Ambient Air Quality and Noise Levels:

Deepawali Festival Monitoring Report 2015.

CENTRAL POLLUTION CONTROL BOARD
Ministry of Environment, Forest & Climate Change
Website: www.cpcb.nic.in

February 2016

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FOREWORD

Noise and air pollution are hazards to the ambient environment and a cause of concern due to bursting of fire crackers during Deepawali. It is, therefore, necessary to conduct ambient noise and air quality monitoring during this festival to understand the level of pollution and correlate with the effectiveness of different abatement programs. Like every year, Central Pollution Control Board, State Pollution Control Boards and Pollution Control Committees carried out extensive ambient noise and air quality monitoring across the country during Deepawali festival on November 11, 2015.

This report is a compilation of ambient noise (248 locations) and ambient air quality (103 locations) data covering 22 states/UTs in the country and incorporates comparison with data of previous year. In general, as compared to last year there was decrease in Noise level at 44 locations in 2015, while increased Noise level was observed at most of other locations. Also, as compared to last year, NO_2, SO_2 and PM_{10} levels were lesser in concentration at 27, 28 and 27 locations, respectively. So despite, mass awareness programs being taken up by respective SPCBs/PCCs, there was increase in the levels of pollution in the country during Deepawali days in 2015.

The exercise was supervised by Dr. D. Saha, Scientist 'E'. The efforts of Shri P. Krishnamurthy, Scientist 'C' towards coordination, data compilation is appreciated.

I hope that the SPCBs/PCCs and other concerned authorities will use this document to celebrate Deepawali festival in more environment friendly ways.

(Arun Kumar Mehta)

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ACKNOWLEDGEMENT

Central Pollution Control Board acknowledges the efforts of State Pollution Control Boards, Pollution Control Committees and other persons associated with this work for monitoring the noise and air pollution levels on Deepawali festival as per the protocol prescribed by CPCB. It would not have been possible to compile this report on ambient noise and ambient air quality without their sincere support and efforts.

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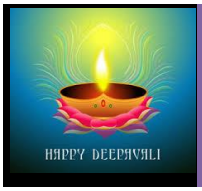


1. Introduction

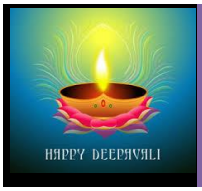
India is a diverse country having the Himalayas in the North, desert in west, forests in the north east, plains in the south, rivers all over, beaches in the east and west and different festivals are celebrated and cherished by people in the north, south, east and west alike. Diwali or Deepawali is the biggest and brightest Hindu festival which is embraced throughout the country regardless of faith by all religious denominations of Jains, Buddhists, Sikhs and others. Deepawali is usually celebrated between mid-October to mid-November and it may last up to five days. Deepawali is popularly known as the "festival of lights" bringing joy to the young and old all alike.

There are numerous types of festivals in the world. Some of the festivals have religious origins, others involve seasonal change or have some cultural significance. In every month many festivals come and fill colours in our life. Every festival plays an important part in the life of different people from different communities of India.

Crackers hold a fascination for both young and old alike. Crackers of varied colors and sounds fill the skies heralding India's favorite festival, however these crackers spoil our environment by causing noise and air pollution and also affect our health**.** The smoke of fireworks consists mainly of fine toxic dusts and chemicals that easily enter the lungs and causing harmful effects for those already sick as well as for the healthy. Therefore, law has been made to ban crackers that make a noise of more than 125 decibels at four meters distance from the point of bursting.

Adverse Effects of Bursting Crackers on Health

- Apart from the mild burns and accidents the children also breathe the toxic air and suffering from nasal irritation and throat congestion.
- The smoke also irritates the eyes causing tears and redness. Sometimes, the sound makes the ears go dumb and also cause deafness.
- Bursting crackers may increase blood pressure and aggravate heart disease. Nausea, headache and giddiness are common effects of bursting crackers.
- Lung infections such as coughing, sneezing. Respiratory disorders like asthma, wheezing often get severe during Deepawali festival. The pollution hazards such as the toxic smoke causes a lot of discomfort in breathing.
- The poisonous gas can also affect pregnant women adversely. It may also affect the mentally ill patients leading to depression, fear and stress.



The increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, fire crackers, sound producing instruments, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deleterious effects on human health and the psychological well being of the people; it is considered necessary to regulate and control noise producing and generating sources with the objective of maintaining the ambient standards in respect of noise. Now, therefore, in exercise of the powers conferred by clause (ii) of sub-section (2) of section 3, sub-section (1) and clause (b) of sub-section (2) of section 6 and section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following rules for the regulation and control of noise producing and generating sources, viz., The Noise Pollution (Regulation and Control) Rules, 2000. The standards are given in Annexure–I.

Ambient Air Quality Standards

The primary aim of the ambient air quality standards is to provide a basis for protecting public health from adverse effects of air pollution and for eliminating, or reducing to a minimum, those contaminants of air that are known or likely to be hazardous to human health and well being.

Ideally, air quality standards should represent concentrations of chemical compounds in air that would not pose any health hazard to the human population. However, the realistic assessment of human health hazards necessitates a distinction between absolute safety and acceptable risk. To aim at achieving absolute safety, one would need a detailed knowledge of dose-response relationships in individuals in relation to all sources of exposure, the types of toxic effect elicited by specific pollutants or their mixtures and existing health status of human population. However, such comprehensive and conclusive data on environmental contaminants are not always available, certainly not for all types of pollutants. Very often, the relevant data are scarce and the quantitative relationship uncertain; scientific judgments and consensus, therefore, play an important role.

The ambient air quality objectives / standards are pre-requisite for developing program for effective management of ambient air quality and to reduce the damaging effects of air pollution. In exercise of the power conferred by Sub – section (2) (h) of section 16 of the Air (Prevention & Control of Pollution) Act, 1981 (Act No. 14 of 1981) CPCB has formulated the ambient air quality standards for 12 parameters, which also describes time waited average, areas (land use) and methods of measurement in November 2009. For details, refer to Gazette Notification as placed at Annexure– II.

Brief about the monitoring

In order to assess the problem of rising air and noise pollution produced by firework during Deepawali festival, Central Pollution Control Board has conducted Ambient Noise and Air Quality Monitoring on Normal Day (November 05 ,2015) and Deepawali Day (November 11 ,2015) at Delhi, Lucknow, Kolkata, Bangaluru, Bhopal, Shillong and Vadodara. These monitoring was carried out at various places covering various zones (viz. Commercial, Residential & Silence). All SPCB's/PCCs were also requested to conduct the similar monitoring at their state HQs & cities.

2. Objectives

- To determine present Air Quality status and trends during Deepawali festival;
- To monitor the ambient noise levels for normal and Deepawali day from 18:00 Hrs to 24:00 Hrs at various locations in different cities;
- To determine the trends and variations of noise levels at various areas of the cities in different monitoring locations; and
- This year special awareness program and common print – awareness materials were also published throughout the country for a period of 15 consecutive days.

3. Methodology

Ambient Air Quality Monitoring

The ambient air quality monitoring was carried out for minimum 24 hours as per the NAMP format 06:00 Hours to 06:00 Hours. The national standard is prescribed for 24 hours. The complete protocol for Particulate Matter (Size less than 10µm) or PM_{10} and gaseous pollutants (SO_2 & NO_2) as well methodology is given at **Annexure III, IV and V.**

Ambient Noise Level Monitoring

Noise measurements was carried out by using a Type 1 integrating sound level meter with free-field microphone which meets the accuracy of noise measurement as per IEC 804 (BS 6698) Grade I or ANSI Type I or equivalent IEC 61672-1(2002-05) Class-I to see the overall impact of bursting crackers on Ambient Air Environment.

Monitoring frequency/Sampling Frequency: Noise Monitoring was conducted from 18.00 Hrs to 24.00 Hrs continuously at each location with sampling frequency of 1 second.

Monitoring Parameters: Measurement of Leq, L_{10}, L_{90}, L_{50}, L_{max}, L_{min} and LAI at all locations during monitoring. Complete Noise monitoring protocol and data sheet is enclosed at **Annexure VI and VII.**

4. Monitoring of major cities and towns

4(a) Ambient Air Quality and Noise Monitoring by CPCB Head Office and Zonal Offices

The CPCB Head office and the Zonal Offices of CPCB also participated in this program since many years. The cities taken for monitoring by Zonal Offices of CPCB: are Agra, Lucknow, Kolkata, Shillong, Bhopal, Bangaluru and Vadodara the CPCB Head Office carried out the monitoring the city of Delhi. A complete data of ambient air quality & noise monitoring carried out in various locations during 2015 in Map-1. The data of preceding year (2011-2015) is given at Table – I & II. It was observed that there was decrease in ambient noise level as compared to 2011, while no significant variation in ambient air quality was observed as compared to 2011 to 2015.

AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Map 1 : Ambient Air Quality & Noise Monitoring Data during Deepawali 2015 at Zonal Offices

AMBIENT AIR	SO_2	NO_2	PM_{10}
East Arjun Nagar	38	62	166
Pragati Maidan	14	78	166
Pitampura	21	72	161
Janakpuri	12	45	119
East Arjun Nagar	36	41	593
Pragati Maidan	22	57	531
Pitampura	19	27	460
Janakpuri	18	25	554
NOISE			
Lajpat Nagar	R	61	76
Mayur Vihar Ph-II	R	60	79
Pitam pura	R	55	74
Kamla Nagar	R	61	86
Janak puri (R)	R	58	79
Okhla	C	66	86

AMBIENT AIR	SO_2	NO_2	PM_{10}
Tajmahal	BDL	12	150
Etmad-ud-daullah	BDL	41	299
Tajmahal	BDL	23	295
Etmad-ud-daullah	04	29	346
NOISE			
Kamla Nagar	R	73	94
Arjun Nagar	R	64	87

AMBIENT AIR	SO_2	NO_2	PM_{10}
Indira Nagar	BDL	21	290
Vikas Khand	BDL	36	221
Indira Nagar	05	31	305
Vikas Khand	08	49	326
NOISE			
Mayur Vihar Indra Ng.	R	60	78
Vikas Khand Gomti Ng.	R	57	70

AMBIENT AIR	SO_2	NO_2	PM_{10}
Lower Motinagar	BDL	BDL	92
Assam Bazar	BDL	BDL	109
Upper Mawprem	BDL	BDL	91
Lower Moti Nagar	BDL	BDL	102
Assam Bazar	BDL	BDL	172
Upper Mawprem	BDL	BDL	203
NOISE			
Lower Moti Nagar	R	50	49
Upper Mawprem	C	58	88

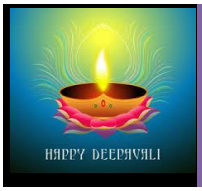
AMBIENT AIR	SO_2	NO_2	PM_{10}
Fatehganj Circle	*BDL*	*50*	*286*
M.S. University	*BDL*	*43*	*149*
Harinagar	*BDL*	*53*	*296*
Fatehgunj	BDL	38	268
MS University	BDL	24	239
Harinagar	21	32	340
NOISE			
Fatehganj	C	77	77
MS University	R	57	64
Harinagar	S	74	80

AMBIENT AIR	SO_2	NO_2	PM_{10}
Behala	BDL	63	82
Tollygunge	07	99	101
Salt Lake	BDL	52	52
Shyambazar	BDL	57	62
Kasba	05	49	52
Behala	06	80	1397
Tollygunge	05	141	2080
Salt Lake	BDL	74	1033
Shyambazar	33	54	477
Kasba	10	63	258
NOISE			
Salt Lake, North Kolkata	R	58	90
Rabindra Sadan, South Kolkata	S	71	90

AMBIENT AIR	SO_2	NO_2	PM_{10}
Basaveshwar Nagar	BDL	16	61
Peenya	BDL	14	-
RT Nagar	BDL	24	88
Kadabeshnahlli	BDL	34	-
BTM Layout	BDL	25	-
Rajarajeshwari	BDL	15	48
Basaveshwar Nagar	BDL	30	86
Peenya	BDL	BDL	-
RT Nagar	BDL	25	116
Kadabeshnahlli	BDL	15	-
BTM Layout	04	BDL	-
Rajarajeshwari	BDL	19	62
NOISE			
Basaveshwar Nagar	R	65	82
R.T. Nagar	R	68	92
Rajarajeswari Nagar	S	52	69

AMBIENT AIR	SO_2	NO_2	PM_{10}
Nehru Nagar	BDL	16	116
TT Nagar	BDL	14	84
Sahjanabad	BDL	20	100
Nehru Nagar	18	47	419
TT Nagar	19	41	318
Sahjanabad	16	46	309
NOISE			
Nehru Nagar	R	65	75
T.T. Nagar	C	67	84
Sahjanabad	R	62	67

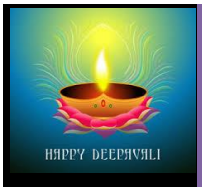
Normal Day **Festival Day**



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Table I: Ambient Air Quality Data During Deepawali festival in the major cities (last 5 years 2011-15)

S. No.	Cities with Locations	2011			2012			2013			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
BANGALORE																
1	Kurbarahalli	BDL	18.0	82	BDL	24	147	-	-	-	-	-	-	-	-	-
2	M.S. Ramaiah Hospital	BDL	BDL	85	BDL	25	153	BDL	16	22	BDL	11.2	81	-	-	-
3	Nagarbhavi	05	06	40	BDL	16	103	BDL	BDL	60	-	-	-	-	-	-
4	Rajaji Nagar	24	08	116	05	22	143	06	15.7	86	06	16	213	-	-	-
5	R.T.Nagar	BDL	25	94	BDL	40	149	-	-	-	BDL	23	103	BDL	25	116
6	Basaveshwar Nagar	-	-	-	-	-	-	-	-	-	-	-	-	BDL	30	86
7	Peenya	-	-	-	-	-	-	-	-	-	-	-	-	BDL	BDL	-
8	Kadabeshnahlli	-	-	-	-	-	-	-	-	-	-	-	-	BDL	15	-
9	BTM Layout	-	-	-	-	-	-	-	-	-	-	-	-	BDL	BDL	-
10	Rajarajeshwari	-	-	-	-	-	-	-	-	-	BDL	11	81	BDL	19	62
BHOPAL																
1	T T Nagar	14	51	411	7	40	291	12	47	212	09	33	208	19	41	318
2	Chhola Road	11	59	482	9	46	373	12	49	255	08	22	348	-	-	-
3	AG Colony	-	-	-	-	-	-	-	-	-	10	39	338	-	-	-
4	Nehru Nagar	09	50	433	10	48	389	13	50	350	-	-	-	18	47	419
5	Saketh Nagar	-	-	-	11	51	430	-	-	-	-	-	-	-	-	-
	Sahjanabad	-	-	-	-	-	-	-	-	-	-	-	-	16	46	309
DELHI																
1	B.S.Z. Marg (ITO)	28	56	416	13	85	795	11	52	>1000	08	82	442	-	-	-
2	Pitampura	22	27	428	17	58	776	18	31	952	10	67	756	19	27	460
3	Sirifort	25	30	635	19	67	760	10	29	875	-	-	-	-	-	-
4	Janakpuri	40	31	441	63	69	951	56	35	969	32	53	648	18	25	554
5	Nizamuddin	21	46	421	25	69	748	05	26	796	-	-	-	-	-	-
6	Shahazada Bagh	35	45	438	13	64	820	40	87	>1000	-	-	-	-	-	-
7	Shahdara	11	28	497	20	44	928	10	33	>1000	-	-	-	-	-	-
	East Arjun Nagar	-	-	-	-	-	-	-	-	-	-	-	-	36	41	593
	Pragati Maidan	-	-	-	-	-	-	-	-	-	08	82	442	22	57	531
LUCKNOW																
1	Nishatganj	29	31	320	-	-	-	-	-	-	-	-	-			
2	Indira Nagar	-	-	-	05	53	498	10	88	617	7	69	476	05	31	305
3	Vikas Khand	20	43	337	05	49	563	07	71	616	5	57	332	08	49	326



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Table – I (Cont.)

AGRA																
1	Tajmahal	-	-	-	-	-	-	04	31	524	BDL	16	191	BDL	23	295
2	Etmad-ud-daullah	-	-	-	-	-	-	05	27	697	5	29	271	04	29	346
VADODARA																
1	Fatehgunj	08	22	222	BDL	34	210	BDL	25	160	BDL	49	337	BDL	38	268
2	M.S.University	09	09	167	04	28	179	BDL	21	97	BDL	20	226	BDL	24	239
3	Harinagar	11	18	233	12	33	249	14	21	189	12	27	265	21	32	340
KOLKATTA																
1	Behala	04	32	401	24	47	>1000	14	36	650	04	34	852	06	80	>1000
2	Tollygunge	14	64	398	23	61	>1000	07	48	>1000	07	56	998	05	141	>1000
3	Kasba	24	38	453	30	60	514	46	53	>1000	60	50	>1000	10	63	258
4	Salt lake	30	40	991	15	51	>1000	21	43	>1000	37	43	>1000	BDL	74	>1000
5	Shyambazar	-	-	-	11	34	>1000	44	43	>1000	29	36	760	33	54	477
6	Canning	07	05	157	-	-	-	-	-	-	-	-	-	-	-	-
7	Cossipur	53	57	413	-	-	-	-	-	-	-	-	-	-	-	-
SHILLONG																
1	Fire Brigade	-	-	-	BDL	BDL	BDL	BDL	BDL	117	-	-	-	-	-	-
2	Upper Mawprem	-	-	-	BDL	BDL	BDL	BDL	BDL	259	BDL	BDL	135	BDL	BDL	203
3	Lower Moti Nagar	-	-	-	-	-	-	-	-	-	BDL	BDL	95	BDL	BDL	102
4	Assam Bazar	-	-	-	-	-	-	-	-	-	BDL	BDL	132	BDL	BDL	172

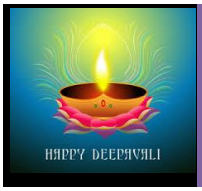


Table - II: Noise Monitoring Data during Deepawali festival in the major cities (last 5 years 2011-15)

S. No.	Location		Average Noise Level in dB (A) Leq.				
			2011	2012	2013	2014	2015
BANGALORE							
1	R.T. Nagar	C	85	75	-	73	92
2	Rajaji Nagar	C	86	80	85	88	-
3	Raja Rajeshwari Nagar	R	74	68	79	69	69
4	Nagarbhavi	R	-	-	80	-	-
5	Malleswaram	R	78	76	-	-	-
BHOPAL							
1	Nehru Nagar	R	80	89	103	-	75
2	TT Nagar	C	79	104	75	81	84
3	Chola Road	R	-	-	-	89	67
4	AG Colony	R	-	-	-	81	-
DELHI							
1	AIIMS	S	76	76	81	80	-
2	Connaught Place	C	69	69	74	80	-
3	Mayur Vihar Ph-II	R	91	73	83	83	79
4	Kamla Nagar	R	81	80	81	80	86
5	Pitam Pura	R	75	75	73	71	74
6	East Arjun Nagar	C	74	74	72	-	-
7	Lajpat Nagar	R	81	81	79	-	76
8	ITO/Pragati Maidan	C	71	71	69	-	-
9	Dilshad Garden	R	80	78	80	-	-
10	Janakpuri	R	-	-	-	78	79
LUCKNOW							
1	Indira Nagar	R	-	81	85	79	78
2	Vikas Khand	R	-	66	66	56	70
AGRA							
1	Kamla Nagar	R	-	-	81	92	94
2	Arjun Nagar	R	-	-	-	-	87
VADODARA							
1	Fatehgunj	C	76	81	76	77	77
2	M.S.University Campus	S	66	65	72	74	64
3	Harinagar	R	88	82	78	73	80
KOLKATTA							
1	North Kolkata	R	96	78	74	71	90
2	South Kolkata	S	91	71	67	64	90
SHILLONG							
1	Lower Moti Nagar	R	-	71	-	71	49
2	Upper Mawprem	C	-	88	86	84	88
3	Fire Brigade	R	-	-	72	-	-
4	Assam Bazar	C	-	-	-	86	-

Note : (-) indicates data not available.

