

# Report of Ambient Air Quality & Noise Levels during Diwali Festival (2020 & 2021)



# Air quality monitoring

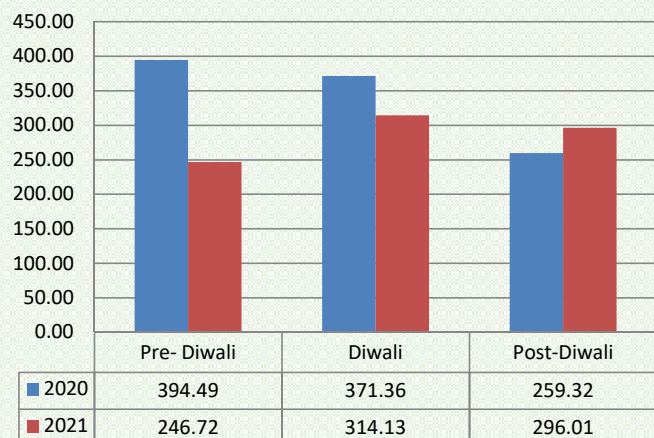


# Details of Monitoring

Name of the city	Name of the monitoring locations	Parameters monitored
1. Lucknow	<ol style="list-style-type: none"><li>1. Chowk</li><li>2. Aliganj</li><li>3. Talkatora</li></ol>	<ol style="list-style-type: none"><li>1. <math>PM_{10}</math></li><li>2. <math>PM_{2.5}</math></li><li>3. <math>SO_2</math></li><li>4. <math>NO_2</math></li><li>5. Metals in <math>PM_{10}</math> (Pb, Ni &amp; As)</li><li>6. Metals in <math>PM_{2.5}</math> (Ba, Al &amp; Fe)</li></ol>

## PM<sub>10</sub> concentration (µg/m<sup>3</sup>) during Diwali in Lucknow (2020-2021)

### Talkatora

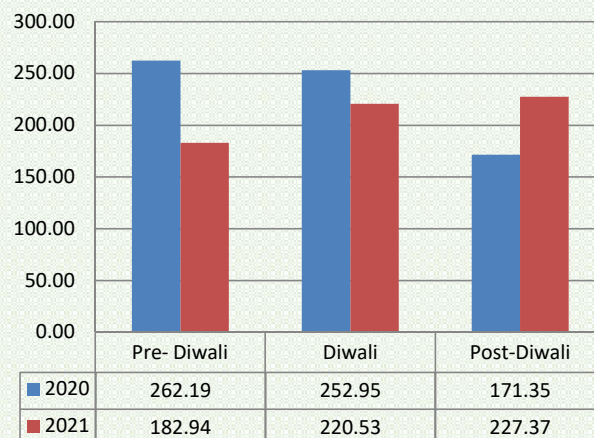


**Talkatora; Pre-Diwali decreased -59.8% in 2021 (as compared to 2020)**

**Diwali decreased -18.2% in 2021 (as compared to 2020)**

**Post-Diwali increased 12.4% in 2021 (as compared to 2020)**

### Aliganj

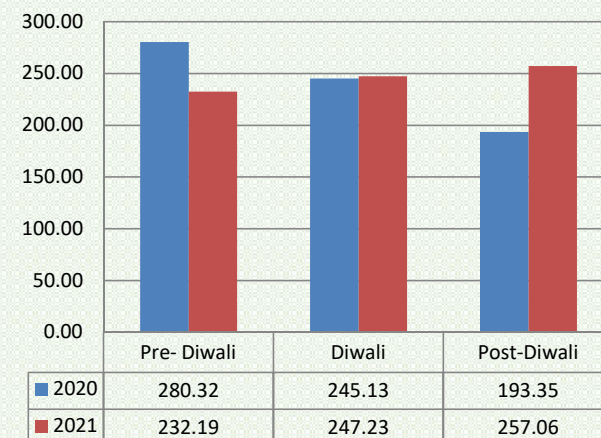


**Aliganj; Pre-Diwali decreased -43.3% in 2021 (as compared to 2020)**

**Diwali decreased -14.7% in 2021 (as compared to 2020)**

**Post-Diwali increased 24.6% in 2021 (as compared to 2020)**

### Chowk



**Chowk; Pre-Diwali decreased -20.7% in 2021 (as compared to 2020)**

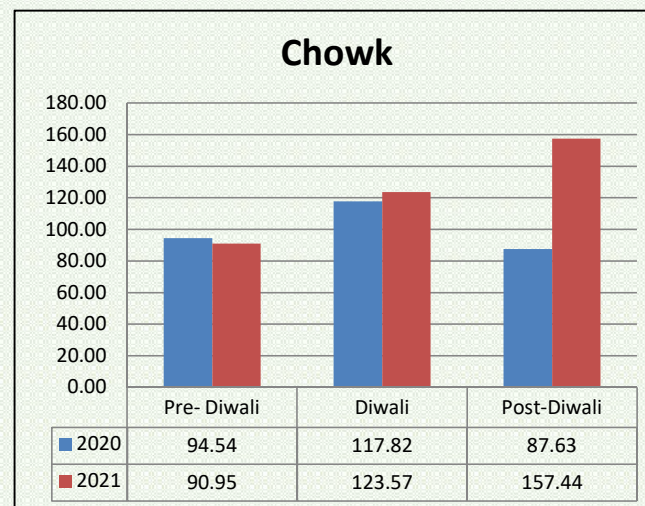
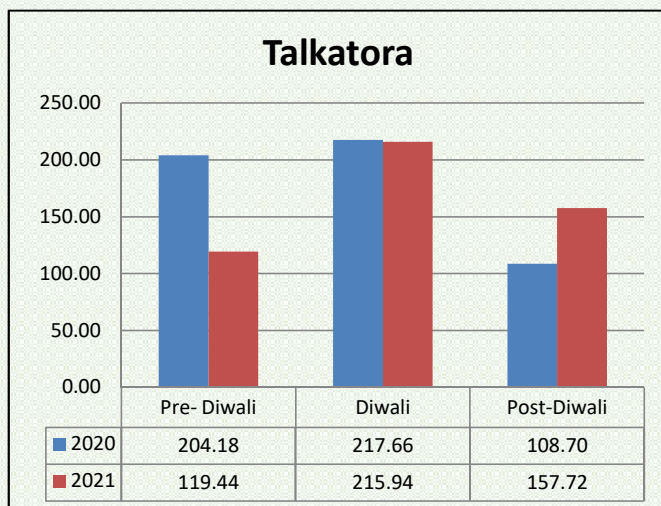
**Diwali increased 0.85% in 2021 (as compared to 2020)**

**Post-Diwali increased 24.8% in 2021 (as compared to 2020)**

**National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> – 100 µg/m<sup>3</sup>**



## PM<sub>2.5</sub> concentration (µg/m<sup>3</sup>) during Diwali in Lucknow (2020-2021)



**Talkatora; Pre-Diwali decreased -70.9% in 2021 (as compared to 2020)**

**Diwali decreased -0.79 % in 2021 (as compared to 2020)**

**Post-Diwali increased 31.07% in 2021 (as compared to 2020)**

**Chowk; Pre-Diwali decreased -3.9% in 2021 (as compared to 2020)**

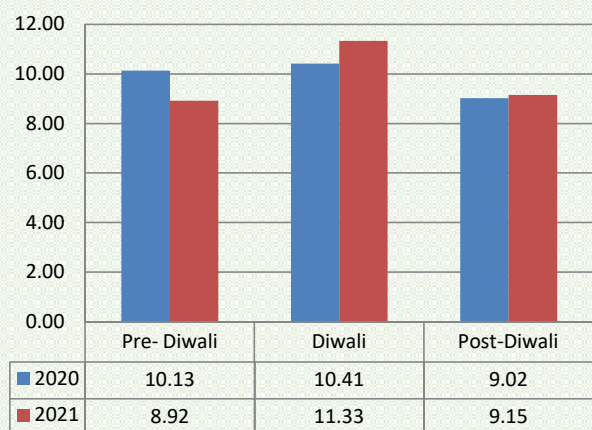
**Diwali increased 4.65% in 2021 (as compared to 2020)**

**Post-Diwali increased 44.3% in 2021 (as compared to 2020)**

***National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>***

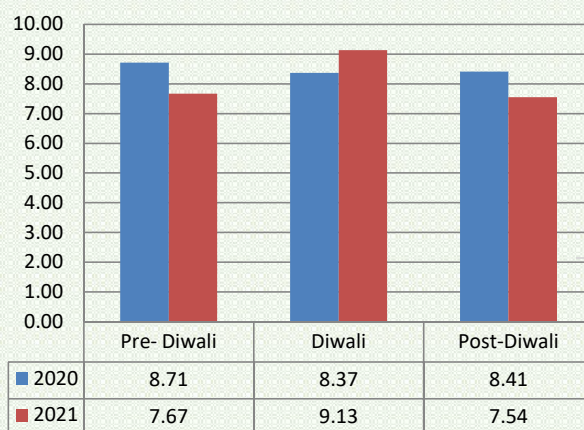
## SO<sub>2</sub> concentration (µg/m<sup>3</sup>) during Diwali in Lucknow (2020-2021)

### Talkatora



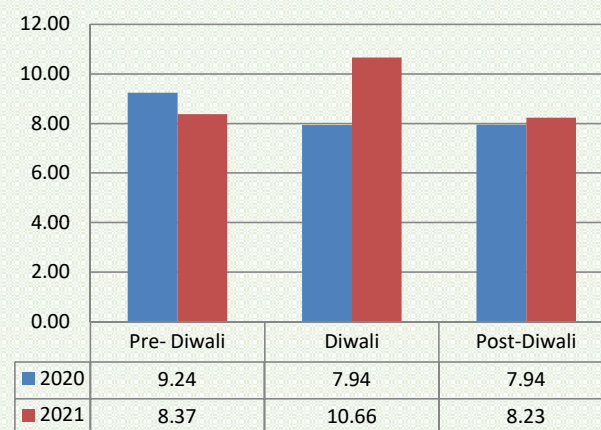
**Talkatora; Pre-Diwali decreased -13.5% in 2021 (as compared to 2020)**  
**Diwali increased 8.12% in 2021 (as compared to 2020)**  
**Post-Diwali increased 1.43% in 2021 (as compared to 2020)**

