

Analysis of Air Quality: In Concern to the NO_x Concentration in Amravati city

Manisha Jane¹, Sangita Ingole²

Department of Environmental Science, Shri Shivaji Science College, Amravati, India

Abstract: *There are many situations human activities have significant effect on the environment. The health effects of air pollution have been subject to intense study in recent years. Exposure to pollutants such as NO_x has been associated with increases Lung irritation and damage; aggravates asthma and chronic bronchitis; increases susceptibility to respiratory infections such as the flu and common colds (especially in young children and older adults). Environmental effects Reduces visibility; acid deposition of HNO₃ can damage trees, soils, and aquatic life in lakes NO_x sampled was collected using fine dust sample model. Attention was focused on the roadside; street-level concentration. The sampling was conducted two days in week from selected location as MIDC Amravati, Shri Shivaji Science College Amravati; Raj Kamal Chawh Amravati. This will create awareness within society about health aspect. These effects have been found in relate day-to-day variations in air pollution and health, over time. Effects have been seen at very low levels of exposure, and it is unclear whether a threshold concentration exists for particulate matter and effects. In this review, we discuss the evidence for adverse effects on health of selected air pollutants.*

Keywords: air pollution, sources, NO_x, health risk, precautionary measures

1. Introduction

Air pollution has long been recognized as brain storming issue worldwide. The onset of technological and scientific innovations in various field and diverse activities of human race for its elegance have put extra load on the atmosphere by way of releasing air pollutants (Yadav M.S.et.al. 2013)

Air pollution may be defined as “any atmospheric conditions in which substance are present in concentration high enough above their normal ambient level to produce a measureable effect on, animals, vegetation or materials” (Seinfeld, 1986). Pollution is not a new phenomenon. In fact, pollution has been a problem since the appearance of our earliest ancestors (Markham, A.1994). The emissions are due to the several non-ideal processes taking place in real combustion and that are harmful both to the environment and human health (Timoney et al 2005).

The term “air quality” means the state of the air around us. Good air quality refers to clean, clear, unpolluted air. Clean air is essential to maintaining the delicate balance of life on this planet not just for humans, but wildlife, vegetation, water and soil. Poor air quality is a result of a number of factors, including emissions from various sources, both natural and “human-caused.” Poor air quality occurs when pollutants reach high enough concentrations to endanger human health and the environment. Our everyday choices, such as driving cars and burning wood, construction activity, can have a significant impact on air quality. For the past few years, it has been realized that troposphere ozone build up poses a serious threat to human health, vegetation, and public welfare (Jager Et Al., 1994; Lippman, 1991)

Air pollution problem are becoming increasingly complex on account of ever-growing consumption of fossil fuels, rapidly expanding transportation network, and fast pace of industrial development. Until recently, concern for air pollution has been largely confined to criteria pollutants, in spite of rapidly growing emission of many other toxic air

pollutants. It is estimated that 3000 different types of chemicals are added to the atmosphere from various industrial and anthropogenic source (Pratap Kumar Padhy 1999)

According to WHO estimates, 4-8 % occurring in the world are related to air pollution, where as a 2005 estimate from WHO indicates that air pollution in major southeast and Chinese cities ranks among the worst in the world and contributes to death of people annually.(abhimanyu singh,et all. 2012)

2. Sources of Pollution

The major sources of NO_x include fossil fuel burning, lightning, emissions from the biosphere, stratospheric injections and biomass burning. NO_x also from naturally when certain bacteria oxidize N-containing compounds. The initial product is nitric oxide (NO). NO₂ is formed in atmosphere by oxidation of NO. Combination of these NO and NO₂ is designated as NO_x. NO₂ has a distinctive reddish brown colour that frequently polluted city air and reduces visibility. When air is humid, NO₂ reacts with water to form nitric acid (HNO₃). (Bijendra Rai 2000)

The various source of NO_x emission to the atmosphere are motor vehicles (49%), electric utilities (25%) and other commercial and residential sources that burn fuel (19%). The main pollutants from diesel engines are NO_x and particulate matter (PM). The mechanisms of formation of NO_x and PM in combustion chamber of diesel engines are contradictory and the simultaneous reduction of both is very difficult (Kanna K.2009).

3. Health and Property Effect

Health effects: Lung irritation and damage; aggravates asthma and chronic bronchitis; increases susceptibility to respiratory infections such as the flu and common colds (especially in young children and older adults).

Environmental effects: Reduces visibility; acid deposition of HNO_3 can damage trees, soils, and aquatic life in lakes. Effect on marble (predominantly calcite), which are the building materials for many important monuments all over the world including Taj Mahal while pollutants like SO_2 and NO_x are the main cause of it (Kumar.S.1999)

Property damage: HNO_3 can corrode metals and eat away stone on buildings, statues, and monuments; NO_2 can damage fabrics.

4. Material and Method

The sampling was conducted for 24 hours at all sites through impingers and sample titrated through Jacob and Hochheiser method. Gas sampler of impingers of fine dust sampler with a gas kit attachment for NO_x .

5. Results and Discussion

The health impacts of air pollution depend on the sensitivity and the exposure level of the susceptible population to the pollutant. NO_x concentration at Raj Kamal Square, Amravati was high as compared to the concentration at Industrial Area & Residential Area due to high vehicular emission. In March to May concentration of NO_x was increase & as rain started concentration suddenly falls down

6. Conclusion

Ambient air quality of NO_x was assessed using three monitoring stations inside Amravati city. Lung irritation and damage; aggravates asthma and chronic bronchitis; increases susceptibility to respiratory infections such as the flu and common colds (especially in young children and older adults. Public awareness regarding NO_x concentration.

