

**Status of Ambient Air Quality and Noise Level
before, during Deepawali Festival**

(2018 to 2022)



Studies conducted and reported by:

**Central Laboratory
Pollution Control Board, Assam
Bamunimaidam, Guwahati-21**



Status of Ambient Air Quality and Ambient Noise Levels during Deepawali Festival in selected Towns of Assam, 2019 to 2022

Introduction

Pollution Control Board, Assam (PCBA) has been carrying out ambient air quality and ambient noise levels monitoring at various locations in Guwahati city as well as in other selected towns of Assam as per the monitoring protocol provided by the Central Pollution Control Board, Delhi, since the last many years. In the year 2019 and 2020, the Board carried such monitoring before Deepawali and during Deepawali festival to assess the impact of firecrackers bursting on ambient air quality and ambient noise levels. In both years, monitoring was carried out at different places in Guwahati city and other selected towns, namely – Bongaigaon, Nalbari, Daranga, Nagaon, Tezpur, North Lakhimpur, Golaghat, Sivasagar, Dibrugarh, Tinsukia, Margherita and Silchar. The data obtained through this monitoring with their interpretation is presented in the following section –

Ambient Air Quality:

To assess the impact of firecracker bursting during Deepawali festival on ambient air quality, the Board monitored three (3) ambient air quality determining parameters i.e. NO_2 , SO_2 , and PM_{10} at selected locations in all above mentioned city/towns of Assam.

The data obtained through these monitoring for the years 2019 and 2020 are given in the Table No. 1 and 2.

**Table No. 1: Ambient Air Quality Before and During Deepawali Festival at different locations
in selected City/Towns of Assam, 2019**

Ambient Air Quality during Deepawali, 2019						
Monitoring Location	Parameters monitored					
	Normal Day (21.10.19)			Deepawali Day (27.10.19)		
	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
Bamunimaidam	9	11	81	11	10	277
Khanapara,	7	13	60	6	17	208
Santipur	6	14	81	9	17	273
Gopinath nagar	6	14	74	9	19	344
Boragaon	7	15	96	6	15	110
Guwahati University	6	14	78	7	15	118
Janiganj Silchar	7	12	50	7	12	46
RLO Silchar Office Building	8	13	54	8	13	55
Drilling Office, ONGC, Sivasagar	6	12	32	9	18	115
Melachakar, Siv.	5	11	25	7	15	116
Nagaon	6	13	69	6	13	89
National Ambient Air Quality Standard (for Residential areas)	80	80	100	80	80	100



**Table No. 2: Ambient Air Quality before & during Deepawali festival, 2020
in selected City/Towns of Assam, 2020**

Monitoring Location	Parameters monitored					
	Pre Deepawali Day (09.11.2020)			During Deepawali Day(14.11.2020)		
	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)
Bamunimaidam, Guwahati	8	14	74	12	17	244
Khanapara, Guwahati	6	14	66	7	15	125
Aryanagar, Guwahati	7	13	80	8	15	148
Santipur, Guwahati	7	12	73	8	14	85
Boragaon, Guwahati	6	13	43	7	15	100
GU Guwahati	6	13	61	6	15	91
Barpara, Bongaigaon	5	12	50	10	16	105
Oil India Ltd. Campus, Bongaigaon	5	12	56	11	17	112
Nagaon	6	13	56	10	13	126
RO, Dibrugarh	6	13	22	8	17	120
Margherita	5	10	20	6	12	39
Shreepuria, Tinsukia	8	15	58	6	14	56
Golaghat RO, Golaghat	6	13	54	7	14	66
RO, Tezpur	6	14	64	7	11	94
Bazar Patti, North Lakhimpur	6	13	44	6	14	64
Darranga, Baksa	6	13	34	7	14	54
Drilling Office, ONGC, Sivasagar	5	10	30	8	15	73
Office Building, RLO, Sivasagar	5	11	35	8	15	73
Janiganj Silchar	6	12	43	8	13	47
RLO Silchar Office Building	6	11	41	7	12	46
National Ambient Air Quality Standard (for Residential areas)	80	80	100	80	80	100

**Table No. 3: Ambient Air Quality Before and During Deepawali Festival at different locations
in selected City/Towns of Assam, 2021**