4.(b) State-wise Ambient Air Quality and Noise Monitoring

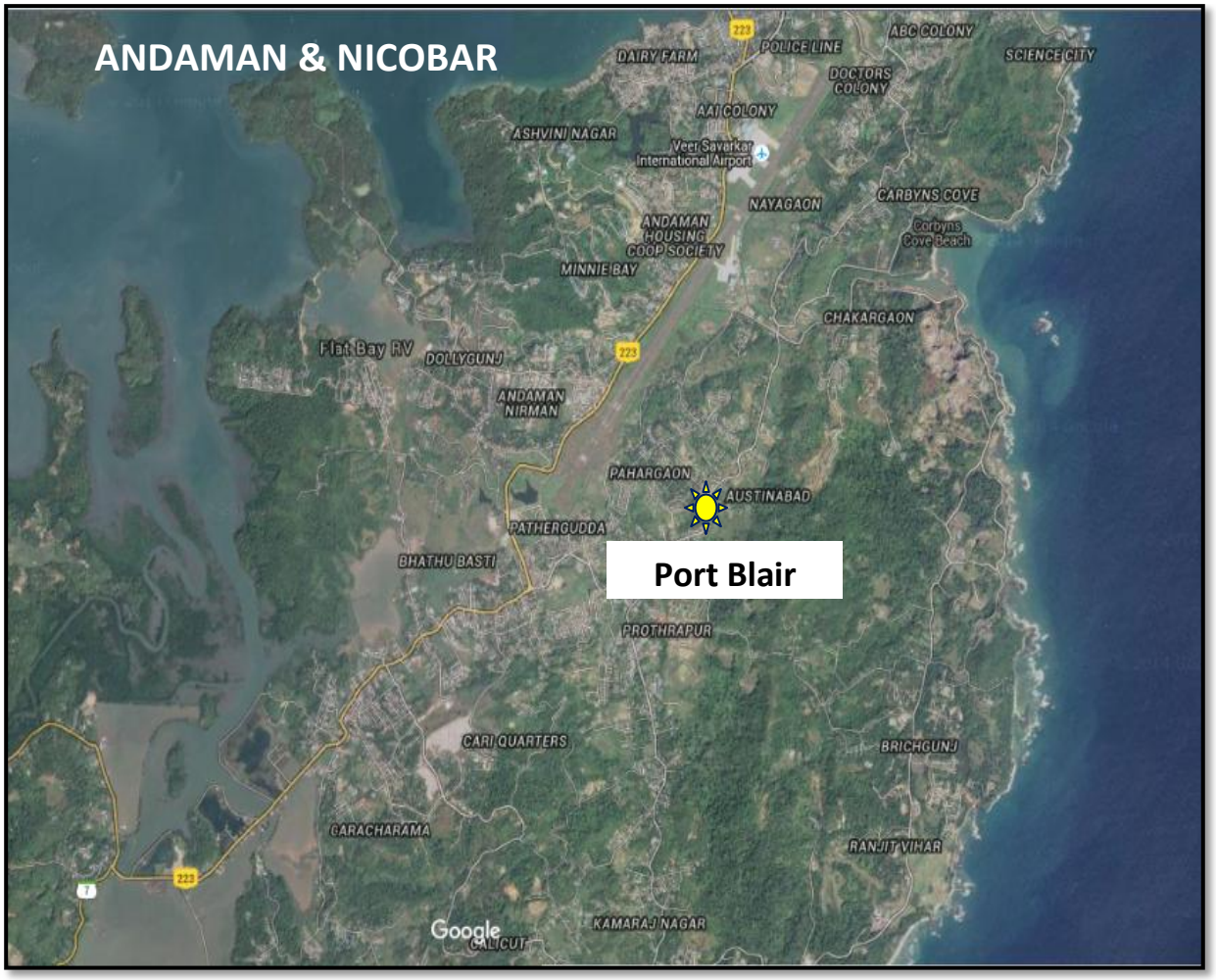
With the view to maintain uniformity in monitoring across a country, the CPCB has prepared protocol for monitoring of ambient noise and circulated it to all SPCBs &PCCs in the country. Data of states and UTs made available to CPCB till Jan-31, 2016 are as under:

State-wise number of monitoring locations.

S. No.	Name of the State	No. of Monitoring Locations	
		Noise Monitoring	AAQ Monitoring
1	ANDAMAN & NICOBAR	05	01
2	ANDHARA PRADESH	32	09
3	ARUNACHAL PRADESH	-	02
4	CHHATTISGARH	18	07
5	DELHI	06	04
6	DD & DNH	02	02
7	GOA	04	05
8	GUJARAT	03	01
9	HARYANA	29	10
10	HIMACHAL PRADESH	13	11
11	KARNATAKA	03	06
12	MADHYA PRADESH	09	04
13	MEGHALAYA	02	03
14	NAGALAND	03	01
15	ODISHA	45	00
16	PUDUCHERRY	01	02
17	SIKKIM	03	-
18	TAMIL NADU	23	10
19	TELANGANA	12	10
20	TRIPURA	25	04
21	UTTAR PRADESH	08	06
22	WEST BENGAL	02	05
	Total	**248**	**103**

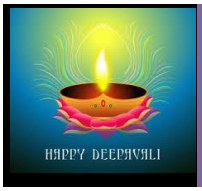
To comply the order of Hon'ble Supreme-court of India, in the year 2001, Noise monitoring and ambient air carried out during Deepawali-2015 & compiled data collected from CPCB, SPCBs & UTs have been given in the following respective state and UTs area maps:

Fig 1: Ambient Air Quality & Noise Level monitoring locations in Andaman & Nicobar



The Andaman and Nicobar one of the seven union territories of India, are a group of islands at the juncture of the Bay of Bengal and Andaman Sea. It comprises two island groups, the Andaman Islands and the Nicobar Islands. The territory's capital is the Andamanese town of Port Blair. The total land area of these islands is approximately 7,950 km^2 (3,070 sq mi). This tropical rain forest, despite its isolation from adjacent land masses, is surprisingly rich with a diversity of animal life.

In this UT, the monitoring was carried out by Andaman Nicobar Administration Pollution Control Committee, Port Blair.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observation- In this UT, ambient air quality monitoring carried out only in Port Blair and noise monitoring carried out also in the same city at five locations.

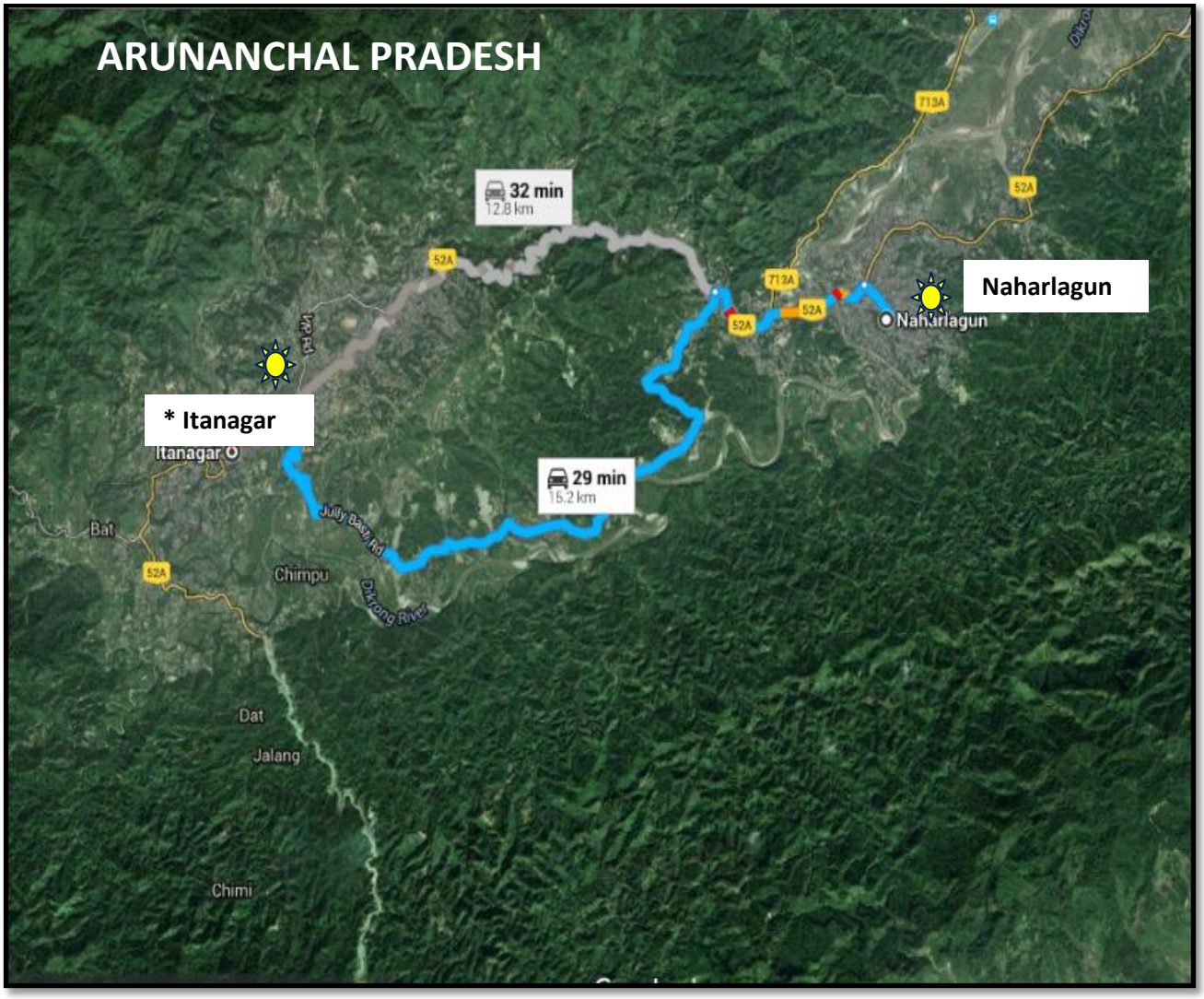
The **normal day,** PM_{10} level was 48 µg/m^3, while same on the **festival day** was 52 µg/m^3. The **normal day** noise level ranged between 45 and 63 Leq.dB(A), while same on the **festival day** ranged between 50 and 67 Leq.dB(A). The maximum noise level value of 62 Leq.dB(A) was reported at ***Haddo*** (C). A pictorial presentation of monitoring Location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal & Deepawali Day 2014 & 2015 in Andaman & Nicobar													
S.No	**City**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	**Port Blair**	29	37	32	15	09	48	36	30	33	31	17	52

Ambient Noise Data During Normal Day & Deepawali Day 2014 & 2015 in Andaman & Nicobar in Leq dB (A)						
S.No	**City**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Port Blair**	Aberdeen Bazaar (C)	66	62	82	66
2		G.B. Pant Hospital (S)	44	45	77	50
3		Haddo (C)	62	61	82	67
4		Dairy Farm (C)	63	63	60	66
5		Shadipur (C)	54	57	72	59
		Min.	***44***	***45***	***60***	***50***
		Max.	***66***	***63***	***82***	***67***
		Average	***58***	***57***	***59***	***62***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

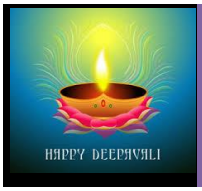
Fig 2: Ambient Air Quality & Noise Level monitoring locations in Arunachal Pradesh



* Indicates location of Maximum PM_{10} concentration this year

Arunachal Pradesh is one of the twenty-nine states of the Republic of India. Located in northeast India, it holds the most north-eastern position among the states in the north-east region of India. Arunachal Pradesh borders the states of Assam and Nagaland to the south, and shares international borders with Bhutan in the west, Burma in the east and China in the north. Itanagar is the capital of the state and their area is 83,743 km^2 (32,333 sq mi), Area rank is 15, and Population total 1,382,611, Rank 27th, Density 17/km^2 (43/sq mi).

In this report the monitoring was carried out by Arunachal Pradesh State Pollution Control Board, Naharlagun



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, only ambient air quality monitoring carried out in Naharlagun and Itanagar city.

The **normal day,** PM_{10} level ranged between 56 and 76 µg/m^3, while same on the **festival day** ranged between 75 and 86 µg/m^3. The maximum PM_{10} value of 86 µg/m^3 was reported at **Itanagar** on the festival day. A pictorial presentation of monitoring Location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Arunachal Pradesh													
S.No	**Locations**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Itanagar	-	-	30	07	BDL	76	-	-	105	-	-	86
2	Naharlagun	-	-	31	BDL	BDL	56	-	-	51	BDL	BDL	75

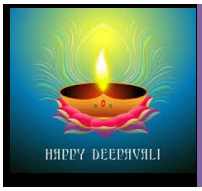
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 3: Ambient Air Quality & Noise Level monitoring locations in Andhra Pradesh

*Indicates location of Maximum PM10 concentration this year ** Indicates location of Maximum Noise Level this year

Andhra Pradesh is a state bordering India's south eastern coast. Tropical forests, rivers, hills, and caves make it a popular ecotourism destination. Beaches line the Bay of Bengal, offering spots for swimming and surfing. Major cultural landmarks include Tirumala Venkateswara Temple, an ornate hilltop shrine to Hindu's Vishnu, in the southern part of the state. Area: 160,205 km², Population: 49.67 million (2011), Capitals: Vijayawada, Hyderabad.

In this state the monitoring was carried out by Andhra Pradesh Pollution Control Board, Hyderabad.



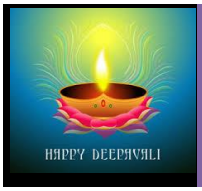
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations – In this State, ambient air quality monitoring carried out in nine cities and noise monitoring carried out in nine cities at thirty two locations.

The **normal day,** PM_{10} level ranged between 32 and 141 µg/m^3, while same on the **festival day** ranged between 76 and 220 µg/m^3. The maximum PM_{10} value of 220 µg/m^3 was reported at **Guntur** on the festival day. The **normal day** noise level ranged between 52 and 88 Leq.dB(A), while same on the **festival day** ranged between 66 and 106 Leq.dB(A). The maximum noise level value of 106 Leq.dB(A) was reported at City **Kota Junction(C)** at **Viziyanagaram**, in on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Andhra Pradesh													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Viziyanagaram	-	-	-	20	22	65	-	-	-	30	41	147
2	Visakha Patnam	-	-	-	17	24	32	-	-	-	30	39	113
3	Kakinada	-	-	-	16	21	63	-	-	-	41	52	133
4	Eluru	-	-	-	05	24	70	-	-	-	8	47	76
5	Vijayawada	-	-	-	05	28	99	-	-	-	08	47	115
6	Guntur	-	-	-	09	23	141	-	-	-	11	36	220
7	Nellore	-	-	-	BDL	BDL	69	-	-	-	BDL	BDL	NM
8	Tirupati	-	-	-	07	13	61	-	-	-	NM	NM	NM
9	Kurnool	-	-	-	18	10	72	-	-	-	08	19	111
	Min	***-***	***-***	***-***	***05***	***10***	***32***	***-***	***-***	***-***	***08***	***19***	***76***
	Max	***-***	***-***	***-***	***20***	***28***	***141***	***-***	***-***	***-***	***41***	***52***	***220***
	Average	***-***	***-***	***-***	***12***	***21***	***75***	***-***	***-***	***-***	***19***	***40***	***131***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

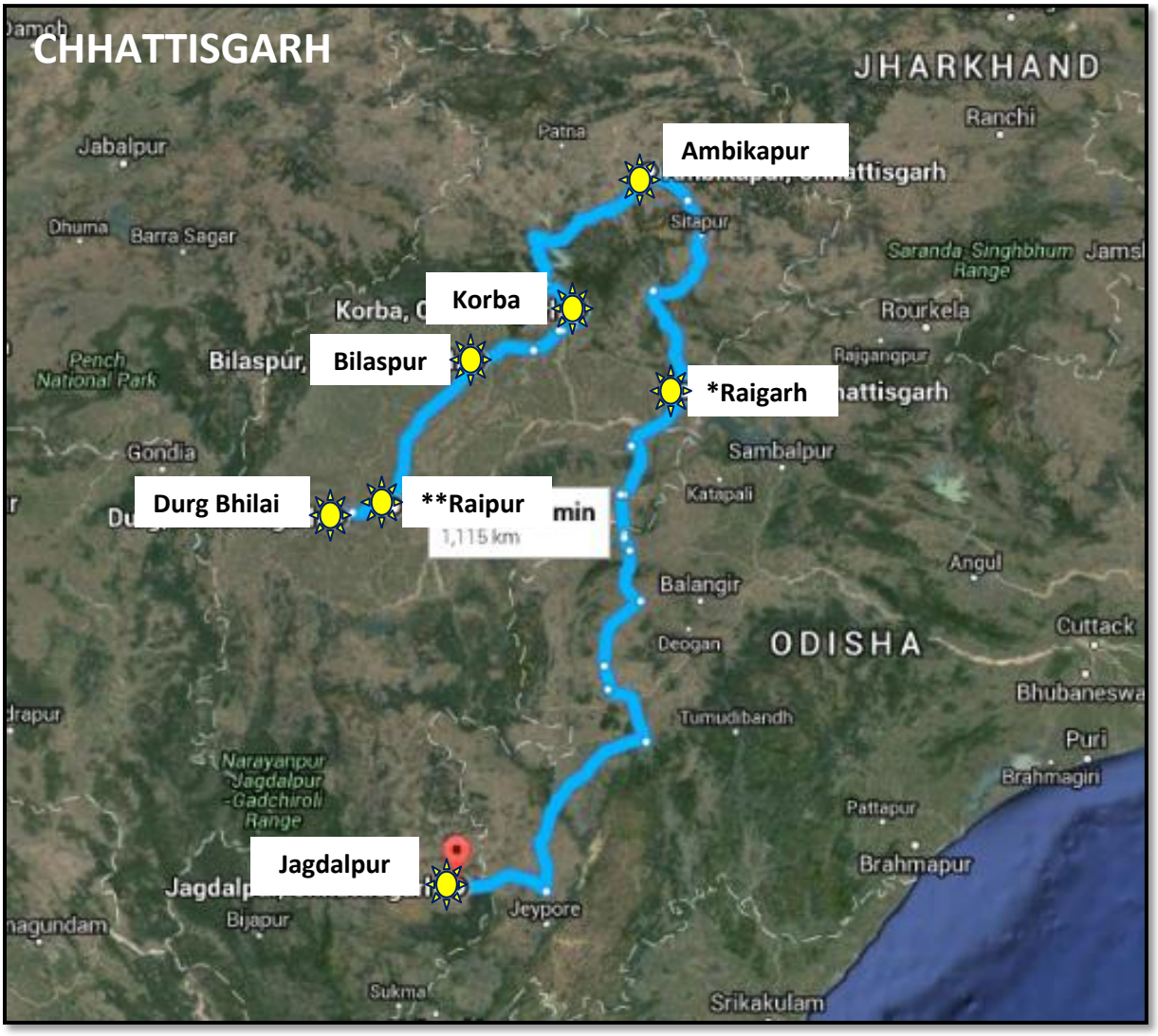


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Andhra Pradesh during Normal & Deepawali Day 2014 & 2015 in Leq. dB (A)						
S. No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Viziyanagaram**	Pradeepnagar (C)	-	67	-	92
2		Kota Junction(C)	-	82	-	106
3		Mayruri Juction (NA)	-	79	-	103
4	**Vishakapatnam**	Pandu Rangapuram (R)	-	63	-	81
5		King George Hospital (S)	-	63	-	74
6		Kurpam Market (C)	-	84	-	95
7		Jagadambha Junction (C)	-	80	-	79
8		St. Anthoni School (S)	-	63	-	78
9		RTC Complex (C)	-	82	-	79
10	**Kakinada**	Ramanayyapeta (C)	-	67	-	87
11		Near Bhanugudi (C)	-	75	-	87
12		JNTU Campus (S)	-	56	-	75
13	**Eluru**	Ashok Nagar,	-	52	-	80
14		District Govt. Hospital	-	54	-	66
15		RR Pet	-	72	-	78
16	**Vijayawada**	Autonagar (I)	-	73	-	84
17		Benz Circle (C)	-	72	-	87
18		Venkateswara Street (R)	-	69	-	73
19	**Guntur**	Laxminagar (R)	-	67	-	84
20		Brundavan Gardens (S)	-	64	-	74
21		Brodipet (C)	-	72	-	84
22	**Nellore**	Near Narthaki Theatre (C)	-	81	-	82
23		Chandramouli Nagar(R)	-	66	-	80
24	**Tirupati**	NT Road (R)	-	65	-	NM
25		Gandhi (C)	-	78	-	NM
26		Balaji Colony (C)	-	69	-	NM
27		Campus School (S)	-	76	-	NM
28		SV University (S)	-	79	-	NM
29		Municipal Office (C)	-	88	-	NM
30	**Kurnool**	Old Town (R)	-	69	-	78
31		Krishna Nagar (R)	-	71	-	81
32		Montessori School (C)	-	65	-	77
	Min.		***-***	***52***	***-***	***66***
	Max.		***-***	***88***	***-***	***106***
	Average		***-***	***71***	***-***	***82***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

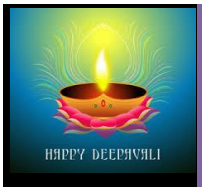
Fig 4 : Ambient Air Quality & Noise Level monitoring locations in Chhattisgarh State



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Chhattisgarh is a state in central India. It is the 10th largest state in India, with an area of 135,194 km². With a population of 25.5 million, Chhattisgarh is the 16th most-populated state of the nation. Area: 35,194 km², Founded: November 1, 2000, Population 25.55 million (2013), Capitals Bilaspur (Judiciary), Raipur.

In this state the monitoring was carried out by Chhattisgarh Environment Conservation Board, Raipur.



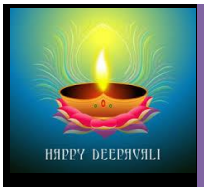
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in seven cities and noise monitoring carried out in seven cities at eighteen locations.

