

Economics of Air Pollution in Malaysia

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Abstract

Air pollutants can be either gases or aerosols with particles or liquid droplets suspended in the air. They change the natural composition of the atmosphere, can be harmful to humans and other living species and can cause damage to natural water bodies and the land. Anthropogenic specifically due to the human causes that in this study, it has been identified that Population, Gross Domestic Product (GDP) and Manufacturing Industry adaptive from IPAT Model is the major contributors to the emission of carbon dioxide. The time series data gained of carbon emission from the years 1970 to 2011 to explain the trend. The Command and Control (CAC) and Economic Incentive (EI) approaches being recommended to assist the government monitoring the air pollution trend in Malaysia

Keywords: Air Pollution, IPAT Model, Population, GDP, Manufacturing Industry, Government Policy

1.0 Introduction

Effluence generally can be expressed as intentioned environment contamination with human created wastes. The wastes are the results of their daily activities occur along energy use such as travelling using any transportation that emits carbon. A pollutant is a material that can cause unfavourable changes in the environment by not only altering a species' growth rate and interfering with food chains, but also bringing disruptions to health, comfort, amenities and human's property values. The consequences from this particular activity will create negative externality. Callan and Thomas (2004) describes negative externality as a 'spill over effect' which sees the production or consumption being extended to a third party outside the market. There are various types of pollutions. However for this study, the primary focus is on air pollution.

Air pollution occurs when air is contaminated with natural and anthropogenic pollutants. Anthropogenic pollutants are contaminants associated with human activities which include polluting residuals from consumption and production activity (Callan & Thomas 2004). The theory of economy stipulates that adequacy in terms of costs and benefits are needed in order to use and circulate resources efficiently in an activity. In many instances, the air emission costs are considered 'external' to the decision-making process involving production and consumption. This is because the costs are borne by the community instead of the party responsible for the pollution. The existence of these 'external' costs is often considered a mark of 'market failure'. This also happens when an activity's social costs exceeds the private costs. In such instance, the decision-making process is not entirely drawn accorded on the 'full' costs of the production, and this leads to inefficiency in resource use and management (United States Department of Environment, 2005).

Air pollution happens due to the presence of anthropogenic pollutants and non-point source pollutants in the air. Non-point source pollutants come from sources that cannot be accurately identified. These pollutants have diffusively and indirectly contributed towards the degradation of environment. According to Callan and Thomas (2004), several researches have validated the identified determinants of the world's air pollution. For example, in the investigation done by Zhu (2012), it is found that the vehicle emissions and industrial waste from the nearby Pearl River Delta degrade the quality of the air in Hong Kong. As such, Hong Kong's financial communities are forced to move to Singapore. Marco (2011) posits that air pollution is majorly caused by combustion engine vehicles such as cars, trucks, and planes. Dangerous nitrous oxide, gaseous oxide and carbon monoxide are housed in the exhausts of vehicles. Smog, which can be seen in Los Angeles, is the result of this type of pollution. This type of pollution has also contributed to the thinning of ozone layers. Thus, it increases the earth's exposure to the harmful rays of the sun. Not only that, it also brings about a host of health problems.

Moreover, Jacob (2010) found that, full life cycle of a vehicle contributes to air pollution, which includes the process of manufacturing, refuelling, emission and disposal of the car. Fuel refining and distribution cause additional pollutants. These pollutants can be further categorized into primary and secondary pollutants. Those considered primary pollutants are released straight to the air. Secondary pollutants on the other hand, are the by-products of chemical reactions that transpire between the pollutants and other minute particles in the atmosphere. From the previous studies, it can be assumed that most of the major pollutants come from manufacturing activities. It is important to note that the increase in the demand of vehicles and the many economic activities occur along population growth. However, the major concern of scientists as well as economists is the tremendous impacts of the exposure to the air pollution. Heat waves are expected to occur more frequently in the future due to anthropogenic climate change. Urban population in particular may suffer adverse health effects with the combination of poor air quality and high temperatures.