Monitoring Location in different City/Towns	Pre Deepawali Day (29.10.2021)			During Deepawali Day (04.11.2021)		
	Parameters monitored (value in µg/m ³)					
	SO ₂	NO ₂	PM ₁₀	SO ₂	NO ₂	PM ₁₀
Barpara, Bongaigaon	5	12	47	11	18	109
OIL Campus, Bongaigaon	6	12	51	13	19	117
WRD Off. campus, Nagaon	7	14	71	6	13	199
Milanpur, Nagaon	6	13	67	6	13	169
Nowgaon Girls College, Nagaon	6	14	70	7	13	206
Nalbari College, Nalbari	6	14	82	7	12	195
Near Power House, Nalbari	7	13	90	7	13	232
Nalbari DC Office, Nalbari	7	14	110	7	13	82
Chowkidinghee, Dibrugarh	8	12	78	11	17	198
Margherita, Coal India Office	5	10	26	10	14	71
Borguri, Tinsukia	7	11	101	8	16	203
Shivdham, Tinsukia	6	12	47	6	13	89
Shreepuria, Tinsukia	5	11	39	10	17	211
Golaghat RO, Golaghat	6	10	22	11	14	101
Mazgaon, RO Office- Tezpur	5	9	71	5	10	159
Bazar Patti, North Lakhimpur	5	14	41	6	13	91
Darranga, Indo-Bhutan Border, Baksa	6	11	57	7	13	36
ONGC, Sivasagar	7	12	70	9	15	151
Melachakar, Sivasagar	7	12	50	8	14	88
Rudrasagar, Sivasagar	8	12	26	6	11	49

Monitoring Location in different City/Towns	Pre Deepawali Day (29.10.2021)			During Deepawali Day (04.11.2021)		
	Parameters monitored (value in $\mu\text{g}/\text{m}^3$)					
	SO ₂	NO ₂	PM ₁₀	SO ₂	NO ₂	PM ₁₀
Janiganj, Silchar	7	12	43	10	13	47
RLO Silchar	6	11	42	9	12	49
Kathal Road, Silchar	7	11	44	8	12	51
Bamunimaidam, Guwahati	7	21	151	8	26	192
Khanapara, Guwahati	7	20	94	6	15	81
Gopinathanagar, Guwahati	7	21	78	8	28	203
Santipur, Guwahati	7	21	71	8	22	163
Boragaon , Guwahati	7	22	44	8	24	39
GU Campus, Guwahati	8	18	69	7	17	64
Bonda, Guwahati	7	15	106	7	13	69
National Ambient Air Quality Standard 24 hrs. avg. (for Residential areas)	80	80	100	80	80	100

Table No. 4: Ambient Air Quality Before and During Deepawali Festival at different locations in selected City/Towns of Assam, 2022

Monitoring Location in different City/Towns	Parameters Monitored (Units are in $\mu\text{g}/\text{m}^3$)											
	Before Deepawali on 18.10.2022				During Deepawali on 24.10.2022				During Deepawali on 25.10.2022			
	Parameters monitored (value in $\mu\text{g}/\text{m}^3$)											
	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	PM ₁₀	PM _{2.5}
Bamunimaidam, Guwahati	8	13	24	14	12	15	64	16	12	15	105	63
Khanapara, Guwahati	6	14	238	93	6	14	128	56	6	14	120	76
Aryanagar,Guwahati	6	14	87	36	7	19	70	30	7	19	70	46
Santipur, Guwahati	7	13	56	34	6	14	78	55	6	14	87	40
Boragaon, Guwahati	7	16	54	31	7	14	46	37	6	14	34	25
GU Campus, Guwahati	7	13	40	26	6	13	27	17	7	13	35	24
Bonda Guwahati	6	12	77	44	6	11	53	35	6	11	92	57
Barpara, Bongaigaon	6	13	69	33	8	14	44	22	9	18	51	26
OIL Campus, Bongaigaon	7	14	66	31	8	16	41	21	10	17	47	25
WRD Campus, Nagaon	6	14	54	33	5	12	68	13	8	19	47	20
Milanpur, Nagaon	7	16	41	-	6	14	47	-	5	13	58	-
Nowgaon Girls College	6	15	57	-	5	12	81	-	6	16	57	-
Nalbari College, Nalbari	7	13	82	61	6	11	41	25	8	12	44	27
Golaghat RO, Golaghat	5	10	30	27	5	10	34	29	-	-	-	-
Chowkindghee RO Dibrugarh	6	12	40	32	6	12	33	15	5	9	42	33
Margherita	5	10	44	33	5	10	36	30	-	-	-	-
Borguri, Tinsukia	5	10	29	28	4	8	35	28	-	-	-	-
Shivdham, Tinsukia	4	8	17	10	5	11	41	23	-	-	-	-
Shreepuria, Tinsukia	6	11	59	50	4	9	30	25	-	-	-	-
Mazgaon, RO, Tezpur	6	15	68	34	7	16	34	18	7	17	38	20
Bazar Patti, Lakhimpur	6	14	36	24	7	15	23	8	7	15	24	13
Daranga, Baksa	6	13	87	-	6	14	75	-	-	-	-	-
ONGC, Sivasagar	5	10	46	11	5	10	24	13	4	9	20	10
Melachakar, Sivasagar	6	12	40	32	6	12	34	15	4	9	42	33
Janiganj, Silchar	6	12	43	26	7	11	47	17	-	-	-	-
RLO ,Silchar	7	10	39	25	6	7	29	15	-	-	-	-
Kathal Road, Silchar	7	11	73	38	8	10	46	24	-	-	-	-
National Ambient Air Quality Standard 24 hrs. avg. (for Residential areas)	80	80	100	60	80	80	100	60	80	80	100	60



