollution in Malaysia?
2) Do industrial fuel burning and processes cause air pollution?
3) Can transportation emissions contribute to air pollution in Malaysia?
4) Can consumption of pesticides and fertilizers in agriculture activities lead to air pollution in Malaysia?
5) Do cigarettes smoke that consists of carbon dioxide, methane and other noxious chemicals cause air pollution in Malaysia?

RESEARCH OBJECTIVE

The overall research objective of this study is to identify the factors that contribute to air pollution in Malaysia. The specific research objectives are:

1) To determine whether the open burning activities contribute to air pollution in Malaysia.
2) To estimate whether industrial fuel burning and processes cause air pollution.
3) To determine whether transportation emissions can contribute to air pollution in Malaysia.
4) To analyse whether the consumption of pesticides and fertilizers in agriculture activities can lead to air pollution in Malaysia.
5) To estimate whether the cigarettes smoke that consists of carbon dioxide, methane and other noxious chemicals can cause air pollution in Malaysia.

LITERATURE REVIEW

Air is one of the most important elements of all living things. However, air pollution has become a major threat to all life in this twenty-first century. Malaysia also experiences regional air pollution, such as severe 'haze' episodes mostly caused by widespread forest fires in Indonesia (Gaveau et al., 2014). Other factors contribute to the air pollution in Malaysia such as vehicle and industrial emissions. Ishii et al. (2007) stated that mobile sources normally are the predominant contributors of air pollution, especially in urban areas in most developing countries. These factors that lead to air pollution can cause far-reaching health issues. For instance, air pollution increases throat discomfort and respiratory illnesses, particularly asthma especially among children and the elderly, and leads to headaches, coughing and breathing difficulties among commuters (Ramakreshnan et al., 2018). Moreover, the local economy also suffers as a result of air pollution, which affects tourism and shipping activities, as well as the costs of hospitalisation, medication, and loss of income opportunities (Ab Manan et al., 2018).

Next, one of the factors that lead to air pollution is transport emission. It is because the gases that emit from transport will produce greenhouse gas. As with most cities and large urban areas, pollution from traffic is the most important issue of urban air pollution in Australia (Beeton et al., 2006). Other than that, air pollution also exists because of emissions from the industrial sector. Emissions from industrial areas near cities do not seem to contribute greatly to the overall urban air pollution levels of those cities, and the concentrations of criteria pollutants and air toxics in the air sheds of industrial areas are generally below national standards (National Pollutant Inventory, 2010). In addition, the agriculture sector is also one of the factors of air pollution. Agriculture contributes 24 per cent of yearly emissions. This estimate, however, does not account for the CO_2 that ecosystems take from the atmosphere by sequestering carbon in biomass, dead organic matter, and soils, which offsets around 20% of emissions from the agriculture sector (IPPC Report, 1996).

As we know, the air is essential in the life of all beings. Without this air, life would not be perfect. However, air pollution often occurs in Malaysia and has become a major issue in this country. For example, places like Klang Valley. One of the causes of air pollution in the area is urban. Based on the Economic Planning Unit (EPU, 2010) around 80% of the population in Malaysia living in urban core areas such as Klang Valley in 2020. This is because development and land use need to be done to accommodate the population. Not only that, the urbanization process that exists in the Klang Valley area has the demand for vehicles increased accordingly. In 2009, the number of vehicles registered in Malaysia was 19.02 million which brought about 68% of Malaysians to have at least one vehicle (Ministry of Transport, 2010). In addition, there is a new study stating that there is a significant and strong relationship between the number of unhealthy and potentially dangerous days with land use in Kuala Lumpur starting from 1995 to 2005 with a correlation coefficient (r) of 0.821, which is significant at 0.05. (Ling et al., 2010). However, the effects of this air pollution can be chronic to humans and other living organisms and can result in damage to the environment and structures when entering the atmosphere (Moustris et al., 2010).