The **normal day,** PM_{10} level ranged between 86 and 192 µg/m^3, while same on the **festival day** ranged between 125 and 302 µg/m^3. The maximum PM_{10} value 302 µg/m^3 was reported at **Raigarh** on the festival day. The **normal day** noise level ranged between 43 and 72 Leq.dB(A), while same on the **festival day** ranged between 53 and 103 Leq.dB(A). The maximum noise level value of 103 Leq.dB(A) was reported at City Kotwali (R), in **Raipur** on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Chhattisgarh State													
S. No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Durg Bhilai	10	17	93	10	17	93	17	22	127	19	23	125
2	Raipur	21	30	167	17	28	133	25	37	260	23	34	177
3	Bilaspur	08	19	73	10	17	93	12	27	242	19	23	125
4	Korba	15	18	88	13	19	86	23	25	194	22	28	188
5	Ambikapur	-	-	-	09	12	171	-	-	-	11	14	266
6	Raigarh	10	16	-	10	16	155	23	27	-	23	27	302
7	Jagdalpur	10	14	-	10	13	192	19	27	-	22	25	256
	Min	***08***	***14***	***73***	***09***	***12***	***86***	***12***	***22***	***127***	***11***	***14***	***125***
	Max	***21***	***30***	***167***	***17***	***28***	***192***	***25***	***37***	***260***	***23***	***34***	***302***
	Average	***12***	***19***	***105***	***11***	***17***	***132***	***20***	***28***	***206***	***20***	***25***	***206***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

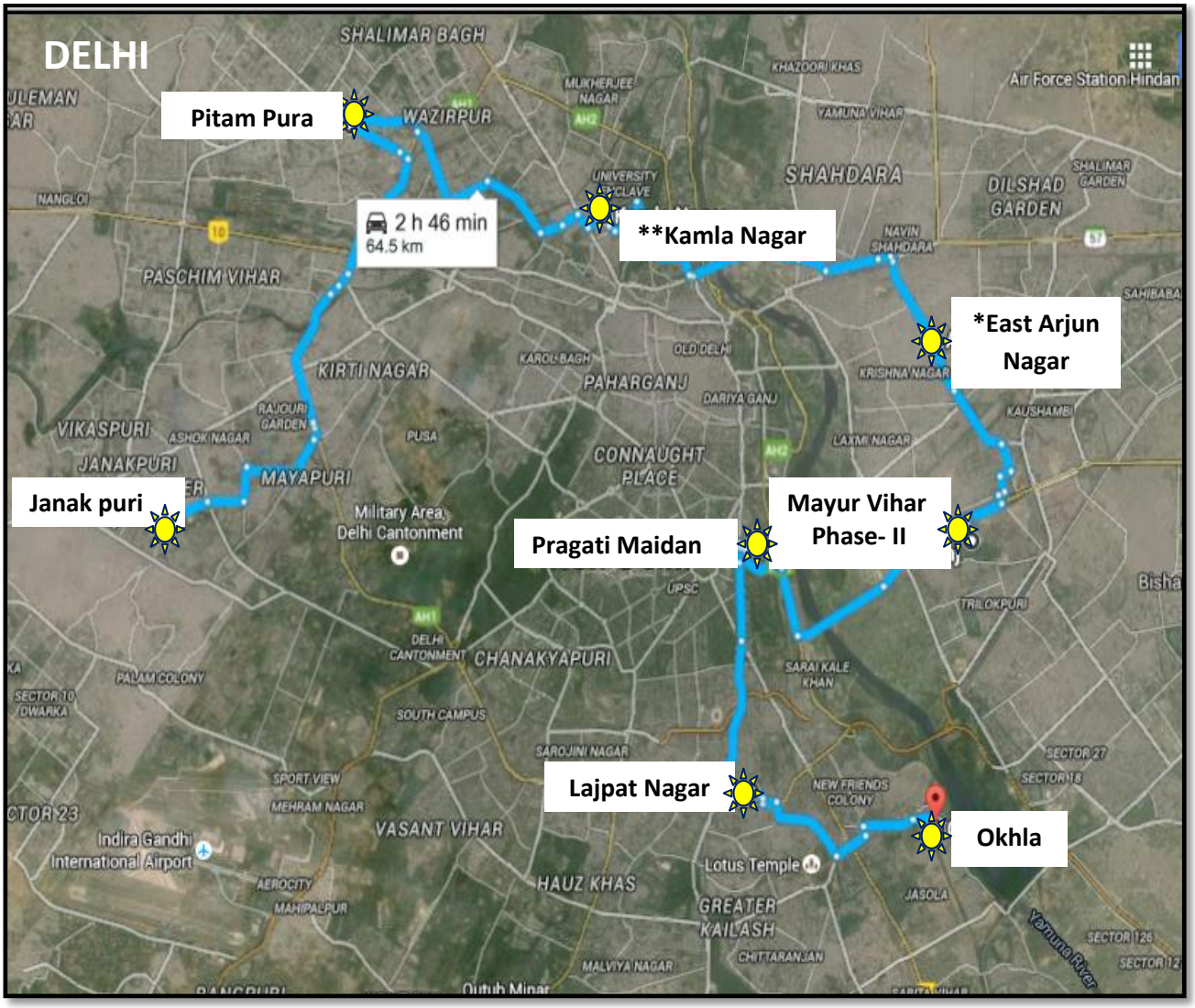


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Chhattisgarh during Normal & Deepawali Day 2014 & 2015 in Leq dB (A)						
S. No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Durg Bhilai**	JLN Hospital (S)	43	43	52	53
2		City Kotwali, Durg (C)	67	67	76	76
3	**Raipur**	Near AIIMS Hospital (M)	61	59	89	93
4		City Kotwali (R)	-	66	-	103
5		Shankar Nagar (C)	62	68	90	99
6		Collect orate (C)	64	69	94	94
7	**Bilaspur**	At Office building Vyapar Vihar(C)	57	49	72	58
8		Traffic Police Thana, (R)	76	69	82	78
9	**Korba**	Darri Jamnipali (R)	60	62	82	79
10		Near Tehsil Office (R)	-	55	77	74
11		T.P Nagar (C)	72	72	87	87
12	**Ambikapur**	RO Building, Nawapara(R)	-	48	-	83
13		Garhi Chowk (C)	-	69	-	90
14		Raghunath District Hospital (S)	57	53	80	55
15	**Raigarh**	RO CECB (R)	50	52	84	83
16	**Jagdal Pur**	Housing Board Colony (R)	55	59	91	68
17		Sanjay Market Chowk (C)	66	64	96	89
18		Maharani Hospital Parisar (S)	-	55	-	67
	Min.		***43***	***43***	***52***	***53***
	Max.		***76***	***72***	***96***	***103***
	Average		***61***	***60***	***82***	***79***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m³*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 5 : Ambient Air Quality & Noise Level monitoring locations in Delhi

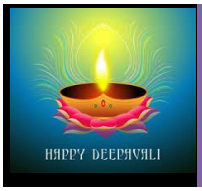


*Indicates location of Maximum PM_{10} concentration this year

** Indicates location of Maximum Noise Level this year

Delhi, the capital of India, is situated in northern India and stands on the west bank of Yamuna River bounded by Uttar Pardesh and on the north, west and south by Haryana. Delhi is spread over an area of 1483 sq. kilometers, 216 meters above sea level and has a population of around 14 million.

In this state the monitoring was carried out by Central Pollution Control Board, Delhi.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations- In this UT, ambient air quality monitoring carried out at four locations and noise monitoring carried out at six locations.

The **normal day,** PM_{10} level ranged between 119 and 166 µg/m^3, while same on the **festival day** ranged between 460 and 593 µg/m^3. The maximum PM_{10} value 593 µg/m^3 was reported at **East Arjun Nagar** on the festival day. The **normal day** noise level ranged 55 and 66 Leq.dB(A), was reported at **okhla (C)** while same on the **festival day** ranged between 76 and 86 Leq.dB(A). The maximum noise level value 86 Leq.dB(A) was reported at **Okhla**(C) on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Delhi

S.No	Locations	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	East Arjun Nagar	-	-	-	38	62	166	NM	NM	NM	36	41	593
2	Pragati Maidan	05	85	129	14	78	166	08	82	442	22	57	531
3	Pitampura	04	45	115	21	72	161	10	67	756	19	27	460
4	Janakpuri	04	42	152	12	45	119	32	53	648	18	25	554
	Min	***04***	***42***	***115***	***12***	***45***	***119***	***08***	***53***	***442***	***18***	***25***	***460***
	Max	***05***	***85***	***152***	***38***	***78***	***166***	***32***	***82***	***756***	***36***	***57***	***593***
	Average	***04***	***57***	***132***	***21***	***64***	***153***	***17***	***67***	***615***	***24***	***38***	***535***

Ambient Noise Level at different locations in Delhi Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

S. No.	Locations	Normal Day		Deepawali Day	
		2014	2015	2014	2015
1	Lajpat Nagar (R)	NM	61	NM	76
2	Mayur Vihar Ph-II (R)	69	60	83	79
3	Pitam pura (R)	73	55	71	74
4	Kamla Nagar (R)	59	61	80	86
5	Janak puri (R)	63	58	78	79
6	Okhla (C)	NM	66	NM	86
	Min.	***59***	***55***	***71***	***76***
	Max.	***73***	***66***	***83***	***86***
	Average	***68***	***60***	***78***	***81***

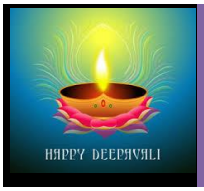
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 6 : Ambient Air Quality & Noise Level monitoring locations in DD & DNH

*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

The second smallest union territory in India, Daman and Diu, is located near Gujarat in India. Daman lies on the Gujarat coast while Diu is an islet in the southern fringe of Kathiawar peninsula. It is bounded on its north and south by Bhagwan and the Kalem Rivers respectively, on its east by the Gujarat state and on its west by the Arabian Sea. Daman and Diu is a coastal union territory in India, once a part of the Portuguese empire neighboring Goa. Area: 102 km², Population: 242,911 (2011).

In this state the monitoring was carried out by Pollution Control Committee DD& DNH Daman.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this UT, ambient air quality monitoring carried out in Nani Daman and Silvassa city.

The **normal day,** PM_{10} ranged between 85 and 109 µg/m^3, **festival day** ranged between 126 and 138 µg/m^3. The maximum PM_{10} value of 138 µg/m^3 was reported at **Silvassa** on the festival day.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in DD & DNH

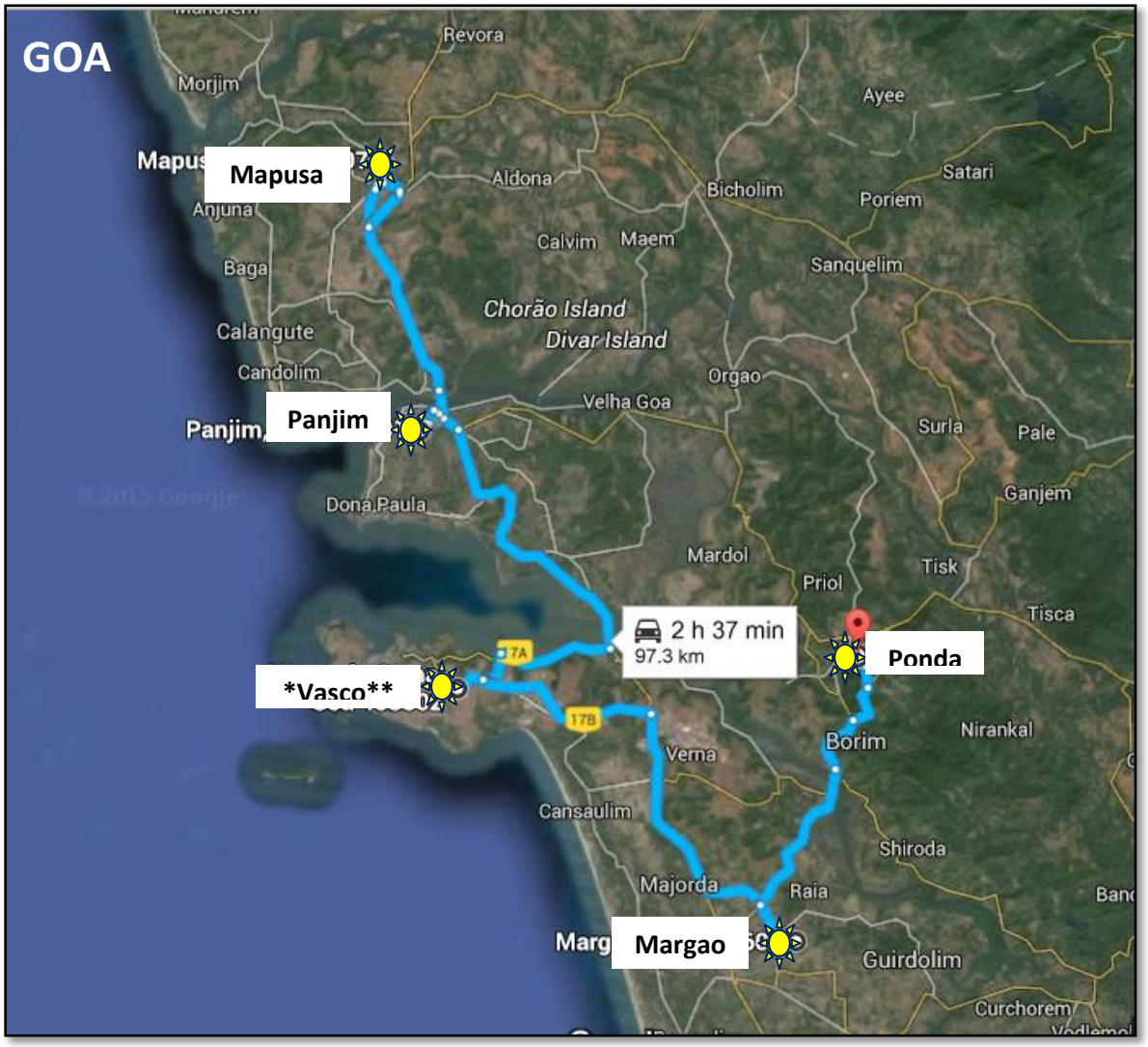
S.No	Locations	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Nani Daman Taxi Stand	-	-	-	29	23	109	30	24	133	33	29	138
2	Silvassa Kilvani Chokdi Gram Panchayat	-	-	-	25	20	85	34	25	146	28	25	126

Ambient Noise Level at different locations in DD & DNH Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

S.No	City	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	DD & DNH	Nani Daman Taxi Stand (C)	-	67	74	76
2		Silvassa Kilvani Chokdi Gram Panchayat (S)	-	59	76	74

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

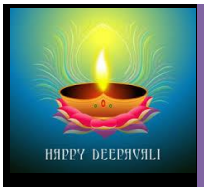
Fig 7: Ambient Air Quality & Noise Level monitoring locations in Goa



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Goa is a state in western India with coastlines stretching along the Arabian Sea. Its long history as a Portuguese colony prior to 1961 is evident in its preserved 16th-century churches and the area's tropical spice plantations. Goa is also known for its beaches, ranging from popular stretches at Baga and Palolem to laid-back fishing villages such as Agonda. Area: 3,702 km², Founded: May 29, 1987,Population: 1.817 million (2012), Capitals: Panaji (Executive Branch).

In this state the monitoring was carried out by Goa State Pollution Control Board, Panaji.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations- In this state, ambient air quality monitoring carried out at five cities and noise monitoring carried out at four cities.

The **normal day,** PM_{10} level ranged between 30 and 287 µg/m^3, while same on the **festival day** ranged between 55 and 239 µg/m^3. The maximum PM_{10} value 239 µg/m^3 was reported at **Vasco** on the festival day. The **normal day** noise level ranged between 61 and 67 Leq.dB(A), while same on the **festival day** ranged between 63 and 71 Leq.dB(A). The maximum noise level value 71 Leq.dB(A) was reported at **Vasco** (C) on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Goa.

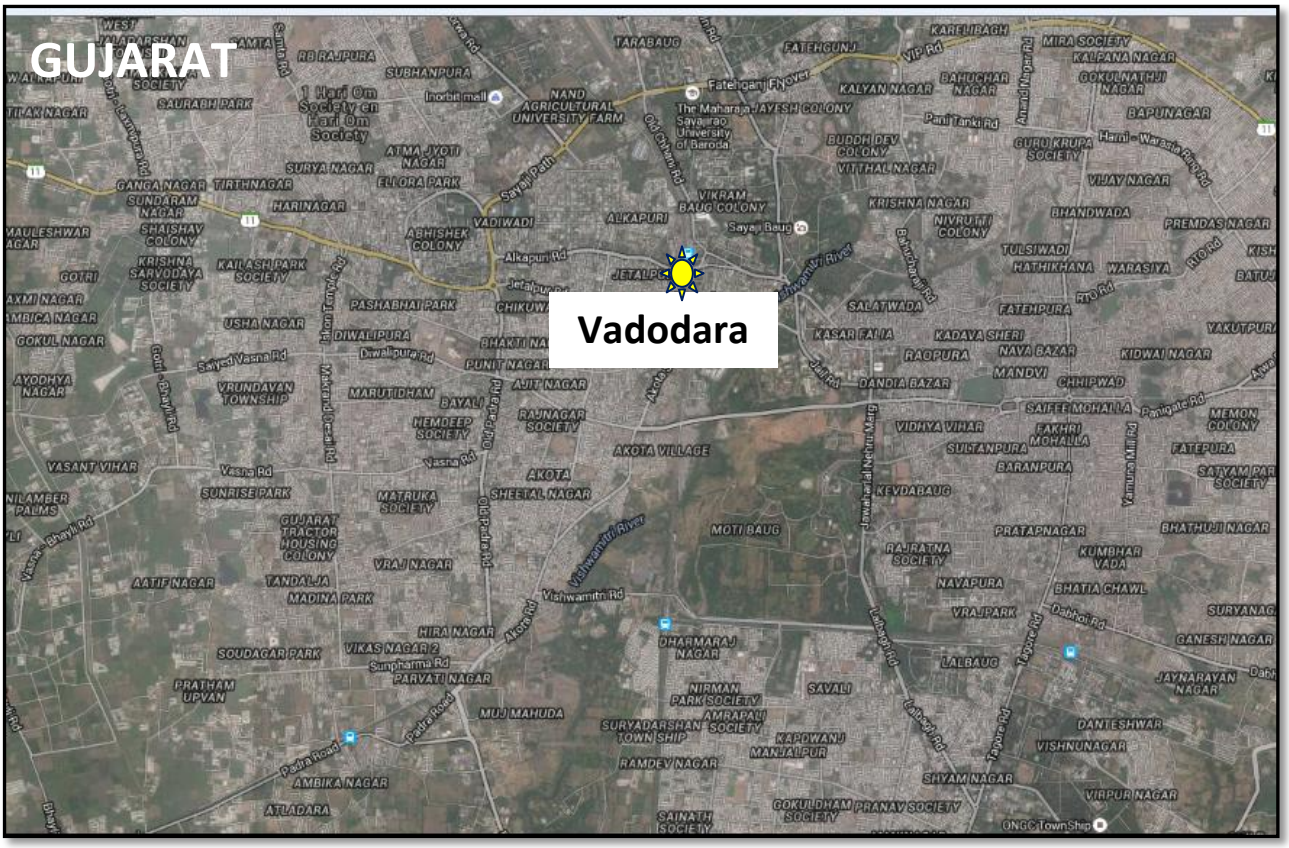
S.No	Cities	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Mapusa	-	-	-	09	BDL	35	-	-	-	12	09	87
2	Panjim	-	-	-	BDL	18	38	-	-	-	BDL	24	55
3	Vasco	-	-	-	05	12	287	-	-	-	BDL	40	239
4	Margao	-	-	-	04	09	61	-	-	-	04	09	63
5	Ponda	-	-	-	BDL	09	30	-	-	-	04	09	57
	Min.	***-***	***-***	***-***	***BDL***	***BDL***	***30***	-	-	-	***BDL***	***09***	***55***
	Max.	***-***	***-***	***-***	***09***	***18***	***287***	-	-	-	***12***	***40***	***239***
	Average	***-***	***-***	***-***	***07***	***11***	***90***	-	-	-	***05***	***18***	***100***

Ambient Noise Level at different locations in Goa Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

S.No	Cities	Zones	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	Mapusa	Silence	-	62	-	NA
2	Panajim	Commercial	-	61	-	63
3	Vasco	Commercial	-	64	-	71
4	Margao	Commercial	-	67	-	63
		Min.	***-***	***61***	***-***	***63***
		Max.	***-***	***67***	***-***	***71***
		Average	***-***	***64***	***-***	***66***

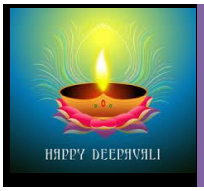
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 8 : Ambient Air Quality & Noise Level monitoring locations in Gujarat



The capital of Gujarat is Gandhinagar with Ahmedabad as the largest city. The population of Gujarat State is 50,671,017 (2001 census). Gujarat covers an area of 1, 96,024 sq km and shares its border with states of Rajasthan, Madhya Pradesh and Maharashtra. The state has a literacy rate of 79.8 percent. Gujarat is the 7th largest state in India in terms of area. The 196,024 sq kms of area in the state is divided into 26 districts at present. The state of Gujarat had 17 districts when it was formed in the year 1960. All the northern districts of the Bombay, which was a state in its own till then, were a part of Gujarat after 1960.

In this state the monitoring was carried out by Central Pollution Control Board, West Zone office Vadodara.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Obserations- In this State, ambient air quality monitoring and noise monitoring carried out in Vadodara.

The **normal day,** PM_{10} was reported 244 µg/m^3, while same on the **festival day** 282 µg/m^3. The maximum PM_{10} value 282 µg/m^3 was reported at **Vadodara** on the festival day. The **normal day** noise level ranged between 57 and 77 Leq.dB(A), while same on the **festival day** ranged between 64 and 80 Leq.dB(A). The maximum noise level value 80 Leq.dB(A) was reported at **Harinagar (C)** in **Vadodara** on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Vadodara

S.No	City	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	**Vadodara**	BDL	31	120	BDL	47	244	12	35	276	21	31	282

Ambient Noise Level at different locations in Vadodara Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

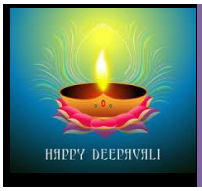
S.No	City	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Vadodara**	Fatehgunj Circle (C)	78	77	77	77
2		M S University (R)	59	57	74	64
3		Harinagar (C)	59	74	73	80
		Min.	***59***	***57***	***73***	***64***
		Max.	***78***	***77***	***77***	***80***
		Average	***65***	***69***	***75***	***74***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 9 : Ambient Air Quality & Noise Level monitoring locations in Haryana

*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Haryana is a North Indian state surrounding New Delhi on 3 sides. The Yamuna River runs along its eastern border with Uttar Pradesh. Shared with Punjab, the state capital Chandigarh is known for its modernist buildings and gridlike street plan designed by Le Corbusier. Its Zakir Hussain Rose Garden features 1,600 species, while its Rock Garden showcases sculptures made with recycled materials. Area: 44,212 km² Capital: Chandigarh Population: 25.35 million (2011).In this state the monitoring was carried out by Haryan State Pollution Control Board, Panchkula.



