

UNIVERSITI TEKNOLOGI MARA

**EFFECTS OF URBAN AREA DEVELOPMENT IN
SELANGOR TO THE AIR POLLUTION INDEX FROM
2012-2014**

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BEng (Hons) Chemical

July 2019

ABSTRACT

Klang Valley's rapid urban development over the years has increased the risk of ambient air pollution. The pollutants may be in different forms such as solid particles, liquid droplets, gases or a mixture of these three forms. This study aims to analyse the air quality trends and their correlation with the anthropogenic and natural factors at three air monitoring stations in Klang Valley. The data of the five primary pollutants (SO_2 , NO_2 , O_3 , CO and PM_{10}) were continuously monitored daily by the Department of Environment Malaysia (DoE). The air quality trends and status could be observed by the data retrieved from DoE. It shows that the concentrations of PM_{10} , SO_2 and O_3 were high due to transboundary haze recorded at $275\mu\text{g}/\text{m}^3$, 0.013ppm and 0.094ppm respectively. This happened during the southwest monsoon where the country experience dry and hot weather. Meanwhile, the concentrations of NO_2 and CO were seen to be influenced more by the motor vehicles near the monitoring stations where the highest concentrations were recorded at 0.064ppm and 4.35ppm respectively. This shows that the source of air pollution from motor vehicles are dominant especially in urban areas. Besides that, industries, forest fires and urbanisation were also found to be the prime contributor to the decrease in air quality level in these three locations.

ACKNOWLEDGEMENT

First and foremost, I would like to thank God for giving me the opportunity to embark on my degree and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor Dr. Safari Zainal for the support, patience and ideas in assisting me with this project. I also would want to express my gratitude towards Universiti Teknologi MARA (UiTM) Shah Alam for giving me the opportunity to conduct this project as my Final Year Project (FYP).

Finally, my appreciation goes to the Department of Environment Malaysia (DoE) for providing the air quality data for this project.

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CHAPTER 1

INTRODUCTION

1.1 Project Background

A gaseous cover of the Earth's surface is the atmosphere which also an essential part of the biosphere (Stuhler et al., 2008). Clean, unpolluted dry air composed of 78% nitrogen, 21% oxygen and small traces gaseous mixture of carbon dioxide, helium, argon, hydrogen etc. completes the composition of air. Additional gases or contaminants enter the Earth's atmosphere as a result of human civilisation such as methane, greenhouse gases, nitrous oxide and even more carbon dioxide (Artinian, 2010; Rao et al., 2007). Interactions between fractions of these gases which is labelled as 'pollutants' and the environment will contribute to the environmental decay, toxicity and diseases (Agarwal, 2005).

Air pollution is an intricate societal problem especially in developing countries (Vallero, 2014). It defines as any unusual increase or decrease of the concentration of the normal components of atmosphere (Mudakavi, 2010). Air pollution also defines as one or more pollutants presence in the outdoor atmosphere in quantities and duration that could harm humans, plants, animal life, or anything that could impede the enjoyment of life or business (Liu et al., 2000). Some critics commented that air pollution in western countries caused by growing industrialisation is referred to as "the price of industrialisation" while the air pollution caused by automobiles is referred to as "the disease of wealth" (Kumari et al., 2014). Usually, visible signs of pollution such as dark plumes emitted from smoke stacks or hazy conditions will be frequently seen by people living nearby industrial area. On top of that, the increased usage of automobiles contributes to more emission of pollutants such as carbon monoxides (CO), nitrogen oxides (NO_x), and hydrocarbons (HC) (Krzyzanowski et al., 2005). Globally, 75% of CO emission comes from the transport sector (Kanagasabai, 2010). Although there are clean air laws and air quality standards in many countries to protect the environment and public's health, human actions counteract these gains and more harmful levels of air pollutants are being exposed to the people.

Human actions in this growing industrialisation and globalised world are affecting both the air quality and climate change (Gurjar et al., 2010; Kanagasabai, 2010). One of the most obvious effect that could be observed is a micro-climatic phenomenon called urban heat island (UHI) which occurs within urban areas. The temperature in these areas are generally warmer than rural or suburban areas.