

AIR POLLUTION IN URBAN AHMEDABAD, GUJARAT, INDIA

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ABSTRACT

Ahmedabad is 7th largest metropolitan city of India, situated on bank of Sabarmati river in state of Gujarat India at longitude 23^o 1'N, 72^o 41'E. Ahmedabad city has an area of 464 square kms and population of 5,570,585: urban/metropolitan population would be 6,352,254 (Census 2011). Ahmedabad is well connected by road, rail and air to all major cities of India. The Ahmedabad municipal corporation declared the city as megacity and Ahmedabad Urban Development Authority had built up Sardar Patel ring road on periphery of the city providing necessary infrastructure and growth platform. Except the peripheral agricultural land, rest part is the city area. Once upon a time, Ahmedabad was considered as "Manchester of East" as it was hub of textile industry. The city is agglomerated with the surrounding satellite-towns of Dani-Limda, Naroda, Odhav, Ranip, Saijpur- Bogha, Sarkhej and Sardarnagar. We have studied air pollution of urban Ahmedabad, especially RSPM, SPM, SO₂ and NO_x concentrations and analyzed it

Keywords: Ahmedabad, Air Pollution, Gujarat

INTRODUCTION

Ahmedabad has grown up to a mega level in last 10 years which can be witnessed from development in business/industry, real estate, population and infrastructure growth. Somehow this growth has led to incremental air pollution as necessary infrastructure was not in place at right time. Although city management had put efforts to manage air pollution, it could have been better. Taking part in growth of city, industry development was major contribution. There are many types of industry, mainly pharmaceuticals, chemicals, engineering, textile and newly developed automotive industry. We have reviewed concentration of RSPM, SPM, SO₂ and NO_x in various zone/ward of Ahmedabad and analyzed it.

METHODOLOGY

We have divided Ahmedabad in to 6 zones namely East, West, South, North, New West and Central. We further divided each zones in to different wards for easiness of visiting and recording. We have as well visited Government records (Gujarat Pollution Control Board) for their measurements on mentioned aspects. We have analyzed available detail and arrived on conclusion.

RESULT

While reviewing climate of Ahmedabad, we have considered following data from Gujarat Pollution Control Board (GPCB). GPCB has installed measuring equipment at different places in each ward/zone and regularly measuring it. Let's study effect of RSPM, SPM, SO₂ and NO_x in particular year, starting from 2012 to 2008 (5years).

Abbreviations for measurement place :

P1=at Naroda-SP ring road, P2=At Naroda GIDC (above police chowky), P3=At Narol-Mukesh industries, P4=At Ghodasar-Cadila laboratory, P5=At Vatva-VIA Hall (Reliance Petrol Pump), P6=At Saraspur- Shardaben hospital, P7=At Behrampura- Referral hospital, P8=At Nehru bridge – on terrace of traffic booth, P9=At Satellite-Jodhpur, P10=At Sabarmati-Torrent power, P11=At Mirzapur-RC technical institute, P12=At L.D. College of Engineering, Navrangpura

Table 1. Year 2012 - RSPM level in µg/m³

Sr. No	Month	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	Jan	71.6	97.37	116.27	82.3	88.37	73.23	74.23	97.93	76.63	91.37	67.8	64.4
2	Feb	81.33	101.4	125.8	74.25	76.15	68.42	68.75	86.71	75.17	93.06	64.75	59
3	Mar	89.33	131.8	154.1	94.71	85.75	90.08	89.04	108.08	88.04	97.61	79.5	65.79
4	Apr	76.40	128.4	139.5	92.77	69.68	78.33	74.67	93.83	76.27	89.84	69.07	66.03
5	May	83.33	129.1	146.13	85.04	81	85.25	81.29	100.38	81.50	72.01	74.29	67.08
6	Jun	87.96	114.2	149.50	99.71	86.21	88.08	87.08	107.00	85.33	69.44	77.96	71.15
7	Jul	76.67	105.1	135.43	85.48	75.67	77	74.47	94.00	79.17	56.94	70.3	62.62
8	Aug	64.58	84.88	118.21	71.08	63.13	63.96	62.29	80.42	61.00		56.08	47.58
9	Sept	67	82	128	76	66	65	64	75.00	70.00	63.17	59	55
10	Oct	61	73	126	66	59	52	69	88.00	57.00		70	52