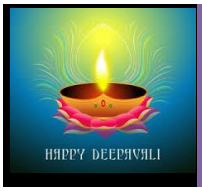
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in ten cities and noise monitoring carried out in eleven cities at twenty nine locations.

The **normal day,** PM_{10} level ranged between 49 and 849 µg/m^3, while same on the **festival day** ranged between 98 and 930 µg/m^3. The maximum PM_{10} value 930 µg/m^3 was reported at **Ballabhgarh** on the festival day. The **normal day** noise level ranged between 44 and 70 Leq.dB(A), while same on the **festival day** ranged between 56 and 83 Leq.dB(A). The maximum noise level value 83 Leq.dB(A) was reported at **Sec-14 & Indira Nagar (C)** in **Faridabad** on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Haryana in Leq dB (A)													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Panchkula	-	-	-	12	25	89	-	-	-	15	25	145
2	Yamuna Nagar	-	-	-	10	17	132	-	-	-	17	26	166
3	Panipat	-	-	-	10	15	92	-	-	-	12	25	108
4	Sonipat	-	-	-	09	15	142	-	-	-	NA	NA	156
5	Faridabad	-	-	-	BDL	29	84	-	-	-	BDL	21	98
6	Ballabhgarh	-	-	-	10	26	849	-	-	-	19	29	930
7	Gurgaon	-	-	-	09	25	180	-	-	-	13	33	294
8	Dharuhera	-	-	-	12	27	121	-	-	-	13	34	142
9	Bahadurgarh	-	-	-	13	16	276	-	-	-	27	15	200
10	Hisar	-	-	-	09	11	49	-	-	-	38	20	122
	Min	-	-	-	***09***	***11***	***49***	**-**	**-**	**-**	***12***	***15***	***98***
	Max	-	-	-	***13***	***29***	***849***	**-**	**-**	**-**	***38***	***34***	***930***
	Avg.	-	-	-	***10***	***21***	***201***	**-**	**-**	**-**	***19***	***25***	***236***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

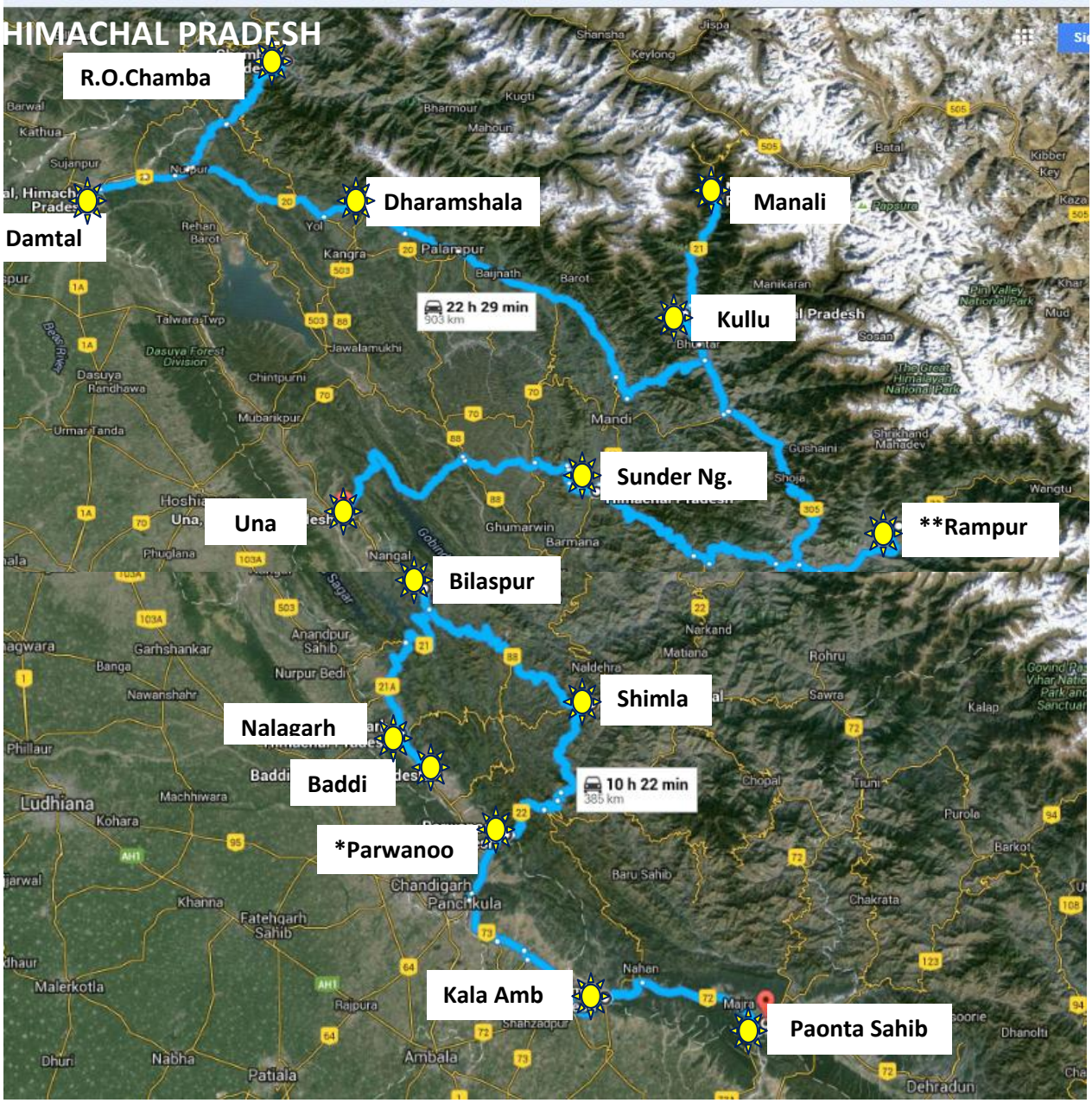


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Haryana during Normal & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No.	Cities	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Panchkula**	Raffles hospital Sec-14	-	64	-	70
2		Sect-11	-	65	-	81
3	**Yamuna Nagar**	Fountain Chowk	-	53	-	63
4		Nehru Chowk	-	54	-	63
5		Bus stop, Jagdhari	-	49	-	58
6	**Panipat**	NFL, Colony	-	52	-	71
7	**Sonipat**	Sec-14	-	46	-	62
8		Geeta Bhawan	-	44	-	62
9		Model Town	-	44	-	62
10	**Faridabad**	Sec-16A	-	67	-	84
11		Sec-15	-	68	-	85
12		Indira Complax	-	66	-	85
13	**Ballabhgarh**	Sec-8,	-	52	-	79
14		Chawla Colony	-	48	-	66
15	**Gurgaon**	Jai Shree Chemical Patoudhi	-	51	-	66
16		Manesar	-	57	-	67
17		North Mehroli	-	56	-	61
18		Bus Stand	-	54	-	59
19		Sec-4	-	52	-	56
20	**Dharuhera**	Industrial area	-	70	-	79
21		Chungi Rewadi	-	69	-	75
22	**Bahadurgarh**	Sec-16	-	70	-	76
23		Sect-9	-	59	-	74
24		Purani Sabji Mandi	-	61	-	76
25	**Hisar**	Urban estate	-	57	-	76
26		Sec-13	-	58	-	77
27	**Jind**	General Hospitl	-	58	-	69
28		SCO-21, Huda City Center	-	53	-	74
29		Urban Estate	-	60	-	80
		Min.	-	***44***	-	***56***
		Max.	-	***70***	-	***85***
		Average	-	***57***	-	***71***

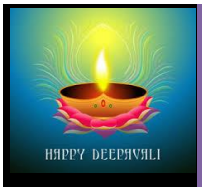
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	$\mu g/m^3$	
*Industrial area **(I)***	*75*	*70*	SO_2	*80*
*Commercial area **(C)***	*65*	*55*	NO_2	*80*
*Residential area **(R)***	*55*	*45*	PM_{10}	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 10 : Ambient Air Quality & Noise Level monitoring locations in Himachal Pradesh



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Himachal Pradesh is bordered by Jammu and Kashmir on the north, Punjab on the west, Uttar Pradesh on the south and Uttaranchal on the east. The word "Himachal" means the abode of snow. Shimla is the capital of Himachal Pradesh and the total area of the state is 55,673 square km. The state is covered with immense natural beauty and is, undoubtedly, one of the most popular tourist destinations in the world. A majority of the area is mountainous with lofty ranges, deep valleys, swaying waterfalls and lush greenery. In this report the monitoring was carried out by Himachal State Pollution Control Board, New Shimla.



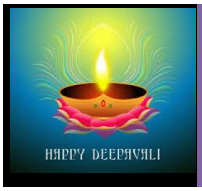
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in eleven cities and noise monitoring carried out in ten cities at thirteen locations.

The **normal day,** PM_{10} level ranged between 12 and 174 µg/m^3, while same on the **festival day** ranged between 41 and 209 µg/m^3. The maximum PM_{10} value 209 µg/m^3 was reported at **Parvanoo** on the festival day. The **normal day** noise level ranged between 44 and 74 Leq.dB(A), while same on the **festival day** ranged between 56and 83 Leq.dB(A). The maximum noise level value 83 Leq.dB(A) was reported at **Recongpeo, Bhushar (C)** in **Rampur** on the festival day. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day Deepawali Day 2014 & 2015 in Himachal Pradesh													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Damtal	-	-	-	BDL	12	80	-	-	-	BDL	16	208
2	Dharmshala	BDL	BDL	19	BDL	08	41	16	23	45	BDL	08	41
3	Manali	BDL	13	36	BDL	05	12	06	26	75	BDL	08	60
4	Sunder Nagar	BDL	11	45	BDL	12	174	BDL	19	102	BDL	16	89
5	Una	-	-	86	-	-	81	-	-	98	-	-	96
6	Shimla	BDL	12	58	BDL	10	36	BDL	16	94	BDL	09	41
7	Nalagarh	-	-	-	-	-	89	-	-	-	-	-	106
8	Baddi	-	-	93	-	-	86	-	-	75	-	-	-
9	Parwanoo	BDL	14	23	BDL	09	41	BDL	20	134	BDL	39	209
10	Kala Amb	BDL	12	78	BDL	13	68	06	20	108	BDL	18	103
11	Paonta Sahib	BDL	12	138	BDL	13	58	08	28	162	05	17	117
	Min	***BDL***	***11***	***19***	***BDL***	***05***	***12***	***06***	***16***	***45***	***05***	***08***	***41***
	Max	***BDL***	***14***	***138***	***BDL***	***13***	***174***	***16***	***28***	***162***	***05***	***39***	***209***
	Average	***BDL***	***12***	***64***	***BDL***	***10***	***70***	***09***	***22***	***99***	***05***	***16***	***107***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

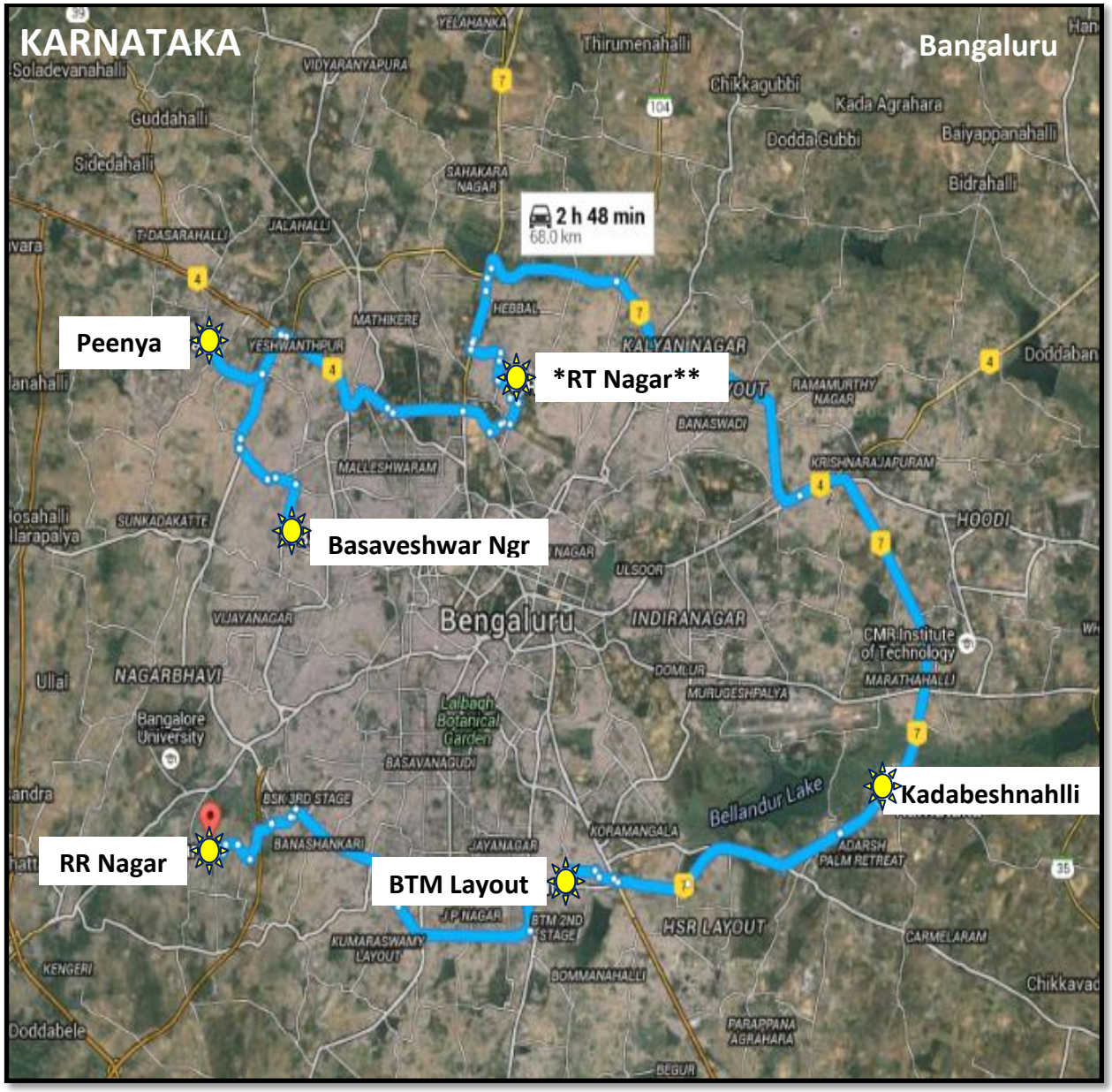


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Himachal Pradesh during Normal & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Chamba**	RO Chamba (R)	55	44	55	56
2	**Dharmshala**	Dharmshala on the top roof of building (C/R)	-	51	-	68
3	**Kullu**	Himuda complex beasa moar(C)	54	46	66	59
4	**Una**	Rotary Chowk(R)	64	56	64	63
5		Rakkar Colony(R)	-	51	-	58
6		Govt. Hospital (S)	-	55	-	61
7	**Rampur**	Recongpeo, (C)	44	74	63	83
8		Bhushar (C)	51	74	64	83
9	**Bilaspur**	Bilaspur (C/R)	48	51	72	76
10	**Shimla**	Rigde (C)	49	46	67	60
11	**Baddi**	DIC (R)	64	57	70	71
12	**Parwanoo**	Sector IV (R)	61	50	69	66
13	**Paonta Sahib**	Paonta Sahib (R)	48	47	58	58
		Min.	***44***	***44***	***55***	***56***
		Max.	***64***	***74***	***72***	***83***
		Average	***41***	***54***	***65***	***66***

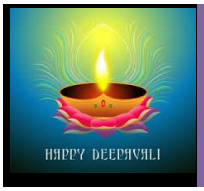
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 11 : Ambient Air Quality & Noise Level monitoring locations in Karnataka



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Karnataka is one of the well-known states in South West India. Originally, it was known as State of Mysore but was renamed Karnataka in the year 1973. Karnataka is the 9th largest state in India by population. The area of the state is 191,976 square km. It is the 8th largest state in India by area. According to the 2011 census, the population of the state is 61, 130,704. Bangaluru is the largest city, and also the capital of this state.
In this report the monitoring was carried out by Central Pollution Control Board, Bangaluru.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in Bangaluru six locations and noise monitoring carried out in Bangaluru city at three locations.

The **normal day,** PM_{10} level ranged between 48 and 88 µg/m^3, while same on the **festival day** ranged between 62 and 116 µg/m^3. The maximum PM_{10} value 116 µg/m^3 was reported at **RT Nagar** on the festival day. The **normal day** noise level ranged between 52 and 68 Leq.dB(A), while same on the **festival day** ranged between 69 and 92 Leq.dB(A). The maximum noise level value 92 Leq.dB(A) was reported at **RT Nagar(R)** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Bangaluru

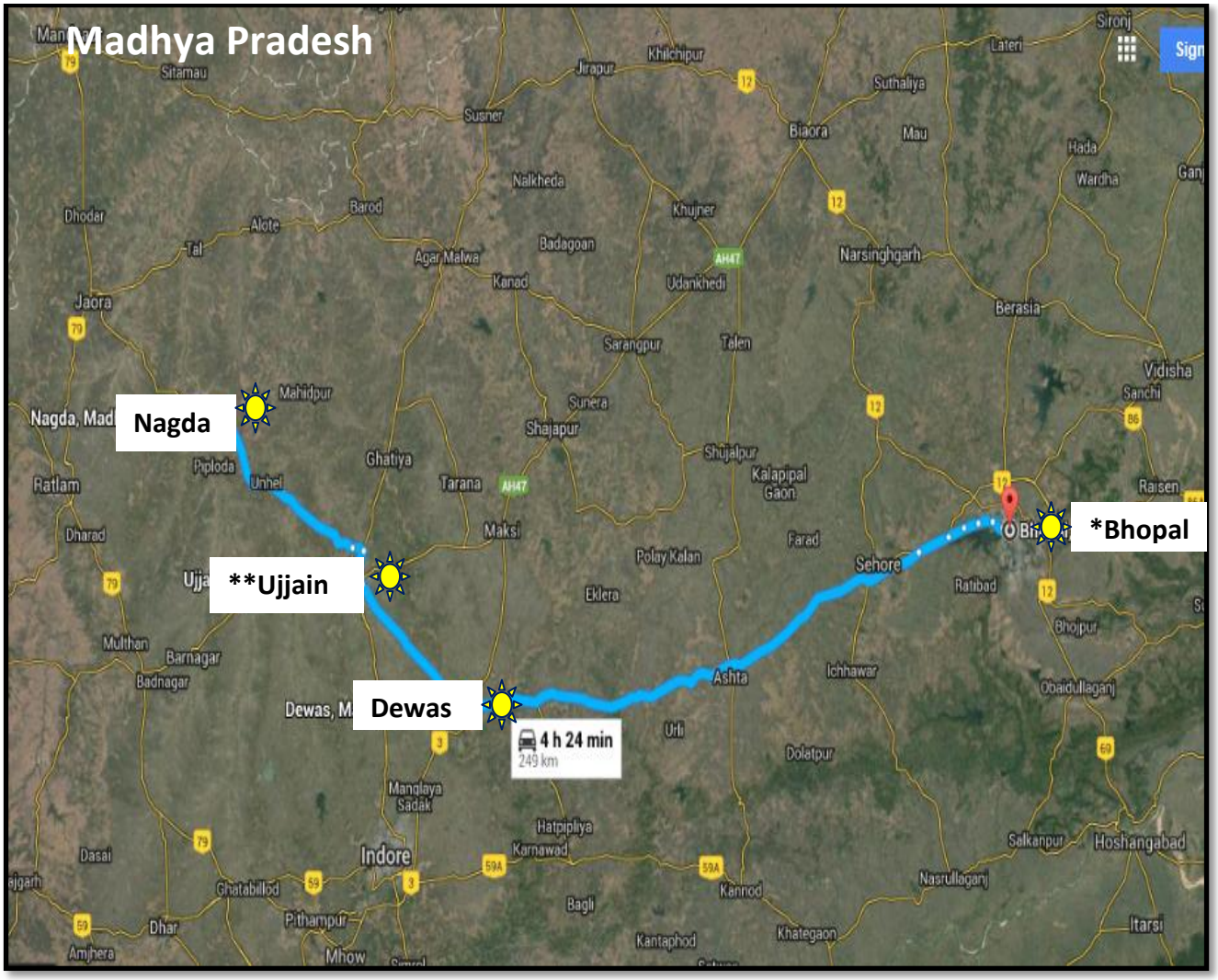
S.No	Locations	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Basaveshwar Nagar	-	-	-	BDL	16	61	-	-	-	BDL	30	86
2	Peenya	-	-	-	BDL	14	-	-	-	-	BDL	BDL	-
3	RT Nagar	BDL	11	48	BDL	24	88	BDL	23	103	BDL	25	116
4	Kadabeshnahlli	-	-	-	BDL	34	-	-	-	-	BDL	15	-
5	BTM Layout	-	-	-	BDL	25	-	-	-	-	04	BDL	-
6	Rajarajeshwari	BDL	BDL	48	BDL	15	48	BDL	-	-	BDL	19	62
	Min	***BDL***	***BDL***	***-***	***BDL***	***14***	***48***	***BDL***	***23***	***103***	***BDL***	***15***	***62***
	Max	***BDL***	***11***	***48***	***BDL***	***34***	***88***	***BDL***	***23***	***103***	***BDL***	***30***	***116***
	Average	***BDL***	***08***	***48***	***BDL***	***21***	***66***	***BDL***	***23***	***103***	***BDL***	***22***	***88***

Ambient Noise Level at different locations in Bangaluru during Normal & Deepawali Day 2014 & 2015 in Leq dB (A)

S.No.	City	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Bangaluru**	Basaveshwar Nagar (R)	-	65	-	82
2		R.T. Nagar (R)	56	68	73	92
3		Rajarajeswari Nagar (R)	50	52	69	69
		Min.	***50***	***52***	***69***	***69***
		Max.	***56***	***68***	***73***	***92***
		Average	***54***	***62***	***71***	***81***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

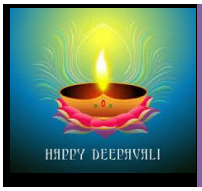
Fig 12 : Ambient Air Quality & Noise Level monitoring locations in Madhya Pradesh



*Indicates location of Maximum PM10 concentration this year ** Indicates location of Maximum Noise Level this year

Madhya Pradesh is situated in the heart of India. Also known as 'MP', the state spreads across an area of 3,08,244 sq. km, making it the second largest state in India. Bhopal serves as the capital of Madhya Pradesh. Indore happens to be the largest city, while Jabalpur is the most important commercial center of the state. Madhya Pradesh is the sixth largest state in India by population.