In the area, the city of peninsular Malaysia, the combination of local pollution and cross-border pollution is one source of emissions identified as an important source, the effects of air pollution on human health are minimized. In general air pollution occurs from sources of material on earth which are resources that exist in the form of, solids, liquids and gases will help be one of the main factors that damage and change the natural characteristics of the atmosphere and also pose health risks to all living things and environment. In addition, in Malaysia also respiratory deaths and natural deaths are deaths that are significantly related to the daily average Ozone (0_3), Carbon dioxide (CO_2), Nitrogen dioxide (NO_2) and (PM_{10}), which are known as major pollutants, thus deaths due to the respiratory system increased by 3.63% compared to natural deaths which were only 0.99%. In addition, it is expected to happen in 2020 which will be a developed country in the industrial world and this can cause the level of air quality in Malaysia to be the main focus of all parties. According to Sansuddin (2011), the Air pollution Index (API), used by government agencies in characterizing air quality status, because the method (API) provides easily on assessment as well as coordination in a given location throughout the country. Lastly, the country also creates various systems such as the Malaysian air quality index (MAQI), air pollutant index (API) to help Malaysia produce the right results to improve the health of the atmosphere caused by air pollution.

METHODOLOGY

Research methodology is the process in the research that will be conducted by a researcher to collect and gather the information that is needed to be related to their field of study. The process or research is essential in every study as it is the requirement needed to answer the proposed research question thus meet the objectives of the study. The research methodology consists of the research framework, research design, sampling of design, instrument, pilot study, method of analysis and hypothesis which will be covered later in this article.

Thus the conceptual theory can be said to have similarities to research-based theoretical theories. Nevertheless, this conceptual theory is created from both current and possible sources. In addition, it can also be defined as a group of chamber ideas and research theoretical aids which will use this conceptual theory as the question and purpose of research.

Conceptual Framework

This section illustrates the framework between the independent variables towards the dependent variable. The framework consists of a total of 5 independent variables; which is open burning activities, industrial fuel burning and processes, transportation emissions, agriculture activities, and cigarette smoke. The dependent variable is the factor of air pollution.