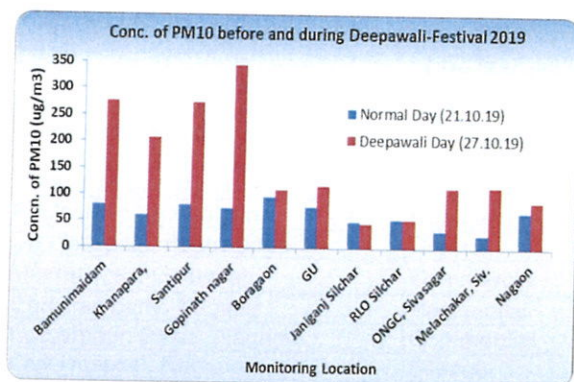


Fig. 1: Concn. of PM10 before and during Deepawali-2019

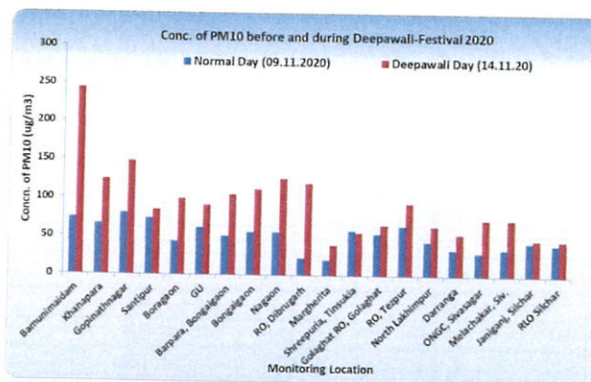


Fig. 2: Concn. of PM10 before and during Deepawali-2020

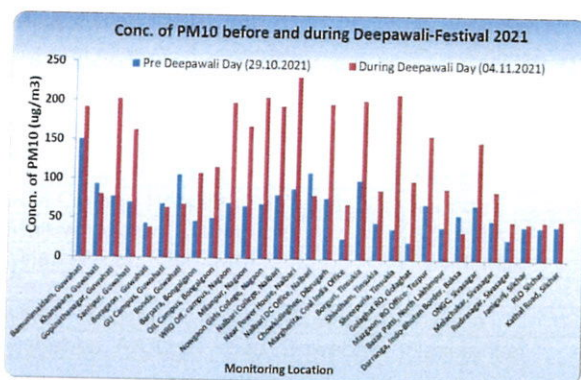


Fig. 3: Concn. of PM10 before and during Deepawali-2021

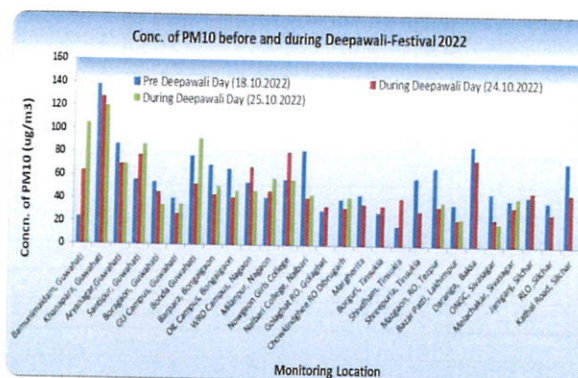


Fig. 4: Concn. of PM10 before and during Deepawali-2022

From the analytical data in the **Table 1 to 4**, it is observed that the concentration of SO_2 and NO_2 before and during Deepawali festival in all monitoring stations were within the prescribed National Standard of $80 \mu\text{g}/\text{m}^3$. However, it is also noticed that the SO_2 and NO_2 values in most of the cases have marginally increased during Deepawali day in comparison to the days before the Deepawali. This indicates that there are some impacts of firecrackers bursting on ambient air.