In this State, the monitoring was carried out by Madhya Pradesh State Pollution Control Board.



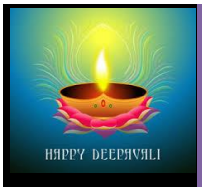
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in four cities and noise monitoring carried out in four cities at 09 locations.

The **normal day,** PM_{10} level ranged between 54 and 108 µg/m^3, while same on the **festival day** ranged between 90 and 349 µg/m^3. The maximum PM_{10} value 349 µg/m^3 was reported at Bhopal on the festival day. The **normal day** noise level ranged between 43 and 73 Leq.dB(A), while same on the **festival day** ranged between 47 and 95 Leq.dB(A). The maximum noise level value of 95 Leq.dB(A) was reported at Vikas Nagar (R)**, Dewas** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Madhya Pradesh													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Nagda	13	22	71	11	18	54	19	44	93	17	32	90
2	Ujjain	14	15	117	12	13	108	17	18	179	15	16	148
3	Dewas	14	19	86	16	22	90	23	26	152	31	35	206
4	Bhopal	04	21	94	BDL	17	100	09	31	298	18	45	349
	Min	***04***	***15***	***71***	***11***	***13***	***54***	***17***	***18***	***93***	***15***	***16***	***90***
	Max	***14***	***22***	***117***	***16***	***22***	***108***	***23***	***44***	***298***	***31***	***45***	***349***
	Average	***11***	***19***	***92***	***13***	***18***	***88***	***17***	***30***	***181***	***20***	***32***	***198***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

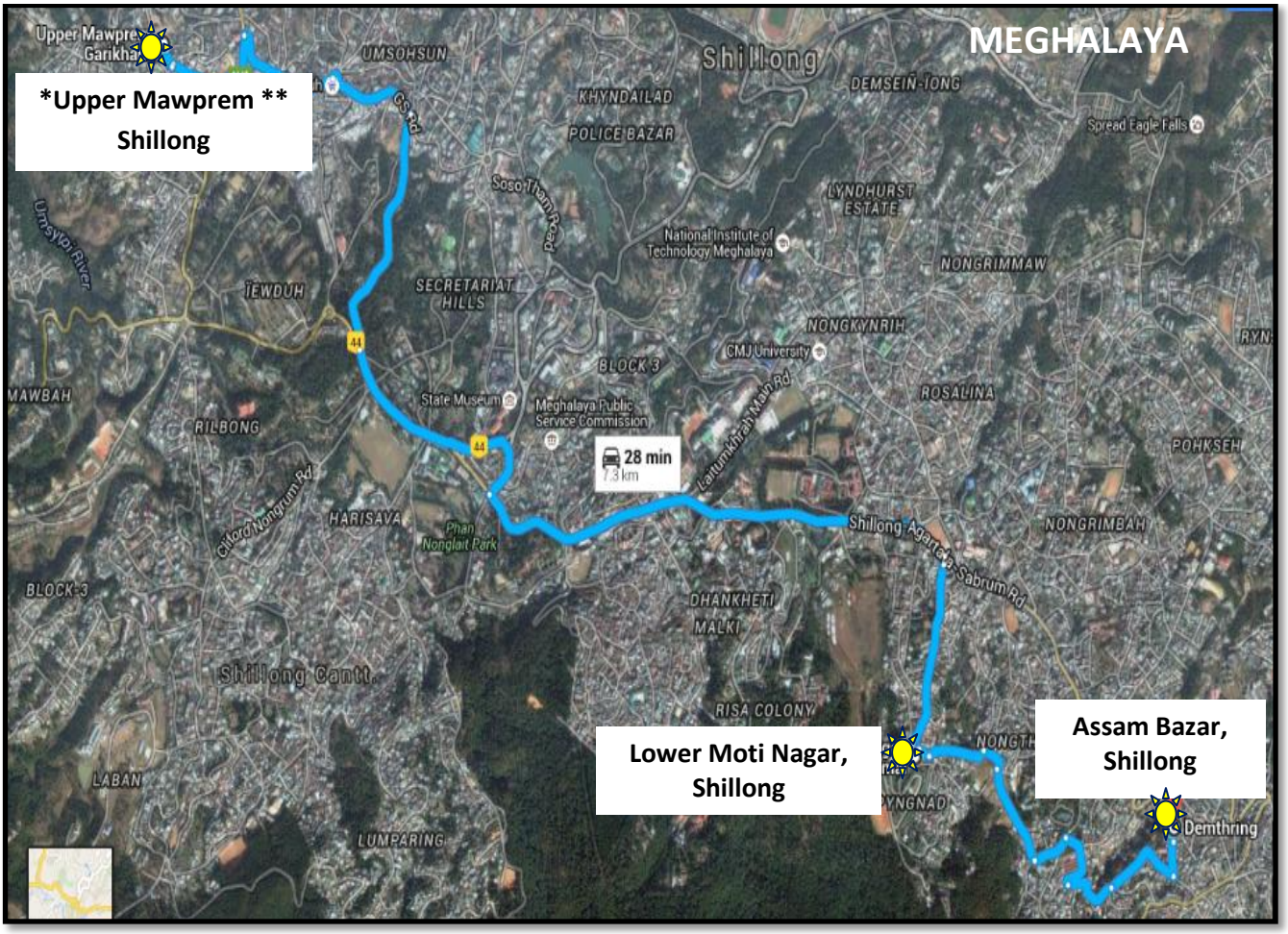


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Madhya Pradesh Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Nagda**	Janseva Hospital, Birla gram (S)	42	43	44	47
2		Grassim Staff Colony (R)	49	52	69	78
3		Maharastra Mandal Bhawan Transport (R)	-	60	-	77
4	**Ujjain**	Kshipra Vihar Colony	68	73	-	90
5	**Dewas**	744, MIG Vikas Nagar (R)	64	64	92	95
6		Gejra Gears (P) Ltd. (C)	73	67	90	92
7	**Bhopal**	Nehru Nagar (R)	-	65	-	75
8		T.T. Nagar (C)	68	67	81	84
9		Sahjanabad (R)	-	62	-	67
		Min.	***42***	***43***	***44***	***45***
		Max.	***73***	***73***	***92***	***95***
		Average	***61***	***61***	***75***	***78***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m³*	
*Industrial area **(I)***	*75*	*70*	SO_2	*80*
*Commercial area **(C)***	*65*	*55*	NO_2	*80*
*Residential area **(R)***	*55*	*45*	PM_{10}	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

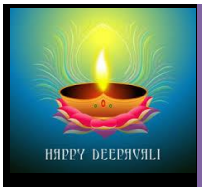
Fig 13 : Ambient Air Quality & Noise Level monitoring locations in Meghalaya



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

The total area of Meghalaya is approximately 22,429 square kilometres. The total population you can associate with the state is 29,64,889 (2011). It is true that the most important aspect that you can relate to the state is its rivers. The major rivers you can find in the Garo hills are Kalu, Ringgi, Daring, Sanda and Simsang. Shillong is the capital of Meghalaya.

In this report the monitoring was carried out by Central Pollution Control Board, Shillong.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in three locations and noise monitoring carried out in two locations.

The **normal day,** PM_{10} level ranged between 91 and 109 µg/m^3, while same on the **festival day** ranged between 102 and 203 µg/m^3. The maximum PM_{10} value 203 µg/m^3 was reported at **Upper Mawprem** the festival day. The **normal day** noise level ranged between 50 and 58 Leq.dB(A), while same on the **festival day** ranged between 49 and 88 Leq.dB(A). The maximum noise level value of 88 Leq.dB(A) was reported at **Upper Mawprem** (C) on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Shillong

S.No	Locations	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Upper Mawprem	BDL	BDL	63	BDL	BDL	91	BDL	BDL	135	BDL	BDL	203
2	Lower Motinagar	BDL	BDL	38	BDL	BDL	92	BDL	BDL	95	BDL	BDL	102
3	Assam Bazar	BDL	BDL	68	BDL	BDL	109	BDL	BDL	132	BDL	BDL	172
	Min	***BDL***	***BDL***	***38***	***BDL***	***BDL***	***91***	***BDL***	***BDL***	***95***	***BDL***	***BDL***	***102***
	Max	***BDL***	***BDL***	***68***	***BDL***	***BDL***	***109***	***BDL***	***BDL***	***135***	***BDL***	***BDL***	***203***
	Average	***BDL***	***BDL***	***56***	***BDL***	***BDL***	***97***	***BDL***	***BDL***	***121***	***BDL***	***BDL***	***159***

Ambient Noise Level at different locations in Shillong during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

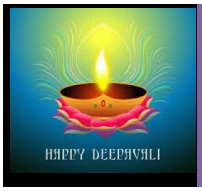
S.No	City	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Shillong**	Lower Motinagar	66	50	71	49
2		Upper Mawprem	55	58	86	88

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 14 : Ambient Air Quality & Noise Level monitoring locations in Nagaland

Nagaland is one of India's smallest states, with a total area of 16,579 sq km (6400 sq mi). The Naga Hills run through this small state, here is a wide variety of plant and animal life. Nagaland has a monsoon climate with generally high humidity; rainfall averages between 1800 to 2500 mm (70 to 100 inches) a year. And the population is 1,978,502.

In this report the monitoring was carried out by Nagaland Pollution Control Board, Dimapur.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in Dimapur and noise monitoring carried out in Dimapur in three Locations.

The **normal day,** PM_{10} level 79 µg/m^3, while same on the **festival day** it was 250 µg/m^3. The maximum PM_{10} value 250 µg/m^3 was reported at **Dimapur** the festival day. The **normal day** noise level ranged between 51 and 62 Leq.dB(A), while same on the **festival day** ranged between 63 and 78 Leq.dB(A). The maximum noise level value 78 Leq.dB(A) was reported at *City Tower (R)*, on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Nagaland													
S. No	**City**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	**Dimapur**	-	-	-	BDL	14	79	-	-	-	BDL	15	250

Ambient Noise Level at different locations in Nagaland during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No	**City**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Dimapur**	Bank Colony (R)	-	54	-	71
2		City Tower (R)	-	62	-	78
3		District Hospital (S)	-	51	-	63
		Min.	-	**51**	-	**63**
		Max.	-	**62**	-	**78**
		Average	-	**57**	-	**71**

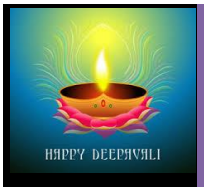
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 15 : Ambient Air Quality & Noise Level monitoring locations in Odisha

** Indicates location of Maximum Noise Level this year

Odisha (formerly Orissa), an eastern Indian state on the Bay of Bengal, is known for its tribal cultures and its many ancient Hindu temples. The capital, Bhubaneswar, is home to hundreds of temples, notably the Nagara-style Mukteswar. Total area of the state : 155,820 km², Capital: Bhubaneswar, Population: 43.73 million (census 2014)

In this report the monitoring was carried out by State Pollution Control Board Odisha, Bhubaneswar.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, only noise monitoring carried out in twelve cities at forty five locations.

The **normal day,** The **normal day** noise level ranged between 43 and 82 Leq.dB(A), while same on the **festival day** ranged between 58 and 100 Leq.dB(A). The maximum noise level value 100 Leq.dB(A) was reported at Ainthapalli (R), **Sambalpur** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Noise Level at different locations in Odisha during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

S.No.	Cities	Locations	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Angul**	Amalpada (R)	-	*53*	-	*60*
2		Bazar Chhak (C)	-	67	-	71
3		District HQ (S)	-	57	-	62
4		Hakimpada (I)	-	49	-	67
5	**Balasore**	Sahadevkhunta (R)	-	58	-	65
6		Motiganj (C)	-	68	-	82
7		District HQ (I)	-	53	-	59
8		Balasore Industrial Estate (I)	-	63	-	68
9	**Behrampur**	Brahmanagar (R)	-	56	-	64
10		Girija Market Square (C)	-	79	-	80
11		MKCG Medical College Hospital Campus (S)	-	57	-	61
12		Ankuli (I)	-	63	-	79
13	**Bhubaneswar**	Lingaraj (R)	-	64	-	79
14		Nayapalli (R)	-	63	-	72
15		Sahid Nagar (C)	-	68	-	73
16		Capital Hospital (S)	-	56	-	60
17		Rasulgarh (I)	-	71	-	73
18	**Cuttack**	Suryavihar Link (R)	-	67	-	64
19		Badambadi (C)	-	72	-	75
20		SCB Medical College & Hospital (S)	-	61	-	68
21		Khapuria (I)	-	65	-	66
22	**Jharsuguda**	Near Puuna Basti (R)	-	64	-	84
23		Near jhanda Chowk (C)	-	68	-	82
24		District HQ Hospital (S)	-	52	-	58
25		Near Bombey Chowk (I)	-	75	-	77
26	**Kalinganagar**	Umapada (R)	-	53	-	60
27		Gopabandhu Chhak (C)	-	72	-	79
28		CHC Hospital (S)	-	52	-	60
29		Industrial Complex (I)	-	63	-	72

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	$\mu g/m^3$	
*Industrial area **(I)***	*75*	*70*	SO_2	*80*
*Commercial area **(C)***	*65*	*55*	NO_2	*80*
*Residential area **(R)***	*55*	*45*	PM_{10}	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

30	**Keonjhar**	Baniapat Chowk (R)	-	68	-	68
31		Punjabi Chowk (C)	-	69	-	72
32		Govt. Hospital (S)	-	61	-	61
33	**Paradeep**	Police Colony Jagatsing pur (R)	-	55	-	78
34		Building Jagatsinghpur Town (C)	-	73	-	90
35		District HQ hospital (S)	-	62	-	67
36	**Puri**	Kumutisahi, Old Sadar lane (R)	-	66	-	71
37		Gundicha Temple(C)	-	68	-	72
38		District HQ Hospital (S)	-	62	-	66
39	**Rourkela**	Sec- 4 (R)	-	63	-	64
40		Bisra Chowk (C)	-	82	-	83
41		IGH, Steel Township(S)	-	55	-	58
42		RSPL Sail (I)	-	81	-	82
43	**Sambalpur**	Ainthapalli (R)	-	68	-	100
44		Goal Bazar Chowk (C)	-	77	-	82
45		Dist HQ Hospital (S)	-	43	-	58
		Min.	-	***43***	-	***58***
		Max.	-	***82***	-	***100***
		Average	-	***64***	-	***71***

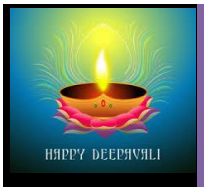
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 16 : Ambient Air Quality & Noise Level monitoring locations in Puducherry

*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

The total area of the union territory is 479 square kilometers and it comprises four small unconnected districts - Puducherry, Karaikal, Yanam and Mahe. Mahe lies in the Arabian Sea while the other three districts lie in the Bay of Bengal. The largest sections are Puducherry and Karaikal which are enclaves of Tamil Nadu. Mahe and Yanam are enclaves of Kerala and Andhra Pradesh respectively. Puducherry district comprise an area of 293 square kilometers, Karaikal 160 square kilometer, Yanam 30 square kilometers and Mahe 9 square kilometers. This place lies close to the sea, which is why the climate here is warm and humid. The summer season experiences a rise in temperature that rises up to 38 degrees. In the winter, the temperature is pleasant. And there population is 1,247,953.

In this report the monitoring was carried out by Puducherry State Pollution Control Committee, Puducherry.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations- In this UT, ambient air quality monitoring carried out in two locations and noise monitoring carried out in only one location.

The **normal day,** PM_{10} level ranged between 36 and 45 µg/m^3, while same on the **festival day** ranged between 72 and 100 µg/m^3. The maximum PM_{10} value 100 µg/m^3 was reported at **Karaikal** on the **festival day**. The **normal day** noise level was 67 and **festival day** was 78 Leq.dB(A) was reported at **Muthiapet (R)**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Puducherry

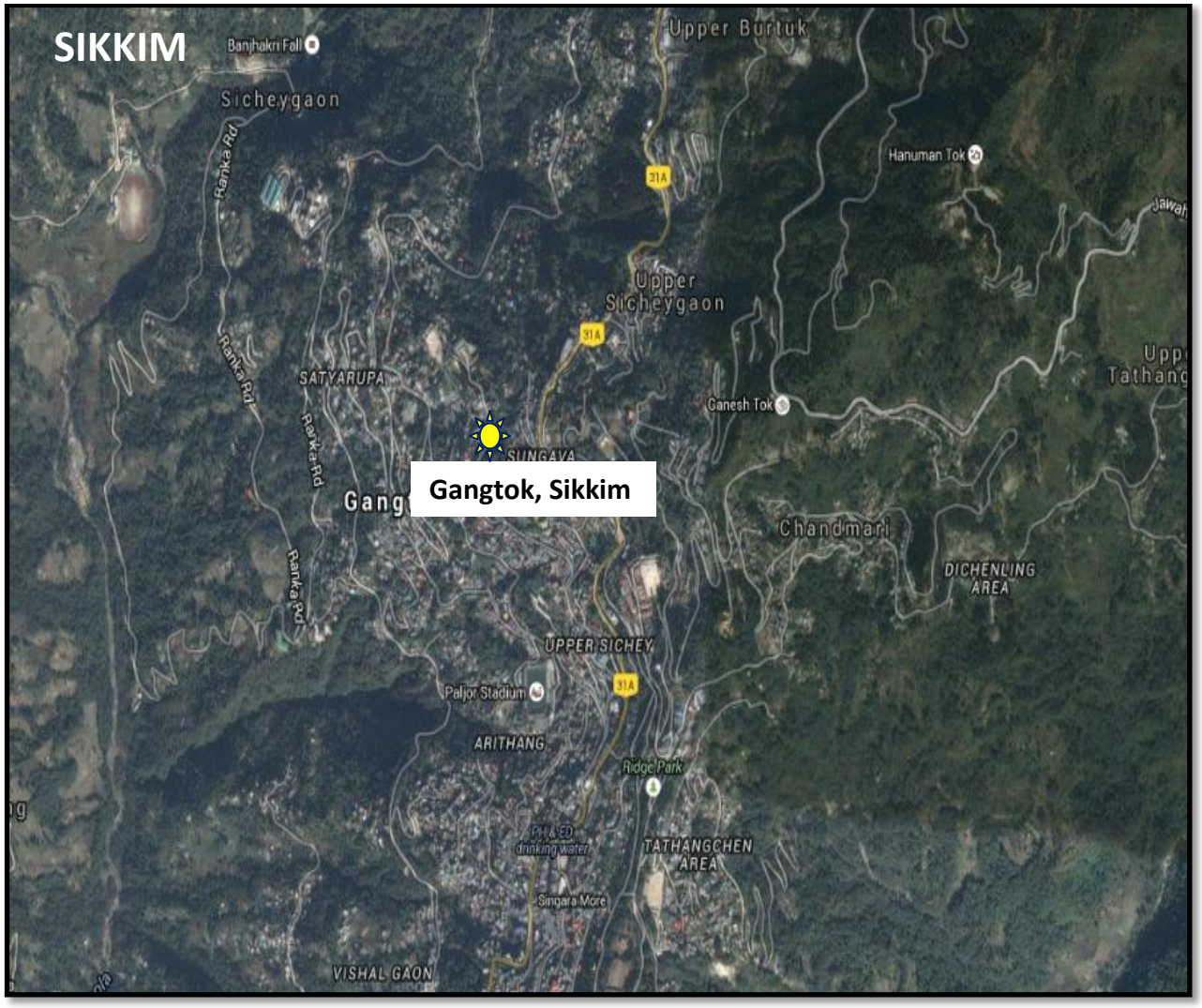
S.No	Cities	Normal Day						Deepawali Day					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Anna Nagar	07	BDL	21	11	08	45	18	12	116	08	10	72
2	Kovilpattu, karaikal	13	14	28	13	11	36	28	20	69	25	13	100

Ambient Noise Level at different locations in Puducherry during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)

S.No	City	Location	Normal Day		Deepawali Day	
			2014	2015	2014	2015
1	**Poducherry**	Muthiapet (R)	68	67	82	78

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 17 : Ambient Air Quality & Noise Level monitoring locations in Sikkim



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Sikkim is a Northeastern state of India and its capital is Gangtok. It is also the largest city in the state. Situated on the Shivalik hills, it is found at the height of about 5,500 feet on the southeast of the state Gangtok. The weather condition of the state is mainly divided into 5 seasons, Spring, Summer, Autumn, Monsoon, Winter.

In this report the monitoring was carried out by State Pollution Control Board, Deorali.

