International Journal of Academic and Applied Research (IJAAR)
ISSN: 2000-005X
Vol. 2 Issue 2, February – 2018, Pages: 12-24

Study on Air Quality Data at various Locations in Three Different Areas of Central India

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Abstract: *The central India plateau is environmentally very important to understand the rich Indian biodiversity and diffuse chemical pollution. Madhya Pradesh literally means' central province' and is located in the geographic heart of India, between latitude 21.2^{0}N-26.87^{0}N and longitude 74^{0}02'-82^{0}49'E. Madhya Pradesh is the second largest state in the country by area. Air sampling is done as per the CPCB guideline for manual sampling and analysis. Eighty air samples were collected for seasonally i.e. (winter, summer and Monsoon). Sampling sites were selected to represent industrial area and residential area as per NAAQS-1994. All the air samples of NOx were detected below the standard limit (80µg/m^3). SPM, NOx and SO_2 did not exceed the standard limit in almost all the sampling stations of central India. Based on the result it may be concluded that the air quality had not been affected due to study area as of Now. To arrives a definite conclusion it is suggested to monitor SPM, along with NOx and SO_2.*

Keywords: Air Quality, SPM, NOx, SOx, Central India.

1. INTRODUCTION

The Central India Covers the seven states of our country, it has long industrial development and also has deep cultural heritage. Madhya Pradesh literally means' central province' and is located in the geographic heart of India, between latitude 21.2^{0}N-26.87^{0}N and longitude 74^{0}02'-82^{0}49'E. Madhya Pradesh is the second largest state in the country by area. It borders the state of Uttar Pradesh to the north-east, Chhattisgarh to the southeast, Maharashtra to the south, Gujarat to the west and Rajasthan to the North West. According to diffuse unsystematic residential, urban and industrial structure of this area the proposed research project is intended to analyzing and mapping of diffuse chemical pollution in central India.

Air pollution is a major problem in developed and developing countries. It causes respiratory diseases and chronic illness [1] and affects the environment [2-3]. Both human activities and natural environmental processes are sources of air pollution. Particulate matter and gaseous pollutant emission from industries and auto exhausts are responsible for rising discomfort, increasing airway diseases and deterioration of artistic and cultural patrimony in urban centers. The urban population is exposed to high levels of air pollution including metals as well as fine and ultrafine particles [4] from the vehicular emission [5]. Every city has its own characteristics which becomes the progress, if not checked poses risk to environment and health of the people.
In recent times there has been significant development activity in terms of industrialization and urbanization in almost all cities in Central India. Different industrial activities degrades various environmental components like air, soil, water and vegetation [6-10] .The chemical composition of the atmosphere is being altered by the addition of gases, particulate matter and volatile substances, which may be toxic to living beings. Cement industry is a potential anthropogenic source of air pollution. It is a major contributor to dust, nitrogen oxides (NOx), sulfur oxides (SOx), and carbon monoxide (CO) in metropolitan areas. Furthermore, it contributes about 5% of the global CO_2, the famous greenhouse gas. In cement industries, dust is emitted from stock piles, quarrying, and transportation of raw materials, kilns operation, clinker cooling and milling. Stone Crushing industry is an important industrial sector in the country engaged in producing crushed stone of various sizes depending upon the requirement which acts as raw material for various construction activities, such as concentration of roads, highways bridges, building, canals, etc. it was found that there were 12,000 stone crusher units approximately in India [11].
Present study is aim to evaluated the quality of ambient air due to SO_2. NOx and SPM .The ill effects of these air pollutants on human health such as asthma, acute respiratory diseases, eye irritation, gastrointestinal diseases, dental diseases, skin diseases, blood pressure diseases and headache due to pollution are well documented. The amount of different pollutants is compared with the standard limits recommended by Central Pollution Control Board. Proper planning, management and monitoring of the pollution status depend on the availability of accurate information. The World health organization estimates that air pollution contributes to approximately 800000 death and 4.6 million lost life year's annually [11].

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2. MATERIAL AND METHODS:

We assume Madhya Pradesh as a central India (study area) which is divided in to two zones (a) East Zone of Central India (b) West Zones of Central India. In the present study we are intended to find out the diffuse chemical pollution in Central India on the basis of an industrial area, residential area and urban area of atmospheric air. We have designed twenty sampling stations district for this study in east zones i.e. Rewa, Satna, Sidhi, Singrauli, Shahdol, Umaria, Katni, Panna, Chhatarpur, Jabalpur, Mandala, Dindori, Siwani, Chhindwara, Narsinghpur, Hosangabad, Betul, Damoh, Sagar, Bhopal and twenty district in west zone i,e. Gawaliar, Shivpuri, Ashok Nagar, Datiya, Muraina, Bhind, Guna, Tikamgarh, Vidisha, Raisen, Sihora, Rajgarh, Sajapur, Dewash,Ujjain, Ratlam, Indore, Khandawa, Burhanpur and Harda of Central India. Air sampling is done as per the CPCB[12] guideline for manual sampling and analysis. Eighty air samples were collected for seasonally i.e. (winter, summer and Monsoon). Sampling sites were selected to represent industrial area and residential area as per NAAQS-1994[13]. Sulphur dioxide from air is absorbed in a solution of potassium tetrachloromercurate (TCM). Air is bubbled in 30ml of absorbing solution (TCM) in an impinger for 4hr at the flow rate of 1l/min. Similarly ambient nitrogen dioxide (NO_2) is collected by bubbling air through a solution of sodium hydroxide and sodium arsenite. Monitored parameters were suspended particulate matter (SPM), Gaseous SO_2 and NOx; HVS (APM46) was used for air sampling and analyzed as per standard methods. The samples collected and transported to the laboratory. SO_2 and NOx concentration are calculated by measuring absorbance through spectrophotometer. The locations of sampling stations are shown in **table-1.2 and fig-1.**

