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Poster Book

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ACID RAIN AND NO₂ CONCENTRATION IN PENINSULAR MALAYSIA 2020

INTRODUCTION

- Acid rain is an environmental phenomena that can exists due to the rapid modernization and increase of development activities without the consideration of environmental aspects.
- Acid rain is closely related to air quality. Deterioration of air quality leads to an increase of acidity in rainwater droplets. Anthropogenic activities, carbon burning in energy sector and increasing number of vehicles using petrol are the main reasons that can escalates the occurrence of acid rain
- Acid rain is studied based on the pH value (Hydrogen Potential), which is a measurement method based on a pH indicator or pH meter device. According Main (2003) and (Wonderfraw, 2014), in the research stated that the acid rain has pH value less than 5.6.

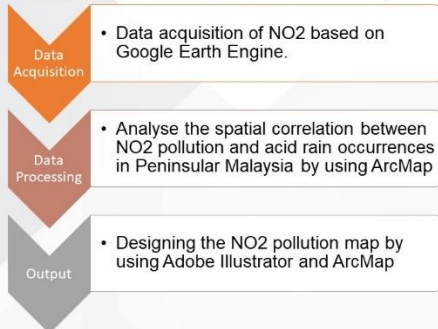
PROBLEM STATEMENT

- Since 1990, acid rain has been recorded in Malaysia (Main,2003). The most significant concentration of acid rain is at the west coast of Peninsular Malaysia which then extends further towards the south. The pH reading value between pH 4.4 to pH 4.8 which is the highest pH recorded in Malaysia occurred in the Sitiawan area, Perak (MHC Omar et al 2021)
- It is a fact that the existence of acid rain is also caused by emissions release of NO₂ and SO₂ (MMS Report 1988), but studies related to acid rain in Malaysia which are decreasing (MHC Omar et al 2021) and there is no study in Malaysia that can relate the occurrence of acid rain and NO₂ pollutant concentration

OBJECTIVES

- To correlate graphically the occurrences of acid rain and NO₂ pollutant sources in Malaysia
- To map the areas that receive the highest acid rain for Peninsular Malaysia.

METHODOLOGY



FINDINGS

- NO₂ hotspot from the satellite able to identified that Sitiawan Perak as one of the highest NO₂ is also having the highest pH recorded in for the same time frame.
- Although pH ground reading identify Klang Valley as having moderate reading of acid rain than Setiawan but the NO₂ reading is found to be higher or equal as in Setiawan.

CONCLUSION

- The study manage to show that satellite data is able to identify NO₂ emission sources which relates well with acid rain occurrences especially over western Peninsular Malaysia.

NOVELTY

- Providing hotspot of NO₂ and acid rain map used as a comparison of the relationship between acid rain and NO₂ emissions

COMMERCIALIZATION

- This map can be use by The Department of Environment (DOE) of Malaysia awareness of air pollution and acid rain phenomenon in Malaysia .

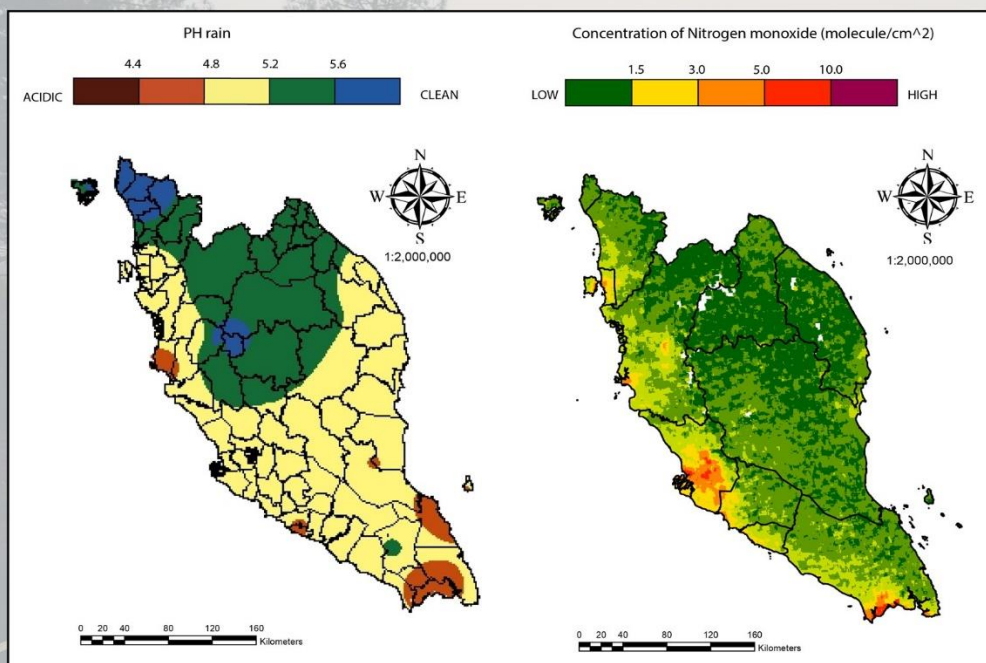
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FULL SCALE MAP



ACID RAIN AND NO₂ CONCENTRATION IN PENINSULAR MALAYSIA 2020



Coal Emission gases

Parameter	Coal emission factor (lb/ton)
SO ₂	38.5
NO _x	22
CO	0.5

Sources of Acid Rain

Volatile Organic Compound (VOC)	Organic that exists in the form of gas, solid or liquid resulting from the emission of vehicle smoke and industrial activities.
Karbon Monoxide (CO)	Type of gas that is colorless and odorless to humans and is toxic
Karbon Dioxide (CO ₂)	Colorless, odorless and tasteless gas.
Gas Sulphur Dioxide (SO ₂)	Colorless gas with a strong odor.
Nitrogen Dioxide (NO ₂)	Gas that oxidizes in the atmosphere and is very dangerous to the physical environment and humans

Analysis:

- The density NO₂ does not provide the greatest impact on the pH of the acid rain.
- The hotspot of acid rain mostly located at the coal power plant area.