



## Air Quality Status of Amravati City a Geographical Survey

**Dr. Tatipamul R. V**

Assistant Professor, Department of Geography

S.M.Dnyandeo Mohekar

Mahavidyalaya, Kalamb, Dist. Osmanabad

**Corresponding Author- Dr. Tatipamul R. V**

Email-[raghavendra268@gmail.com](mailto:raghavendra268@gmail.com)

### Abstract

Air quality is major issues in the present world in most of the populated counties and cities. Delhi, Mumbai are facing problem regarding the quality of Air. Population and Growing number of vehicles are the major reason for Air and Noise pollution. The major cities in world and in India are facing same problem in last few decade. The present paper is deals with the study of quality of air in Amravati city of Maharashtra.

**Keywords: - Population Growth, Quality of Air, Pollution**

### Introduction

Air quality is the major content of studies in the environment, especially in the urban environment. Air quality status is different in every City. Air pollution consists of chemical or particles in the air that can harm the health of humans, animals and plants. It also effects on the buildings. Industrial revolution is the first major reason to increase the air pollution in the world. The world environment is very different before industrial revolution. Population growth is also one of the major cause to increase air pollution directly and indirectly. Quality of environment is changed after the population growth and industrial revolution. Population growth leads increase the use of vehicles especially in the urban areas in India. India is the largest country in terms of population size. Population size in various cities in India like Mumbai, Delhi, Chennai, Hyderabad, Pune are very large. Air quality index is used by government agencies to communicate to the public how polluted the air currently is or how polluted it is forecast to become.

### Study

Amravati City is one of the leading city in the Vidarbha region as well as it is the 9th largest city in the Maharashtra. It is the administrative headquarter of district as well as of the Amravati division. Amravati City is nominated for smart City mission. Amravati city is located on 20° 55" and 33' North latitude and 77° 45" 53' East longitude. The

### Area

total population is 647601. The total area of city is 1803.5 Sq.Km. The climate of cities tropical wait and dry climate.

### Objectives

The present studies based on certain specific objectives. 1) To study air quality status of Amravati City. 2) To study sources of air pollution in the Amravati City.

### Data Collection and Research Methodology

The present studies based on the secondary data collected from the pollution control board Maharashtra. Some of the data collected from the census. Local data collected by field observation. The data for present work 14 years average database is analyzed from 2006 to 2020. The comparative analysis method is adopted for the present research.

### Data Analysis

The continuous and anthropogenic activities, population explosion, industrialization and excess use of vehicles produce air pollution in the city. In the study area there are three stations installed. It includes three types of areas residential area, industrial area, and rural area with other type area.

### 1. Rajkamal chowk (547)

Rajkamal chowk is a rural and other type of areas data collect recorder. It is located 20° 55" 42' North longitude and 77° 45" 14' East longitude. The station code is

547. It is situated in rural and Fringe area of the city.

Table 1.1 and graph 1.1 shows the average data of 14 years especially SO<sub>2</sub>, NO<sub>x</sub> and RSPM. Average SO<sub>2</sub> concentration at Rajkamal chowk station shows below 50. It is the level of acceptable of our human body. The highest average SO<sub>2</sub> was recorded in 2018-19 with 18 ug/m<sup>3</sup>.