This can indeed impinge the well being of mankind. This further emphasizes the need for assessing the health risks of residents in relation to air pollutants and anomalously high summer air temperatures (Merbitz H., Buttstädt M., Michael S., Dott W., Schneider C. 2012). On that note, there are many evidences that support the notion that air pollution affects human health as it triggers diseases like asthma, bronchitis, and lung cancer, as reported in the researches done by among others (Brunekreef & Holgate 2002; Künzli N, Kaiser R, Medina S, Studnicka M, Chanel O, Filliger P, Herry M, Horak F Jr, Puybonnieux-Textier V, Quénel P, Schneider J, Seethaler R, Vergnaud JC, Sommer H. 2000; Pope, Pope CA 3rd, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. 2002). In the studies conducted by Dockery DW, Pope CA 3rd, Xu X, Spengler JD, Ware JH, Fay ME, Ferris BG Jr, Speizer FE. (1993) along with Schwartz and Marcus (1990) on the effects of air pollution on the death rate of adults and the health of their respiratory system, they found that some age groups who are not in their radar of observation appeared to be more vulnerable than the other groups. Saldiva PH, Pope CA 3rd, Schwartz J, Dockery DW, Lichtenfels AJ, Salge JM, Barone I, Bohm GM. (1995) in one example, has shown that the effects on mortality and respiratory system are higher in the adults than in the overall range of the population.

Health risks researches among children, which involve cases of hospital admissions for asthma and other respiratory illnesses, suggest that children, being at the other endpoint of the age continuum are becoming increasingly vulnerable to the ill effects air pollution than other age groups in the entire population (Dockery & Pope 1994; Heinrich J, Hoelscher B, Wjst M, Ritz B, Cyrus J, Wichmann H. 1999; Schwartz J, Dockery DW, Neas LM, Wypij D, Ware JH, Spengler JD, Koutrakis P, Speizer FE, Ferris BG Jr. (1994).

Together with these descriptions, there also exists the looming trend that air pollution is also link with the increased risk of complications associated with pregnancies (Glinianaia SV, Rankin J, Bell R, Pless-Mulloli T, Howel D. 2004; Maisonet M, Bush TJ, Correa A, Jaakkola JJ. 2001). Beelen R, Hoek G, Fischer P, van den Brandt PA, Brunekreef B. (2007) along with Brunekreef and Holgate, (2002) summarized that many long term as well as short term negative consequences are associated with urban air pollution with relation to human health, along with increased death rate. They also believe that motorcycles are the largest contributors of Malaysia’s air pollution. The hydrocarbon, lead and nitrogen oxide that are released into the air cause acute health complications. This notion is supported by Kampa and Castanas, (2008). They point out that ailments such as asthma, bronchitis, chronic lung diseases and neurological shortcomings, affect people through air pollution. Furthermore, the vigorous increase of CO₂ released from the many vehicles travelling on the roads is the subject of worry to not only scientists, but also the policy makers who are very much concerned about the consequent rise in global temperature. In average, approximately one percent of population increases causes a rise of 1.42 percent in CO₂ emissions (Shi, 2003). Depleting the quantity of green house gases (GHG) such as CO₂ in the atmosphere is therefore, a highly daunting work for Malaysia.

The scenario of air pollution in Malaysia is tremendously increased due to various determinants. The increased amount of Carbon Dioxide (CO₂) in the air is attributed to the rise in income level and the number of vehicles. According to World Resource Institute, (2007), the year 2000 itself saw Malaysia producing 5.4 metric ton of CO₂, which exceeded the global average production of 3.9 metric ton per capita, and Asian average production of 2.2 metric ton per capita. The information from the international body also revealed the increase of CO₂ emission in Malaysia. However, according to Ho and Fong (2007), the volume of Malaysia’s CO₂ emission can still be controlled by limiting the numbers of motor vehicles and cutting down travel distances. In conclusion, problems related to air pollution are getting very complex and fuzzy nowadays. Humans, despite their awareness, have inflicted more complications by polluting the air via industrial activities, operating of motor vehicles, open burning and many more. It is projected that the environment will experience more severe impacts as this matter becomes more serious.