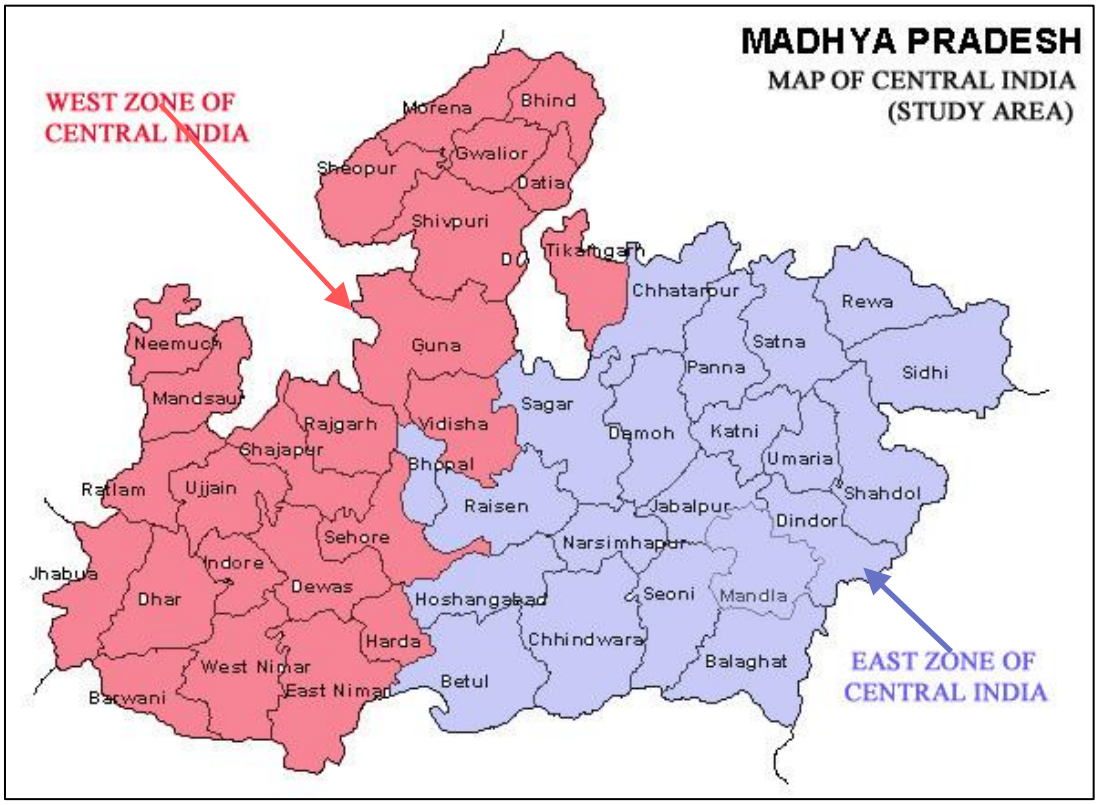

Table- -1 Location of Sampling Station with Code for Ambient Air in East Zone Central India (of year 2013 to 2014)

S. No	Urban, Residential Area	Industrial Area
1	R_1= Rewa Near Nehru Nagar,	I_1= Near J.P. Cement Plant Rewa,
2	R_2= Satna Near Rajendra Nagar,	I_2= Near Birla Cement Plant Satna,
3	R_3= Sidhi Near Sanjay Gandhi P.G. College,	I_3= Near Madariya Industrial area Sidhi,
4	R_4= Singrauli Near Railway Colony,	I_4= Near N.T.P.C. Singurauli,
5	R_5= Shahdol Near New Bus Stand,	I_5= Near Ramnagar Coal Mince area Shahdol,
6	R_6= Umaria Near Govt. R.V.P.S. College,	I_6= Near beersinghpur Coal Mince area Umaria,
7	R_7= Katni Near Swetamber Temple,	I_7= Near Ardinance Factory Katni,
8	R_8= Panna Near District Hospital,	I_8= Near Majhgama Mince area Panna,
9	R_9= Chhatarpur Near Higher Secondary,	I_9= Near Mince area Chhatarpur,
10	R_{10}= Jabalpur Near S.B.I. Chhorha,	I_{10}= Near Khamaria Industrial area Jabalpur,
11	R_{11}= Near R.D. P.G College Mandala,	I_{11}= Maneri Industrial area Mandala,
12	R_{12}= Dindori Near Main Post Office,	I_{12}= Mining area Dindori,
13	R_{13}= Near Govt P.G. College Siwani,	I_{13} Near Kelori Tehsil Mince area Siwani,
14	R_{14}= Chhindwara Near State Bank of India,	I_{14}= Near Amabana Coal Mince area Chhindwada,
15	R_{15}= Narsinghpur Near Railway Colony,	I_{15}= Near Oil Mills Gadarwara Narsinghpur,
16	R_{16}= Near District Hospital Hosangabad,	I_{16}= Near Itarsi Industrial area hosangabad,
17	R_{17}= Betul Near Kala Patha,	I_{17}= Near Oil Plant Betul,
18	R_{18}= Damoh Near Main Post Office,	I_{18}= Near Gandhi Ashram Industrial area Damoh,
19	R_{19}= Sagar Near Engineering College,	I_{19}= Near Belai Industrial area Sagar,
20	R_{20}= Bhopal Near Arera Colony.	I_{20}= Near Manddeep Industrial area Bhopal.

3.

Table- 2-Location of Sampling Station with Code for Ambient Air in West Zone Central India (of year 2013 to 2014)

S. No	Urban, Residential Area	Industrial Area
21	$R_{21=}$ Near Gajaraja Medical College Gawaliar	$I_{21=}$ Near Taxtile Industry Gawalior
22	$R_{22=}$ Near Tatyatope Park Shivpuri	$I_{22=}$ Shivpuri Near Kattha Factory
23	$R_{23=}$ Ashok Nagar Near Busstand	$I_{23=}$ Near New Industrial Area Rawasar Tehsil
24	$R_{24=}$ Datia Near Pitamabra Temple	I_{24} = Datia Near Metal Industries Industrial Area ,Datia
25	$R_{25=}$ Muraina Near Railway Station	I_{25} = Muraina, Near Banmaor Cement Plant
26	$R_{26=}$ Bhind ,Near Head Post Office	$I_{26=}$ Bhind Near Cotton Textile Industry
27	$R_{27=}$ Near Delhi Public School Guna	$I_{27=}$ Near National Fartilizer Limited ,Guna
28	$R_{28=}$ Civil Line Tikamgarh	$I_{28=}$ Tikamgarh, Near Plastics , Rubber Spectro Based Industry
29	$R_{29=}$ Near S.A. Institute of Technology Vidisha	$I_{29=}$ Near Kurwai Industrial area Vidisha
30	$R_{30=}$ Raisen, Near Higher Secondary School	$I_{30=}$ Near Obedulaganj Industrial area Raisen
31	$R_{31=}$ Sihore, Near Railway Colony	$I_{31=}$ Near Budani Industrial Area Sihore District.
32	$R_{32=}$ Near Anjalilal Temple ,Rajgarh Biora	$I_{32=}$ Near Jut Mils Rajgarh
33	R33=Near Ghati Shajapur Housing Board Colony.	I_{33}= NearCauesting Foundry and Rerolling mills.
34	R_{34}=Near Tilak Nagar Dewas	I_{34}=Near renboxi Pharmaceutical industry Dewas
35	R_{35}=Near Dussehra Maidan, Ujjain	I_{35}= Near Synthetic yarn industry Ujjain
36	R_{36}= Near Sai Baba Mandir Ratlam	I_{36}=Drag and Pharmaceutical industry, Ratlam.
37	R_{37}=Near Maheswari Higher Secondary School, Indore.	I_{37}=Near Plastics industry, Indore.
38	R_{38}=Near Malviya Colony,lal chowki Khandwa.	I_{38}=Near cotton mills Khandwa.

