

Analysis of Air Quality and Control Measures for Wagholi Area

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ABSTRACT

The prime aim of this research is to support decision making, e.g., air quality impact analysis, human health assessment, through spatially modelling traffic-induced air pollution dispersion in urban areas at street level. A major challenge in traffic-related air pollution exposure studies is the lack of information regarding pollutant exposure characterization. Air quality modelling can provide spatially and temporally varying exposure estimates for examining relationships between traffic-related air pollutants and adverse health outcomes. Based on the information needed in decision making, a framework for a street level air quality decision support method is established. A Box Model is easy to use for evaluating the presence of air pollution in Wagholi area, and the potential exposure of frequents to that risk. It can be used for studying the air pollution in an area. The data obtained by prediction of air pollution can be used to think about the measures and various other issues that will be sorted out successfully. Mining is the major area of dust production and has been creating problems for the residents around it. There are various effects and many disadvantages to the humans as well as the mother Earth which is needed to be reduced by finding best ways. The measures taken here are use of air suction pump in divider to reduce the suspended particulate matter with gases and also plantation, to make the area greener, so that the pollutants are trapped or reduced and fresh oxygen is induced to take a breath of betterment. This will comparatively lead to sustainable development of Wagholi considering environment as well as living things. If possible and good measures are taken on the obtained results then there will surely be a safer and cleaner environment to be lived happily. It concludes that, predicting data on air pollution using air quality modelling can give us better results to find out the control measures in the area and reduce the danger of pollution caused due to residential, industrial, educational and commercial development of Wagholi with increased rate of congested transportation.

Keywords: Box Model, Air Quality, air pollution.

I. INTRODUCTION

The need to study the fundamental atmospheric problems and understand the mechanism of monsoon, weather systems and climate related processes in the tropical region, particularly over the monsoon region, became acute for India in 1950's when the country's post-Independence economic development program was launched. Considering this urgent need the World Meteorological Organization (WMO), in its Third Congress, recommended the creation of meteorological research and training institutes in the tropical countries. The proposal was formally approved by the Government of India in February 1962 as one of the schemes under its Third Five

Year Plan and finally the Institute was founded as the Institute of Tropical Meteorology (ITM) on 17 November, 1962 at Pune (the then Poona), as a distinct unit of the India Meteorological Department (IMD). Consequent upon the recommendation of the Committee for Organization of Scientific Research (COSR) appointed by the Government of India the Institute was transformed into an autonomous organization on 1st April 1971 under the name Indian Institute of Tropical Meteorology (IITM).

SAFAR:

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SAFAR envisages a research based management system where strategies of air pollution mitigation go hand in hand with nation's economic development to target a win-win scenario.

Through SAFAR know the City Air Quality- Over all city pollution and Location specific Air Quality- A relative contribution of different environments in a city Under the plan scheme "Metropolitan Advisories for Cities for Sports, Tourism (Metropolitan Air Quality and Weather Services), Ministry of Earth Sciences (MoES), Govt. of India, has introduced a major national initiative, "System of Air Quality and Weather Forecasting and Research" known as "SAFAR" for greater metropolitan cities of India to provide location specific information on air quality in near real time and its forecast 1-3 days in advance for the first time in India. It has been combined with the early warning system on weather parameters. The SAFAR system is developed by Indian Institute of Tropical Meteorology, Pune, along with ESSO partner institutions namely India Meteorological Department (IMD) and National Centre for Medium Range Weather Forecasting (NCMRWF). The implementation of SAFAR is made possible with an active collaboration with local municipal corporations and various local educational institutions and governmental agencies in that Metro city. The ultimate objective of the project is to increase awareness among general public regarding the air quality in their city well in advance so that appropriate mitigation measures and systematic action can be taken up for betterment of air quality and related health issues.

II. ROAD SURVEY

Distance covered (Road in km.)

The distance covered in the project is around 8 km. i.e. starting from the junction at the BJS college in Wagholi to the Old Jakat naka in Chandan Nagar.

Road width

The road width in Wagholi is which is the major factor for the increased traffic problems and the increased pollution. Hence there is need to increase the road width.



i. Divider width and height:

The width of the divider is to be decided as there is around ___ m space is readily available and there is need to place the dividers there and plantations in them and the height of the divider must be 3 to 3.5 ft and the suction pump to be

fit on the height of 1 to 1.5 ft from ground level on the divider.



III. METHODOLOGY

The aim is to study and analyze the air pollutants in the area by using Gaussian Air Dispersion model used for prediction of air quality and control or reduce the increasing air pollution in Wagholi by using the modern techniques i.e. the use of air suction pump in the road dividers to suck the gases and suspended particulate matter to make human life smooth and better. Use of natural ways to have it as a secondary source of air pollution control.

Readings were taken for the well know institute namely IITM (Indian Institute of Tropical Meteorology). We collected the seasonal data which included dates and their corresponding concentration readings for three selected points namely, P1- Wageshwar, P2- Kesanand Phata, P3- BJS. We collected the concentration of CO, NO_x, pM-2.5 and pM-10 respectively. After that graphs are been prepared which has dates on X-axis and concentration on Y-axis respectively. Also combined graph for concentration of CO, NO_x, pM-2.5 and pM-10 of all three selected points are prepared.

IV. CONCLUSION

Emissions of all the considered pollutants, except VOCs and CO, from vehicles in Wagholi were mainly from the high population of the commercial goods vehicles and the buses, though the contribution of the cars and taxis was also considerable. Since commercial vehicles and buses contribute considerable pollutant emissions, it points out the need for bypassing of external traffic that currently passes through Wagholi. The ever increasing demand of personal vehicles also contributes substantially towards emissions of CO, VOCs and other pollutants. Thus, there is a need to improve the mass transit system in the city. As the contribution of diesel buses is quite large, introduction of CNG mass transit in the megacity could be considered. Also the mining areas contribute to the pollutant level and many court cases are filed against them.

An important task of an air quality modelling is to establish suitable air quality targets; and to determine how effective these targets are temporally and geographically complied. Another important aspect is to forecast the possibility to reduce pollution emissions. Such an air quality system has three important components: monitoring of main pollutants; realization of a comprehensive model, and development of satisfactory legal strategies. This article emphasizes the modelling efforts.

The air quality modelling (Box Model) gives us the prediction of the air pollutant from the data collected. From this data, we can apply few measures as explained in the project like the air suction pump in the road divider and plantations. The measures taken will give us better results overall from point of view of environmental as well as other living things in Wagholi. This project gives the measures which can help to control air pollution using modern technology, to construct a new clean and green future of the rapid developing Wagholi.

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