2.0 Trend Analysis

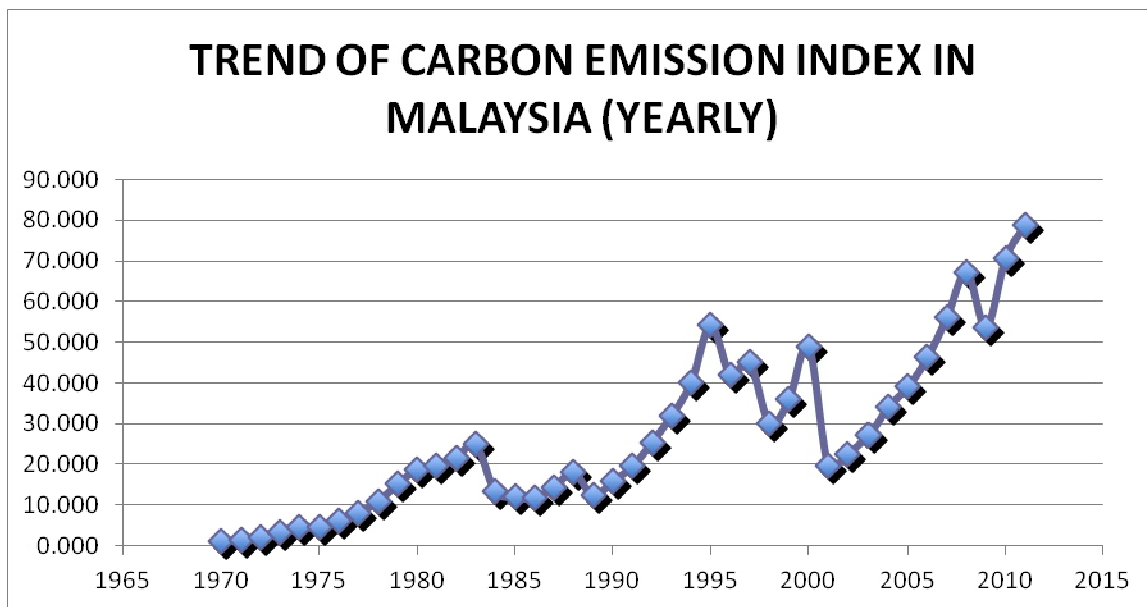


Figure 1: Trend of Carbon Emission Index in Malaysia (Yearly)

Figure 1 shows the trend of Air Pollution from the year 1970 to the year 2011. The trend is increasing sharply until the year 1980 and it slowing down and tremendously increases again until the year 1995. The next situation is the trend is fluctuating over the year. In this part, it is not to explain the situation; however, it is more to observe the trend situation and pattern. It is found the rise in production of goods and services warrants the use a lot of energy. This energy comes in the form of electricity, gas, petroleum product, coal and crude oil that affect the quality of air and create negative externality.

The country's economic progress and turn leads to social progress are driven by energy consumption. All over the world, energy has changed the lifestyles of households as well as changes the level of value added through the activities associated with production. In addition, energy also produces negative effects to the environment through the direct and indirect energy consumption, with direct and indirect impact on the level of CO₂ being released to the air.