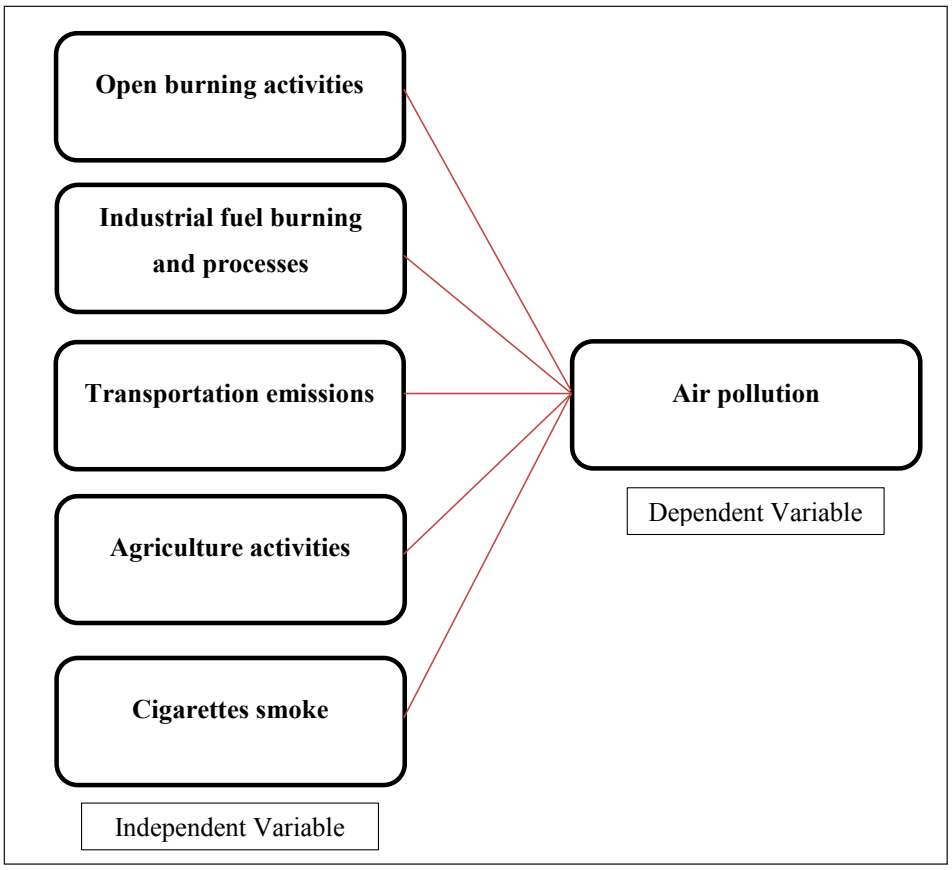

Figure 1 Research framework

Research Design

According to Sileyew (2019), a research design is a goal that provides an appropriate framework for a research study. Making the right choices about a research approach is a very important decision in the research design process. This is because it shows the way the information relevant to the study will be obtained. Nevertheless, the design decisions of this research require many interrelated results. The research design used in this study is the quantitative approach whereby a survey study was conducted using a questionnaire to gather data required for this study. The data is analysed and the hypothesis in this study is tested to answer the research question, hence achieving the objective of this study. This research design strategy consists of several components such as research sampling and research instruments. The main focus of this research is to identify the factors that lead to air pollution. In this research, we have decided to go through quantitative research. In addition, as we all know, quantitative research involves data collection, analyzing, interpreting and the last is showing the result. Not only that, but quantitative also transported into the numbers, objectives to obtain information and also describe variables and their relationships.

Sample Design

Sampling is a process that determines the observation from a larger population. In this research, we will design a questionnaire survey on the population that will be implemented. In this study, we used a type of non-probability convenience sampling method. Based on Trochim (2020), non-probability convinience sampling does not involve random selection and probability occurs as well as depends on the rationale of probability theory. Not only that, in this type of method, not all populations have the same opportunity to be involved in this sampling. In addition, this study was conducted in Malaysia such as Klang Valley as the place is a place that is very related to air pollution. Initially, our number of respondents was only 30, but we realized that our Cronbach alpha was below 0.05 so we had to increase the number of respondents to a total of 55 respondents for this study. The questionnaire will be distributed in the form of a Google Form that we will design ourselves. After that, the questionnaire will be distributed through friends, family online like Whatsapp. One of the reasons why we opted for the questionnaire through Google Form is to make it easier for respondents to answer online without having to meet directly during the COVID-19 pandemic season.

RESEARCH INSTRUMENT

This study used one set of questionnaires as the primary instrument, which was distributed using random sampling to gather data and information. The questionnaire used is an open-ended question that is used to answer all the research questions of this study. For this study, the questionnaire is prepared in the English version to ensure that the respondents understand the question.

The questionnaire is developed into three (3) sections which the first section is related to the respondents' demographic which consist of 8 questions. The second section is regarding the independent variables which consist of 16 questions. The second section of the questionnaire focuses on the factors that contribute to air pollution in Malaysia while the last section is referring to the dependant variable which involves 6 questions. A Likert Scale ranging from 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) were used to answer the questionnaire. A total of 55 questionnaires were obtained with 26 (47.3%) respondents are currently students, 18 (32.7%) coming from full-time employees, 4 (7.3%) respondents are self-employed, 3 (5.5%) respondents are part-time employees and the rest is coming from unemployed which consist of 4 (7.3%) respondents.

Pilot Study

In the pilot study section, the result of factor analysis and the Cronbach alpha.

Factor Analysis

Factor analysis is classified as a method in reducing or shortening some data as well as reducing the value of big data to smaller data for easier understanding and clarity. This is a way to be able to show hidden variables or unidentified variables. (Hair et, al. 2010; Chuo, 2009) where according to both explain that factor analysis factor is defined as a statistical method used in analyzing the relationship between some variables with other variables by describing the data set into a particular form of factor.

Table 1 Total variance explained

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.782	35.371	35.371	5.019	22.815	22.815
2	2.607	11.849	47.221	3.667	16.670	39.484
3	2.204	10.017	57.237	3.061	13.912	53.396
4	1.698	7.718	64.955	1.874	8.518	61.914
5	1.421	6.460	71.415	1.806	8.209	70.123
6	1.303	5.923	77.338	1.587	7.215	77.338
7	.923	4.195	81.533			
8	.775	3.524	85.057			
9	.577	2.621	87.678			
10	.550	2.500	90.178			

As shown in the SPPS analysis data in Figure 2, where the number of variances shown in each component is present, there are 7 components with Eigenvalues of 1 and above. Analysis Component 1 showed an explanation of 16.35%, while component 2 showed an explanation with a value of 12.38% and 10.33% showed an explanation for component 3, while component 4 showed a variance value of 8.68% and a variance value indicating 8.26%, 7.85%, and 6.76% respectively each shows an explanation for the three components namely Component 5, 6 and 7.