39	R_{39}=Near Bus Stand Burhanpur District	I_{39}=Near Papers mills NepaNagar, Burhanpur.
40	R_{40}=Near Harda Polytechhnique College.	I_{40}=Eknath Solvent Extraction Gram Pidgoan, Harda.

4. RESULT AND DISCUSSION

The air samples were analyzed some parameters like, Sulphur dioxide (SO_2), Nitrogen Dioxide (NO_2) and Suspended Particulate matter (SPM). The average physico-chemical characteristics of the ambient air quality data of the study area were shown in **table-3 and table4**.Comparative Sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and Suspended particulates Matter (SPM) profiles of two different Zone of central India are shown in **figure2, 3and figure-4.** Mapping of the data is represented the condition of the pollution in different sampling location of the study area is depicted in **figure-5 to 10.**

Sulphur Dioxide (SO_2): The gas irritates airways and eyes and is known to cause longer-term heart diseases, other cardiovascular ailments and bronchitis. It also readily causes shortness of breath and coughing amongst asthma sufferers. SO_2 is also a major contributor to acid rain, which damage the environment and upset ecosystems [14].In the present study Sulphur dioxide concentration ranged from 1.0 µg/m^3 to 17.0µg/m^3.The highest value of 17.0 µg/m^{3}was found at sampling location I_{20} (Near Manddeep Industrial Area Bhopal), while the lowest value 1.0 µg/m^{3}was observed at location R_{12} (Dindori Near Mainpost office) as shown in **table-3 and table-4.** All the results were below the permissible limit set by central pollution control board (2)as 80 µg/m^3. [15] studied ambient air quality status of Jaipur city, Rajasthan India, found the SO_2 concentration in range of 5.7 µg/m^3 to 24.1 µg/m^3 . [16]studied ambient air quality status in Uttarakhand , India: a case study of Haridwar and Dheradun using air quality index, observed the concentration of SO_2 ranged between 8.64 µg/m^3 to 12.30 µg/m^3.[17] carried out the effect of urbanization on air quality in district Bhopal, Madhya Pradesh (India), reported the concentration of SO_2 varied between 6.32 to 12.30 µg/cu-m.[18] carried out the status of ambient air quality at selected sites in Chennai, reported the SO_2 concentration in the range of 13.0 µg/m^3 to 33.0 µg/m^3. High value of SO_2 may be attributed to congested traffic, garbage burning at near nearby highways and residential areas. Similar observation were observed and it was reported that high value of SO2 may be likely due to heavy traffic, load, stationery fuel combustion, other environmental conditions may also result buildup of high SO_2 concentration in the ambient air. The air and the resultant air quality can be attributed to emission from transportation, Industrial and domestic activities.

Nitrogen Dioxide (NO_2): It causes severe respiratory problems, especially in children. When combined with water, it forms nitric acid and other toxic nitrates. NO_2 is also a main component in the formation of ozone at the surface level. The gas irritates the lungs and has been known to lower the immune system**.** A nitrogen oxide is a group of different gases mode up of different levels of oxygen and nitrogen. Two of the most common nitrogen oxides are Nitrogen dioxide and nitric oxide. Nox is given off in many forms, such as smog or particles. Nox is formed when certain fuels (oil, gas and coal) are burned at a high temperature, such as combustion. Nox, plus other ground level ozone, can cause other major respiratory problems in high levels [19]. The nitrogen dioxide value range to be 1.0 µg/m^3 to 43.0 µg/m^3.The highest NOx was detected (43.0 µg/m^3) at sampling location I_2 (Near Birla Cement plant Satna) while lowest value was found (1.0 µg/m^3)at sampling location I_{32} (Shivpuri Near Kattha Factory) as given in **table-4**. All the sampling locations of NO_2 were found to be lower than the permissible limit (NAAQS,30 µg/m^3) except two location I_1(34.6 µg/m^3) and I_2 (43.5 µg/m^3) of the study area.[20] studied quantifying the cement air pollution related human health diseases in maihar city, observed the NO_2 concentrations varied between 21.75 µg/m^3 to 48.75 µg/m^3.[21] studied the assessment of air pollution emission from wonder cement ltd., Nimbahera, reported the NO_2 concentration ranged from 15.5 µg/m^3 to 22.2 µg/m^3.[22] worked on status of ambient air quality at Jabalpur city- A case study is reported the value of NO_2 ranged between 16.3 µg/m^3 to 52.0 µg/m^3. [2]

Suspended Particulate Matter: [23] worked on air pollution and respiratory diseases in children. They found that acute exposure to air pollution, specifically due to dust was associated with increased respiratory systems and this might decrease lung function in children. In the presented study**,** suspended particulate matter concentration in the ambient air of the study area was found varied from 59.0 µg/m^3 to 426.0 µg/m^3 The maximum concentration of suspended particulate matter 426.0 µg/m^3 was observed the location I_{25} (Muraina,Near Banmaor Cement plant)**.** Minimum concentration of SPM was Found at sampling stationR_{24} (Datia near metal industries Industrial area Datia) are **shown in table-3 and table-4.**The value of SPM at sampling stations R_{10} (222.33), R_{39} (211.0), I_1 (248.3), I_5 (285.0), I_8 (235.0), I_9 (201.66), I_{11} (220.0), I_{21} (250.6), I_{25} (426.0), I_{27} (211.33), I_{30} (236.6), I_{31} (223.6) and I_{37} (220.3) µg/m^{3}are higher than the permissible limit prescribed by central pollution control board, New Delhi as 200 µg/m^3. [24] studied air quality status and its effect on plants proximate to lime kilns of maihar city, reported the air ambient SPM concentrations are range from 377.6 µg/m^3 to 710.4 µg/m^3.[25] studied Seasonal concentrations of SPM, SO2 and NOx in the ambint air at various sampling sites of JK white cement plant Gotan, (Rajasthan) found the SPM concentration ranged between 351.6 µg/m^3 to 939.5 µg/m^3.[26] studied the Statistics of ambient air quality at Bondamunda of Rurekela Industrial complex have reported

maximum SPM concentration as 742.0 µg/m^3. [27] Worked on a Study of chemical turbulence in ambient air quality in Satna (M.P.) reported the SPM concentration maximum (317.0µg/m^3) in Near Prism Cement Plant Satna while minimum (82.8 µg/m^3) in Pnni lal chauk Satna.

