



Studies on Air quality of Maharashtra, India

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Abstract

Environmental pollution is considered now as a global phenomena that attracts the attention of human beings for its severer long term consequences. Various sources of pollutants like NO₂, SO₂ that have altered composition of the air must be measured to determine air quality. Monitoring of the pollution is first and the most important step of air pollution control. We exposed to outdoor and indoor air pollution. Repeated exposure may damage lung tissue of human being, it also has harmful effects on plants, and animals. Even air pollution can deteriorate buildings and monuments. On this background in the present research paper the data published by MPCB is analysed and results are drawn.

Keywords: Air, pollution, quality, pollutant.

Introduction

About 90% air we inhaled is gaseous nitrogen and oxygen along with trace amounts of other gases, minute droplets of other liquids and tiny particles of various solids. Many of those particles are classified as air pollutants. Most of them come from various vehicles, some from factories, and power plants. Other sources of air pollution are cigarette smoking, use of chemical cleaners and volatiles, burning of fossil fuel, and vehicles are responsible for half of the urban air pollution.

We exposed to outdoor and indoor air pollution. Repeated exposure may damage lung tissue of human being, plants, and animals. Even air pollution can deteriorate buildings and monuments.

A sulphur dioxide is a primary air pollutant and its source is human activities and sometimes even natural events are responsible for it. As a result of chemical reaction of primary air pollutants, secondary air pollutants like sulphuric acid are produced in the atmosphere.

Amount of precipitation along with relative size of the particle also influence length of time for which suspended air particulate matter remain in the atmosphere of various areas.

We have many defense mechanisms in our body for various diseases like for diseases caused by exposure to different air pollutants we have a filtration system in the form of hairs in the nose to filter out large particles. Even though mortality is due to exposure to fine particles arises because of combustion activity. It has become an important environmental risk factor for lung cancer and cardiopulmonary disturbances¹.

The presence and concentration of air pollutants in the environment determines its quality. Air quality means the state

of air around us. Clean, unpolluted and clear air represents good air quality. It is absolutely required to maintain health of all living things like wildlife, human beings, and nonliving things such as vegetation, water and soil. However natural and human activities are responsible to release many air pollutants in high concentrations in air and make quality of air poor.

Daily activities like driving vehicles, wood burning shows bad effect on quality of air. Air present in indoor as well as outdoor environment. Quality of air in outdoor environment is referred as ambient air quality. It is measured at ground level and not at the source of pollution. Air quality of indoor environment is equally important issue. Air in the enclosed spaces like houses, hospitals, offices get polluted from various sources along with movement of pollutant from outdoor environment. sometimes indoor air quality becomes worst and dangerous due to activities like tobacco smoking, release of toxicants, chemicals etc².

Maharashtra Pollution Control Board (MPCB) established on 7 September 1970 deals with all kinds of environment issues of Maharashtra. It functions under the administrative control of Environment Department of the Government of Maharashtra. MPCB monitors ambient air quality under National Ambient Air Quality Monitoring Program (NAMP) / particularly in Maharashtra under State Ambient Air Quality Monitoring Program (SAMP) and Continuous Ambient Air Quality Monitoring Stations (CAAQMS) at Mumbai, Pune and Solapur³.

Material and Methods

The data of the ambient air quality of six districts in Maharashtra for the year 2013-14 is collected from MPCB (from Economic Survey of Maharashtra 2014-15). Then it is analysed.

Results and Discussion

SO₂ is probably most important among gaseous pollutants that generated from various activities including domestic burning, vehicular transport and wide varieties of industries. It is a main pollutant causing acid rain and also one of the main pollutant responsible for deterioration of the monuments.

NO₂ (oxides) are also acidic gases and contribute to corrosion of materials, but their larger significance arises from their photochemical reactivity and consequent capability to produce carcinogens and very strong oxidants in atmosphere the main sources of air pollution is vehicles and industries.

Air quality is monitored by MPCB at 77 stations located in 17 districts of Maharashtra. They take help of educational institutions for this monitoring.

Table-1 and 2 represents ambient air quality in six main cities of Maharashtra as minimum, maximum and average of the readings taken in case of Mumbai RSPM and NO₂ emissions are decreased in 2014 compared to 2013. readings of Pune do not show any significant change in both the years. In Nashik quality readings did not changed significantly. In Aurangabad

RSPM is increased in 2014 than 2013. Really Amravati do not show any change in 2013 and 2014. Nagpur also does not show noticeable change in the emissions of SO₂, NO₂, RSPM. Mumbai and Pune as per expectation shows SO₂, NO₂ emissions, RSPM maximum than all other cities Nashik and Aurangabad if compared are very near to each other just as in case with Amravati and Nagpur.

RSPM become probably the most important air pollutant in India because of its relatively high concentrations. Graph 1 and 2 also shows high concentrations of RSPM in all six cities of Maharashtra.

Conclusion

Concentration of NO₂ is more than the limit in Pune and Mumbai during 2013 RSPM level is high in each of the six cities during 2013, Concentration of NO₂ is more than the limit in pune and Mumbai during 2014 but it is slightly decreased as compared to 2013. Concentration of SO₂ is within limit in both the years in each city selected for sampling. RSPM has crossed the limit even in 2014 but the values are slightly decreased in 2014.