Cronbach Alpha

Table 2 Reliability statistic

Cronbach's Alpha	N of Items
.758	6

The study data, shown in the SPSS analysis showed statistics for the reliability of the questionnaire. Therefore this questionnaire was distributed to 55 respondents to assist in examining the reliability of the data in measuring the objectives of the study. As the study conducted has shown that Cronbach alpha is 0.75, this can be summarized because having an estimated value of Cronbach alpha greater than 0.6 can be concluded and the questionnaire is a reliable instrument to measure the objectives of the study regarding air pollution factors. Cronbach's alpha is a measure of internal consistency that is to ensure that a set of items and a group are closely related which is classified as scale reliability. Such a thing can be seen in the Likert scale.

Table 3 Scale reliability

Cronbach's alpha	Internal consistency
$a \geq 0.9$	Excellent
$0.9 > a \geq 0.8$	Good
$0.8 > a \geq 0.7$	Acceptable
$0.7 > a \geq 0.6$	Questionable
$0.6 > a \geq 0.5$	Poor
$0.5 > a$	unacceptable

Next, theoretically also explains where the result of a Cronbach alpha will give one of the numbers from 0 to 1, however, Cronbach alpha can also produce a number of negative nature, such that the number of negative nature indicates if the data produced an error related to some item values, as we see Cronbach alpha from 0.60 onwards is one of the best data values in terms of internal reliability or consistency.

Method of Analysis

Descriptive Analysis

The questionnaire that had been distributed to respondents is the Likert scale to collect qualitative data. The data collected are extracted to scree plot.

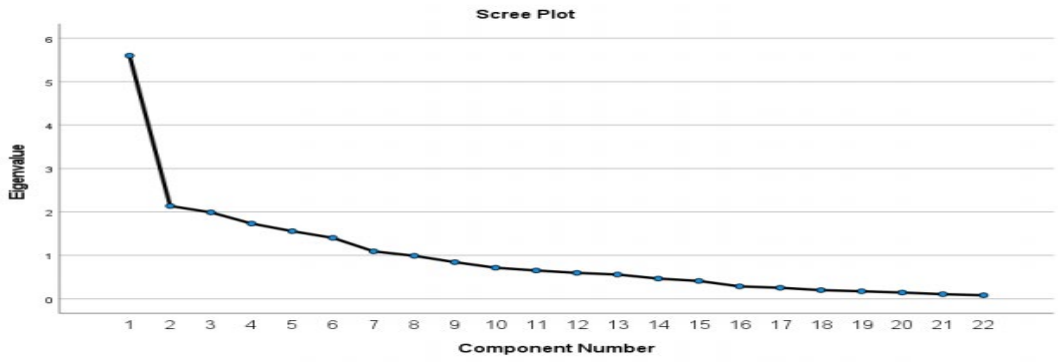

Figure 2 Scree plot

Open Burning Activities

According to the government of the Hong Kong Protection Department, the open burning of wastes generates excessive emissions of pollutants such as dense and odorous smoke, dust, and toxic fumes. These emissions often cause serious nuisances and may threaten the health of the people in the neighbourhood.

Table 4 The response choices for the respondents for each item

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. One of the main causes of air pollution is due to open burning.
2. Areas such as a vast forest become places where open burning is done
3. The negative effect air pollution from open burning can causes haze

Industrial Fuel Burning and Processes

Emissions from industrial areas near cities do not seem to contribute greatly to the overall urban air pollution levels of those cities, and the concentrations of criteria pollutants and air toxics in the air sheds of industrial areas are generally below national standards (National Pollutant Inventory, 2010).

Table 5 The response choices for the respondents for each item

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. Release of chemicals from industry closely related to air pollution.
2. Protracted haze conditions are one of the causes of air pollution.
3. Smoke emissions from combustion and industry, are effects that lead to air pollution.

Transportation Emission

One of the factors that lead to air pollution is transport emission. It is because the gases that emit from transport will produce greenhouse gas. As with most cities and large urban areas, pollution from traffic is the most important issue for urban air pollution in Australia (Beeton et al., 2006).