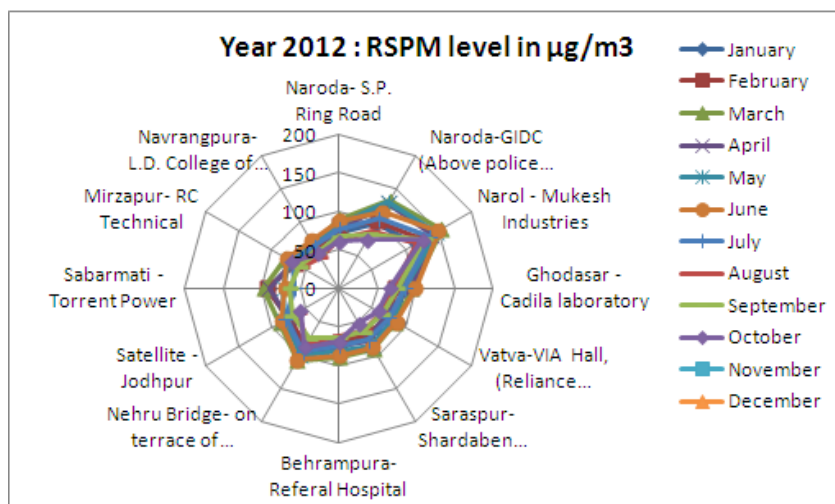


Chart: A

Table 2. Year 2012 : SPM level in $\mu\text{g}/\text{m}^3$

Sr. No.	Month	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	Jan	36.9	45.4	45.5	45.4	37.7	45.4	29.4	48.00	37.7	199.34	38.6	45.4
2	Feb	44.63	56.12	59.25	56.12	49	56.12	36.75	50.25	42.00	198.07	32.25	56.12
3	Mar	42.63	75.5	71.4	75.5	49.75	75.5	43.62	57.63	39.50	203.82	41.72	75.5
4	Apr	34.10	66.8	61.6	66.8	38.9	66.8	35	47.30	35.60	189.19	30.3	66.8
5	May	37.88	73.75	76.5	73.75	50.38	73.75	31.25	58.13	37.25	184.91	39.5	73.75
6	Jun	40.5	58.1	74.75	58.1	47.87	58.1	35.37	62.37	37.22	167.15	41.5	58.1
7	Jul	36.9	47.7	62.9	47.7	44.2	47.7	32	51.70	34.10	128.68	33.2	47.7
8	Aug	31	35.87	45.75	35.87	29.5	35.87	31.62	35.62	28.00		29	35.87
9	Sept										118.77		