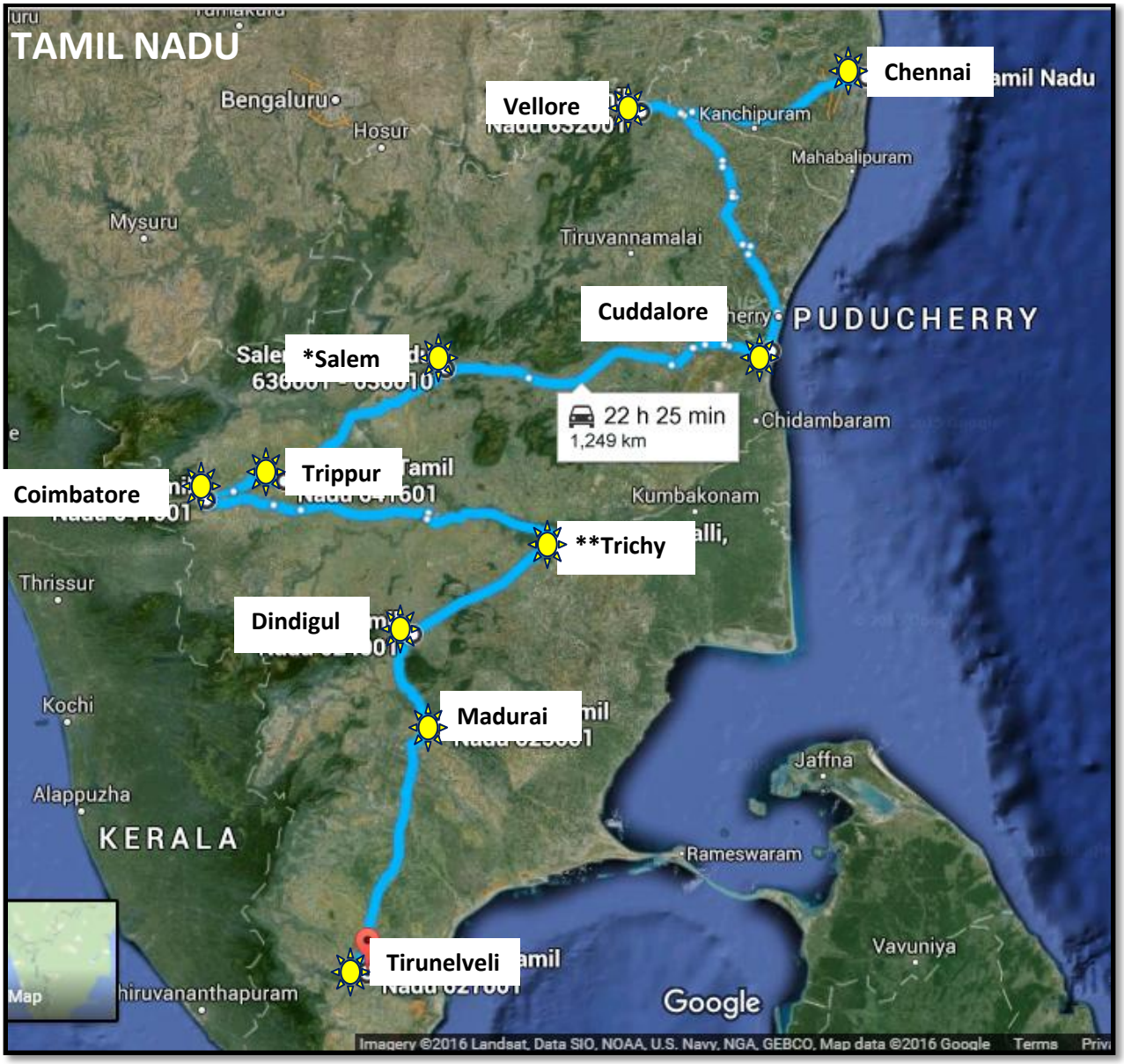
Observations - In this State, Noise monitoring carried out at three locations at Gangtok cities.

The **normal day** noise level ranged between 38 and 56 Leq.dB(A), while same on the **festival day** ranged between 36 and 59 Leq.dB(A). The maximum noise level value of 59 Leq.dB(A) was reported at ***Mahatama Gandhi Marg (C)*** in **Gangtok** on the **festival day.** A pictorial presentation of monitoring location is depicted in the map.

Ambient Noise Level at different locations in Sikkim during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No	**City**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Gangtok**	Gangtok (R)	-	45	-	48
2		Mahatama Gandhi Marg (C)	-	56	-	59
3		White Hall Complex (C)	-	38	-	36
		Min.	**-**	***38***	**-**	***36***
		Max.	**-**	***56***	**-**	***59***
		Average	**-**	***46***	**-**	***48***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	$\mu g/m^3$	
*Industrial area **(I)***	*75*	*70*	SO_2	*80*
*Commercial area **(C)***	*65*	*55*	NO_2	*80*
*Residential area **(R)***	*55*	*45*	PM_{10}	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

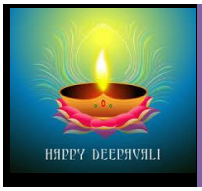
Fig 18 : Ambient Air Quality & Noise Level monitoring locations in Tamil Nadu



*Indicates location of Maximum PM10 concentration this year ** Indicates location of Maximum Noise Level this year

Tamil Nadu is the most urbanized state in India. The key industries of the state are heavy engineering and manufacturing-based companies and textiles. The average annual rainfalls in Tamil Nadu range between 25 and 75 inches (635 and 1,905 mm) a year. Tamil Nadu covers total land area of 130,058 km2 and is divided into 32 districts and the population is 72,147,030 (**Census 2011).**

In this report the monitoring was carried out by Tamil Nadu Pollution Control Board, Chennai.



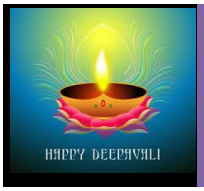
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in ten cities and noise monitoring carried out at 23 locations in ten cities.

The **normal day,** PM_{10} level ranged between 19 and 83 µg/m^3, while same on the **festival day** ranged between 80 and 155 µg/m^3. The maximum PM_{10} value 155 µg/m^3 was reported at **Salem** on the **festival day**. The **normal day** noise level ranged between 57 and 76 Leq.dB(A), while same on the **festival day** ranged between 65 and 90 Leq.dB(A). The maximum noise level value 90 Leq.dB(A) was reported at **Thillai Nagar (R)** in **Trichy** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Tamil Nadu													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Chennai	11	12	62	9	18	47	20	19	193	11	20	106
2	Vellore	10	20	57	9	15	56	14	25	117	12	19	80
3	Cuddalore	08	19	45	9	12	47	10	29	76	11	26	94
4	Salem	10	24	39	8	30	48	12	34	160	11	35	155
5	Trippur	13	27	53	12	25	83	16	36	134	21	28	153
6	Coimbatore	BDL	23	30	23	35	67	04	23	93	64	76	104
7	Trichy	15	19	70	11	15	58	22	25	107	18	22	96
8	Dindigul	11	14	45	8	11	79	14	22	86	11	15	108
9	Madurai	13	29	52	13	46	19	15	22	93	22	16	123
10	Tirunelveli	20	38	72	23	35	67	29	55	45	64	76	104
	Min	***08***	***12***	***30***	***08***	***11***	***19***	***04***	***19***	***45***	***11***	***15***	***80***
	Max	***20***	***38***	***72***	***23***	***46***	***83***	***29***	***55***	***193***	***64***	***76***	***155***
	Average	***12***	***23***	***53***	***13***	***24***	***57***	***16***	***29***	***110***	***25***	***33***	***112***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

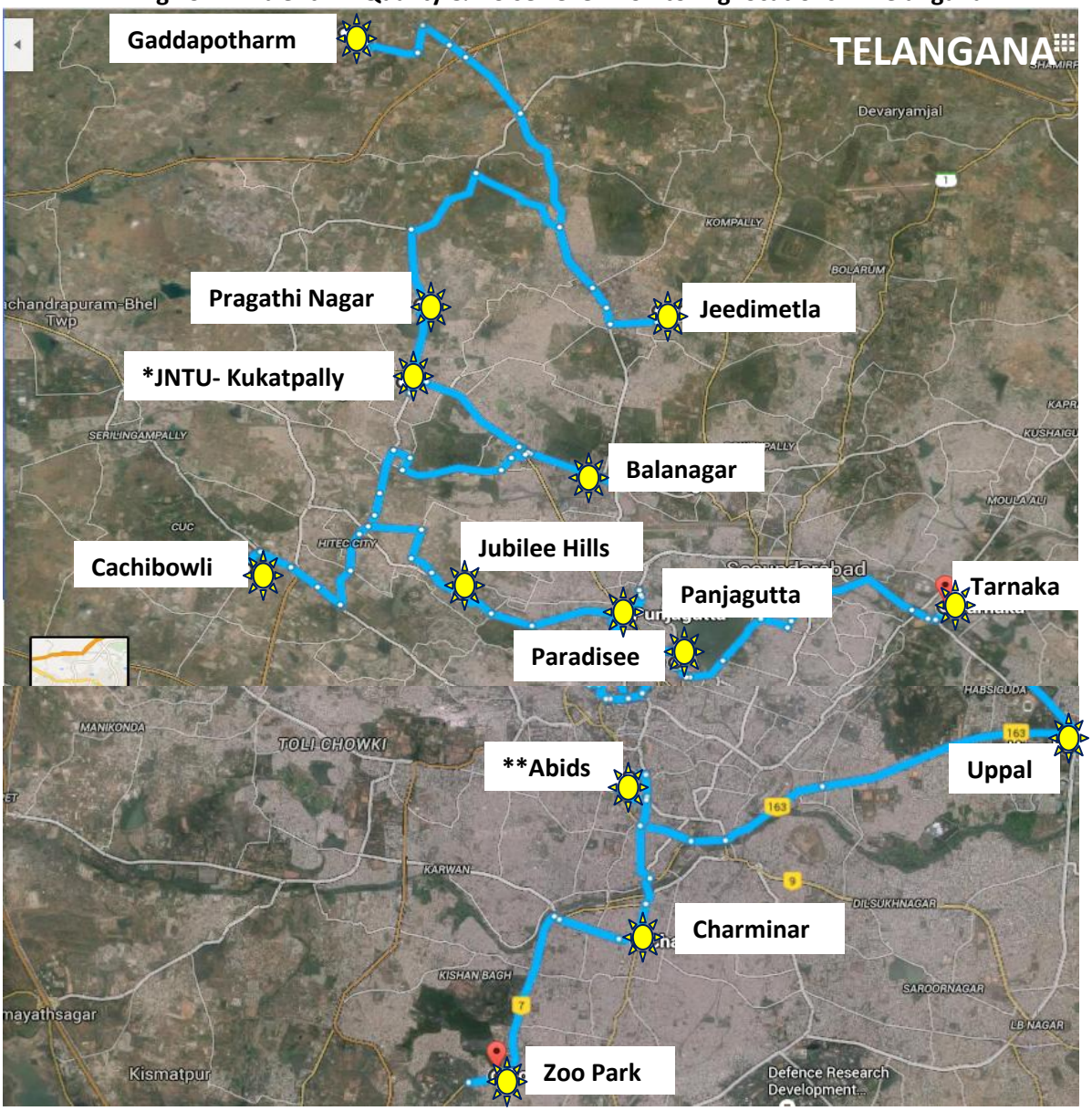


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Tamil Nadu during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Chennai**	Triplicane (R)	70	66	86	84
2		Besant Nagar (R)	61	76	78	87
3		Nungambakkam (R)	64	71	87	82
4		Sowcarpt (M)	79	64	84	79
5		T. Nagar (C)	75	75	81	82
6	**Vellore**	Gandhi Nagar (R)	66	62	83	85
7		Sainathapuram	62	59	88	88
8	**Cuddalore**	Imperial Road (C)	75	76	76	77
9	**Salem**	Sri Saradha Balamandhir (R)	51	60	81	68
10		Silva Tower, Meyyanur Main Road(R)	61	63	74	78
11	**Trippur**	Kumaran Complex (C)	61	65	65	65
12		Rayapuram- (R)	68	70	79	71
13	**Coimbatore**	Ponniyarajapuram (R)	67	59	82	80
14		Saibaba Kovil Signal CBE- 43 (C)	72	69	68	68
15	**Trichy**	Thillai Nagar (R)	67	57	84	90
16	**Dindigul**	Nagal Pudhur(R)	-	66	-	77
17		Jeyaraj Bhavan (M)	-	67	-	74
18	**Madurai**	Thirunagar (R)	59	62	84	84
19		K. Pudur (S)	-	69	82	77
20		Madurai Corporation South (M)	70	72	87	73
21	**Tirunelveli**	Tirunelveli Town (R)	82	61	74	85
22		Samathanapuram (C)	64	58	88	83
23		Pettai Nearer to nursing home (S)	67	60	90	85
		Min.	***51***	***57***	***65***	***65***
		Max.	***82***	***76***	***90***	***90***
		Average	***67***	***66***	***81***	***79***

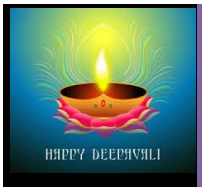
Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 19 : Ambient Air Quality & Noise Level monitoring locations in Telangana



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Telangana became the 29th state of India on 2 June 2014. It was previously a part of the state that was earlier known as Andhra Pradesh. Before India became independent it was included in the state of Hyderabad, which comprised two divisions, namely, Warangal and Medak. At that time the region was governed by the Nizams. The region has been in news recently as the focal point of a tussle between the erstwhile state of Andhra Pradesh and the national administration - while the Union Government has agreed to the creation of the new state, Andhra Pradesh has opposed it on grounds of territorial integrity. In this report the monitoring was carried out by Telangana State Pollution Control Board, Hyderabad.



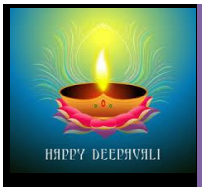
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in ten cities and noise monitoring carried out at twelve cities.

The **normal day,** PM_{10} level ranged between 53 and 222 µg/m^3, while same on the **festival day** ranged between 164 and 412 µg/m^3. The maximum PM_{10} value 412 µg/m^3 was reported at **JNTU-Kukatpally** on the **festival day**. The **normal day** noise level ranged between 52 and 80 Leq.dB(A), while same on the **festival day** ranged between 61 and 88 Leq.dB(A). The maximum noise level value 88 Leq.dB(A) was reported at **Abids (NA)** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Telangana													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Jeedimetla	-	-	-	BDL	16	106	-	-	-	BDL	20	215
2	JNTU-Kukatpally	-	-	-	05	13	222	-	-	-	13	35	412
3	Balanagar	-	-	-	BDL	27	183	-	-	-	BDL	36	259
4	Jubile Hills	-	-	-	05	16	58	-	-	-	05	26	171
5	Panjagutta	-	-	-	BDL	44	184	-	-	-	14	56	323
6	Paradise	-	-	-	BDL	14	59	-	-	-	BDL	15	171
7	Uppal	-	-	-	BDL	18	53	-	-	-	BDL	36	164
8	Abids	-	-	-	BDL	18	83	-	-	-	BDL	19	243
9	Charminar	-	-	-	BDL	24	120	-	-	-	BDL	36	259
10	Zoopark	-	-	-	08	45	103	-	-	-	15	59	206
	Min	-	-	-	***05***	***13***	***53***	-	-	-	***05***	***15***	***164***
	Max	-	-	-	***08***	***45***	***222***	-	-	-	***15***	***59***	***412***
	Average	-	-	-	***06***	***24***	***117***	-	-	-	***12***	***34***	***242***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

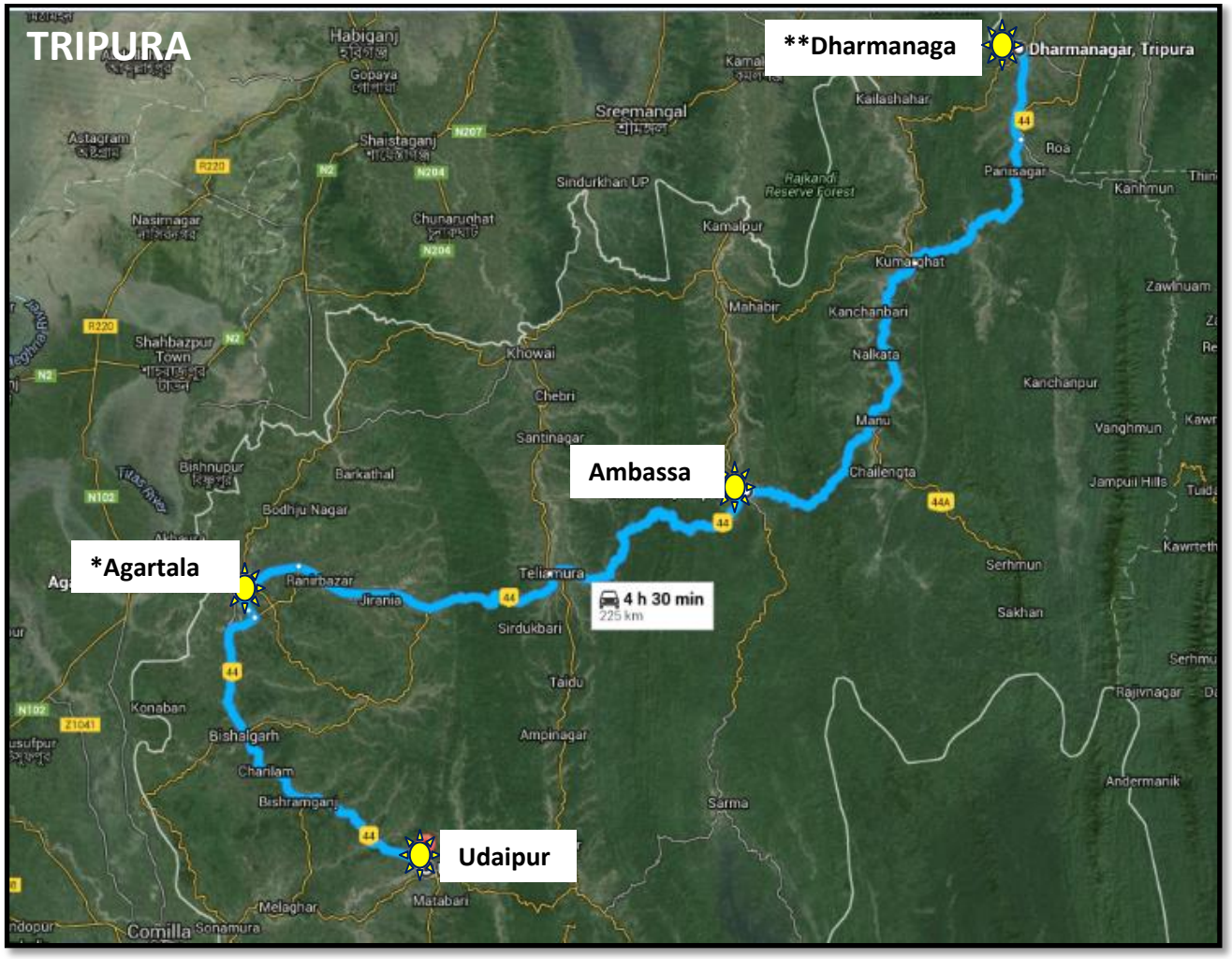


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Telangana during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)					
S. No.	**Locations**	**Normal Day**		**Deepawali Day**	
		2014	2015	2014	2015
1	Gaddapotharm (NA)	-	52	-	66
2	Jeedimetla (NA)	-	64	-	69
3	Pragathi Nagar (NA)		58		81
4	JNTU - Kukatpally (NA)	-	69	-	74
5	Gachibowli (NA)	-	53	-	61
6	Jubilee Hills (NA)	-	59	-	74
7	Panjgutta (NA)	-	80	-	84
8	Paradise (NA)	-	79	-	77
9	Tarnaka (NA)	-	56	-	75
10	Uppal (NA)	-	69	-	87
11	Abids (NA)	-	77	-	88
12	Zoopark (NA)	-	52	-	67
	Min.	-	***52***	-	***61***
	Max.	-	***80***	-	***88***
	Average	-	***64***	-	***75***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

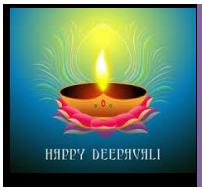
Fig 20 : Ambient Air Quality & Noise Level monitoring locations in Tripura



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

Tripura is one of the Northeastern seven sister states in India. In fact, it is the 3rd smallest state of India and covers an area of 10,486 square km. The state is surrounded by Bangladesh on its north, west and south. On its eastern side, it is surrounded by the state of Mizoram and Assam. Agartala is the capital of this state. As per the 2011 census, the population of the state is 36,73,032. It constitutes around 0.3% of the total population of the country.

In this report the monitoring was carried out by Tripura State Pollution Control Board, Agartala.



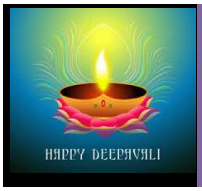
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations- In this State, ambient air quality monitoring carried out in eleven cities and noise monitoring carried out at 28 locations in eleven cities.