Table 6 The response choices for the respondents for each item

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. Carbon dioxide gas is more dangerous and contributes to air pollution.
2. Transport emissions in Malaysia is one of the factors in the occurrence of air pollution
3. The use of public and private transport is the factor in the occurrence of air pollution

Agriculture Activities

Agriculture contributes 24 per cent of yearly emissions. This estimate, however, does not account for the CO_2 that ecosystems take from the atmosphere by sequestering carbon in biomass, dead organic matter, and soils, which offsets around 20% of emissions from the agriculture sector (IPPC Report, 1996).

Table 7 The response choices for the respondents for each item

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I always use pesticides and fertilizer when planting/ in agriculture activity
2. Frequently uses of pesticides can lead to air pollution.
3. Pesticides contain a harmful chemical that can pollute the air

Cigarettes Smoke

Tobacco smoking in the environment contributes to air pollution particles. These microscopic particles are a risk factor for chronic obstructive pulmonary disease, which may be severe and deadly. According to the researchers, they can cause asthma, bronchitis, and emphysema, as well as increase the chance of lung cancer (Hitti, 2004).

Table 8 The response choices for the respondents for each item

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. Smoking habits can affect air pollution.
2. There is no connection between cigarettes smoke and air pollution
3. Air pollution caused by cigarettes smoke is extremely dangerous for the environment and human health.
4. Nitrogen contained in cigarette smoke also can lead to air pollution.

Regression Analysis

For regression results, we are using linear regression. In general, regression results are classified as a form of inferential statistics, where P-values are used as an item to help determine the relationship that exists in the study sample, it also exists in larger populations, in addition to the P-value for each variable free to test the null hypothesis, i.e. where the variable has no relationship with the dependent variable. Further, if in the item value there is no correlation then there will be no relationship between the change of the independent variable with the dependent variable or there will be no true evidence, to conclude if there is an effect at the population level. P-values that have a large value of the fidelity level will indicate where there is insufficient evidence in the study sample to assist in concluding that an open-zero correlation exists. As we understand regression analysis exists because it is associated with a statistical concept also includes sampling, correlation, guessing, probability and hypothesis testing as well as other analyzes involved. According to Jim Frost (2020), he explained that P-values and coefficients in a regression analysis work together in telling where the statistical significance and the nature of the relationship, even coefficients explain the mathematical relationship between each independent variable and dependent variable even the P-value for the coefficient indicates whether this relationship is statistically significant.

Hypotheses

The study consists of 5 research hypotheses:

Hypothesis 1: Open burning activity has a significant relationship with air pollution in Malaysia.

Hypothesis 2: Industrial fuel burning has a significant relationship with air pollution in Malaysia.

Hypothesis 3: Transportation emission has a significant relationship with air pollution in Malaysia.

Hypothesis 4: Agriculture activity has a significant relationship with air pollution in Malaysia.

Hypothesis 5: Cigarettes smoke has a significant relationship with air pollution in Malaysia.

FINDINGS

Characteristics of the Respondents

Based on the findings, the majority of respondents are female, 39 respondents (70.9%), followed by males, 16 respondents (29.1%) making the total number of respondents as many as 55 people. For ethnicity, the result showed that the majority of respondents are of Malay, 35 respondents (63.6%), followed by the other ethnicities 12 (21.8%). The Chinese ethnic showed a total of 6 equal respondents (10.9%) and finally, the Indian ethnic is the least that is only 2 equal respondents (3.6%).

According to findings, the age of the respondents' section showed that most respondents are from between 18 to 25 years old (47 respondents, 85.5%), then followed by the age of between 26 to 33 years old (7 respondents, 12.7%). The less of the age is between 34 to 41 years old that recorded only 1 respondent (1.8%). The highest level of education is from high school (22 respondents, 40.0%), followed by diploma education (17 respondents, 30.9%). For degree and master, it showed that the Degree record the higher than master which is 15 respondent or (27.3%), while the less education is master that state only 1 respondent or (1.8%) in this terms.