### Aliganj



**Aliganj; Pre-Diwali decreased -13.5% in 2021 (as compared to 2020)**  
**Diwali increased 8.32% in 2021 (as compared to 2020)**  
**Post-Diwali decreased -11.4% in 2021 (as compared to 2020)**

### Chowk

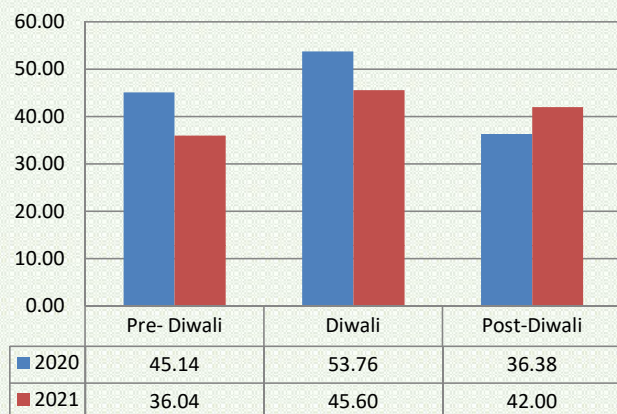


**Chowk; Pre-Diwali decreased -10.4% in 2021 (as compared to 2020)**  
**Diwali increased 25.5% in 2021 (as compared to 2020)**  
**Post-Diwali increased 3.52% in 2021 (as compared to 2020)**

**.National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>**

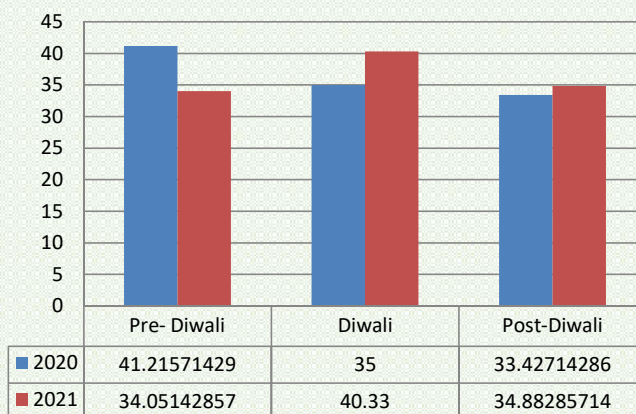
## NO<sub>2</sub> concentration (µg/m<sup>3</sup>) during Diwali in Lucknow (2020-2021)

### Talkatora



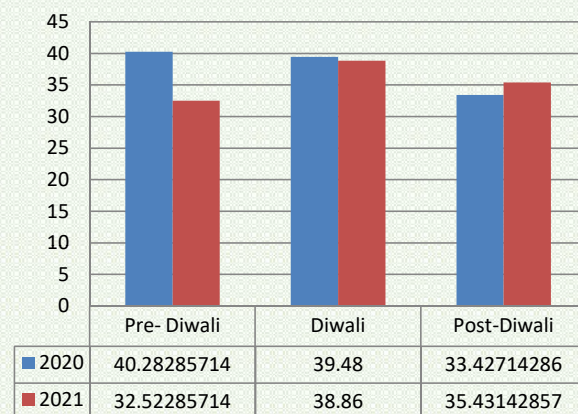
**Talkatora; Pre-Diwali decreased -25.2% in 2021 (as compared to 2020)**  
**Diwali decreased -17.8% in 2021 (as compared to 2020)**  
**Post-Diwali increased 13.4% in 2021 (as compared to 2020)**

### Aliganj



**Aliganj; Pre-Diwali decreased -21.0% in 2021 (as compared to 2020)**  
**Diwali increased 13.2% in 2021 (as compared to 2020)**  
**Post-Diwali increased 4.17 % in 2021 (as compared to 2020)**

### Chowk

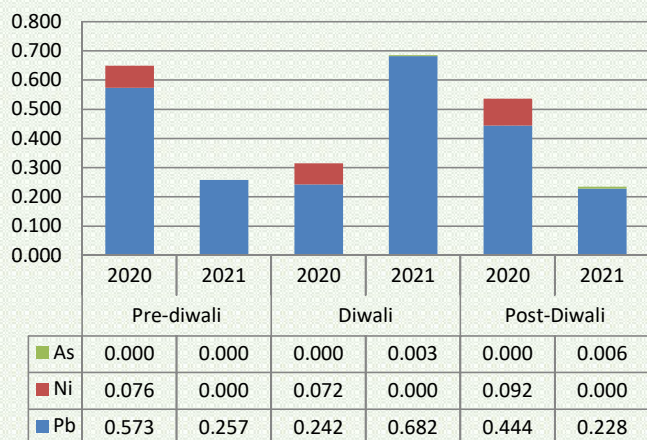


**Chowk; Pre-Diwali decreased -23.8% in 2021 (as compared to 2020)**  
**Diwali decreased 1.6% in 2021 (as compared to 2020)**  
**Post-Diwali increased 5.66% in 2021 (as compared to 2020)**

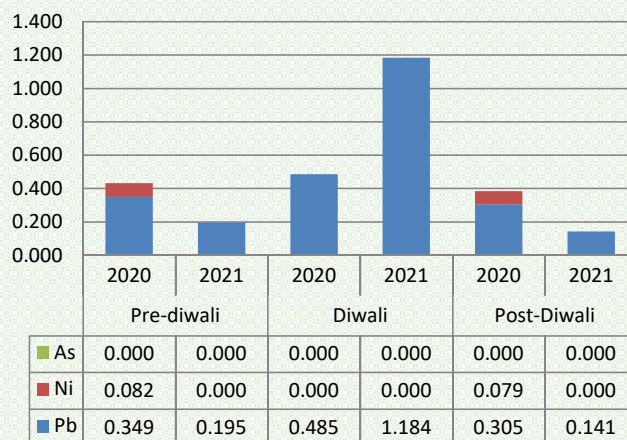
*National Ambient Air Quality standard (24-hour average) : NO<sub>2</sub> – 80 µg/m<sup>3</sup>*

## Ni, Pb & As concentration ( $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{10}$ during Diwali in Lucknow (2020-2021)

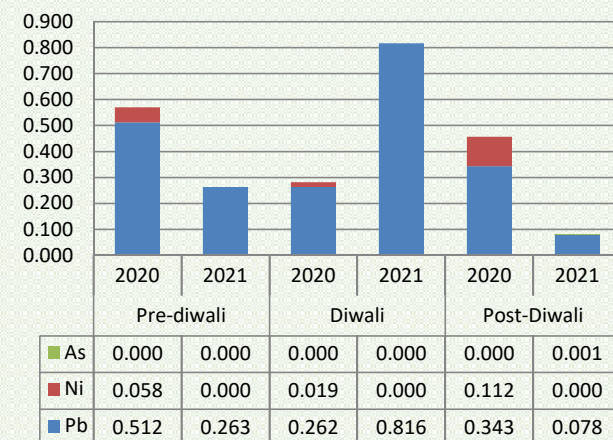
**Talkatora**



**Aliganj**



**Chowk**



A decreasing trend in Ni concentration values in 2021 as compared to 2020 during pre-Diwali, Diwali & post-Diwali.

An increasing trend in Pb concentration values in 2021 as compared to 2020 during Diwali.

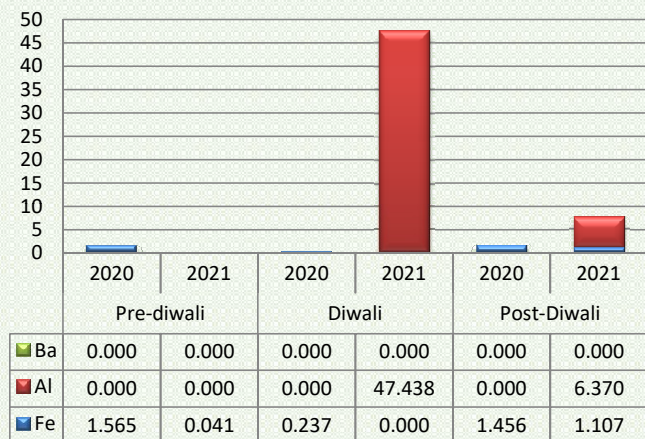
Arsenic (As) concentration values were not detected in 2021.

*Standard Ambient Air Quality Concentration Values (24-hour average) Pb-  $1.0 \mu\text{g}/\text{m}^3$*

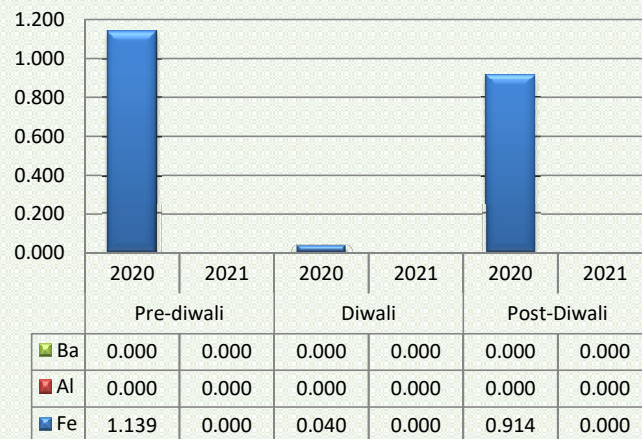


## Ba, Al and Fe concentration ( $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{2.5}$ during Diwali in Lucknow (2020-2021)