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Observation Table

Ambient Air Quality of NO_x
Sampling Location Shri Shivaji Science College, Amravati
Residential Area Year:2013

Nox 24 Hrs. average						
Sr.No.	January	February	March	April	May	June
1	12	14	13	15	13	13
2	10	13	12	13	14	14
3	12	11	13	14	16	11
4	13	13	11	13	14	10
5	10	12	13	11	15	14

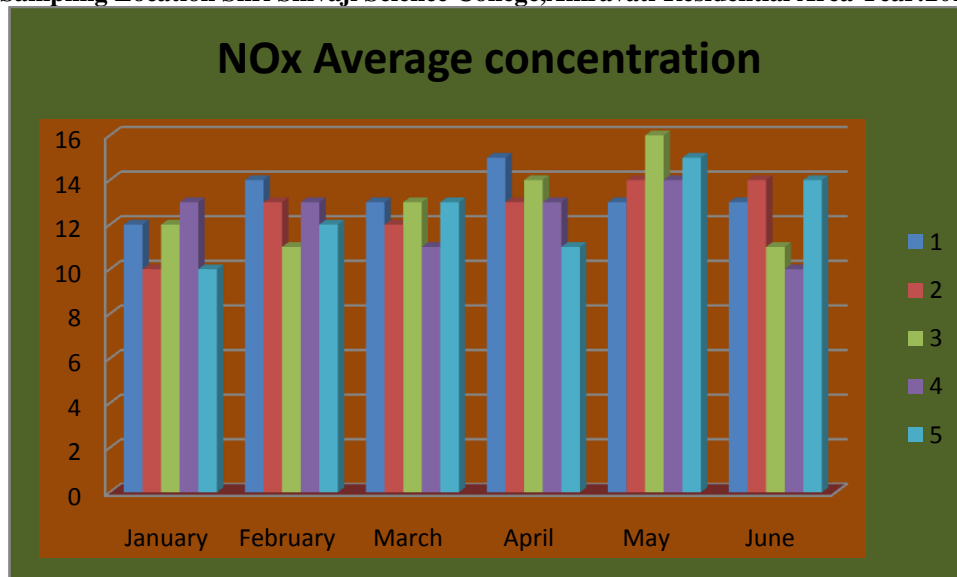
Ambient Air Quality of NO_x
Sampling Location MIDC, Amravati. Industrial area year 2013

Nox 24 Hrs. average						
Sr.No.	January	February	March	April	May	June
1	14	15	16	15	16	11
2	12	13	13	14	15	12
3	15	15	14	16	17	13
4	13	13	13	15	19	8
5	14	14	15	14	17	10

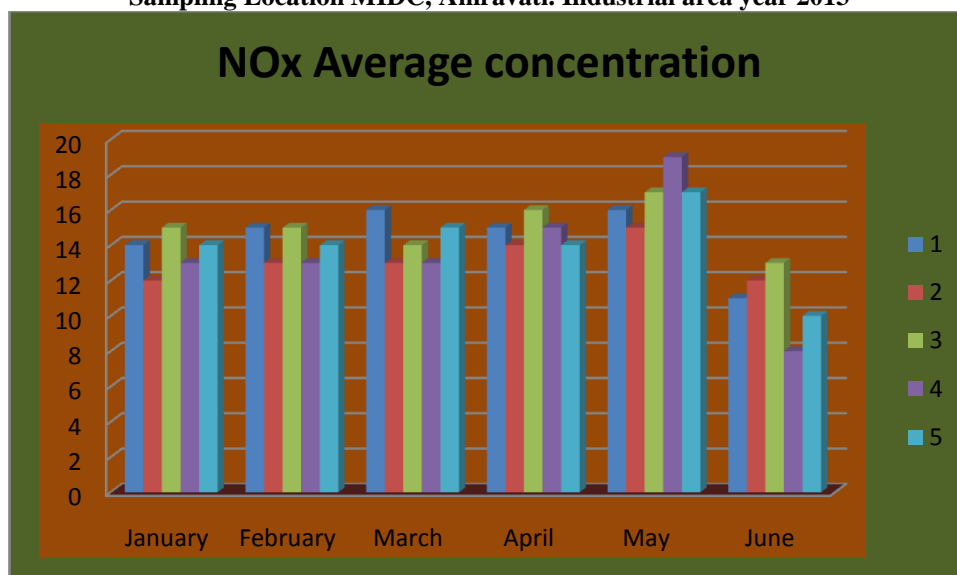
Ambient Air Quality of NO_x
Sampling Location Rajkamal Square, Amravati. Commercial area year:2013

Nox 24 Hrs. average						
Sr.No.	January	February	March	April	May	June
1	14	15	16	15	16	11
2	12	13	13	14	15	12
3	15	15	14	16	17	13
4	13	13	13	15	19	8
5	14	14	15	14	17	10

Ambient Air Quality of NO_x
Sampling Location Shri Shivaji Science College, Amravati Residential Area Year:2013



Ambient Air Quality of NO_x
Sampling Location MIDC, Amravati. Industrial area year 2013



Ambient Air Quality of NO_x
Sampling Location Rajkamal Square, Amravati.Commercial area year: 2013