According to the findings, the majority of the respondents are students with 26 respondents (47.3%), followed by full-time employees with 18 respondents (32.7%). The findings also indicated that the minority of respondents are self-employed, and unemployed followed by part-time employees with 4 respondents (7.3%) and 3

respondents (5.5%) whereas self-employed and unemployed have the same frequency. As previously stated, the majority of respondents are range in age from 18 to 25 years old and have a high level of education, implying that the majority of them are still students.

The study indicates that 41 (74.5%) of the respondents have a monthly income of RM2,500 or less followed by 9 (16.4%) respondents that earned monthly income between RM2,501 to RM5,000. The third rank is between RM5,001 to RM7,500 of monthly income with 4 or 7.3% respondents. The findings also showed 1 of the respondent with 1.8% has an income of more than RM7,501 per month.

Out of the total number of survey participants, most of the respondents are non-smoker which indicates 49 (89.1%) respondents, while 6 (10.9%) of the respondents are a smoker. This result appears logical given that the majority of respondents are female and students. Thus, they tend to not be a smoker. In the household vehicle section, the majority of the respondents have 1 or 2 vehicles with 16 (29.1%) and 19 (34.5%) respondents respectively. This study also revealed that 10 (18.2%) respondents owned more than 3 vehicles. Approximately 10 respondents (18.2%) do not have a vehicle.

Table 9 Respondents demographic (N = 55)

Variable	Category		Frequency, *N*	Percentage, %
Gender	Male		16	29.1
	Female		39	70.9
		Total	55	100.0
Ethnicity	Malay		35	63.6
	Chinese		6	10.9
	Indian		2	3.6
	Others		12	21.8
		Total	55	100.0
Age	18 – 25 years old		47	85.5
	26 – 33 years old		7	12.7
	34 – 41 years old		1	1.8
		Total	55	100.0
Education	High school		22	40.0
	Diploma		17	30.9
	Degree		15	27.3
	Master		1	1.8
		Total	55	100.0
Employment status	Full-time		18	32.7
	Part-time		3	5.5
	Self-employed		4	7.3
	Unemployed		4	7.3
	Student		26	47.3
		Total	55	100.0

Household monthly income	2,500 or less		41	74.5
	2,501 – 5,000		9	16.4
	5,001 – 7,500		4	7.3
	More than 7,501		1	1.8
		Total	55	100.0
Smoke habit	Yes		6	10.9
	No		49	89.1
		Total	55	100.0
Household vehicle	None		10	18.2
	1		16	29.1
	2		19	34.5
	More than 3		10	18.2
		Total	55	100.0

Regression Results

Table 10 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661a	.437	.379	.37769

Table 10 shows an R-square value of 0.437. This means 43.7% changes in the factor that contribute to air pollution in Malaysia was influenced by open burning activities, industrial burning fuel and processes, transportation emission, agriculture activities and cigarette smoke. Meanwhile, 56.3% was influenced by other factors.

Table 11 ANOVA

		Sum of Square	df	Mean Square	F	Sig.
1	Regression	5.422	5	1.084	7.602	.000b
	Residual	6.990	49	.143		
	Total	12.412	54			

Table 11 shows the stability of the model used. The estimated F-value of 7.602 was significant at a 5% significance level (Sig = 0.00). Therefore, it can be concluded that the model is stable and the regression can be used for forecasting.

Table 12 Coefficient

Model	Unstandardized B	Coefficient Std.Error	Standardized Coefficients Beta	t	Sig.
Constant	2.247	.689		3.261	.002
Open burning	–.072	.134	–.061	–.536	.594
Factory	.268	.087	.423	3.063	.004
Transport	.125	.083	.231	1.512	.137
Pesticides	.094	.118	.102	.794	.431
Cigarettes	.066	.099	.078	.669	.507

Table 12 shows the regression result. As discussed earlier, the dependent variable is factors that contribute to air pollution in Malaysia meanwhile the independent variables are open burning activities, industrial fuel burning and processes, transportation emissions, agriculture activities and cigarette smoke. Table 12 shows that the Sig value is 0.002 for constant and it is means there was a significant independent variable. The factory as the industrial fuel burning and processes has a 0.004 significant value which is means this independent variable is significant. The Beta coefficient of the factory is 0.288 which means that there is a positive correlation between the industrial fuel burning process and air pollution.