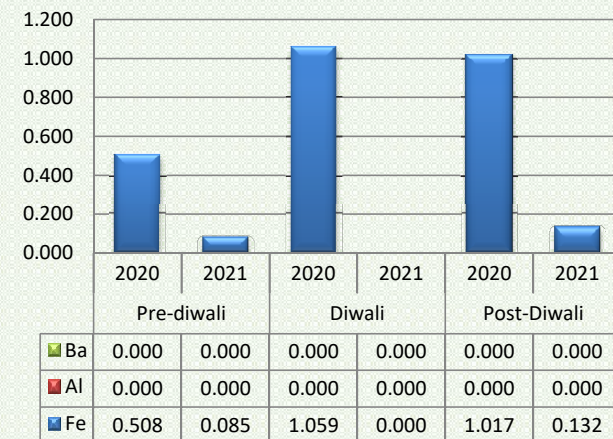
**Talkatora**



**Aliganj**



**Chowk**



**Barium (Ba) concentration values were below detection limit in 2020 & 2021.**

**An increasing trend in Al concentration values in 2021 as compared to 2020 during Diwali & post-Diwali in Talkatora.**

**A decreasing trend in Fe concentration values in 2021 as compared to 2020 during pre-Diwali, Diwali & post-Diwali.**

*Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average) Ba -  $4 \mu\text{g}/\text{m}^3$ , Al -  $40 \mu\text{g}/\text{m}^3$  & Fe -  $40 \mu\text{g}/\text{m}^3$*



# Noise monitoring



# Details of Noise Monitoring

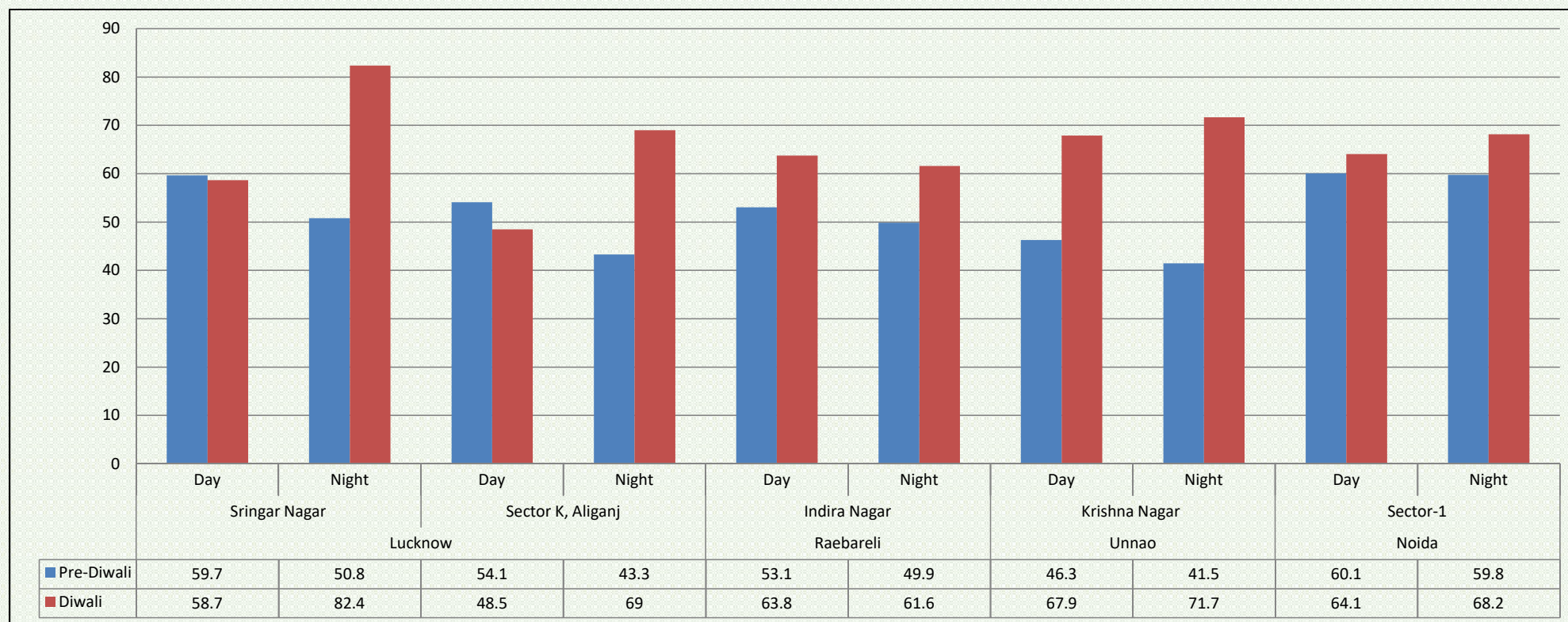
Name of the city	Number of the monitoring locations	Names of Locations
Lucknow	2	New Sringer Nagar ; Sector K, Aliganj
Raebareli	1	Indira Nagar
Unnao	1	Krishna Nagar
Noida	1	Sector 1, Regional Office Building
Bijnor	1	Judgi Chowk
Ghaziabad	2	Vasundhara ;Model Town
Moradabad	1	Budhi Vihar
Greater Noida	1	Jagat Farms
Muzaffarnagar	3	Gandhi colony; Mahavir chowk; District Hospital
Kanpur	2	Awas Vikas Colony; Jarib Chowki
Agra	4	Bodla RO; Sanjay Palace; District Hospital; Taj Mahal
Mathura	2	Krishna Nagar; Baldevpuri

# Ambient Noise standards

## **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
<i>Day time shall mean from 6.00 a.m. to 10.00 p.m</i>			
<i>Night time shall mean from 10.00 p.m. to 6.00 a.m</i>			

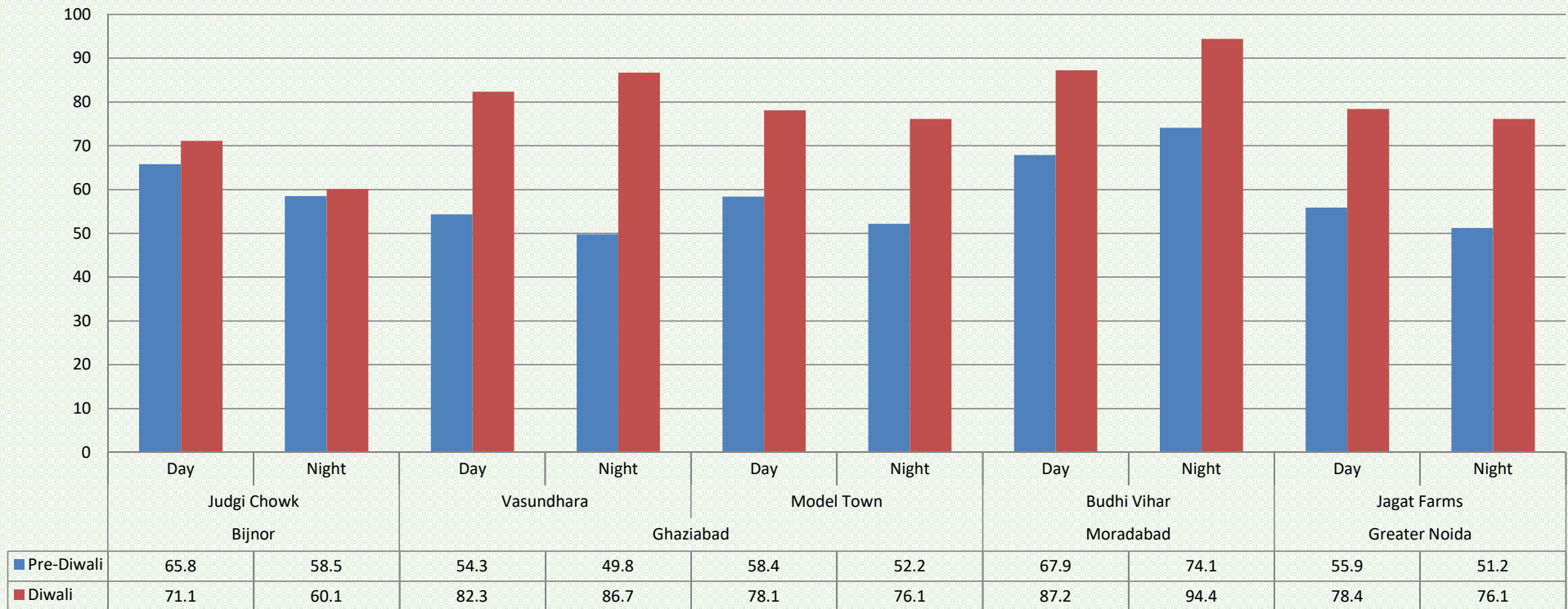
## Comparative analysis of Noise monitoring in Lucknow, Raebareli, Unnao & Noida (2021)



- Average noise level has decreased during daytime in Lucknow
- Average noise level has increased during Diwali as compared to pre-Diwali at Unnao, Raebareli & Noida.