The **normal day,** PM_{10} level ranged between 61 and 92 µg/m^3, while same on the **festival day** ranged between 53 and 152 µg/m^3. The maximum PM_{10} value 152 µg/m^3 was reported at **Agartal** on the **festival day**. The **normal day** noise level ranged between 46 and 77 Leq.dB(A), while same on the **festival day** ranged between 51 and 89 Leq.dB(A). The maximum noise level value 89 Leq.dB(A) was reported at Hospital Area (**S)** in **Dharmanagar** on the **festival day**. A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Tripura													
S.No	**Cities**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Dharma Nagar	-	-	-	37	35	64	-	-	-	39	37	62
2	Ambassa, Dhalai	-	-	-	36	34	77	-	-	-	38	36	86
3	Agartal	-	-	-	34	32	92	-	-	-	37	34	152
4	Udaipur	-	-	-	32	30	61	-	-	-	34	32	53
	Min	***-***	***-***	***-***	***32***	***30***	***61***	***-***	***-***	***-***	***34***	***32***	***53***
	Max	***-***	***-***	***-***	***37***	***35***	***92***	***-***	***-***	***-***	***39***	***37***	***152***
	Average	***-***	***-***	***-***	***35***	***33***	***74***	***-***	***-***	***-***	***37***	***35***	***88***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

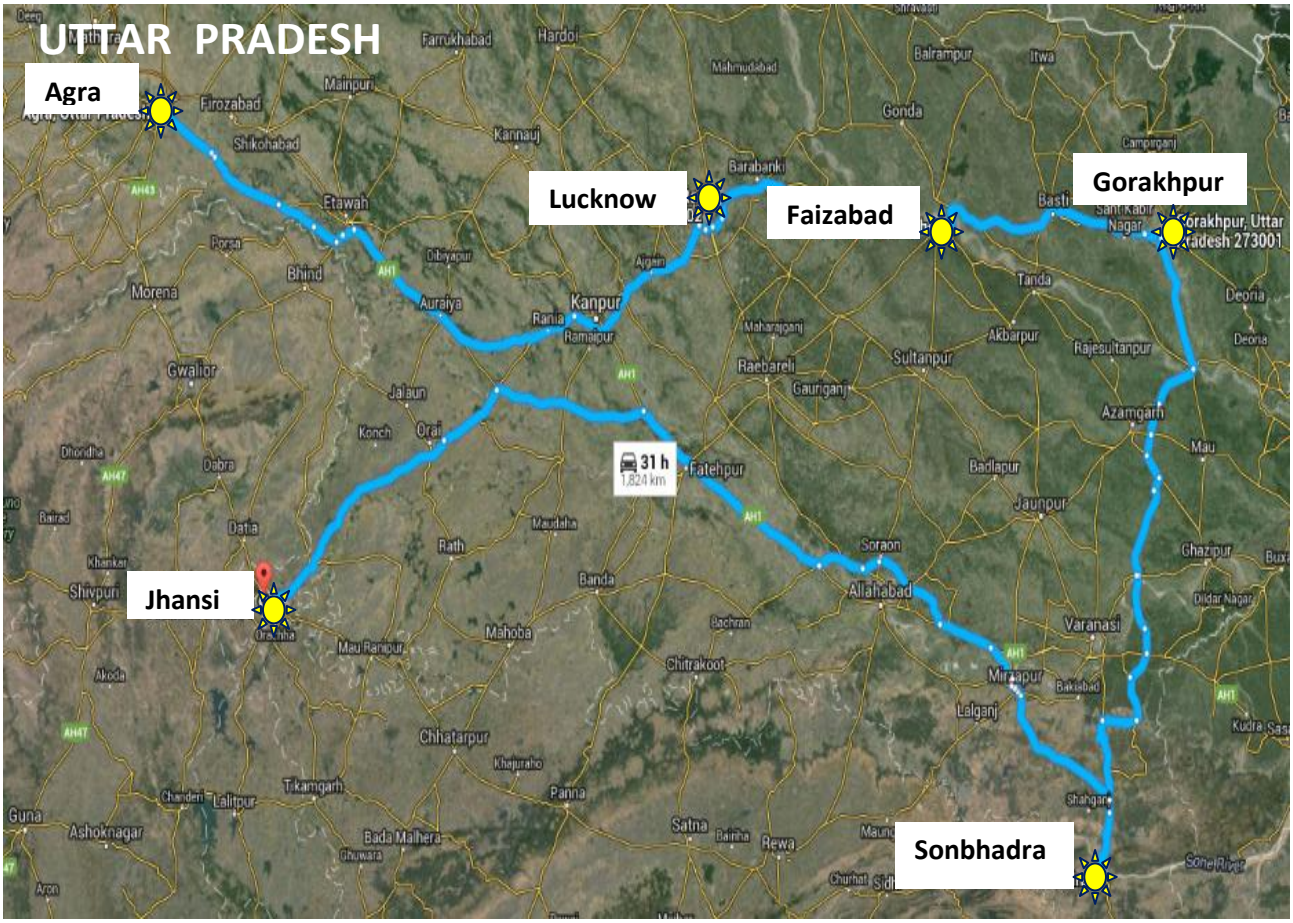


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Tripura during Normal Day & Deepawali Day 2014 & 15 in Leq dB (A)						
S. No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	**2015**	**2014**	**2015**
1	**Dharmangar**	Railway Stataion (C)	53	53	72	69
2		Dharmanagar circuit house (R)	49	48	60	52
3		SDM and judges quarter (R)	61	64	71	74
4		Hospital Area (S)	54	55	57	89
5		D.N. Vidyamandir (S)	58	59	66	76
6	**Ambassa**	Kulai District Hospital (C)	49	50	54	51
7		Bhawaliya Basti (R)	49	53	59	55
8		Dalubari Gate (S)	62	62	75	63
9		Ambassa Bazar (S)	64	62	73	72
10	**Agartala**	Ashram chowmuhani (C)	68	68	72	87
11		Capital complex (R)	60	67	57	59
12		Circuit House (R)	52	69	69	76
13		Indranagar (R)	58	66	63	76
14		G.B Hospital (S)	55	67	67	68
15		M.B.B. Collage (S)	45	63	59	64
16		Battala (C)	72	73	72	78
17		Astabal(C)	60	64	65	75
18		Duraga Chowmuhani (C)	66	70	76	81
19		Netaji Chowmuhani (C)	66	77	75	88
20		A. D. Nagar (R)	51	52	68	74
21		I.G.M Hospital (S)	49	51	61	66
22	**Udaipur**	Brahmabari (C)	62	59	76	68
23		Bridge Chowmuhani (R)	65	54	71	65
24		West Bank of Amar Sagar (R)	57	49	64	62
25		Hospital Area (S)	55	46	59	58
		Min.	***51***	***46***	***54***	***51***
		Max.	***82***	***77***	***76***	***89***
		Average	***67***	***67***	***60***	***70***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

Fig 21 : Ambient Air Quality & Noise Level monitoring locations in Uttar Pradesh

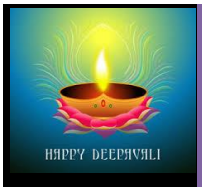


*Indicates location of Maximum PM10 concentration this year

** Indicates location of Maximum Noise Level this year

Uttar Pradesh has a total area of 2,40,928 sq km and is situated in the Northern part of India, sharing international borders with Nepal. The Himalayas are located in the North part of the state and the plains cover most of the state. UP can be separated into three different hypsographical regions. The first one is the Himalayan region in the north. It has an extremely rugged and varied terrain. The topography varies to elevation ranging from 300m to 5000m. The second is the Gangetic Plain in the centre. It has highly fertile alluvial soils and a flat landscape which is dotted by numerous lakes, rivers, etc. The third are the Vindhya Hills and Plateau in the south. It has a hard rock strata and a diverse topography of plains, hills, valleys and plateau. Water is limited in this region. And the population is 199,812,341 (census 2011).

In this report the monitoring was carried out by Uttar Pradesh State Pollution Control Board.



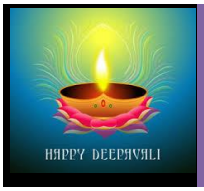
AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in six cities and noise monitoring carried out at 8 locations in six cities.

The **normal day,** PM_{10} level ranged between 65 and 256 µg/m^3, while same on the **festival day** ranged between 102 and 321 µg/m^3. The maximum PM_{10} value 321 µg/m^3 was reported at **agra** on the **festival day**. The **normal day** noise level ranged between 57 and 73 Leq.dB(A), while same on the **festival day** ranged between 64 and 94 Leq.dB(A). The maximum noise level value 94 Leq.dB(A) was reported at **Kamla Nagar (R)** in **Agra** on the **festival day.** A pictorial presentation of monitoring location is depicted in the map.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Uttar Pradesh												
S.No	**Cities**	**Normal Day**						**Deepawali Day**				
		2014			2015			2014			2015	
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Agra	11	20	153	BDL	27	225	25	33	465	04	26	321
2	Faizabad	-	-	-	-	-	118	-	-	-	-	-	178
3	Jhansi	-	-	64	-	-	65	-	-	24	-	-	181
4	Luckow	05	29	139	BDL	29	256	16	56	412	07	40	316
5	Gorkh pur	18	30	81	19	30	86	22	35	95	22	36	102
6	Sonebhadra	BDL	28	165	18	28	-	-	-	-	-	-	147
	Min	***05***	***20***	***64***	***18***	***27***	***65***	***16***	***33***	***24***	***04***	***26***	***102***
	Max	***18***	***30***	***165***	***19***	***30***	***256***	***25***	***56***	***465***	***22***	***40***	***321***
	Average	***06***	***18***	***100***	***19***	***29***	***150***	***21***	***41***	***249***	***11***	***34***	***208***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

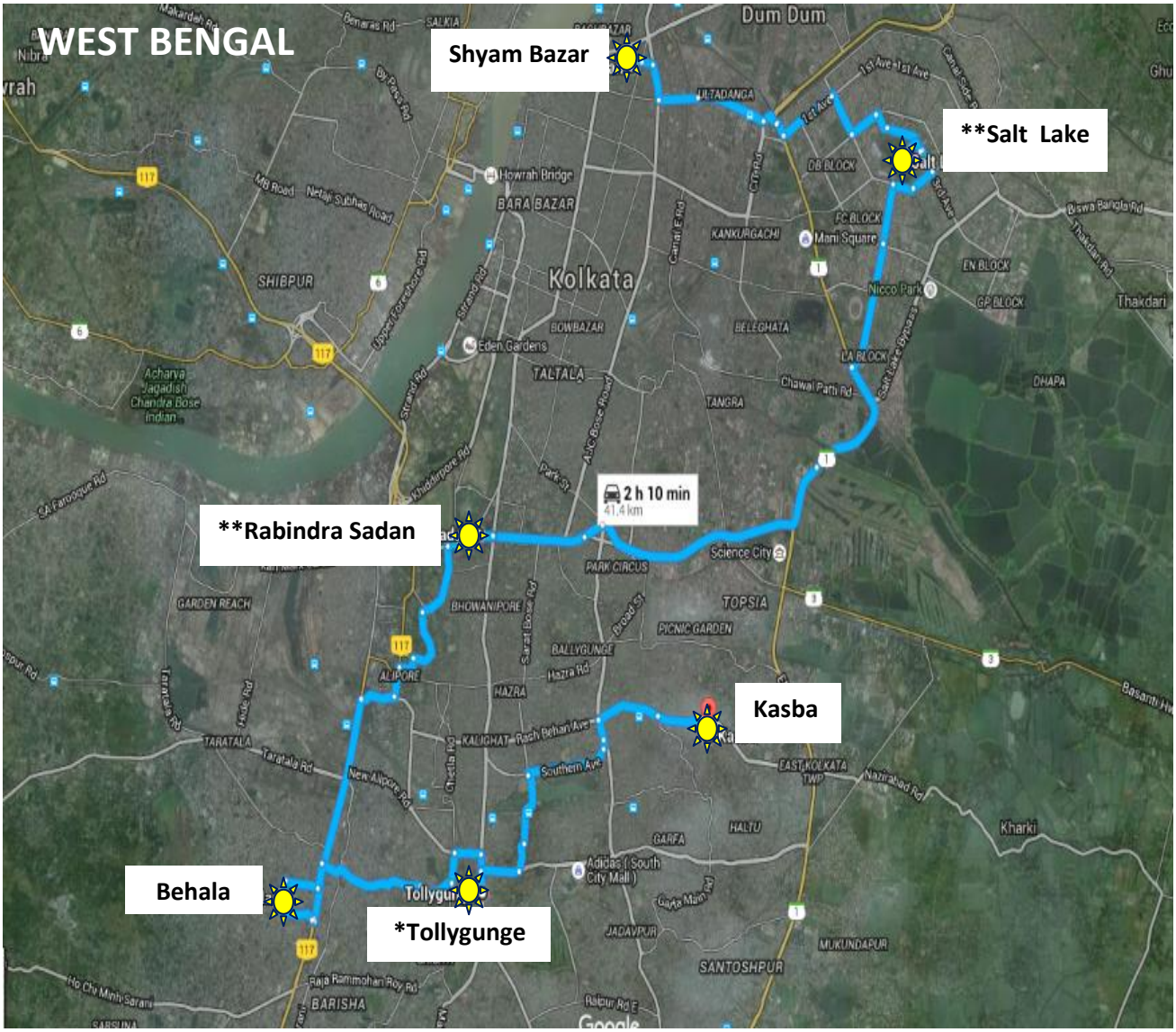


AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Ambient Noise Level at different locations in Uttar Pradesh during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)						
S.No.	**Cities**	**Locations**	**Normal Day**		**Deepawali Day**	
			2014	2015	2014	2015
1	**Agra**	Arjun Nagar (R)	-	64	-	87
2		Kamla Nagar (R)	72	73	92	94
3	**Faizabad**	Office Building (C)	-	70	-	80
4	**Jhansi**	Shivaji Nagar(R)	67	57	79	64
5	**Luckow**	Mayur Vihar, Indira Nagar(R)	55	60	79	78
6		Vikas Khand, Gomti Nagar (R)	53	57	56	70
7	**Gorkh Pur**	Avas vikas Colony (R)	61	62	89	85
8	**Sonebhadra**	Anpara colony (R)	-	57	-	67
		Min.	***55***	***57***	***56***	***64***
		Max.	***72***	***73***	***92***	***94***
		Average	***39***	***63***	***79***	***78***

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*$\mu g/m^3$*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

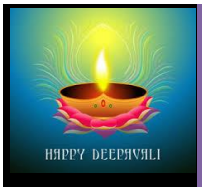
Fig 22 : Ambient Air Quality & Noise Level monitoring locations in West Bengal



*Indicates location of Maximum PM_{10} concentration this year ** Indicates location of Maximum Noise Level this year

West Bengal is a state which is located in eastern India. The state extends from Bay of Bengal in the south to the Himalayan mountain ranges in the north. The capital of the state of West Bengal is Kolkata and it is the biggest city of the state as well. The state covers a total area of 34,267.3 sq miles or 88,752 km2. And the population is 91,347,736 (Census 2011).

In this report the monitoring was carried out by West Bengal State Pollution Control Board, Kolkata.



AMBIENT AIR & NOISE LEVELS DURING DEEPAWALI FESTIVAL 2015

Observations - In this State, ambient air quality monitoring carried out in five cities and noise monitoring carried out at 02 locations.

The **normal day,** PM_{10} level ranged between 52 and 101 µg/m^3, while same on the **festival day** ranged between 258 and >1000 µg/m^3. The maximum PM_{10} value >1000 µg/m^3 was reported at **Tollygunge** on the **festival day**. The **normal day** noise level ranged between 58 and 71 Leq.dB(A), while same on the **festival day** ranged between 90 Leq.dB(A). The maximum noise level value 90 Leq.dB(A) was reported at **Salt Lake (R)** & **Rabindara Sadan (S)** on the **festival day**. A pictorial presentation of monitoring data is depicted.

Ambient Air Quality Data (µg/m^3) During Normal Day & Deepawali Day 2014 & 2015 in Kolkata													
S.No	**Locations**	**Normal Day**						**Deepawali Day**					
		2014			2015			2014			2015		
		SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
1	Shyambazar	BDL	16	47	BDL	57	62	29	36	760	33	54	477
2	Salt Lake	BDL	17	126	BDL	52	52	37	43	1000	BDL	74	>1000
3	Behala	BDL	08	40	BDL	63	82	04	34	852	06	80	>1000
4	Tollygunge	BDL	21	51	07	99	101	07	56	998	05	141	>1000
5	Kasba	BDL	16	29	05	49	52	60	50	1000	10	63	258
	Min	***BDL***	***08***	***29***	***05***	***49***	***52***	***04***	***34***	***760***	***05***	***54***	***258***
	Max	***BDL***	***21***	***126***	***07***	***99***	***101***	***60***	***56***	***1000***	***33***	***141***	***>1000***
	Average	***BDL***	***16***	***59***	***06***	***64***	***70***	***27***	***44***	***922***	***14***	***82***	***>1000***

Ambient Noise Level at different locations in Kolkata during Normal Day & Deepawali Day 2014 & 2015 in Leq dB (A)					
S.No.	**Locations**	**Normal Day**		**Deepawali Day**	
		2014	2015	2014	2015
1	Salt Lake (R)	61	58	71	90
2	Rabindra Sadan(S)	61	71	64	90

Ambient Noise Standards			*AAQM Parameters*	*Standard*
Category of Area / Zone	*Day Time Leq dB(A)*	*Night Time Leq dB(A)*	*µg/m^3*	
*Industrial area **(I)***	*75*	*70*	*SO_2*	*80*
*Commercial area **(C)***	*65*	*55*	*NO_2*	*80*
*Residential area **(R)***	*55*	*45*	*PM_{10}*	*100*
*Silence Zone **(S)***	*50*	*40*	*BDL: SO2: < 5*	*BDL: NO2: < 9*

5. Overall Observations

Ambient air quality monitoring

The most significant observation in 2015, was that there was decrease in Ambient Air Quality concentration Levels as compared to last year Deepawali day with respect to PM_{10}, SO_2 and NO_2 at 27, 28 and 27 locations, respectively. Table-3, describes details of these identified locations.

Table - III: Decrease in, SO_2, NO_2 PM_{10} concentration in 2015 at different locations.

State	Cities show decrease in parameters concentration		
	Parameters		
	SO_2	NO_2	PM_{10}
Andaman & Nicobar	Port Blair	Port Blair	
Arunachal Pradesh			Itanagar
Chhattisgarh State	Raipur	Raipur	Durg Bhilai
	Korba	Bilaspur	Raipur
		Jagdalpur	Bilaspur
			Korba
Delhi	Janakpuri	Pragati Maidan	Pitampura
		Pitampura	Janakpuri
		Janakpuri	
DD & DNH	Silvassa Kilvani Chokdi Gram		Silvassa Kilvani Chokdi Gram
Gujarat		Vadodara	
Himachal Pradesh	Dharmshala	Dharmshala	Dharmshala
	Manali	Manali	Manali
	Sunder Nagar	Sunder Nagar	Sunder Nagar
	Shimla	Shimla	Shimla
	Parwanoo	Parwanoo	Parwanoo
	Kala Amb	Kala Amb	Kala Amb
	Paonta Sahib	Paonta Sahib	Paonta Sahib
Madhya Pradesh	Nagda	Nagda	Nagda
	Ujjain	Ujjain	Ujjain
Poducherry	Anna Nagar	Anna Nagar	Anna Nagar
	Kovilpattu, karaikal	Kovilpattu, karaikal	
Tamil Nadu	Chennai	Vellore	Chennai
	Vellore	Cuddalore	Vellore
	Cuddalore	Trippur	Salem
	Salem	Trichy	Trippur
	Trippur	Dindigul	Trichy
	Trichy	Madurai	
	Dindigul		
Uttar Pradesh	Agra	Agra	Agra
	Luckow	Luckow	Luckow
West Bengal	Kasba		Shyambazar
	Salt Lake		Kasba
	Tollygunge		
Total	**28**	**27**	**27**

The **normal day**, NO_2 level ranged between 09 and 99 µg/m^3, while same on the **festival day** ranged between 09 and 141 µg/m^3. The maximum NO_2 value of 141 µg/m^3 was reported at Tollygunge**, in Kolkata, West Bengal** on the **festival day**.

The **normal day**, PM_{10} level ranged between 12 and 849 µg/m^3, while same on the **festival day** ranged between 41 and **>** 1000 µg/m^3. The maximum PM_{10} value of **>** 1000 µg/m^3 was reported at **Salt Lake,** Behala, Tollygunge in **Kolkatta, West Bengal** on the **festival day**.

The **normal day**, SO_2 level ranged between 04 and 38 µg/m^3, while same on the **festival day** ranged between 04 and 64 µg/m^3. The maximum SO_2 value of 64 µg/m^3 was reported at Coimbatore**, Tamil Nadu** on the **festival day**.

Manual noise monitoring

With respect to Noise levels on the festival day, there was decrease in noise levels at 44 locations as compared to 2014. The details of these locations are described at Table-IV.

Table - IV : Decrease in Noise level in 2015 at different locations.

State-wise number of Monitoring Locations				
Name of the State	City	Locations	Deepawali Day	
			2014	2015
Andaman & Nicobar	Port Blair	Aberdeen Bazaar (C)	82	66
		G.B. Pant Hospital (S)	77	50
		Haddo (C)	82	67
		Shadipur (C)	72	59
Chhatisgarh	Bilaspur	At Office building Vyapar Vihar(C)	72	58
		Traffic Police Thana, (R)	82	78
	Korba	Darri Jamnipali (R)	82	79
		Near Tehsil Office (R)	77	74
	Ambikapur	Raghunath District Hospital (S)	80	55
	Jagdal Pur	Sanjay Market Chowk (C)	96	89
	Raigarh	Housing Board Colony (R)	91	68
		RO CECB (R)	84	83
Delhi	New Delhi	Mayur Vihar Ph-II (R)	83	79
DD	DD & DNH	Silvassa Kilvani Chokdi Gram (S)	76	74
Gujarat	Vadodara	M S University (R)	74	64
Himachal Pardesh	Kullu	Himuda complex beasa moar(C)	66	59
	Una	Rotary Chowk(R)	64	63
	Shimla	Rigde (C)	67	60
	Parwanoo	Sector IV (R)	69	66
Meghalaya	Shillong	Lower Motinagar	71	49
Puducheery	Poducherry	Muthiapet (R)	82	78

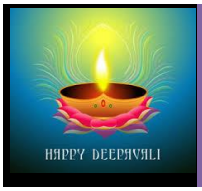


Table -IV (Cont.)

