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Assessment of Air Quality Index for Greater Bengaluru Area

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A B S T R A C T

Presence of specific substances in air unfavorably influences human wellbeing, climate and environment. These synthetic compounds are for the most part added because of human exercises. Keeping up with air quality requires standard checking, recognizable proof of wellspring of contamination and reception of preventive measure. Bengaluru a city in India has filled in size and populace as of late because of development of IT industry. This quick development and related municipal action has impacted its environmental administrations. The target of this study is to distinguish air contamination pattern in Bengaluru and explore the variables contributing towards it. Information for investigation has been acquired from state contamination control board site and has been utilized with no adjustment. Three standards toxins estimated consistently and for longest timeframe, Sulfur dioxide (SO2), nitrogen dioxide (NO2) and respirable particulate matter (PM10) have been researched for air quality investigation.

Keywords:Air Pollution, Bengaluru, Transport

1. INTRODUCTION

Aggregation of specific substances in the air which antagonistically influence the prosperity of human, plant, creatures and the climate causes air contamination. These synthetic substances are included numerous ways, for instance pesticides, fumigants and so on are delivered deliberately, hydrocarbons during fuel use and solvents get away from when utilized (solvents and so on) A portion of these synthetics change their temperament by responses in barometrical conditions. Nature of air is kept up with

normally as these synthetics scatter not long after discharge. Ongoing issue of air contamination is really emerged as the pace of expansion of toxins is considerably more than its expulsion.

Air is all over as is its impact. Dirtied air can antagonistically influence the human wellbeing, structures, landmarks, plants, environments and the rundown is unending. Contaminated air has been connected to environment as particulate matter ingest or mirror daylight and influence cloud arrangement and precipitation example of a place1.

Its wellbeing sway has been accounted for around the world. World Health Organization (WHO) studies has detailed sudden passing of 3.7 million individuals world over in 2012 because of air pollution2 while in India positive relationship between air contamination and wellbeing impacts in urban communities like Delhi3, Hisar4 and Hyderabad5 has been accounted for.

Every country has issued air quality guidelines for pollutants concentration in air for protectingpublichealthfromairpollutioninacountry. In India, Central Pollution Control Board(CPCB) in its notification 2009[6] has identified 12 criteria pollutants,whichareparticulatematter(PM_{10},$PM_{2.5}$),

sulphurdioxide,nitrogendioxide,carbonmonoxide, ozone, lead, benzene, ammonia, Benzo(a)Pyrene (BaP Particulate phase only), Arsenic and Nickel to be measured at national level through National Air Quality monitoring Program[7] and for easy understanding of the pollution level by everybody CPCBhasdevelopedExceedanceFactor(EF)which is calculated by the formula shown by equation (1) givenbelow.

EF = Observed Annual Mean of Criteria Pollutants/Annual Standard For Respective Pollutant

Air quality can be low, moderate, high or critical based on the following criteria:

- Critical pollution (C) : EF > 1.5
- High pollution (H) : EF ϵ [1.0 -1.5]
- Moderate pollution (M) : EFϵ [0.5- 1.0]
- Lowpollution(L):EF<[0.5-1.0]

2.METHOD ADOPTED FOR AQI CALCULATION

AQI can represent the overall air quality status in a better way since the cumulative effect of all the pollutants and the related standard can be taken into account. As a result an equation, which transforms the parameter, values by means of numerical manipulation into a more simple and precise form can be obtained. The index of specific pollutant is derived mainly from the physical measurement of pollutants like SPM, RSPM, SO_2 and NO_x . There are several methods and equations used for determining the AQI. In the present study AQI for each location in the study area has been estimated with the help of a mathematical equation given below.

$$\mathbf{AQI=1/3[\{SO_2/_SSO_2\} + \{NO_X/_SNO_X\} +\{RSPM/_SRSPM\}]*100}$$

Where,

SO_2= Individual Values of sulphur dioxide

NO_X = Individual values of oxides ofnitrogen

RSPM= Individual values of Respirable suspended particulate matter and$_SSO_2$, $_SNO_2$

RSPM = Standards of ambient air quality of sulphur dioxide, oxides of nitrogen, Respirable suspended particulate matter.

Tables

All tables should be numbered with Arabic numerals. Every table should have a caption. Headings should be placed above tables, left justified. Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table, and immediately above and below the table. Tables must be embedded into the text and not supplied separately. Below is an example which the authors may find useful.

AQI Values and the Level of Health Concerns

Sl. No	AQI Values (When the AQI Value in this Range)	Levels of Health Concern (Air Quality Condition)
1	0-50	Good
2	51-100	Moderate
3	101-150	Unhealthy For Sensitive Group
4	151-200	Unhealthy
5	201-300	Very Unhealthy
6	301-500	Hazardous

3.CONCLUSION

To meet the destinations of this present proposed study, air quality information of various Areas of Bangalore city were gathered and furthermore to evaluate the air quality at these pockets for the year 2014, the observing was likewise completed. The outcomes are

addressed in tables and diagrams. In view of the information and results acquired conversations were made and surmisings were drawn. At long last after ends have been drawn.

•As a general rule, expanding/diminishing/characterized patterns in the grouping of boundaries contemplated from one year to another has not been noticed and this pattern is ascribed to meteorological conditions which may have brought about scattering/dispersion.

Except for RSPM, levels of other two pollutants(SO_2 andNO_2)areundercontrol.Transport sector is the main contributor of air pollutants in Bengaluru. It is observed that the rapid expansion of city without development of proper infrastructure has led to increase in number of non transport vehicles, majority of them are two wheelers.Thesevehicles not only emit the RSPM, SO_2 and NO_2 but also HC and CO and their concentration in air is expected to have increased in the sameproportion. Diesel consumption in vehicles and DG sets emits SO_2 and particulate matter of all size. Since diesel consumptionhasincreased,presenceofparticulate matterofsizelessthan2.5and1μmisalsoexpected to have increased which is a cause of concern. AdoptionofBharatStageIVhashelpedincontrolling the air pollution. High concentration of RSPM level duetoconstructionactivitycanbemanagedifproper care is taken duringconstruction.

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