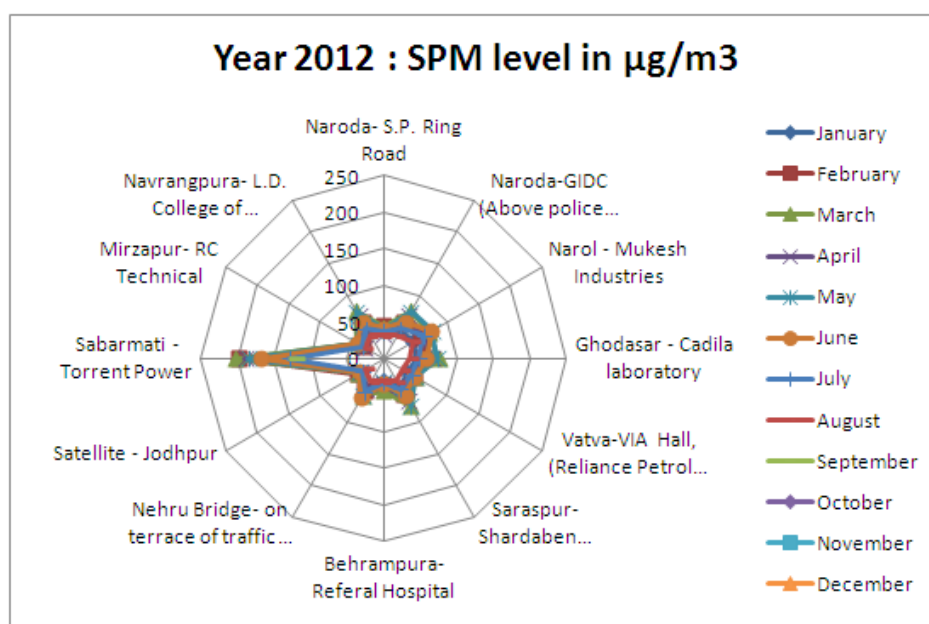


Chart: B

Table 3. Year 2012 : SO₂ level in $\mu\text{g}/\text{m}^3$

Sr. No.	Month	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	Jan	10.29	17.76	18.06	12.14	11.54	11.84	11	11.75	11.41	33.51	10.92	9.81
2	Feb	12.36	17.4	16.93	10.27	11.64	10.58	12.74	13.07	11.07	33.32	9.56	10.31
3	Mar	12.39	18.64	18.96	11.03	12.85	11.91	12.04	14.35	11.50	31.63	10.08	10.23
4	Apr	11.72	16.64	17.4	11.74	11.97	12.54	10.73	12.95	10.69	31.98	10.95	10.42
5	May	11.14	15.59	16.15	12.04	11.84	11.76	10.48	12.10	10.58	32.17	10.54	10.28
6	Jun	10.33	12.4	14.63	11.01	10.78	10.87	9.81	11.18	9.74	32.44	9.86	9.5
7	Jul	11.13	13.36	14.39	11.71	11.71	11.45	10.98	12.22	10.34	28.1	10.91	10.38
8	Aug	10.44	12.39	12.94	11.09	11.03	10.48	10.33	11.68	9.94		10.1	9.9

Table 3. Year 2012 : SO₂ level in µg/m³(Contd...)

Sr. No.	Month	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
9	Sept	11.8	13.2	12.7	12	13.2	12	11.4	13.10	10.90	26.25	10	9.5
10	Oct	11.2	12.7	12.7	14.2	11.5	12.1	12.7	12.60	12.30		12.2	8.9

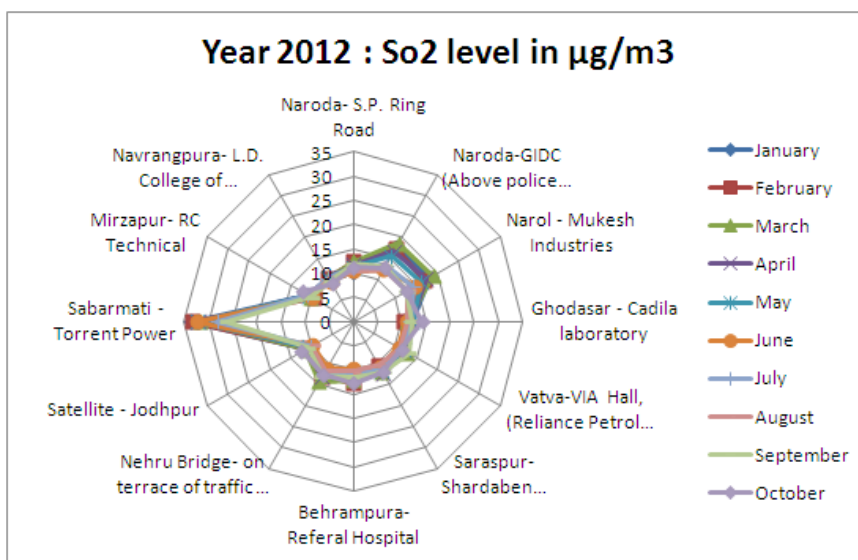


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Table 4. Year 2012 : NO_x level in µg/m³