Table-1
Ambient air quality in residential areas at major monitoring stations, during 2013

	Limit	SO ₂			NO ₂			RSPM		
		min	max	ave	min	max	ave	min	max	ave
	80				80				100	
Station	Mumbai (Sion)	2	81	09	24	268	117	20	428	138
	Pune Swargate	10	45	19	14	114	44	13	188	71
	Nashik NMC building	21	43	28	22	44	29	35	182	86
	Aurangabad (CADA Office)	7	16	10	28	51	37	23	129	70
	Amravati (Govt. College of Eng.)	5	15	11	6	16	12	35	110	82
	Nagpur (Reg office of MPCB)	5	21	9	12	69	25	15	216	59

Source: MPCB µg/m³ Microgram per cubic meter

Table-2
Ambient air quality in residential areas at major monitoring stations, during 2014

	Limit	SO ₂			NO ₂			RSPM		
		Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
Station	Mumbai (sion)	2	86	10	5	208	93	36	390	129
	Pune Swargate	12	51	23	16	105	45	8	268	79
	Nashik NMC building	5	34	25	16	46	27	34	138	73
	Aurangabad (CADA Office)	7	37	12	26	77	39	15	153	77
	Amravati (govt. College of Eng.)	5	14	11	6	16	12	42	108	77
	Nagpur (reg office of MPCB)	7	14	19	16	45	26	27	117	64

Source: MPCB µg/m³ Microgram per cubic meter

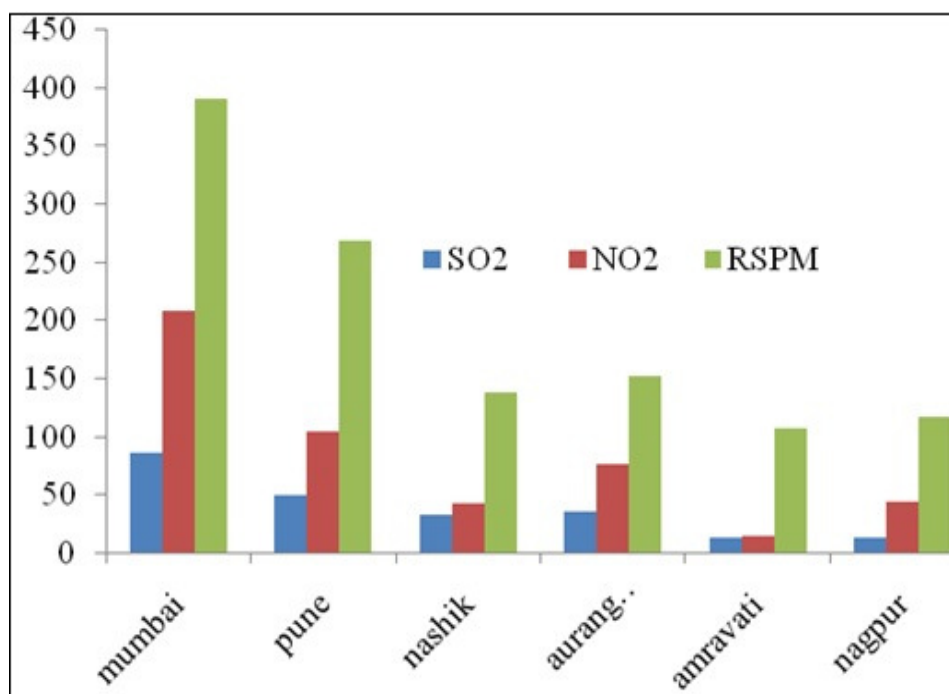


Figure-1
 Values of NO₂, SO₂, RSPM during 2014

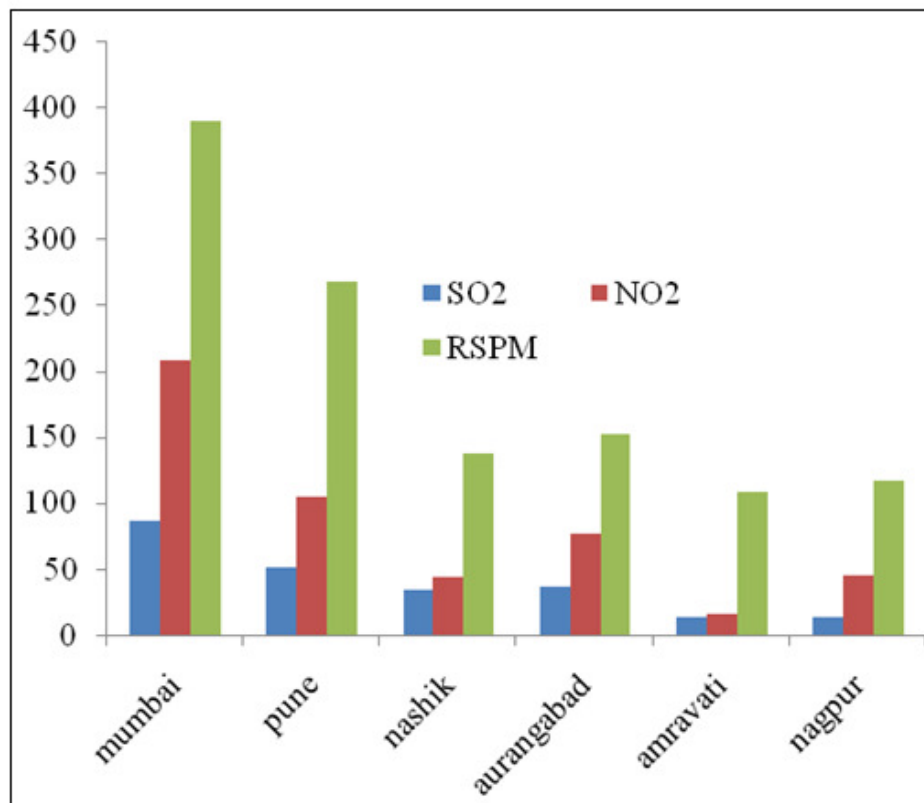


Figure-2
 Values of NO₂, SO₂, RSPM during 2013

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