Table-3: Average Air Quality Data at Various Locations in Urban- Residential Area of East Zone of Central India.

S.N.	District	Two different Zone of Central India	Sampling Code	Sulphur Dioxide (SO_2)	Nitrogen Dioxide (NO_2)	Suspended Particulate Matter (SPM)
1	Rewa	East Zone	R1	3.33	15.33	162.00
2	Satna	East Zone	R2	3.00	18.33	136.33
3	Sidhi	East Zone	R3	2.50	12.66	80.00
4	Singrauli	East Zone	R4	1.00	9.50	107.66
5	Shahdol	East Zone	R5	0.00	6.00	74.33
6	Umaria	East Zone	R6	0.00	6.33	88.00
7	Katni	East Zone	R7	2.00	18.33	93.33
8	Panna	East Zone	R8	3.00	10.00	123.00
9	Chhatarpur	East Zone	R9	1.00	10.66	113.66
10	Jabalpur	East Zone	R10	5.00	25.33	222.33
11	Mandala	East Zone	R11	0.00	13.00	93.33
12	Dindori	East Zone	R12	1.00	8.00	71.00
13	Siwani	East Zone	R13	0.00	7.66	88.33
14	Chhindwara	East Zone	R14	3.33	11.66	98.33
15	Narsinghpur	East Zone	R15	2.00	15.00	88.33
16	Hosangabad	East Zone	R16	3.00	18.66	126.66
17	Betul	East Zone	R17	3.00	17.66	158.33
18	Damoh	East Zone	R18	1.66	11.33	146.00
19	Sagar	EasZone	R19	3.66	13.66	103.66
20	Bhopal	East Zone	R20	5.00	19.00	106.33

Table-3 continues Average Air Quality Data at Various Locations in Urban- Residential Area of West Zone of Central India.

21	Gawaliar	West Zone	R21	3.66	21.00	106.33
22	Shivpuri	West Zone	R22	1.33	5.00	151.00
23	Ashok Nagar	West Zone	R23	0.00	14.33	81.33
24	Datiya	West Zone	R24	0.00	0.00	59.00
25	Muraina	West Zone	R25	1.00	9.66	107.67
26	Bhind	West Zone	R26	0.00	10.33	168.00
27	Guna	West Zone	R27	1.66	23.00	142.00
28	Tikamgarh	West Zone	R28	0.00	12.00	86.33
29	Vidisha	West Zone	R29	2.00	12.66	144.33
30	Raisen	West Zone	R30	3.33	22.33	131.33
31	Sihor	West Zone	R31	0.00	14.00	116.67
32	Rajgarh	West Zone	R32	0.00	7.33	104.67
33	Shajaput	West Zone	R33	2.00	7.33	135.67
34	Dewash	West Zone	R34	3.00	13.00	120.00
35	Ujjain	West Zone	R35	2.66	15.66	140.33
36	Ratlam	West Zone	R36	4.66	24.00	133.00
37	Indore	West Zone	R37	6.33	11.33	232.00
38	Khandawa	West Zone	R38	1.66	7.33	221.00
39	Burhanpur	West Zone	R39	5.66	18.66	183.67
40	Harda	West Zone	R40	0.00	0.00	83.67

Table-4: Average Air Quality Data at Various Locations in Industrial Area of East Zone of Central India.

S.N.	District	Two different Zone of Central India	Sampling Code	Sulphur Dioxide (SO_2)	Nitrogen Dioxide (NO_2)	Suspended Particulate Matter (SPM)
1	Rewa	East Zone	I1	12.00	34.66	165.33
2	Satna	East Zone	I2	13.33	43.50	248.33
3	Sidhi	East Zone	I3	3.50	17.33	112.00
4	Singrauli	East Zone	I4	12.50	22.00	129.66
5	Shahdol	East Zone	I5	3.00	19.00	285.00
6	Umaria	East Zone	I6	0.00	14.00	127.66
7	Katni	East Zone	I7	5.00	19.33	175.33
8	Panna	East Zone	I8	1.00	0.00	235.00
9	Chhatarpur	East Zone	I9	1.00	13.00	201.66
10	Jabalpur	East Zone	I10	9.00	24.66	195.33
11	Mandala	East Zone	I11	0.00	7.66	220.00
12	Dindori	East Zone	I12	2.50	0.00	124.66

13	Siwani	East Zone	I13	2.00	16.00	162.33
14	Chhindwara	East Zone	I14	4.33	8.66	169.66
15	Narsinghpur	East Zone	I15	2.00	10.00	152.66
16	Hosangabad	East Zone	I16	6.33	16.33	121.33
17	Betul	East Zone	I17	6.00	22.66	173.33
18	Damoh	East Zone	I18	2.00	10.66	89.00
19	Sagar	EasZone	I19	9.33	18.00	198.00
20	Bhopal	East Zone	I20	17.00	27.50	132.00

5.

Table-4 continues Average Air Quality Data at Various Locations in Industrial Area of West Zone of Central India.

21	Gawaliar	West Zone	I21	7.33	26.00	250.66
22	Shivpuri	West Zone	I22	5.00	0.00	168.00
23	Ashok Nagar	West Zone	I23	2.00	7.00	120.66
24	Datiya	West Zone	I24	0.00	15.00	97.66
25	Muraina	West Zone	I25	8.00	27.00	426.00
26	Bhind	West Zone	I26	0.00	12.00	140.00
27	Guna	West Zone	I27	6.33	26.00	211.33
28	Tikamgarh	West Zone	I28	0.00	2.00	87.00
29	Vidisha	West Zone	I29	2.33	18.00	128.33
30	Raisen	West Zone	I30	6.00	29.00	236.66
31	Sihor	West Zone	I31	1.00	15.33	223.66
32	Rajgarh	West Zone	I32	0.00	1.00	86.66
33	Shajaput	West Zone	I33	4.33	14.66	153.33
34	Dewash	West Zone	I34	9.33	20.00	126.66
35	Ujjain	West Zone	I35	8.00	13.66	160.00
36	Ratlam	West Zone	I36	6.33	22.33	191.33
37	Indore	West Zone	I37	11.66	29.66	220.33
38	Khandawa	West Zone	I38	3.00	13.33	95.66
39	Burhanpur	West Zone	I39	6.66	22.33	96.00
40	Harda	West Zone	I40	1.50	2.00	80.33