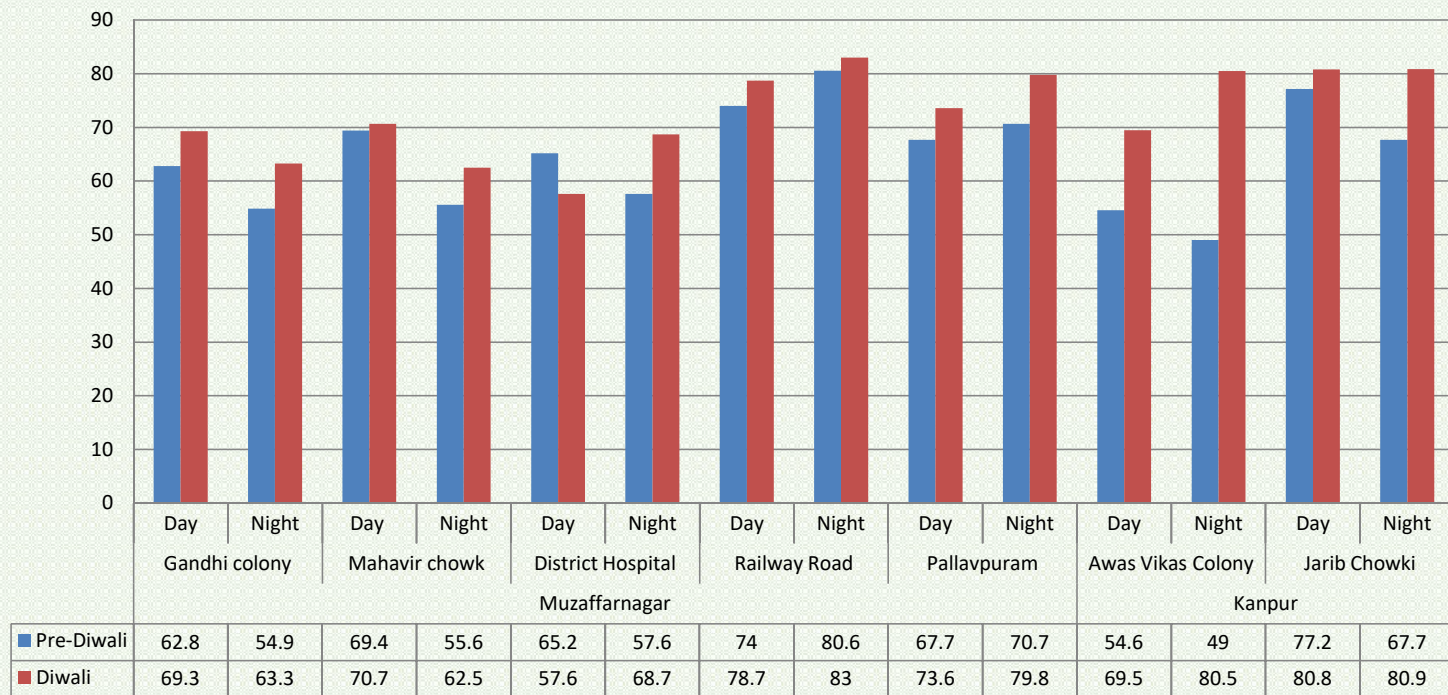


## Comparative analysis of Noise level in Bijnor, Ghaziabad, Moradabad & Greater Noida (2021)



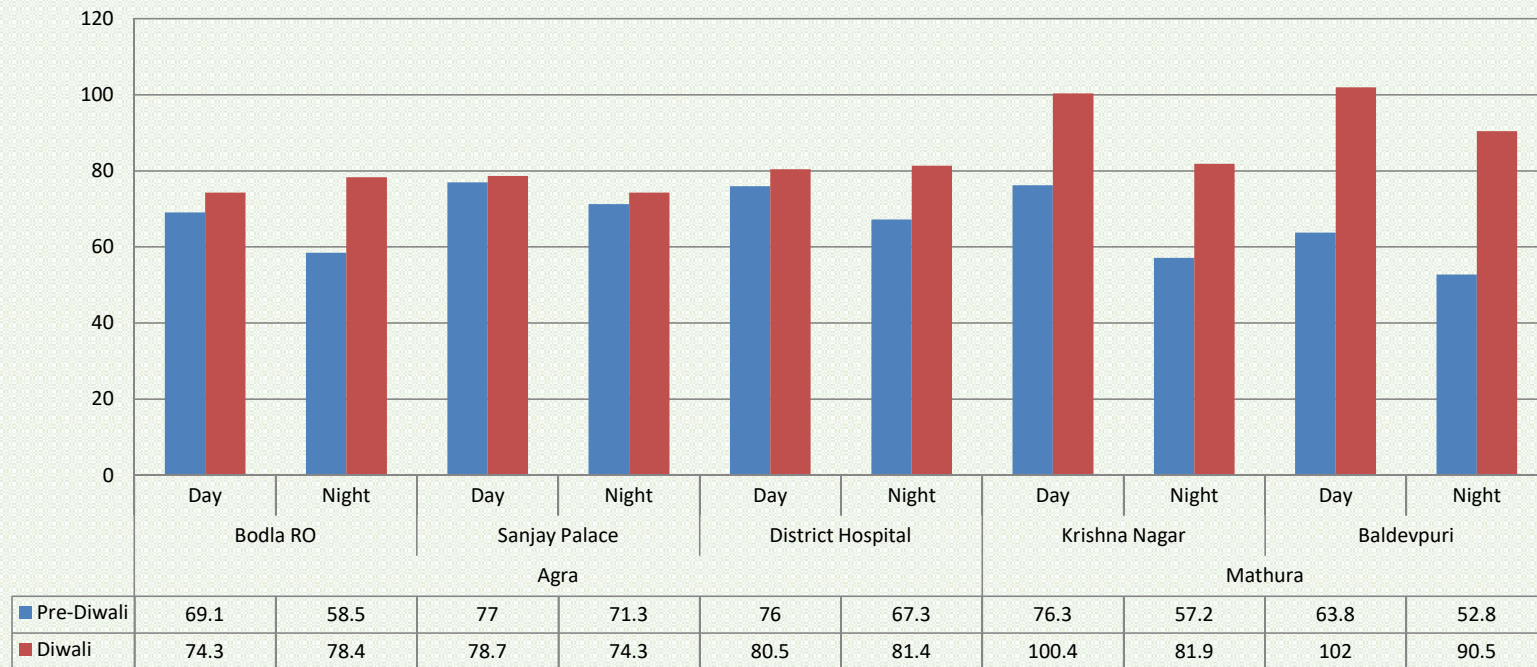
- Average noise level has decreased during pre-Diwali as compared to Diwali.

## Comparative analysis of Noise level in Muzaffarnagar & Kanpur(2021)



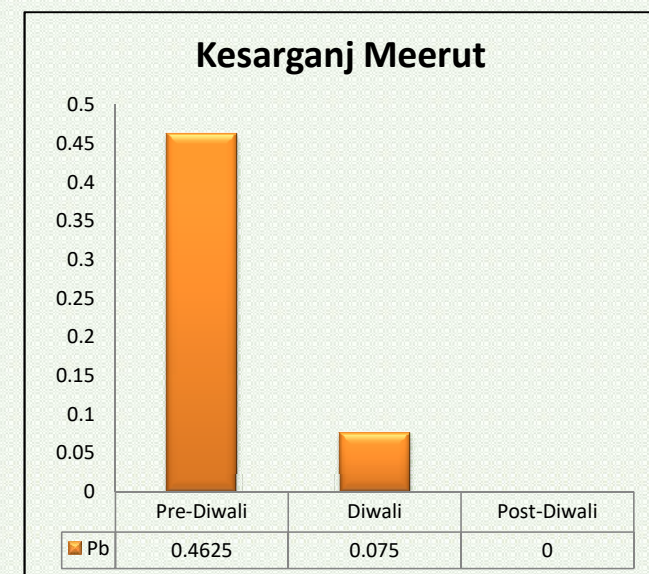
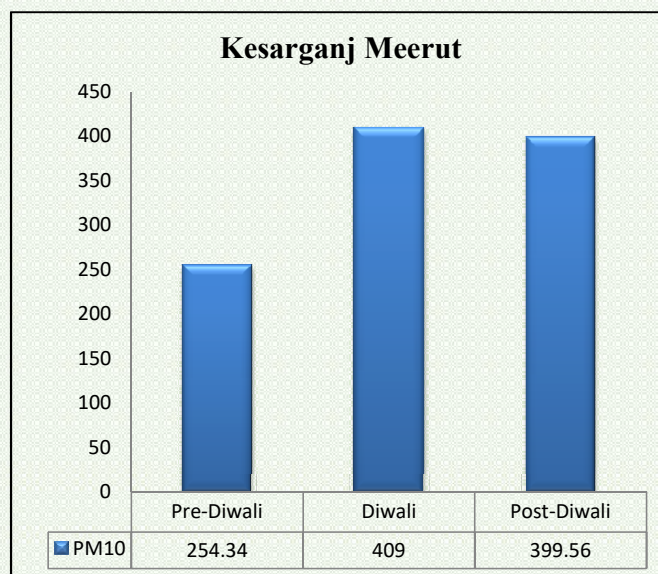
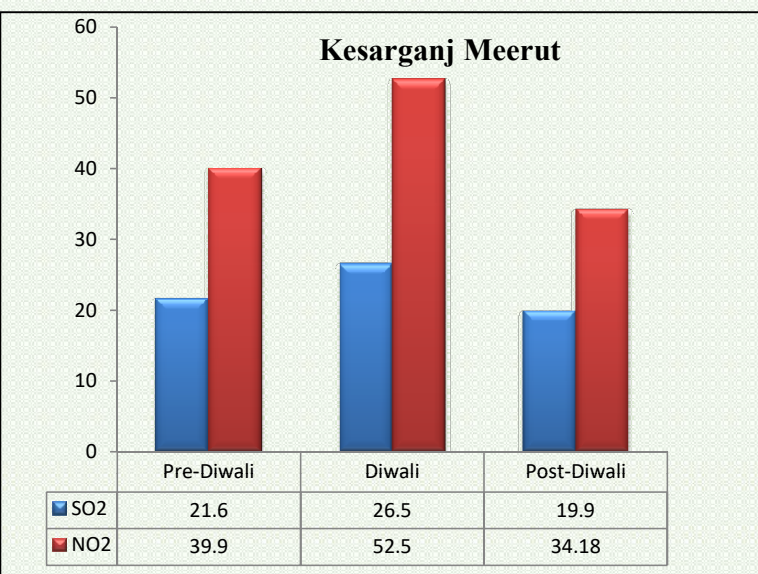
- Average noise level has decreased during daytime in Muzaffarnagar & Kanpur as compared to Pre-Diwali.

## Comparative analysis of Noise level in Agra & Mathura(2021)



- Average noise level has increased during night in Agra & Mathura as compared to Pre-Diwali.

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Kesarganj Meerut (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during Pre-Diwali (-18.5 %) and post Diwali (-24.9%) as compared to Diwali

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during Pre-Diwali (-24.0%) and post Diwali (-53.60 %) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during post Diwali (-2.36 %) and pre-Diwali (37.81 %) as compared to Diwali.