Tamil Nadu	Chennai	Triplicane (R)	86	84
		Nungambakkam (R)	87	82
		Sowcarpt (M)	84	79
	Salem	Sri Saradha Balamandhir (R)	81	68
	Trippur	Rayapuram- (R)	79	71
	Coimbatore	Ponniyarajapuram (R)	82	80
	Madurai	K. Pudur (S)	82	77
		Madurai Corporation South (M)	87	73
	Tirunelveli	Samathanapuram (C)	88	83
		Pettai Nearer to nursing home (S)	90	85
Tripura	Dharmangar	Railway Stataion (C)	72	69
		Dharmanagar circuit house (R)	60	52
	Ambassa	Kulai District Hospital (C)	54	51
	Udaipur	Bhawaliya Basti (R)	59	55
		Dalubari Gate (S)	75	63
		Ambassa Bazar (S)	73	72
		Brahmabari (C)	76	68
		Bridge Chowmuhani (R)	71	65
		West Bank of Amar Sagar (R)	64	62
		Hospital Area (S)	59	58
Uttar Pardesh	Jhansi	Shivaji Nagar(R)	79	64
	Lucknow	Mayur Vihar, Indira Nagar(R	79	78
	Gorakh Pur	Avas vikas Colony (R)	89	85

6. Recommendations:

1. The Noise standards for fire-crackers were notified by MoEF under the Environment (Protection) (Second Amendment) Rules, 1999 vide G.S.R.682(E), dated the 5th October, 1999 and inserted as serial no. 89 of Schedule I of the Environment (Protection) Rules, 1986. Subsequently these Rules were amended by the Environment (Protection) Second Amendment Rules, 2006 vide G.S.R. 640(E), dated the 16th October, 2006, under the Environment (Protection) Act, 1986 guidelines should be followed by the manufacturer and the Department of Explosives to implement the following standards

   (i) The manufacture, sale or use of fire-crackers generating noise level exceeding 125 dB(AI) or 145 dB(C)pk at 4 meters distance from the point of bursting should be prohibited.

   (ii) For individual fire-cracker constituting the series (joined fire-crackers), the above mentioned limit be reduced by 5 log10(N) dB, where N = number of crackers joined together.

2. The State Government shall take measures for abatement of air pollution including noise emanating from various zones during Deepawali festival and ensure that the existing level do not exceed the Ambient Air Quality Standards and Ambient Noise Standards.

3. All concerned agencies like Electronic, print media, Central & State Governments, Central & State Pollution Control Boards or Pollution Control Committees, Educational institutions & NGOs should create awareness among students & public at large to avoid bursting of fire-crackers to reduce air pollution & noise during festival of Deepawali.

4. The order of the Hon'ble Supreme Court of India, dated September 27, 2001, prohibiting the use of fireworks between 10.00 p.m. and 06.00 a.m. should be strictly enforced.

5. Enforcement of legal action on un-authorised manufacturing, processing and selling of fireworks should be strictly ensured.

6. Designed places for burning of fire-crackers/fireworks may be identified by the local authority, so that fire-crackers could be played at community level and not at individual houses.

7. Recognition for fire-crackers noise under criteria of cruelty to animals should be incorporated under relevant acts and rules.

Annexure-I

The Noise Pollution (Regulation and Control) Rules, 2000

SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Note:

(a) Day time shall mean from 6.00 a.m. to 10.00 p.m.

(b) Night time shall mean from 10.00 p.m. to 6.00 a.m.

(c) Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.

(d) Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

***** dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB (A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period

Annexure-II

CENTRAL POLLUTION CONTROL BOARD

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s). S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th October 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect.

Pollutant	**Time Weighted Average**	**Concentration in Ambient Air**		**Methods of Measurement**
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual * 24 Hours **	50 80	20 80	- Improved West and Gaeke Method - Ultraviolet Fluorescence
Nitrogen dioxide (NO_2), $\mu g/m^3$	Annual * 24 Hours **	40 80	30 80	- Jacob & Hochheiser modified ($NaOH-NaAsO_2$) Method - Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM_{10}, $\mu g/m^3$	Annual * 24 Hours **	60 100	60 100	- Gravimetric - TEOM - Beta attenuation
Particulate Matter (Size less than 2.5µm) or $PM_{2.5}$, $\mu g/m^3$	Annual * 24 Hours **	40 60	40 60	- Gravimetric - EOM - Beta attenuation
Ozone (O_3), $\mu g/m^3$	8 Hours * 1 Hour **	100 180	100 180	- UV Photometric - Chemiluminescence - Chemical Method
Lead (Pb), $\mu g/m^3$	Annual * 24 Hours **	0.50 1.0	0.50 1.0	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter

Carbon Monoxide (CO), mg/m^3	8 Hours ** 1 Hour **	02 04	02 04	- Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH_3), $\mu g/m^3$	Annual * 24 Hours **	100 400	100 400	- Chemiluminescence - Indophenol blue method
Benzene (C_6H_6), $\mu g/m^3$	Annual *	05	05	- Gas Chromatography (GC) based continuous analyzer - Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m^3	Annual *	01	01	- Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m^3	Annual *	06	06	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m^3	Annual *	20	20	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE

Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

Annexure-III

Protocol for Ambient Air Quality Monitoring

The ambient air quality monitoring is to be carried out for minimum 24 hours as the national standard prescribed is for 24 hours.

The sampling should be carried out for Particulate Matter (Size less than 10µm) or PM_{10} as well as gaseous pollutants (SO_2 & NO_2) as per the NAMP format 06.00 Hours to 06.00 Hours

The sampling for gaseous should be done in four hourly duration and particulate matter in eight hourly duration.

Methods of measurement

Particulate Matter (Size less than 10µm) or PM_{10}	:	Gravimetric method; Sampling using PM_{10} High Volume Sampler and Glass microfibre filter
Sulphur dioxide (SO_2)	:	Improved West and Gaeke Method
Nitrogen dioxide(NO_2)	:	Modified Jacob & Hochheiser ($NaOH$-$NaAsO_2$) Method

The monitoring data sheets are attached as **Annexure – IV & V.**

Annexure-IV

AMBIENT AIR QUALITY MONITORING

DATA SHEET FOR PARTICULATE MATTER (Size less than 10 µm) or PM_{10}

Station:		**Date:**	
Shift			
Monitoring Duration			
Filter Paper No.			
Hourly Flow Rate (m^3/minute)			
Average Flow Rate (m^3/minute)			
Total Operation Time (Minutes)			
Initial Weight of Filter Paper (gms.)			
Final Weight of Filter Paper (gms.)			
Dust Contents (gms.)			
Total Volume of Air Sampled (m^3)			
Concentration (µg/m^3)			
24 Hourly Average PM_{10} (µg/m^3):			
Remarks:			
Name & Signature of Official on Duty:			
Analyzed by:			

Annexure-V

DATA SHEET FOR GASEOUS POLLUTANTS (AMBIENT AIR QUALITY MONITORING)

									Graph Factor		SO_2	
Station:					Date:				Graph Factor		NO_2	
Shift	Ist Shift				IInd Shift				IIIrd Shift			
Monitoring Period	06:00AM-10:00AM		10:00AM-02:00 PM		02:00PM-06:00PM		06:00PM-10:00PM		10:00PM-02:00AM		02:00AM-06:00AM	
Parameter	SO_2	NO_2	SO_2	NO_2	SO_2	NO_2	SO_2	NO_2	SO_2	NO_2	SO_2	NO_2
Hourly Flow Rate (lpm)												
Average Flow Rate (lpm)												
Total Operation Time (Minutes)												
Initial Volume of Sample (ml)												
Final Volume of Sample (ml)												
Volume Taken For Analysis (ml)												
Total Volume of Air Sampled (lit.)												
Absorbance (Blank)												
Absorbance (Sample)												
Concentration (µg/m3)												
24 Hourly Average SO_2 (µg/m^3):					24 Hourly Average NO_2 (µg/m^3):							
Remarks:												
Name & Signature of Official on duty												
Analyzed by:												

Annexure-VI

Protocol for Ambient Noise Monitoring on

Deepawali Day

1.0 Purpose of Monitoring

This protocol presents the method for Ambient Noise monitoring during Deepawali Festival. The objective is to see the impact of bursting crackers on Environment and whether ambient noise level is within prescribed noise level standard limit.

2.0 Monitoring Locations/Site Selection:

- Site in a city shall be selected such that each category (Residential, Commercial and Silence Zones) should be covered.
- Instrument should be placed considering following points :
  - Instrument must be away from fascades
  - Instrument must be away from obstacles
  - Microphone must be placed 1.2 -1.5 m above the ground level
  - In dry conditions with a wind speed of less than 5 m/s
  - Isolate the instrument from strong vibration and shock
- Close to any domestic premises, Hotel, Hostel, Hospital, Educational institution etc. do not keep the noise level meter and the measurement.

3.0 Monitoring Equipments

Noise measurements will be made with a Type 1 integrating sound level meter with free-field microphone which meets the Accuracy of noise measurement as per IEC 804 (BS 6698) Grade I or ANSI Type I or equivalent IEC 61672-1(2002-05) Class-I.

4.0 Monitoring frequency: Noise Monitoring on Deepawali Day is to be carried out from 18.00 Hrs to 24.00 Hrs continuously at each location.

5.0 Sampling Frequency/rate: Duration is of 6 hours from 18.00 Hrs to 24.00 Hrs with 1 sec sampling period.

6.0 Monitoring Parameters: Leq, L10, L90, L50, Lmax, Lmin, LAI (with 1sec sampling period at all locations).

7.0 Criteria for monitoring:

The following criteria will be observed when undertaking the noise monitoring:

a) During Deepawali sound comes from more than one direction, it is important to choose a microphone and mounting which gives the best possible Omni directional characteristics;
b) The noise measurement equipment will be supervised continuously during the monitoring period and notes will be made of the date, time and prevailing weather conditions;

c) Immediately prior to and following each noise measurement session the accuracy of the noise level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Make sure that the instrument is properly calibrated. The sound level meter and calibrator will hold a current calibration certificate traceable to national standards;

d) Noise measurements should not be made in fog and rain;

e) A wind shield will be used at all times to prevent interference with sound levels;

f) As far as is practicable, the pause facility on the noise measurement equipment will be used to exclude extraneous noise (e.g. low flying aircraft and road traffic passing in front of the microphone) so that the results recorded are representative of the site noise or if possible for road traffic/other source background noise can be eliminated from final reading by using the following formula:

$$L_{pressure} = 10.\log\left[10^{(Lp/10)} - 10^{(LpBackground/10)}\right]$$

8.0 The following details will be recorded:

i) The date, time, location and duration of the measurement;

ii) All predominant noise sources will be noted, which may include extraneous noise such as road traffic, aero-planes and other activity;

iii) Weather conditions will be recorded including wind speed and approximate direction, cloud cover, rain and ground frost;

9.0 Noise Monitoring Records

The particulars of the measurements recorded by the noise level meter shall be furnished in the monitoring data sheet, which is attached at **Annexure VII.**

Annexure-VII

Data sheet for Ambient Noise Monitoring on Deepawali Day

Location:		**Date:**
Noise Level Meter		
Make	:	
Model	:	
Serial No.	:	
Calibration Result of Noise Level Meter		
Calibration	94 dB at 1000 Hz	114 dB at 1000 Hz
Initial		
Final		
Sampling rate		

S. No.	Time duration	File No.	L equivalent dB(A)
	18:00 Hrs. to 19:00 Hrs		
	19:00 Hrs. to 20:00 Hrs		
	20:00 Hrs. to 21:00 Hrs		
	21:00 Hrs. to 22:00 Hrs		
	22:00 Hrs. to 23:00 Hrs		
	23:00 Hrs. to 24:00 Hrs		
		Average L equivalent dB(A) Between (18:00 to 24:00 Hrs)	
		Name & signature of Official on Duty	

L_{max} Between (18:00 to 24:00 Hrs) and L_{min} Between (18:00 to 24:00 Hrs).

Press Release

Monitoring of Ambient Air & Noise Monitoring conducted by CPCB: 2015

Deepawali Monitoring:

This year, the CPCB has attempted to coordinate monitoring of ambient noise levels at more than 200 locations and ambient air quality at about 170 locations across the country. The compiled data shall be published as CPCB does every year.

In Delhi, Ambient Noise was monitored at 16 locations and Ambient Air Quality at 09 locations. The monitoring was carried out on November 05, 2015 to compare the data of Deepawali day.

Observations:

1. The Noise Level Monitoring (Manual Instrumental Method):

Table-I : Ambient Noise Level (Manual) at various locations in Delhi on Nov. 05 & 11, 2015 in Leq dB(A)

S.No.	Monitoring Location	Normal Day		Deepawali Day		Standard
		2014	2015	2014	2015	
1	Lajpat Nagar (R)	64	61↓	NM	76	55
2	Mayur Vihar Ph-II(R)	69	60↓	83	79↓	
3	Pitam pura (R)	53	55↑	71	74↑	
4	Kamla Nagar (R)	59	61↑	80	86↑	
5	Janak puri (R)	63	58↓	78	79↑	
6	Okhla (C)	NM	66	NM	86	65

- In general, there was increase in ambient noise level due to bursting of crackers. The Noise level at Mayur Vihar Phase-II & Kamla Nagar reported 86 Leq dB(A).

2. The Noise Level Monitoring (On-line Instrumental Method):

Table II: Online Ambient Noise Level data on November 05 & 11, 2015 (Leq dB(A)

S.No.	Monitoring Stations	05.11.2015		11.11.2015	
		Day Time	Night Time	Day Time	Night Time
1	Parivesh Bhawan	67	57	67	68
2	ISBT, Anand Vihar	68	63	69	70
3	IBHAS, Dilshad Garden	53	48	65	67
4	Pragati Maidan / ITO	74	68	73	70
5	NSIT, Dwarka	56	52	63	62
6	Mandir Marg	60	46	60	60
7	R.K. Puram	63	52	67	65
8	Civil Lines	62	60	64	66
9	DCE, Bawana	77	80	66	71
10	Punjabi Bagh	60	55	66	71

- There was increase in Noise level at Night time at all locations except Delhi Technological University at Bawana.

3. The Ambient Air Quality Monitoring (Manual Instrumental Method followed by chemical method):

Table III : Profile of Pollutants in different locations in Delhi on November 05 & 11, 2015 (Conc. in µg/m3).

Monitoring location	05.11.2015				09.11.2015				11.11.2015			
	$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2
East Arjun Nagar	96	166	38	62	220	327	30	67	474	593	36	41
Pragati Maidan	NM	166	14	78	NM	327	13	79	NM	531	22	57
Pitampura	117	161	21	72	197	334	21	77	435	460	19	27
Janakpuri	84	119	12	45	194	403	9	49	459	554	18	25
Standards	**60**	**100**	**80**	**80**	**60**	**100**	**80**	**80**	**60**	**100**	**80**	**80**

- The concentrations of SO_2 & NO_2 were within the prescribed standard limit at all locations.

- The concentration of particulate matter ($PM_{2.5}$ and PM_{10}) exceeded the prescribed limit irrespective of locations.

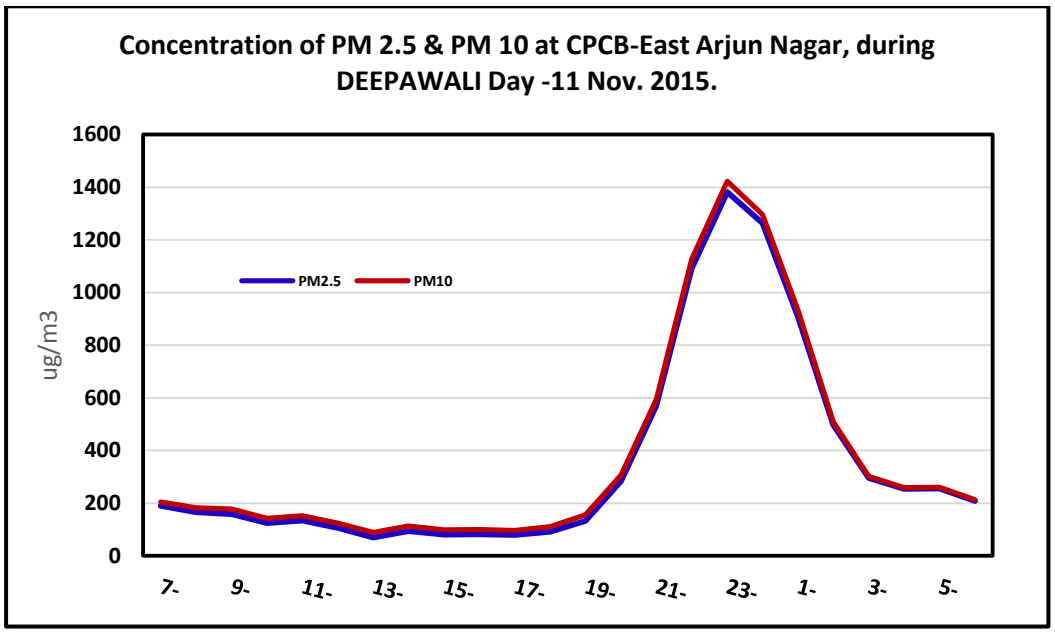
4. The Ambient Air Quality Monitoring (On-line Instrumental Method):

Table IV: Air Pollutants Profile (Online) at various locations								
Monitoring Location	Dates	Pollutants (Conc. in µg/m^3)[Note:* parameter not monitored]						
		$PM_{2.5}$	SO_2	NO_2	CO	Ozone	Ammonia	Benzene
IHBAS Dilshad Garden	05.11.2015	78.2	4.9	63.0	223.3	*	36.8	*
	06.11.2015	136.2	8.3	72.3	177.4	*	31.9	*
	07.11.2015	226.4	7.6	72.7	324.4	*	46.4	*
	08.11.2015	143.2	9.2	62.8	317.1	*	38.7	*
	09.11.2015	136.2	7.4	77.3	934.1	*	41.3	*
	10.11.2015	159.9	7.7	72.0	1022.2	*	33.7	*
	11.11.2015	192.0	9.1	64.1	735.9	*	33.4	*
DMS Shadipur	05.11.2015	108.1	2.5	60.2	333.4	5.3	*	0.3
	06.11.2015	117.8	5.6	70.3	795.5	35.0	*	0.8
	07.11.2015	143.8	5.8	89.3	585.5	40.4	*	0.6
	08.11.2015	107.8	7.3	60.0	506.6	34.6	*	0.5
	09.11.2015	118.7	12.3	78.7	1945.1	20.8	*	4.1
	10.11.2015	138.7	9.3	85.1	516.8	39.4	*	3.8
	11.11.2015	121.1	25.2	48.7	993.4	38.5	*	4.7
NSIT Dwarka	05.11.2015	191.4	8.7	26.7	980.1	13.5	*	1.1
	06.11.2015	176.0	20.7	37.3	1166.7	7.2	*	1.5
	07.11.2015	262.9	16.4	63.2	778.7	7.1	*	1.0
	08.11.2015	105.3	10.2	79.8	844.8	20.5	*	1.1
	09.11.2015	132.1	6.6	79.8	756.9	33.7	*	4.0
	10.11.2015	101.3	10.8	50.9	831.3	20.8	*	4.1
	11.11.2015	99.0	29.9	32.8	697.6	16.1	*	0.8
East Arjun Nagar	05.11.2015	*	45.0	32.4	*	27.0	*	3.3
	06.11.2015	*	8.5	33.1	*	51.5	*	7.2
	07.11.2015	*	23.6	35.5	*	63.0	*	4.7
	08.11.2015	*	40.0	30.9	*	46.0	*	3.5
	09.11.2015	*	21.9	41.3	*	47.0	*	11.4
	10.11.2015		23.8	36.4	*	66.7	*	7.8
	11.11.2015		53.7	25.9		66.4	*	4.4
Pragati Maidan	05.11.2015	*	10.0	44.0	*	29.0	11.0	*
	06.11.2015	*	11.0	70.0	*	19.0	21.0	*
	07.11.2015	*	12.0	53.0	*	20.0	13.0	*
	08.11.2015	*	31.0	61.0	*	29.0	20.0	*
	09.11.2015	*	54.0	89.0	*	32.0	42.0	*
	10.11.2015	*	27.0	75.0	*	25.0	25.0	*
	11.11.2015	*	18.0	40.0	*	25.0	11.0	*

- The concentrations of SO_2 & NO_2 were within the prescribed standard at all locations on the festival day.

- The concentration of particulate matter ($PM_{2.5}$) exceeded the prescribed limit irrespective of locations.

- No other increase was observed in other parameter.
- The following graph shows the incremental rise and fall of particulate matter profile ($PM_{2.5}$ and PM_{10}) during the celebration of festival.



5. The Meteorological Quality Monitoring (On-line Instrumental Method):

Table V: Meteorological Profile at East Arjun Nagar, Delhi November 05-11, 2015.

Date	WS m/Sec.	WD	Temperature (°C)			RH (%)			Mixing Height (m)			Pressure (mb)		
			Min.	Max.	Avg.	Min.	Max.	Avg.	Avg.	Day Avg.	Night Avg.	Min.	Max.	Avg.
05.11.2015	2.2		19	25.6	21	57	84	75	445	528	363	985	988	986
06.11.2015	1.8	NW	19.2	29.4	23.9	42	81	62	585	939	232	984	988	987
07.11.2015	1.8	N	19.7	27.1	23.4	45	83	63	571	887	254	986	990	988
08.11.2015	1.9	NE,N	20.4	27.3	22.9	45	71	60	584	997	171	988	992	989
09.11.2015	1.4	NE	20.7	28.5	24.2	38	70	56	529	967	91	986	992	988
10.11.2015	1.9	NW,N	20.9	28.8	24.7	39	67	53	491	751	231	985	990	987
11.11.2015	3.4	NW,W	20	28.3	23.7	33	60	47	590	855	324	986	990	988

Day Time: 06.00 a.m. to 06.00 p.m. Night Time : 06.00 p.m. to 06.00 a.m.

The data reveals that there was a significant shift in wind direction (from W & NW) on the festival day, which resulted less humidity profile (moving around 42%) besides increase in wind speed from 1.9 m/sec to 3.4 m/sec attributed to dispersion of pollutants. Normal atmospheric pressure of 988mb coupled with increased atmospheric mixing height to the level of 855 meter has resulted easy dispersion of air pollutants.

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