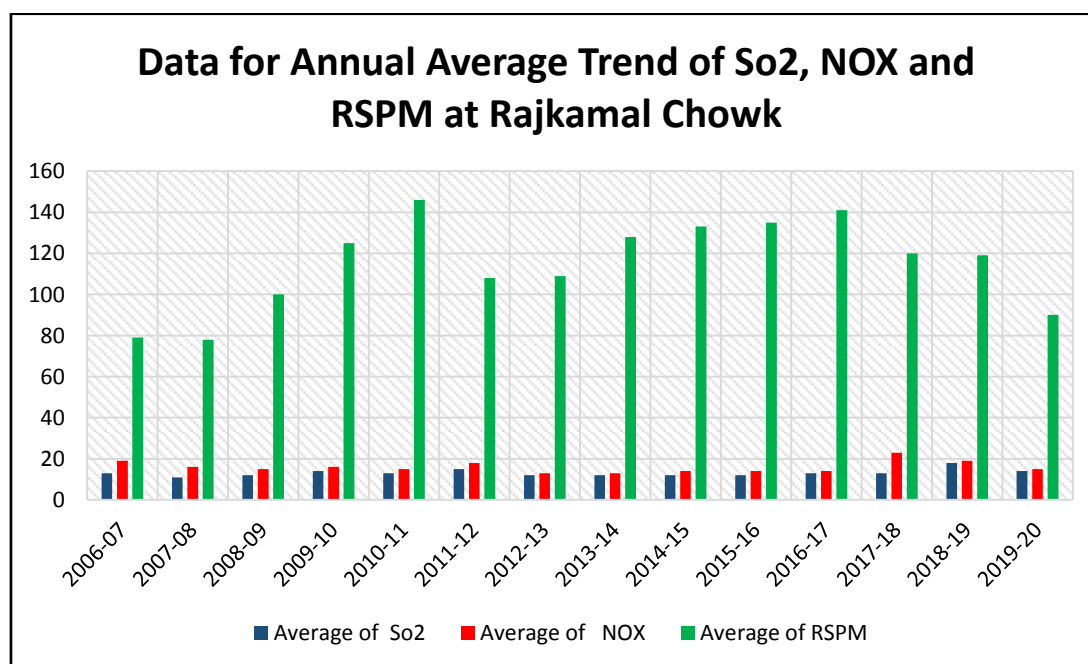
The lowest SO<sub>2</sub> concentration was recorded in 2007-08 with 11. The range of average SO<sub>2</sub> was between 11 to 18 ug/m<sup>3</sup> in last 14 years. The average concentration of NO<sub>x</sub> 40 is not harmful for human being. The average concentration of NO<sub>x</sub> at Rajkamal chowk was below 40. The highest average concentration of NO<sub>x</sub> was recorded in 2017-18 with 23 ug/m<sup>3</sup> and lowest in 2013-14 with

**Table 1.1 Data for Annual Average Trend of So<sub>2</sub>, NO<sub>x</sub> and RSPM at Rajkamal Chowk**

| Station Name                       | Year    | Average of So <sub>2</sub> | Average of NO <sub>x</sub> | Average of RSPM |
|------------------------------------|---------|----------------------------|----------------------------|-----------------|
| Rajkamal Chowk<br>Station Code 547 |         | 50                         | 40                         | 60              |
|                                    | 2006-07 | 13                         | 19                         | 79              |
|                                    | 2007-08 | 11                         | 16                         | 78              |
|                                    | 2008-09 | 12                         | 15                         | 100             |
|                                    | 2009-10 | 14                         | 16                         | 125             |
|                                    | 2010-11 | 13                         | 15                         | 146             |
|                                    | 2011-12 | 15                         | 18                         | 108             |
|                                    | 2012-13 | 12                         | 13                         | 109             |
|                                    | 2013-14 | 12                         | 13                         | 128             |
|                                    | 2014-15 | 12                         | 14                         | 133             |
|                                    | 2015-16 | 12                         | 14                         | 135             |
|                                    | 2016-17 | 13                         | 14                         | 141             |
|                                    | 2017-18 | 13                         | 23                         | 120             |
|                                    | 2018-19 | 18                         | 19                         | 119             |
| 2019-20                            | 14      | 15                         | 90                         |                 |

(547)

Source: Air Quality Status of Maharashtra, Maharashtra Pollution control Board



**Graph 1.1**

13 ug/m<sup>3</sup>. The average RSPM is acceptable in 60 ug/m<sup>3</sup>. At the Rajkamal chowk the average concentration of RSPM is above 60 in last 14 years. From the period 2006 -07 to 2019-20 average of RSPM increasing above 100 ug/m<sup>3</sup>. The highest concentration of RSPM is recorded in 2010-11 with 146 ug/m<sup>3</sup> and lowest in 2007-08 with 78 ug/m<sup>3</sup>. As compare to SO<sub>2</sub> and NO<sub>x</sub> the RSPM is above the normal range of 60. It is due to the Urbanization, City extension, increasing use of vehicles, increasing built up area, deforestation etc.