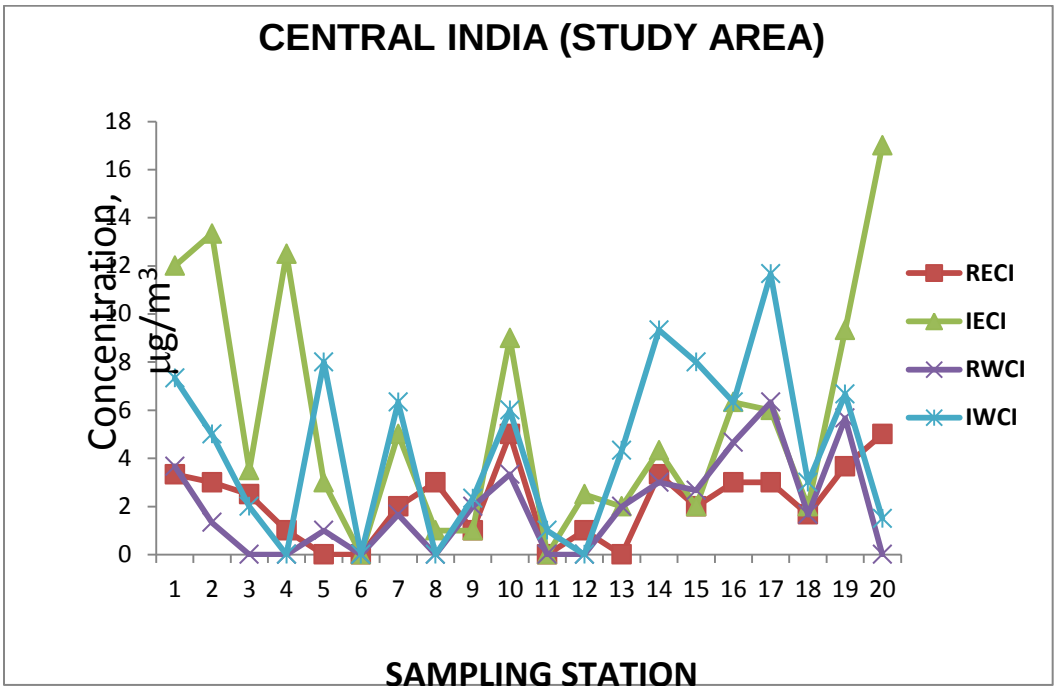

Figure 2: Comparative Sulpher dioxide (SOx) profiles of two different Zone of Central India. * RECI = Residential Area of East Zone Central India ** RWCI = Residential area of West Zone Central India
*** IECI = Industrial area of East Zone Central India ** IWCI = Industrial area of West Zone Central India**

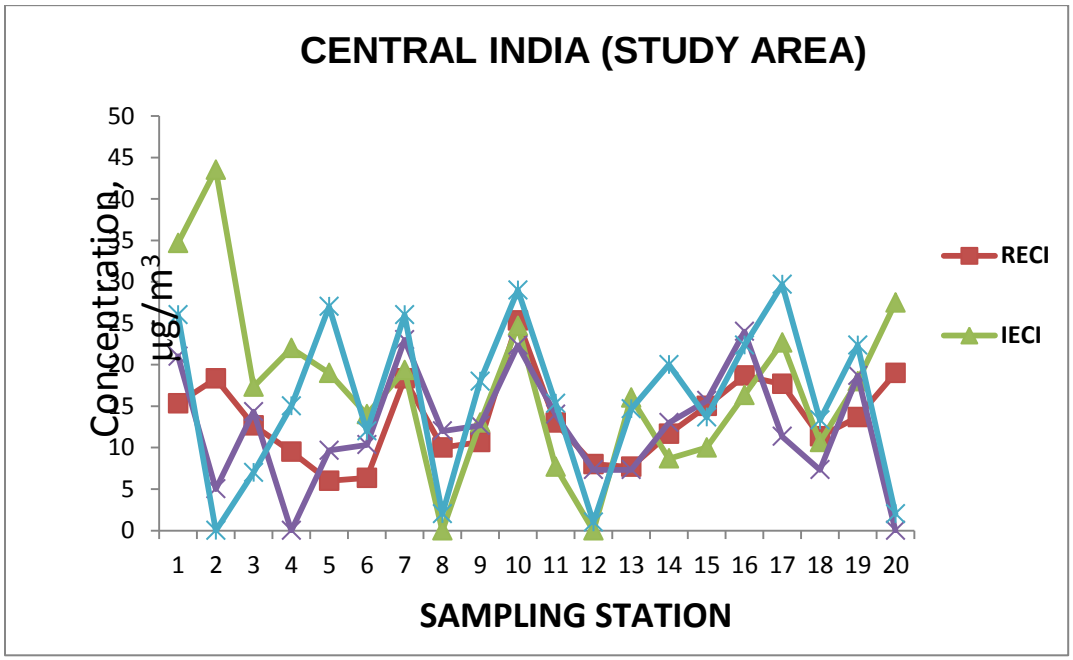

Figure 3: Comparative Nitrogen dioxide (NOx) profiles of two different Zone of Central India RECI = Residential Area of East Zone Central India ** RWCI = Residential area of West Zone Central India
*** IECI = Industrial area of East Zone Central India ** IWCI = Industrial area of West Zone Central India**

International Journal of Academic and Applied Research (IJAAR)
ISSN: 2000-005X
Vol. 2 Issue 2, February – 2018, Pages: 12-24