DISCUSSION AND CONCLUSION

To summarize the things in the study, air pollution is a condition of a country where it involves chemicals, biology or particulate matter that affects the discomfort of all humans and other living organisms and helps damage the environment. Malaysia's air pollution is very severe and is in third place. Various causes of air pollution such as smoke emissions from industry, motor vehicles and which include carbon dioxide, sulphur dioxide and radioactive waste and other materials that also contributed. The consequences will have an impact on the level of health, safety of all human beings and other property. This research has also referred to some previous studies that have been done through articles related to the scope of research, such as the article written by Haryanto and Frankin (2011) as well as several other articles. In addition to collecting accurate data from the public, we have used measurement tools through questionnaires, observations, sampling techniques and analysis methods as well as the use of SPSS.

The survey was conducted on 55 respondents consisting of 39 females and the remaining 16 are males, we also set the age range where the age level of 18 – 25 as many as 46 respondents, at the level of 26 – 33 is as many as 7 respondents while 1 respondent who answered the age level of 34 – 41. In addition, there are 36 ethnic aspects of respondents from ethnic Malay, Chinese 6 respondents and Indian 2 respondents, and natives of Sabah by 11 respondents. A total of 15 respondents answered degree education level, while diploma 17 respondents, the high school also has 22 respondents and master education level is only answered by 1 respondent. In addition, the status of working, student, full time, unemployed, self-employed and part-time, each with a value of 26, 18, 4, 4 and 3 respondents. Respondents who answered a household income of 41 people had an income below RM2,500, while RM2,501 – 5,000 were answered by 11 respondents, 3 respondents had a household income of RM5,001 and income below RM7,501 only answered by 1 respondent. The next question of 49 respondents answered yes in the question section do you smoke, and the remaining 6 respondents answered no. A total of 10 respondents did not own a household vehicle, 15 respondents answered owning 1 household vehicle, and 19 owned 2, while 3 vehicles were answered by 11 respondents.

For air pollution in Malaysia, a total of 27 respondents answered strongly agree to the first question where the main cause of air pollution is fire, 20 agree, 3 neutral, the remaining 2 disagree and 2 strongly disagree. The second question, areas such as vast forests become places where open burning is done, a total of 15 respondents answered strongly agree, 27 agree, while 5 are neutral, 7 disagree and strongly disagree 1 respondent. The third question of 20 respondents answered strongly agree, and 25 answered agree The negative effects of air pollution from open burning can cause haze, however only 5 respondents answered neutral, 4 disagreed and 1 respondent strongly disagreed. Next, the fourth question is the release of chemicals from industries that are closely related to air pollution, here a total

of 22 respondents answered strongly agree compared to respondents who answered agree as many as 27, while neutral and disagree every 3 respondents. Question five Prolonged haze is one of the causes of air pollution, respondents who answered strongly agree only 17 fewer than those who answered agree that is 30 respondents, 5 neutral and 1 disagree and 2 respondents strongly disagree. Analysis for the sixth question Smoke emissions from combustion and industry are effects that lead to air pollution, a total of 22 strongly agree and 19 agree, 4 neutral and 10 respondents answered disagree. Question seven Carbon dioxide gas is more dangerous and contributes to air pollution. A total of 23 respondents agree, 4 abstain, 7 disagree. Next, for the eighth question, on average, almost half of the respondents answered strongly agree that transport emissions in Malaysia are one of the factors in the occurrence of air pollution, namely 26 respondents, 18 agree, 6 respondents answered neutral, 4 and 1 respectively disagree and strongly agree. In addition, the use of public and private transport is a factor in the occurrence of air pollution where respondents only answered 18 strongly agree, 21 agree, 9 neutral, 2 disagree and 5 strongly disagree. Question ten of 3 respondents who answered strongly agree that I always use pesticides and fertilizers while planting / in agricultural activities, 12 answered agree, 17 neutral, 16 disagree and 7 respondents strongly disagree. Next Frequent use of pesticides can cause pollution air, here respondents who answered strongly agree only as many as 15, 24 agree, 9 respondents answered neutrally, 4 and 3 respectively disagree and strongly disagree. Question twelve where a total of 18 respondents strongly agreed that pesticides contain harmful chemicals that can pollute the air, while 24 respondents answered agree, 8 respondents answered neutral and 5 respondents answered disagree. Question thirteen Smoking habits can affect air pollution where only 12 respondents strongly agree and the remaining 25 agree, 12 respondents answered neutral, 5 disagree and 1 respondent strongly disagree. In addition to the fourteenth question There is no relationship between cigarette smoke and air pollution only 2 respondents have answered strongly agree and 12 agree, 8 answered neutral, 15 disagree and 18 respondents strongly disagree. Analysis of question fifteen, air pollution caused by cigarette smoke is very dangerous for the environment and human health, respondents who answered strongly agree as many as 20, while 23 answered agree, 3 neutral, 7 and 2 respectively disagree and strongly disagree. A total of 15 people strongly agreed that Nitrogen contained in cigarette smoke can also cause air pollution, and 27 respondents answered agree, 8 respondents answered neutral, 4 disagree and 1 strongly disagree.