**Metal:** A decrease was observed in Pb during Diwali (-516%) as compared to pre-Diwali. Ni & As were found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

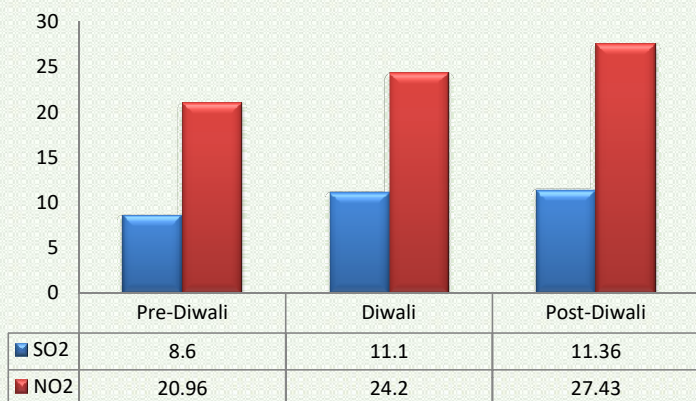
PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

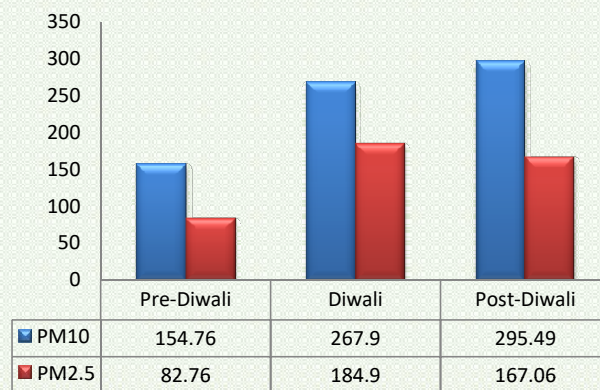
Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in New Mandi Muzzafarnagar (2021)

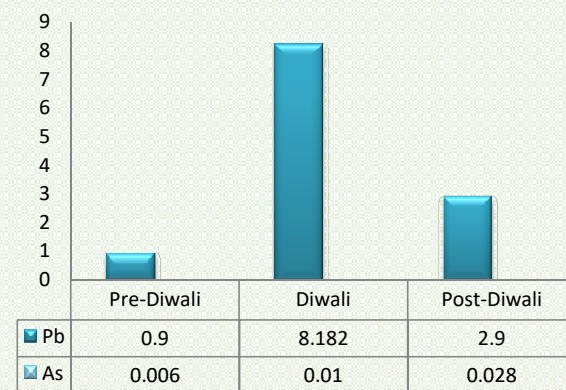
**New Mandi Muzzafarnagar**



**New Mandi Muzaffarnagar**



**New Mandi Muzaffarnagar**



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during Pre-Diwali (-22.5 %) and increase in post Diwali (2.3%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during Pre-Diwali (-13.4%) and increase in post Diwali (13.34 %) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre Diwali (-42.2 %) and increase in post Diwali (10.3 %) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre- Diwali (-55.2%) & post Diwali (-9.6%) as compared to Diwali.

**Metal:** A decrease in Pb observed pre-Diwali (89%) and increase in post Diwali (64.5%) as compared to Diwali. In As metal, decrease was observed in pre-Diwali (-40%) & increase in post Diwali (180%) as compared to Diwali. Ni, Al & Ba were found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

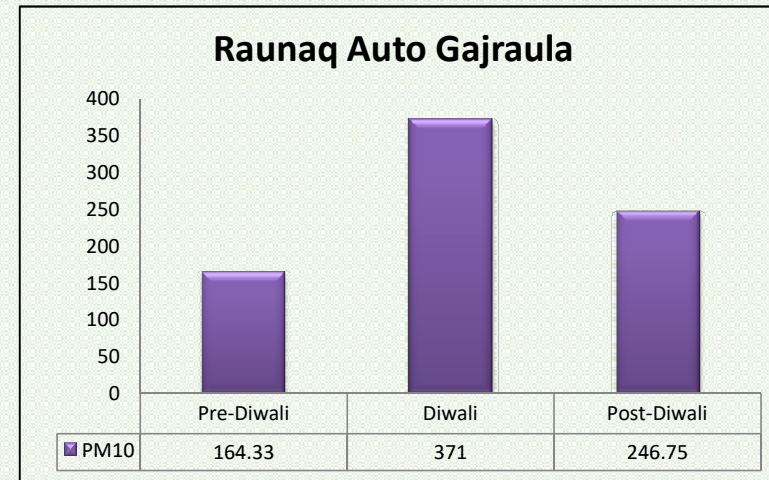
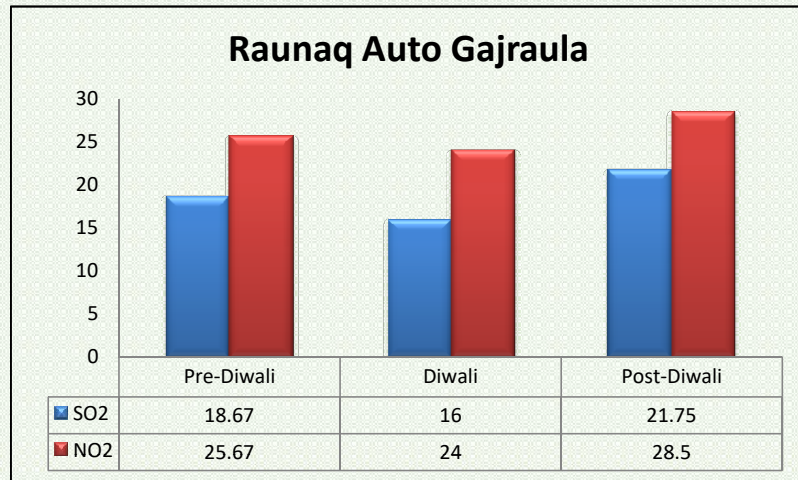
PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup>, Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>



## SO<sub>2</sub>, NO<sub>2</sub> , & PM<sub>10</sub> concentration (µg/m<sup>3</sup>) during Diwali in Raunaq Auto Gajraula (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during Diwali (-14.3 %) as compared to pre-Diwali (-26.4%) as compared to post Diwali.

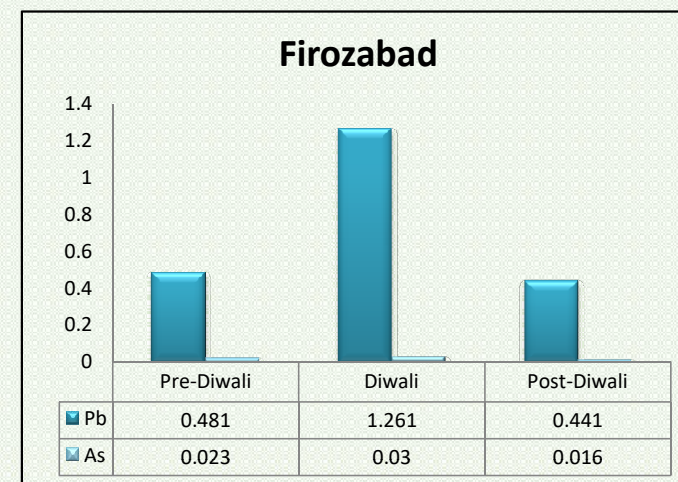
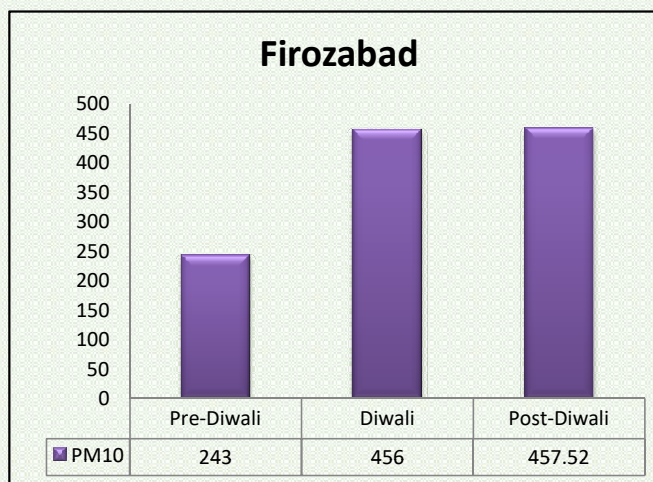
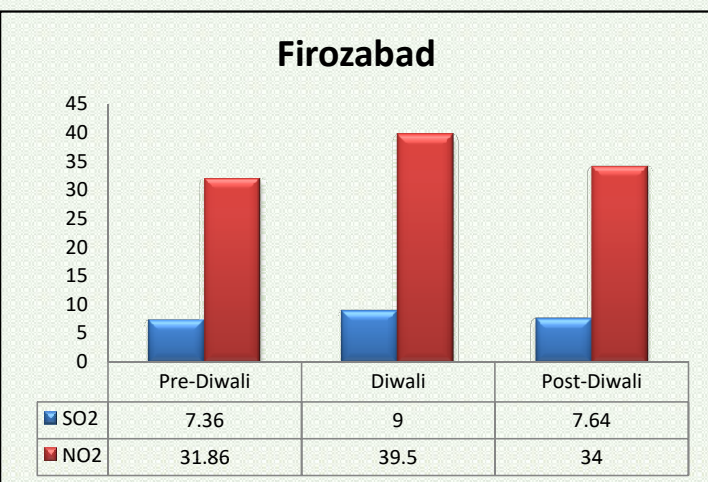
**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during Diwali (-6.5%) as compared to pre-Diwali and increase was observed during post-Diwali (18.8%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre Diwali (-55.7 %) and post Diwali (-33.5%) as compared to Diwali.