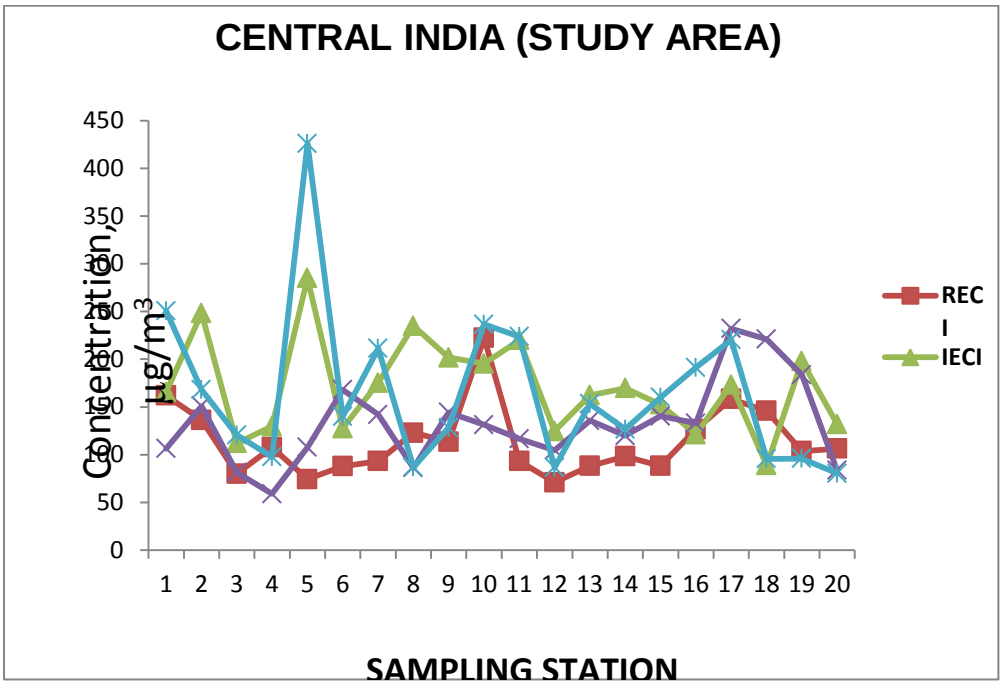

Figure 4: Comparative Suspended Particulates Metter (SPM) profiles of two different Zone of Central India.

Residential Area:

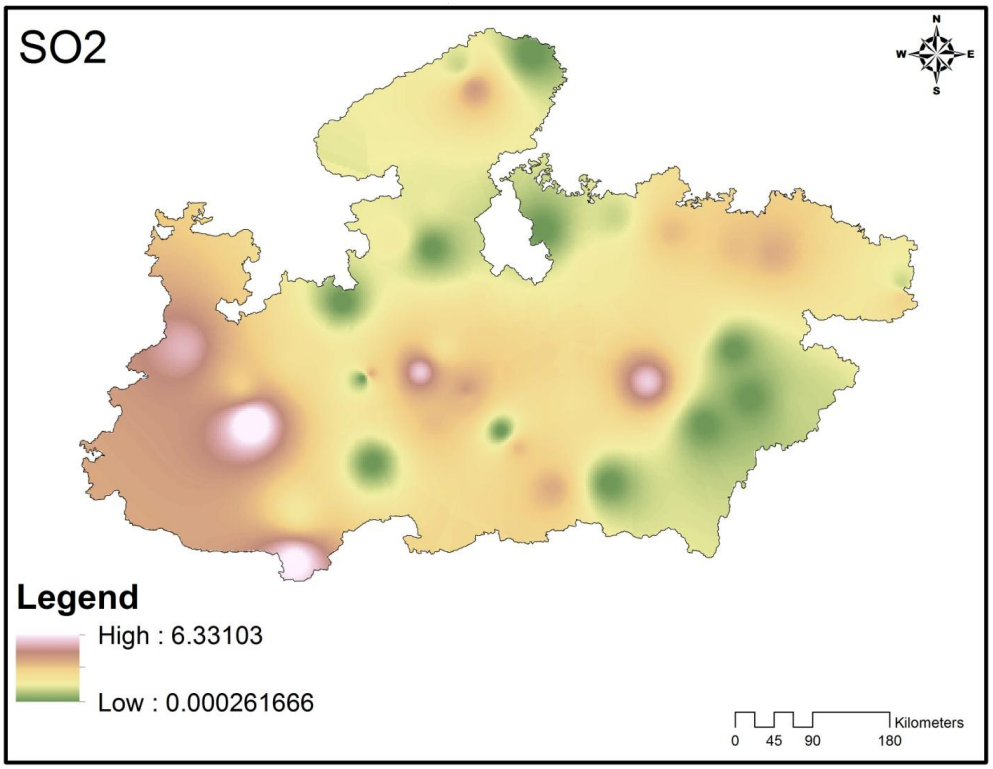

Figure-5: Average Sulphur Dioxide (SO_2) of Air Quality Data at Various Locations in Urban- Residential Area of Two Different Zone of Central India.

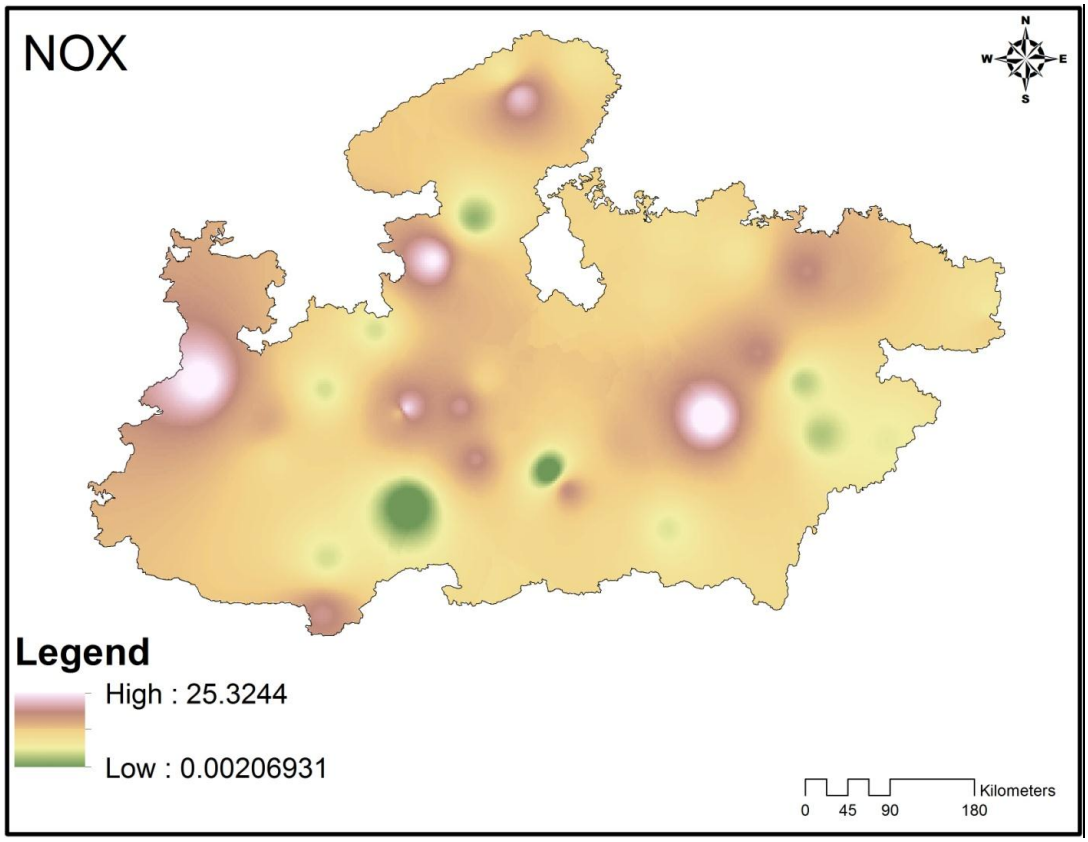

Figure-6: Average Nitrogen Dioxide (NO_2) of Air Quality Data at Various Locations in Urban- Residential Area of Two Different Zone of Central India.