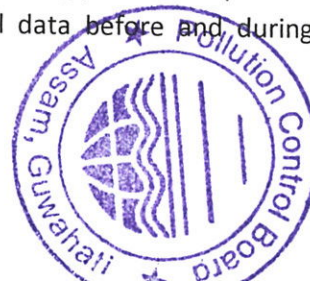
But, as mentioned in the **Table 1 to 4 and Fig 1 to 4**, it is observed that the concentration of PM_{10} increased significantly on Deepawali day in comparison with the days before Deepawali. In most of the cases, the PM_{10} was found higher than the prescribed National Standard of $100 \mu\text{g}/\text{m}^3$. This indicates that the concentration PM_{10} increased due to bursting of fire crackers during Deepawali days.

Fortunately, due to heavy rainfall during Deepawali Days in 2022, the concentrations of PM_{10} and $\text{PM}_{2.5}$ were found to be within the prescribed National Standard of $100 \mu\text{g}/\text{m}^3$ and $60 \mu\text{g}/\text{m}^3$ respectively except two occasions i.e. Bamunimaidam and Khanapara. This indicates that the concentration PM_{10} and $\text{PM}_{2.5}$ increased due to bursting of fire crackers during Deepawali days.

This higher level of PM_{10} concentration in ambient air is harmful to human health.

Ambient Noise Level :

To assess the impact of firecracker bursting during Deepawali festival Board had been also monitored ambient noise level at different places at selected city/towns, namely Bongaigaon, Golaghat, Nagaon, Silchar, Sivasagar, Tezpur, Dibrugarh and Guwahati on the occasion. During past two expanded the ambient noise level to other towns of Assam. The average noise level data before and during Deepawali, 2019 to 2022 is presented in the **Table No. 5 to 8**.



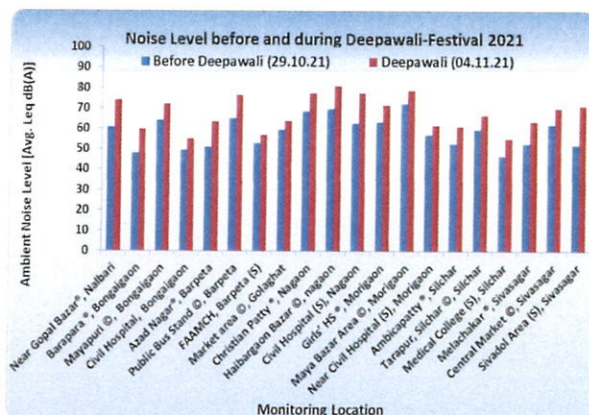


Fig. 7: Noise level before and during Deepawali-2021

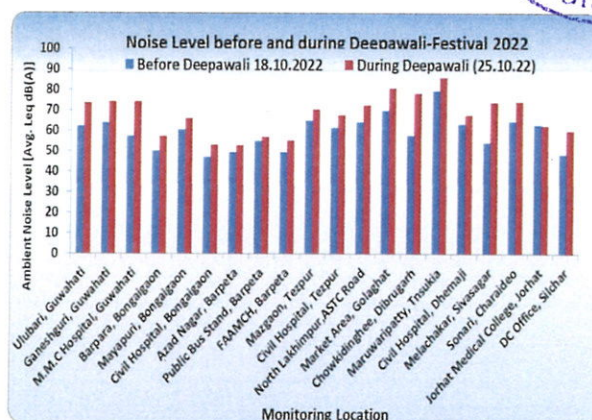


Fig. 8: Noise level before and during Deepawali-2022

From the analytical data in the **Table 5 to 8** and **Fig. 5 to 8**, it is observed that the ambient Noise level in most of the cases have increased during Deepawali day in comparison to the days before the Deepawali. This indicates that there are impacts of firecrackers bursting on ambient noise irrespective of all the zone/area.

Conclusion

From the data presented above and their analyses, it is observed that the concentration of SO_2 and NO_2 were found to be satisfactory and well within the prescribed National Standards. However, the concentration of PM_{10} , $\text{PM}_{2.5}$ and noise levels were found higher during Deepawali days in comparison with the days before Deepawali. These indicate that there were some impacts of firecrackers bursting during the Deepawali days on the ambient air as well as ambient noise levels.