**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Firozabad(2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-18.2 %) & post-Diwali (-15.1%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-19.3%) & post-Diwali (13.9%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-46.7 %) and increase was observed in post Diwali (0.33%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-61.9%) & n post Diwali (-65.0%) as compared to Diwali. In As metal, decrease was observed in pre-Diwali (-23.3%) & post Diwali (-46.7%) as compared to Diwali. Ni was found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

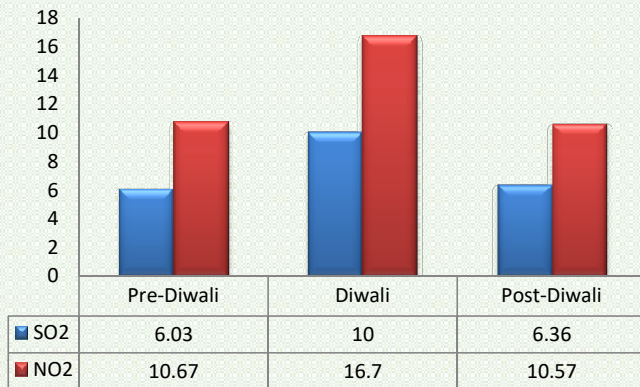
PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

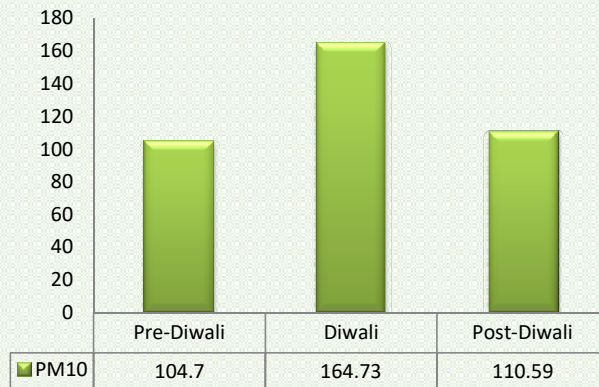
Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup> , Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Indira Nagar Colony, Raebareli (2021)

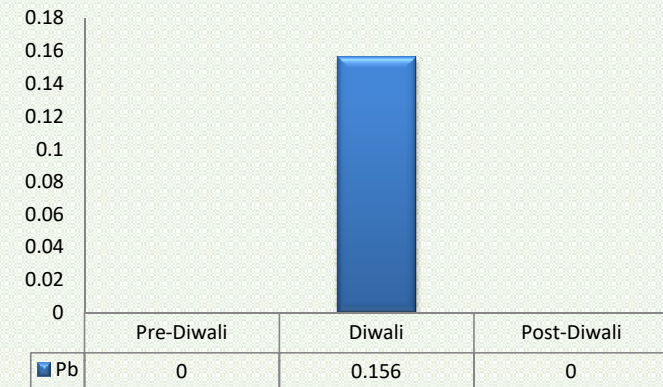
Indira Nagar Colony, Raebareli



Indira Nagar Colony, Raebareli



Indira Nagar Colony, Raebareli



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-39.7 %) & post-Diwali and (-36.4%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-36.1%) & post-Diwali (36.7%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-36.4 %) and post Diwali (32.9%) as compared to Diwali.

**Metal:** Pb was observed during Diwali (0.156 µg/m<sup>3</sup>) As & Ni were found ND (Not detected).

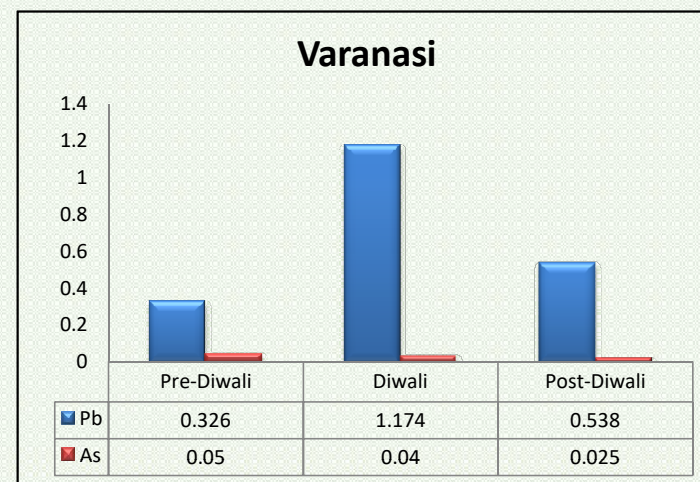
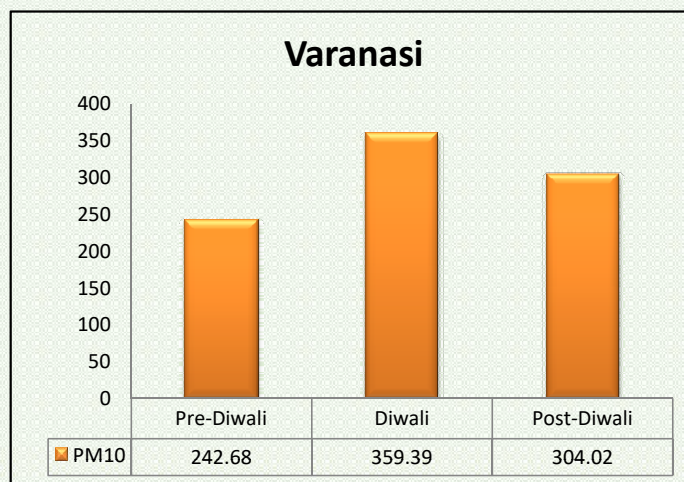
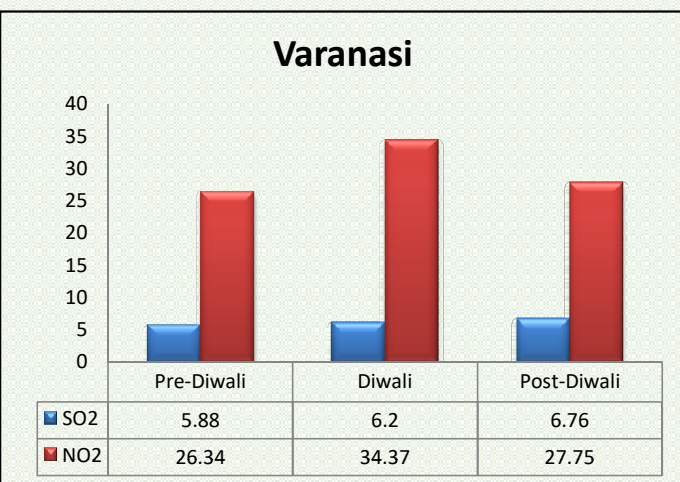
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Varanasi (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-5.2%) & increase in post-Diwali (9.0%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-23.4%) & post-Diwali (-19.3%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-32.5%) and post Diwali (-15.4) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-72.2%) & post Diwali (-54.2%) as compared to Diwali. In As metal, increase was observed in pre-Diwali (25%) & decrease was observed during post-Diwali (-37.5%) as compared to Diwali. Ni was found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

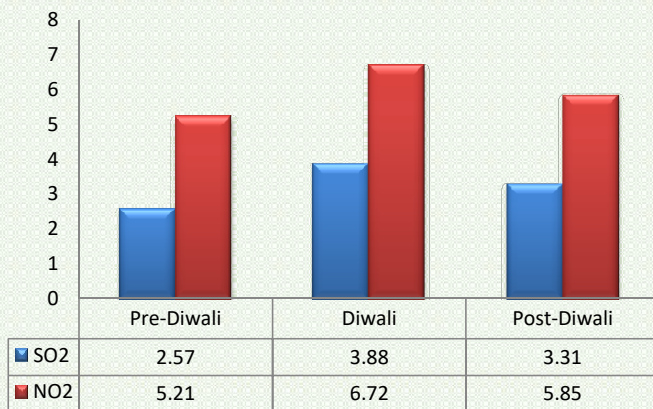
**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup>



## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Gorakhpur (2021)

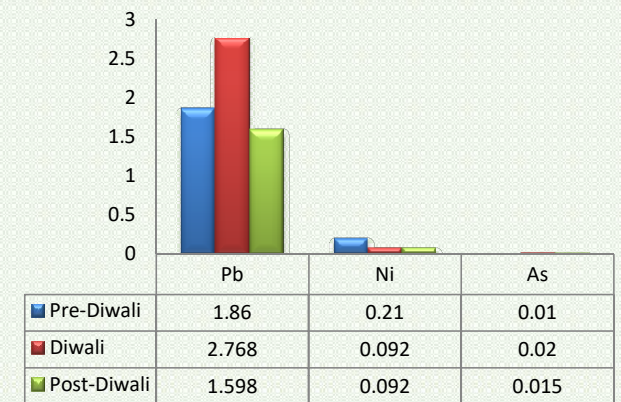
**Gorakhpur**



**Gorakhpur**



**Gorakhpur**



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-33.8%) & post-Diwali (-14.7%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-22.4%) & post-Diwali (-13.0%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-23.3%) and post Diwali (-8.8%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-32.8%) & post-Diwali (-42.3%) as compared to Diwali. In Ni metal, increase was observed in pre-Diwali (128.3%) as compared to Diwali. A decrease in Ni was observed during pre-Diwali (-50%) & post-Diwali (-25%) as compared to Diwali.

**National Ambient Air Quality standard (24-hour average) :**

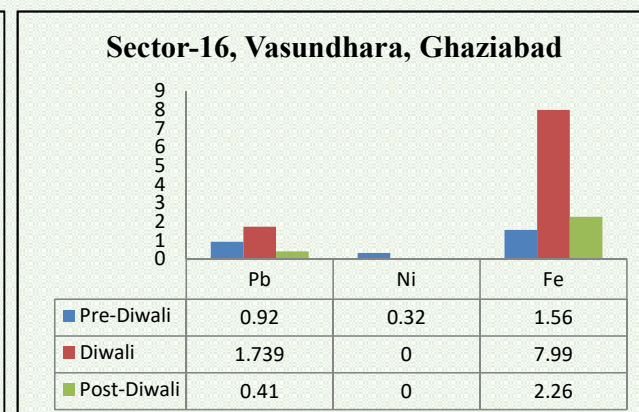
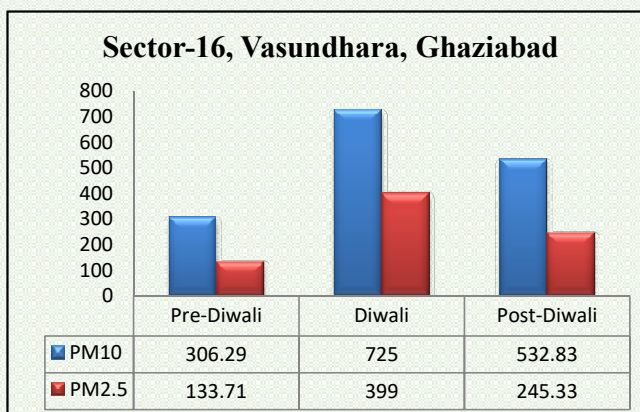
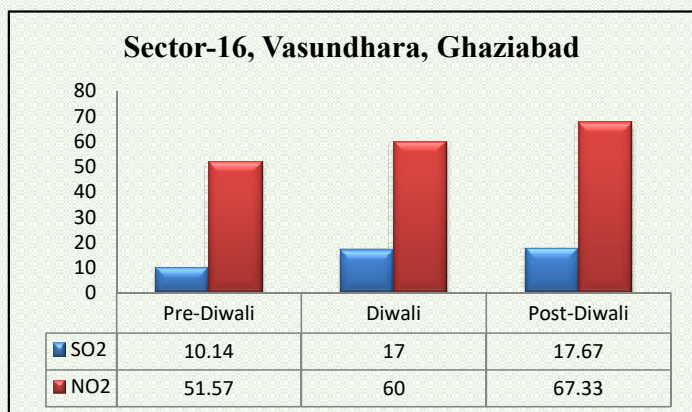
PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup>



## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Ghaziabad (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-40.4%) & increased in post-Diwali (4.0%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-14.1%) & increased in post-Diwali (12.2%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-57.8%) and post Diwali (-26.5%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-47.1%) & post-Diwali (-76.4%) as compared to Diwali. In Ni metal concentration was observed in pre-Diwali (0.32 µg/m<sup>3</sup>). A decrease in Fe was observed during pre-Diwali (-80.5%) & post-Diwali (-71.7%) as compared to Diwali. As, Al & Ba were found ND (Not detected).