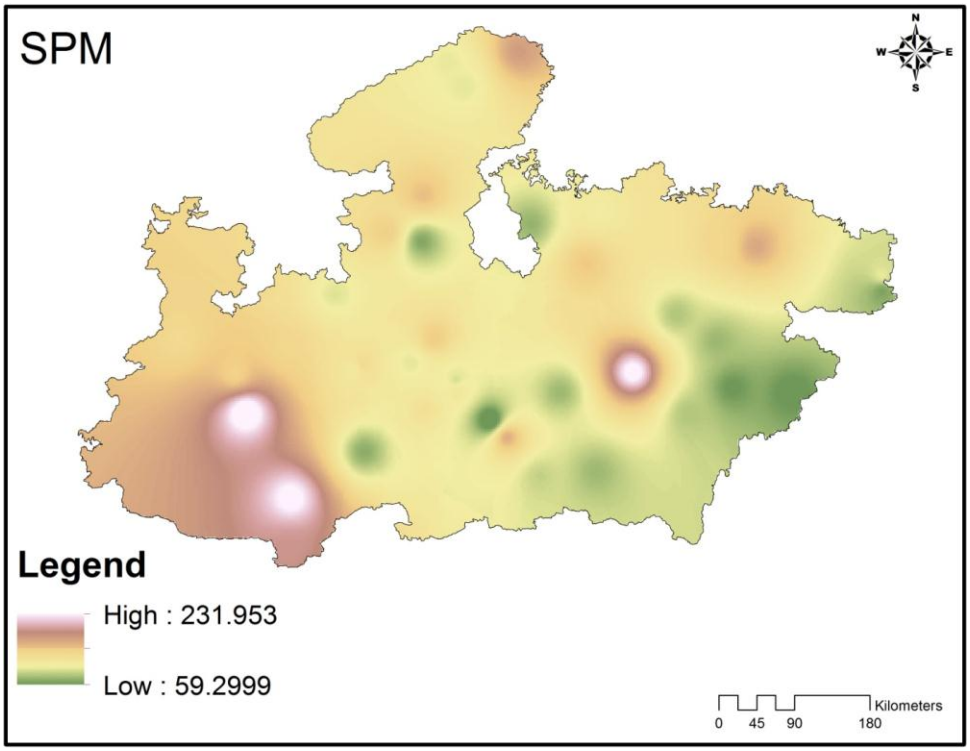

Figure-7: Average Suspended Particulate Matter (SPM) of Air Quality Data at Various Locations in Urban-Residential Area of Two Different Zone of Central India.

Industrial Area:

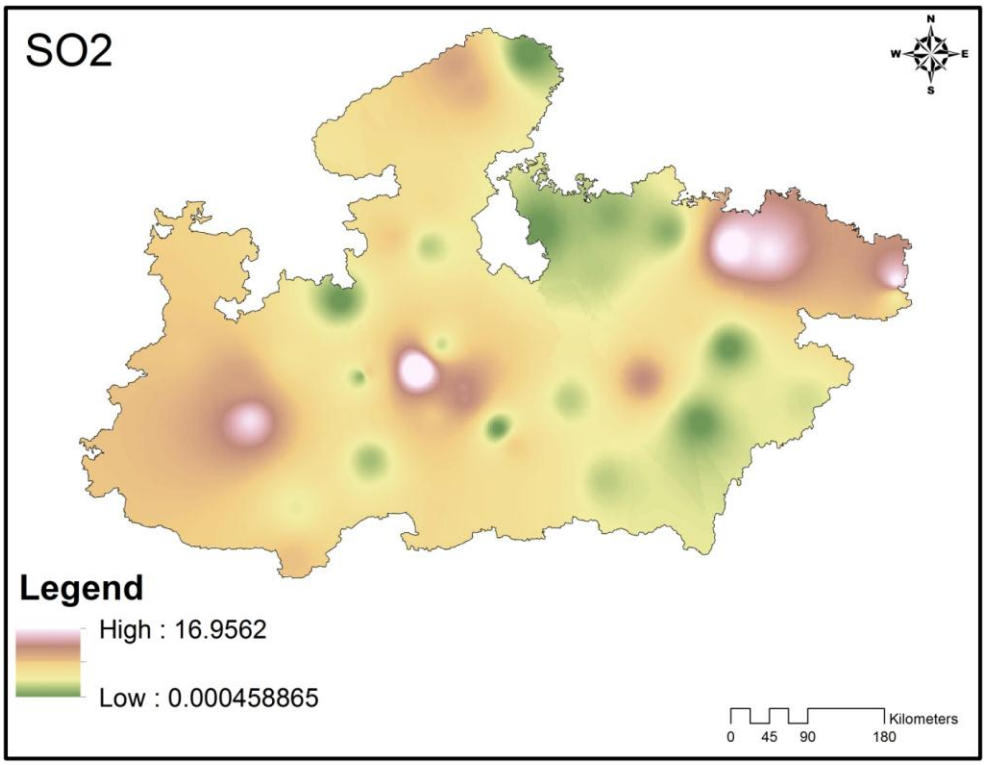

Figure-8: Average Sulphur Dioxide (SO_2) of Air Quality Data at Various Locations in Industrial Area of Two Different Zone of Central India