Next, the analysis for air pollution in Malaysia, almost half of the respondents strongly disagree with the first question that is I do not see air pollution as a problem, 14 disagree and 2 respondents answered neutral, 3 agree and 1 respondent answered strongly agree. The second question air pollution is out of my control and I cannot do anything to change it, only 3 respondents answered strongly agree compared to strongly disagree which is 20 respondents while the other 16 answered disagree, 11 respondents answered neutral and 5 answered agree. Apart from that, air quality data in Malaysia is getting better because of modern science and technology, here also shows that there are still fewer respondents who answered strongly agree that is only 4 people, 15 agree, 9 neutral and 25 respondents disagree and 2 strongly disagree. Fourth question air quality data is important to better understand how to maintain the health of the planet, where most respondents answered in the agree section, compared to strongly agree, neutral, disagree and strongly disagree which each with a respondent value of, 18, 10, 5 and 1 respondent. Air pollution is now the largest environmental risk in the world, where a total of 22 respondents have answered strongly agree, 23 agree, neutral

and disagree each with 4 respondents and 2 respondents strongly disagree. Finally, air pollution will affect future generations and it causes the extinction of flora and fauna, almost half of the respondents agreed because as many as 36 have answered strongly agree, compared to agree and disagree which is 14 and 5 respondents.

RECOMMENDATION FOR FUTURE RESEARCH

One of the suggestions that can be done to address this air pollution problem is legal action. Legal action is the most effective way the government can curb this problem. The government can enforce the law on individuals who commit offences that cause this air pollution to become more widespread. Not only that, the authorities such as the Ministry of Science, Technology and Environment should take legal action against organizations that cause this air pollution problem. For example, imposing imprisonment or cash fines commensurate with individuals or organizations such as factories. With the government implementing these legal actions, individuals or organizations will feel they do not dare to do so and if the country adopts these legal actions then this air pollution will be overcome.

Also, a suggestion that can be proposed is according to Smith (2017), air pollution can be reduced if the use of cars is reduced in a day. This is because the use of cars will contribute to the surface ozone of the soil which can lead to the occurrence of air pollution. The EPA says that an oil refinery is a major producer of sulphur dioxide and this is causing more time or rotation of car wheels to be used on the road and this indicates it is more of air pollution. If the reduction of car use is unavoidable, then we can use the reduction of car use by using public transport such as a commuter train. We are indeed denied that the use of public transport also contributes to air pollution, but it can reduce us from continuing to use our vehicles many times. This commuter train vehicle is also a combination of electricity and energy to get a better travel distance and produce almost zero smoke emissions. Not only that, but we can also plan a trip that is less movement using vehicles.

The next suggestion is our role as a society in this country. We must cultivate a spirit of love for the environment by not making mistakes that can lead to this problem. This is because, if we ignore the negative effects of this air pollution problem in terms of the health and life of other organisms, the life of the environment or the country's environment will become unsafe and unhealthy. Therefore, we as a society need to work together to overcome this problem from getting worse. This can be done by making a complaint or reporting to the authorities if we see suspicious individuals causing air pollution such as open burning in forest areas. This will enable the people to live with comfortable and cosy air without the presence of fire smoke that can pollute the air. Not only that, but the community can also do prevention from this problem by reducing the use of cigarettes. Cigarettes not only endanger one's health, but the smoke released can also endanger the health of others as well as air quality. Therefore, we as a society need to be more sensitive to overcome the problem of air pollution so that society can live more comfortably and harmoniously.

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