## 2. Government College of Engineering (548)

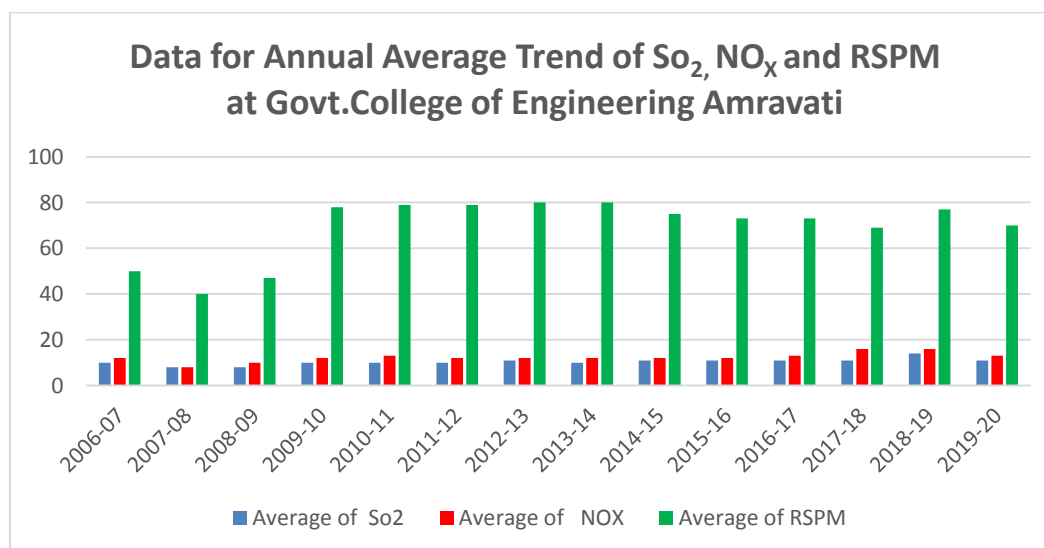
Government College of engineering is another station located in Amravati City. Its absolute location is 20° 57" 14' North latitude and 77° 45" 35' East longitude. It is a residential type of data recorder of air pollution. The station code is 548. It is situated in residential area.

Table 1.2 and graph 1.2 shows the average concentration trend of So<sub>2</sub>, NO<sub>x</sub> and RSPM in last 14 years. The trend of average So<sub>2</sub> concentration shows continuously between 8 to 11 ug/m<sup>3</sup>. Except in 2018 – 19. In the year 2018 – 19 SO<sub>2</sub> concentration recorded up to 14 ug/m<sup>3</sup>. It is the highest in the last 14 years and lowest was 8 ug/m<sup>3</sup> in 2007-08 and 2008 09. SO<sub>2</sub> concentration

**Table 1.2 Data for Annual Average Trend of So<sub>2</sub>, NO<sub>x</sub> and RSPM at Govt.College of Engineering Amravati (548)**

| Station Name                               | Year    | Average of So <sub>2</sub> | Average of NO <sub>x</sub> | Average of RSPM |
|--|---------|----------------------------|----------------------------|-----------------|
| Govt.College of Engineering Amravati (548) |         | 50                         | 40                         | 60              |
|  | 2006-07 | 10                         | 12                         | 50              |
|  | 2007-08 | 8                          | 8                          | 40              |
|  | 2008-09 | 8                          | 10                         | 47              |
|  | 2009-10 | 10                         | 12                         | 78              |
|  | 2010-11 | 10                         | 13                         | 79              |
|  | 2011-12 | 10                         | 12                         | 79              |
|  | 2012-13 | 11                         | 12                         | 80              |
|  | 2013-14 | 10                         | 12                         | 80              |
|  | 2014-15 | 11                         | 12                         | 75              |
|  | 2015-16 | 11                         | 12                         | 73              |
|  | 2016-17 | 11                         | 13                         | 73              |
|  | 2017-18 | 11                         | 16                         | 69              |
|  | 2018-19 | 14                         | 16                         | 77              |
| 2019-20                                    | 11      | 13                         | 70                         |                 |

Source: Air Quality Status of Maharashtra, Maharashtra Pollution control Board.