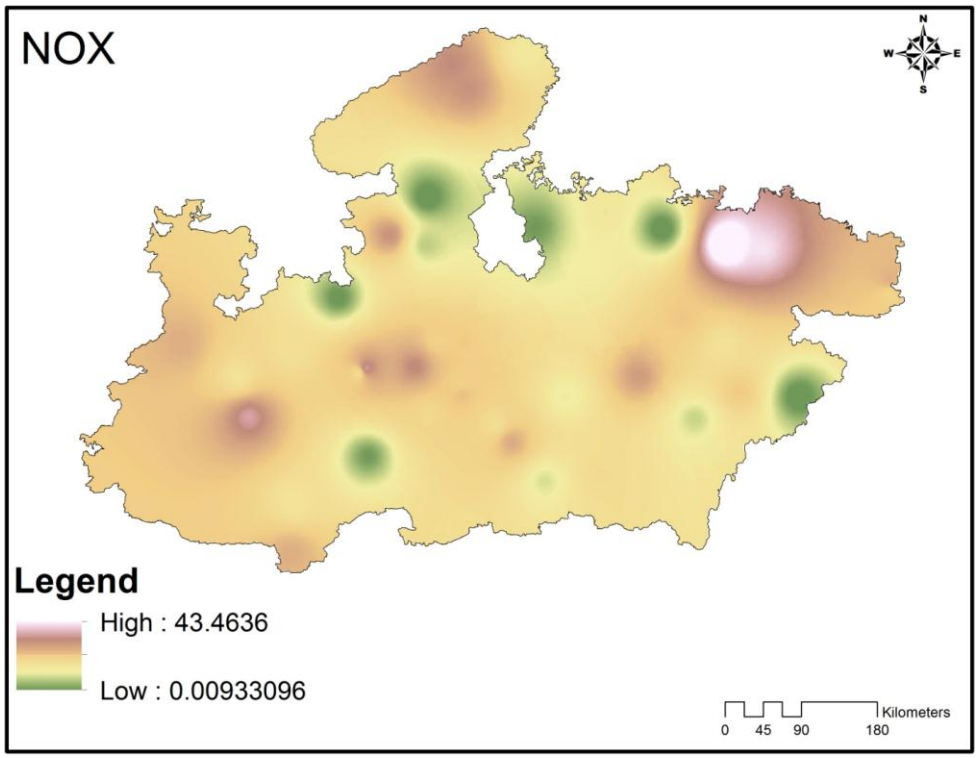

Figure-9: Average Nitrogen Dioxide (NO_2) of Air Quality Data at Various Locations in Industrial Area of Two Different Zone of Central India.

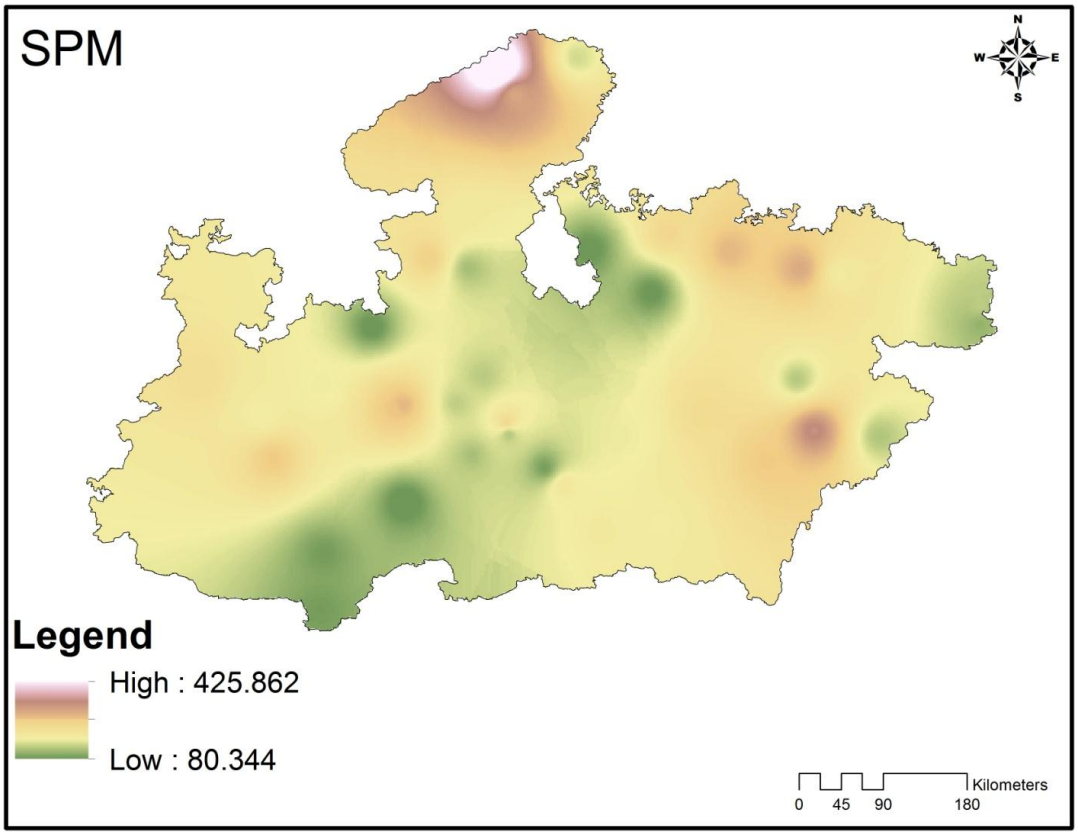

Figure-10: Average Suspended Particulate Matter (SPM) of Air Quality Data at Various Locations in Industrial Area of Two Different Zone of Central India.

5. CONCLUSIONS

In the present study Ambient air samples were collected from Residential area, urban area and industrial area of two different zone of central India, the sulphur dioxide (SO_2) ranged between 1.0 µg/m^3 to17.0 µg/m^3, nitrogen dioxide (NO_2) 1.0 µg/m^3 to 43.0 µg/m^3 and Suspended particulate matter 59.0 to 426.0. The value of SPM at sampling location R_{10}, R_{39}, I_1, I_5 , I_8 , I_9 , I_{11}, I_{21}, I_{25}, I_{27} , I_{30} , I_{31} and I_{37} are exceeded the permissible limit prescribed by central pollution control board, New Delhi as 200 µg/m^3. All the sampling locations of NO_2 were found to be below the permissible limit (NAAQS, 30µg/m^3) except two locations I_1 and I_2 of the three different areas of central India. All the results of sulphur dioxide were found within the range of permissible limit prescribed by central pollution control board, New Delhi, India. The air pollutants are occurred due to emission from transportation, industrial and other anthropogenic activities. The human populations of some selected sampling locations were surveyed for prevalence of various diseases such respiratory diseases, eye diseases, skin diseases and other diseases. Result indicated maximum people of some sampling locations of study area suffering from respiratory diseases, blood pressure and allergic problems compare to other health problems. It may, thus regulations and adoption of adequate pollution control measures is need of the hour. Regular monitoring for adequacy of pollution control equipments installed at various industries should be undertaken to check emission from industrial processes.

6. ACKNOWLEDGEMENT

Author would like to thanks the University Grant Commission, New Delhi (Project No - No.F41-855/2012(SR)) for the financial Support. We also express sincere thanks to Prof. K.B. Pandaya Vice-chancellor, Nehru Gram Bharti Vishwavidyalaya, Allahabad U.P. for their kind support and guidance.

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