The impact of energy use to the level CO₂ release in Malaysia is not a novel issue and has drawn the attention of many NGOs and political parties, which have been showing growing interest on this matter for the last twenty years. Given these conditions, the government has launched the initiatives to reduce the amount of energy consumption as well as to reduce CO₂ emission through efficient energy use and accord due consideration environmental issues per stated in the 10th Malaysia Plan. Therefore, Malaysia aspires to reduce the amount carbon dioxide by up to 40 percent by year 2020 in comparison to 2005 level, even though Malaysia is directly not affected by the Kyoto Protocol. This is therefore an exercise in encouraging the reducing of the CO₂ emission. The subject of air pollution is no longer a regional issue. It has become a global phenomenon and extra measures need to be taken into consideration by all organization government, non-government and private institution. It is important to preserve the condition the environment by efficiently managing the consumption of energy. This is because positive economic growth is worthless if the environment is in a bad shape. In order to minimize CO₂ emission in this country, the sectors that contributed to the highest amount CO₂ emission must identified. Environmental problem is about to one of the most challenging issues faced by Malaysia.

Even though Malaysia has the least environmental problems in Asia, given the massive infrastructural changes of recent times through rapid industrialization, agricultural activities, tourism, and export activities it also indicates that Malaysia has undergone the positive economic growth over the years. Due to this growth, air pollution which can be attributed to industrial activities and motor vehicles emissions is inevitable. The worsening cases of pollutions also have many other damaging effects. One of the damaging effects that have occurred was the global warming due to rising presence of CO₂ in the air. The impact of too much CO₂ in the environment is that it might negatively affect the flora and fauna that inhabit both land and sea due by contributing to the rise of global temperature. This green house effects also could change the world geographical structure, causing floods, drought and an increase in damaging storms.

As for social benefit and health, diseases such malaria and dengue could spread. Air pollution also contributes towards the decline in crop yields. Long-lasting and intense heat waves could cause more deaths and illnesses as well as increasing the cases malnutrition in some countries. All of these disasters are mainly caused by human activities and it will continue happening without stopping. The disasters such as floods, landslides, erosion and extreme heat often happen in the country and it has destroyed many things like houses, cars, home appliances and infrastructure. In Malaysia, the occurrence of flood is due the tropical wet season that is marked by heavy and constant rainfall from October to March. However, the cases of floods that occurred in December 2006 to January 2007 in Southern Johor were believed to be partly due to recent effects global warming.

3.0 Conclusion

Malaysia is one of the countries that are blessed with abundant natural resources. It is also a country which has high biodiversity. Malaysia is also home to many renewable and non renewal resources. Its economy records among the fastest growing as compared to other ASEAN nation. Malaysia is among the leading producers of natural rubber, hardwoods, oil and tin. However, Malaysia is facing numerous problems challenges that come in the form of climate change, degradation of biodiversity, increasing scarcity of natural resources, unwise management of natural resources, hazardous waste management, and growing rate of urbanization. This country also saw ineffective law enforcements and short-term, inconsistent term policy, instable and defective foreign policy, lack of technicalities, lack of good governance and many more. These problems are accountable to depletion of its natural resources. That matter is elaborated in the various journals, books, newspapers and websites which are available online. In order to efficiently manage the consumption of natural resources while preserving the environment at the same time, the Government enacted a set of laws and regulations to oversee the sectors involved such as the Environmental Quality Act 1974 the Fisheries Act 1985 the Protection of Wildlife Act 1972; the National Parks Act 1980; National Forestry, Act 1984, Act 317, the Town and Country planning Act 1976, the Sarawak Natural Resources and Environment Ordinance 1997 along with the Department of the Environment, the Ministry of Science, Technology and the Environment which covering international, regional mechanisms in protecting and maintain a sound and healthy environment (Jomo,2005).

Moreover, it is important to note that the Malaysian constitution does not deal with anything directly unlike the other countries. Consequently, rightful protections that should accorded the flora and fauna which apart from people are not guaranteed under the constitution. Laws and regulation need to be modified immediately with the enhancement of existing punishments, incorporating the environmental provisions, amendment of the constitution as well as incorporating the ICT application in order to save and conserve the natural resources as well as to provide sustenance to our younger generations. But unfortunately, according to (Wan Portiab Hamzab, 2011) these laws and policy are not adequately due to lack of expertise, resources and commitments. Thus, it is the right time to increase and enhance the expertise, resources and commitments in order to overcome the air pollution issue.

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