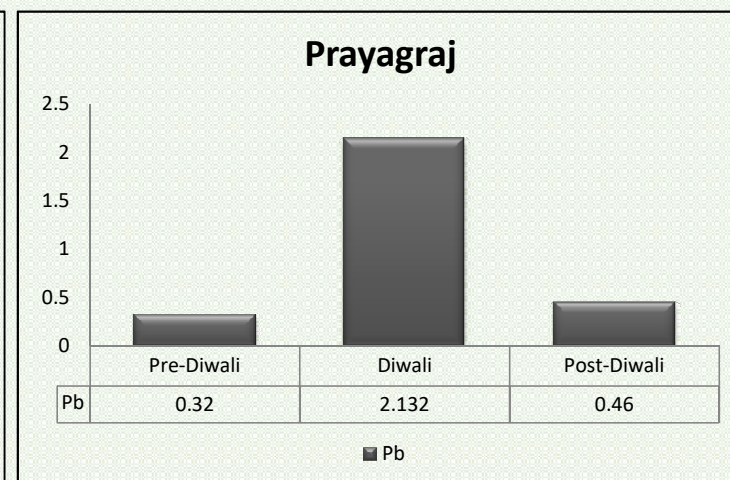
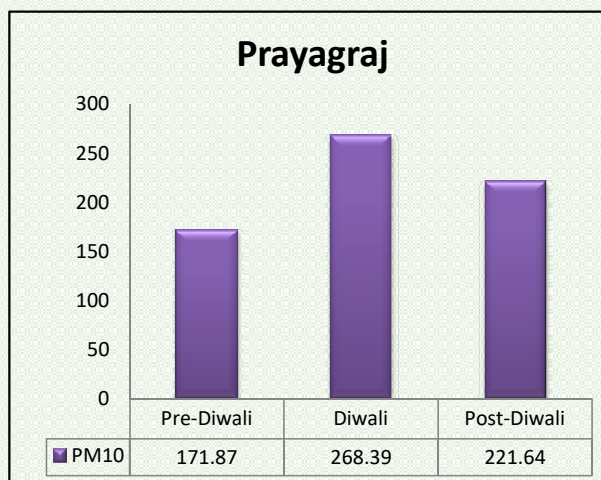
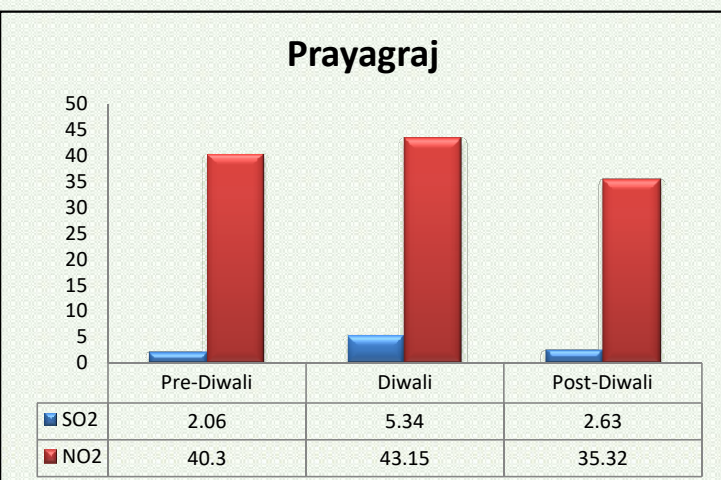
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup> , Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Prayagraj (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-61.4%) & post-Diwali (-50.7%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-6.6%) & post-Diwali (-18.1%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-36.0%) and post-Diwali (-17.4%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-85.0%) & post-Diwali (-78.4%) as compared to Diwali. Ni, & As were found ND (Not detected).

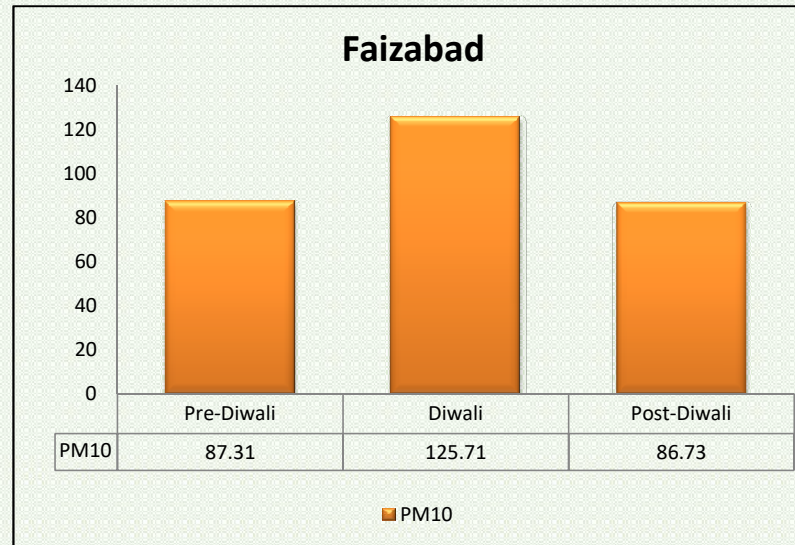
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni– 20 ng/m<sup>3</sup>, As– 6 ng/m<sup>3</sup>

## PM<sub>10</sub> concentration (µg/m<sup>3</sup>) during Diwali in Faizabad (2021)



**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-30.6%) and post-Diwali (-31.0%) as compared to Diwali.

**Metal:** Pb, Ni & As were found ND (not detected).

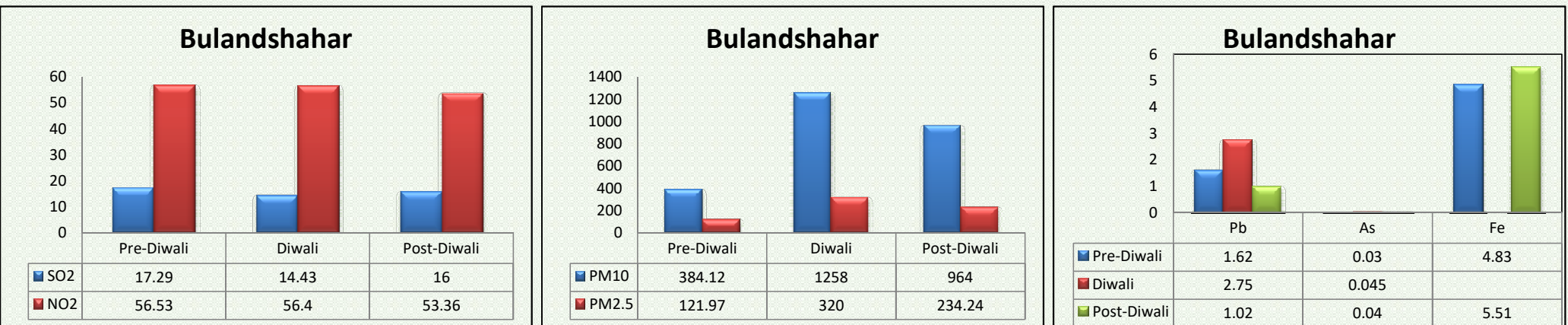
**National Ambient Air Quality standard (24-hour average) :**

**PM<sub>10</sub> – 100 µg/m<sup>3</sup>**

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

**Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup>**

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Bulandshahar (2021)



**SO<sub>2</sub>:** An increase in SO<sub>2</sub> was observed during pre-Diwali (19.8%) & post-Diwali (10.9%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during post-Diwali (-5.4%) & increased during pre-Diwali (0.2%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-69.5%) and post-Diwali (-23.4%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-61.9%) & post-Diwali (-26.8%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-41.0%) & post-Diwali (-63.0%) as compared to Diwali. In As metal, decreased in pre-Diwali (-33.3%) and post-Diwali (-11.1%) as compared to Diwali. The concentration of Fe were 4.83 & 5.51 µg/m<sup>3</sup> while it was not detected during Diwali. Ni, Al & Ba were found ND (not detected).

