**Air Quality Predictive Modelling**

**INTRODUCTION:**

*Air quality management refers to all the activities a regulatory authority undertakes to help protect human health and the environment from the harmful effects of air pollution. The process of managing air quality can be illustrated as a cycle of inter-related elements.*

**Problem Statement:**

Predictive modeling to forecast air quality trends based on historical data.

**Proposed Solution:**  Polludrone is a fully integrated real-time air quality monitoring System that delivers reference equivalent performance. It is a comprehensive solution to monitor all the critical ambient environmental parameters related to air quality, noise, odor, weather, and radiation.

**METHADOLOGY**: AQI is predicted using a hybrid method that comprised of binary grey wolf optimization-based feature reduction, discrete wavelet packet transform-based decomposition, extreme learning machine and adaptive boosting-based prediction model which is compared with other prediction models such as artificial neural network

**EXPECTED OUTPUT:**

Malaysia installed nationwide air quality monitoring networks to keep track of air quality in various places such as residential areas, industrial areas, commercial areas, roadside areas, and reference areas. The Department of Environment (DOE) of Malaysia contracted out national air quality monitoring to a private company, Alam Sekitar Malaysia (ASMA) Sendirian Berhad (private limited). The company provides continuous ambient air and manual air quality monitoring using 51 continuous and 25 manual monitoring stations. In addition to this, the DOE, with assistance from Germany, has designated 4 ‘hotspots’ in Kuala Lumpur where air quality is measured by a MiniVol Portable Air Sampler. To further ensure the protection of ambient air, the DOE has taken steps to ensure that fuels used in industries and motor vehicles do not produce harmful air pollutants or only produce the minimum amount of harmful air pollutants that may adversely affect the health of people and the quality of the environment. Hence, limits have been set on the maximum sulfur and lead contents of coal and petroleum fuels. In industrial fuel, sulfur content is limited to a maximum of 2–3% by weight, whereas in automotive diesel, the maximum limit is 0.05–0.5% by weight. The manual air quality monitoring stations, however, measure air pollutants once every 6 days.

The air quality is reported based on the Air Pollution Index (API) computed from five criteria parameters, namely, PM10, carbon monoxide, nitrogen dioxide, ozone, and sulfur dioxide. The main sources of air pollution identified were stationary sources (e.g., industries), mobile sources (e.g., motor vehicles), open burning, and trans-boundary haze pollution. Only during a few occasions did the API in some areas of Malaysia reach dangerous levels. For example, the API reading in the morning of 11 August 2005 was relatively high, but worsened in the afternoon. At 1700 h more than six stations in Peninsular Malaysia recorded hazardous levels, whereas seven other stations recorded unhealthy to very unhealthy conditions of air pollution

**CONCLUSION:**

While the effects of air pollution on materials, vegetation, and animals can be measured, health effects on humans can only be estimated from epidemiological evidence. Most of the evidence comes from occupational exposure to much higher concentrations of pollutants than the general public is exposed to.