Sr. No.	Month	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	Jan	24.84	34.58	32.41	28.11	25.77	26.05	24.02	32.36	24.89	23.8	25.86	18.88
2	Feb	19.36	28.93	32.25	23.41	23.19	21.38	21.18	30.95	25.28	23.41	21.16	16.42
3	Mar	20.08	30	36.25	26.5	25.56	22.36	25.14	29.69	25.49	21.66	20.71	14.47
4	Apr	18.95	27.17	32.7	24.66	23.59	20.8	26.28	27.98	24.53	21.25	18.62	14.66
5	May	22.71	36.77	33.77	21.92	21.56	24.9	23.62	27.16	24.64	21.05	20.7	15.36
6	Jun	20.34	25.6	32.06	20.63	19.91	23.25	21.95	24.60	21.99	20.89	18.71	14.06
7	Jul	22.25	27.84	31.19	25.18	23.52	21.5	21.48	27.01	20.15	18.1	21.33	18.33
8	Aug	21.29	26.26	27.92	23.14	22.48	21.21	20.83	24.74	19.96		20.38	17.84
9	Sept	22.3	28	28	24.9	27.1	24.6	23.2	29.2	20.60	17.66	20.1	17.4
10	Oct	21	27	28.1	29.3	24.1	24.9	26	28	23.20		25	16.1

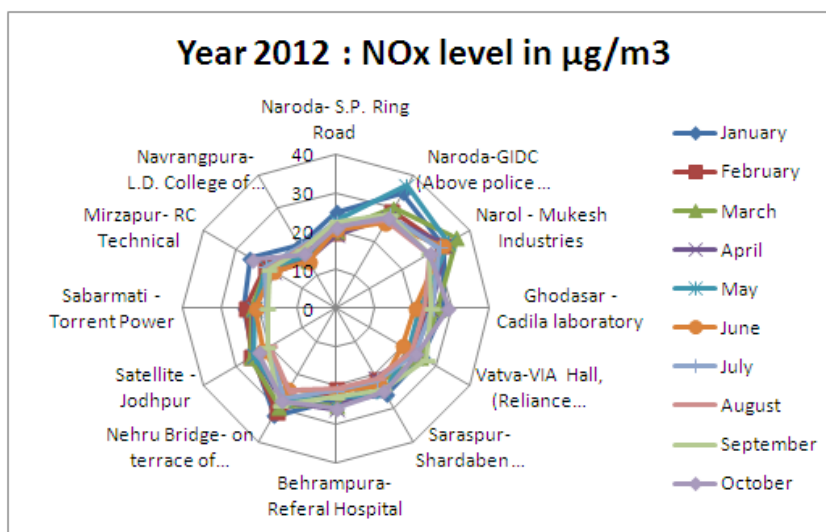


Chart: D

DISCUSSION AND CONCLUSION

RSPM

It is clearly visible that RSPM level in industrial area like Naroda, Narol and Vatva are relatively high and Ghodasar follow Vatva due to proximity. RSPM level at Sabaramati-Torrent power fluctuate during complete year which shows that plant operated at different capacity and generates RSPM more in summer season. Nehru bridge corner being very important transit point from east to west Ahmedabad, it shows higher RSPM concentration. Relatively the greenest area, Navrangpura shows the least RSPM as it represents generally low rise residential area and more of educational area.

SPM

SPM is worst part ever in Sabarmati-Torrent power area, mainly because of concentration of humidity and coal dusts. This signals high risk for large particle size-SPM and call for immediate effective measurement and execution. Also industrial area like Narol and Naroda creates nightmare for human being as well as tree species. Alarming situation in areas like Navrangpura, Saraspur and Nehrubridge is intolerant, this mainly could be real estate development and incremental traffic.

SO2 and NOx

Both these gases are quite dangerous for lives and heavy presence in industrial area and Nehrubridge corner is quite disturbing.

Final conclusion on climatic effect is following :

1. RSPM, SPM, SO2 and NOx values were relatively high where tree density is low and industrial area is closer.
2. Also Ahmedabad has witnessed great real estate boom in 2007-2009 which contributes to pollution in certain extent time to time.

3. RSPM, SPM, SO₂ and NO_x values starts reducing since early year-2010, mainly due to following corrective actions, but is not improving much near Nehru bridge corner.
 - a. Starting up of BRTS system
 - b. Change in fuel from Petrol/Diesel to Compressed Natural Gas (CNG) for auto-rickshaw and city-transport bus system
 - c. Widening of roads where traffic was heavy
 - d. Constructing over bridges where traffic was very heavy
 - e. Industry were put in to control on releasing polluted gas/other substances
 - f. Newly developed industrial belt- Sanand which help to reduce pollution to a great extent.
 - g. Slow down in real estate development

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