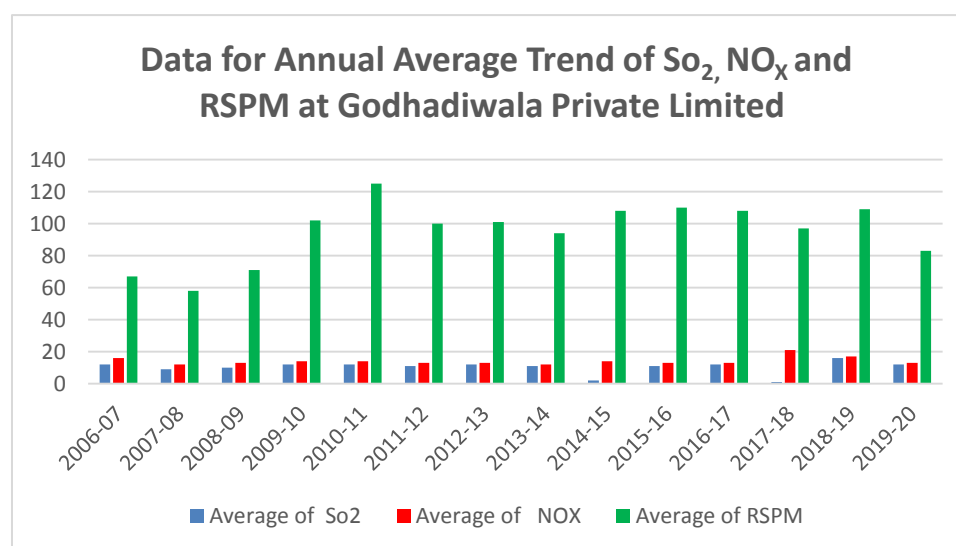
**Graph 1.2**

In last 14 years was below 50 which is good for human health. The average NO<sub>x</sub> concentration rangers between the 8 to 16 in last 14 years. The highest concentration of NO<sub>x</sub> was recorded in 2017-18, 2018-19 with 16 and lowest in 2007-8 with 8. The NO<sub>x</sub> concentration in last 14 years in station 548 was below 40. It is good for environmental and human health point of view. RSPM was major threat to humans in the City. The average RSPM trend shows above 60 except 2006 to 2009 in last 14 years. The average of RSPM concentration was above 60 from 2009 to 2020. The highest concentration of RSPM was recorded in 2012-13, 2013-14 with 80 and lowest in 2007-8 with 40 ug/m<sup>3</sup>. As compare to Rajkamal chowk station the

**Table 1.2 Data for Annual Average Trend of So<sub>2</sub>, NO<sub>x</sub> and RSPM at Godhadiwala Private Limited (549)**

| Station Name                      | Year    | Average of So <sub>2</sub> | Average of NO <sub>x</sub> | Average of RSPM |
|-----------------------------------|---------|----------------------------|----------------------------|-----------------|
| Godhadiwala Private Limited (549) |         | <b>50</b>                  | <b>40</b>                  | <b>60</b>       |
|                                   | 2006-07 | 12                         | 16                         | 67              |
|                                   | 2007-08 | 9                          | 12                         | 58              |
|                                   | 2008-09 | 10                         | 13                         | 71              |
|                                   | 2009-10 | 12                         | 14                         | 102             |
|                                   | 2010-11 | 12                         | 14                         | 125             |
|                                   | 2011-12 | 11                         | 13                         | 100             |
|                                   | 2012-13 | 12                         | 13                         | 101             |
|                                   | 2013-14 | 11                         | 12                         | 94              |
|                                   | 2014-15 | 2                          | 14                         | 108             |
|                                   | 2015-16 | 11                         | 13                         | 110             |
|                                   | 2016-17 | 12                         | 13                         | 108             |
|                                   | 2017-18 | 1                          | 21                         | 97              |
|                                   | 2018-19 | 16                         | 17                         | 109             |
| 2019-20                           | 12      | 13                         | 83                         |                 |

Source: Air Quality Status of Maharashtra, Maharashtra Pollution control Board.



**Graph 1.3**

The range of annual average SO<sub>2</sub> was between 9 to 16 but frequently 11 and 12. The annual average NO<sub>x</sub> was concentration was below 40 in last 14 years. The highest annual average annual concentration was recorded in 17-18 with 21 and lowest was in 12 in 2007-8 and 2013-14. The annual average of RSPM trend shows above 60 in last 14 years except the year 2007 -8 with 58. It is below the 60. The highest annual average RSPM was recorded in 2010 -11 with 125 ug/m<sup>3</sup>. As compared to government college of engineering station RSPM concentration was high but low with compared with Rajkamal chowk station.

### Conclusion

The present paper focused on the air quality status of Amravati City. The data from the 2006 to 2020 shows that, station was air quality status was different. Some of the major conclusions are below.

1. The annual average concentration of SO<sub>2</sub> was below the tolerate level of 50 in all three stations in the study area.
2. The average concentration of NO<sub>x</sub> was below the harmful level of 40 in the 14 years in all the three stations in the Amravati City.
3. The annual average of RSPM concentration in last 14 years shows the above the dangerous level of 60.
4. The Rajkamal chowk shows that RSPM level was high above the 60.
5. The station code 548 shows the RSPM concentration was low compared with station code 547 and 549.
6. The quality of air status shows that RSPM level was major reason for the poor quality of air in the study area.

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