**National Ambient Air Quality standard (24-hour average) :**

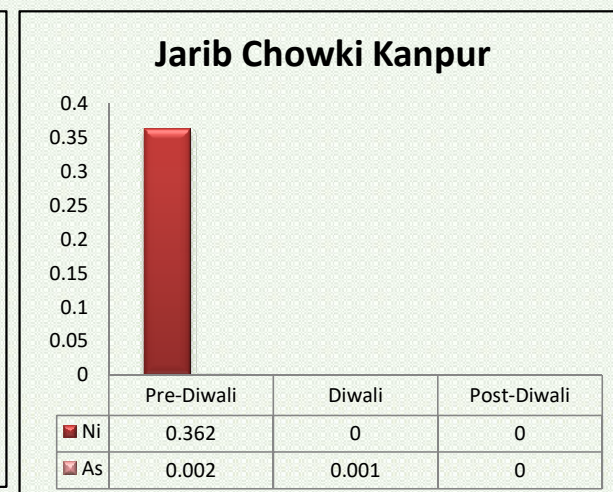
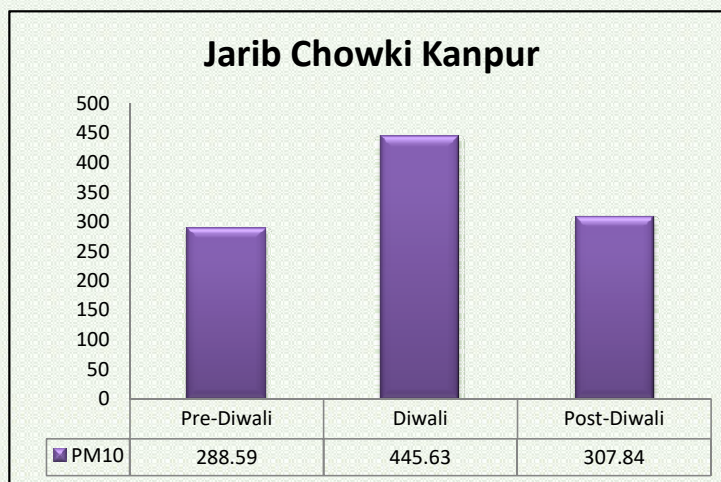
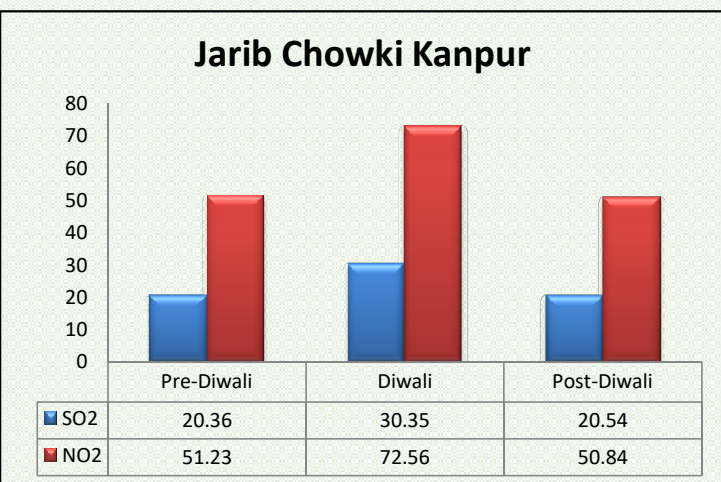
PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup> , Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>



## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Jarib Chowki, Kanpur (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-33.0%) & post-Diwali (-32.3%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-29.4%) & post-Diwali (30.0%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-69.5%) and post-Diwali (-23.4%) as compared to Diwali.

**Metal:** An decrease in As was observed during pre-Diwali (100%) as compared to Diwali. The Ni was observed during Diwali (0.362 µg/m<sup>3</sup>).

Pb was found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

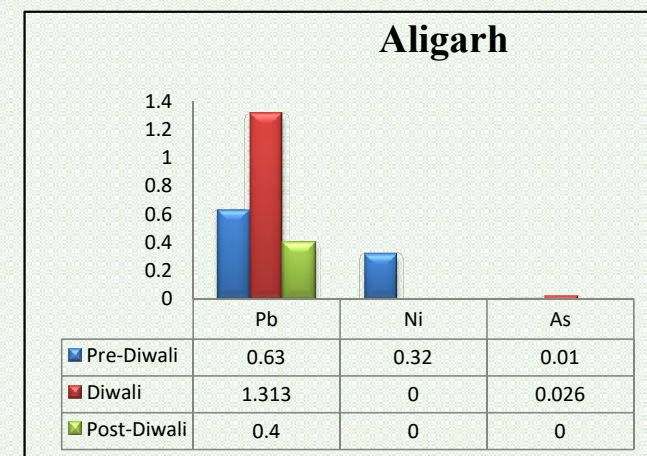
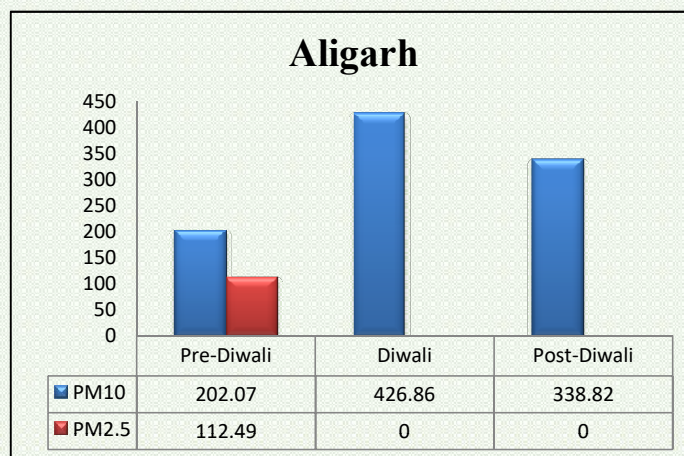
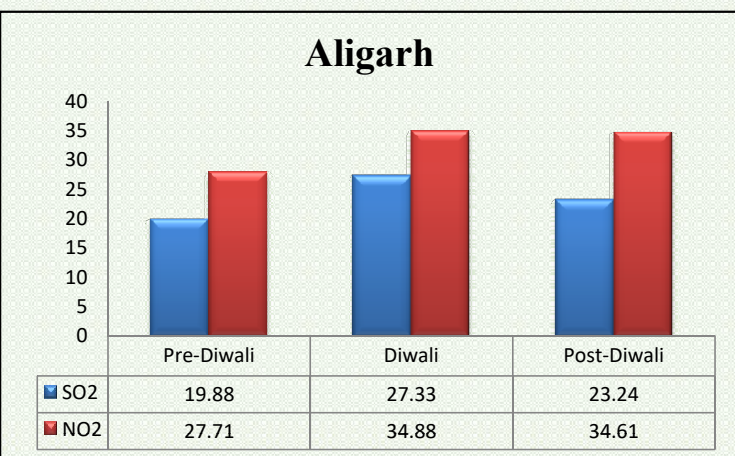
PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>, As- 6 ng/m<sup>3</sup>



## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Aligarh (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-27.3%) & post-Diwali (-15.0%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-20.6%) & post-Diwali (0.77%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-52.7%) and post-Diwali (-20.6%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-37.8%) & post-Diwali (-60.5%) as compared to Diwali. The Ni was observed during pre-Diwali (0.32 µg/m<sup>3</sup>). The As concentration were 0.01 & 0.026 µg/m<sup>3</sup> during pre-Diwali & Diwali, respectively. Fe, Al & Ba were found ND (Not detected).

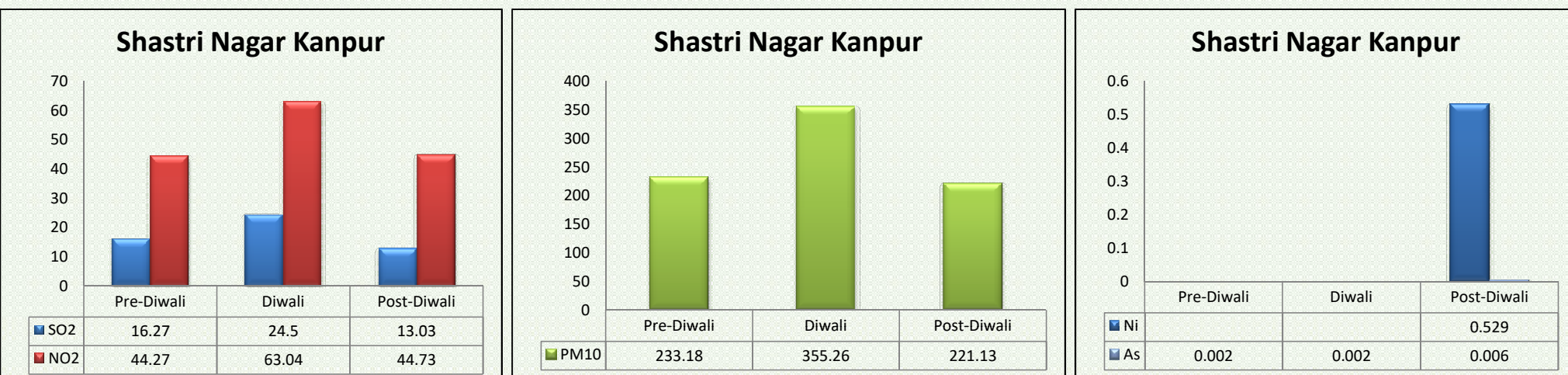
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup> , Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Shastri Nagar, Kanpur (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-33.6%)& post-Diwali (-46.9%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-29.8%) & post-Diwali (-29.0%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-34.4%) and post-Diwali (-37.8%) as compared to Diwali.

**Metal:** A decrease in As was observed during post-Diwali (-200%) as compared to Diwali. The concentration of Ni was observed 0.529 µg/m<sup>3</sup> during post-Diwali. Pb was found ND (Not detected).

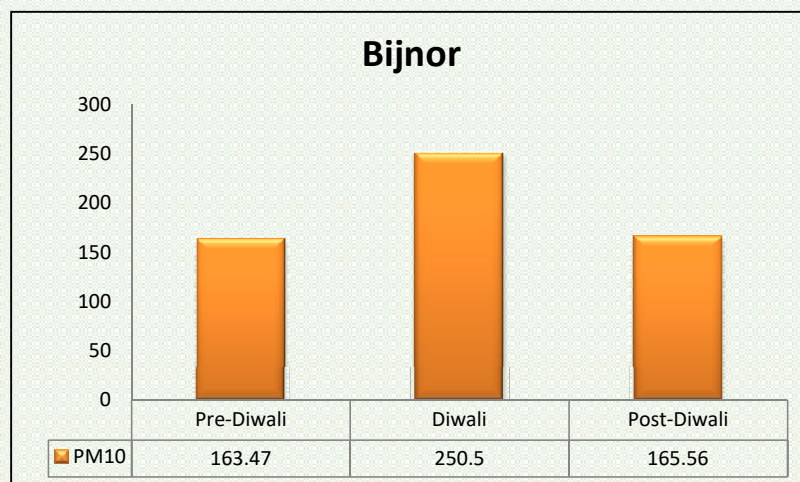
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup>· As- 6 ng/m<sup>3</sup>

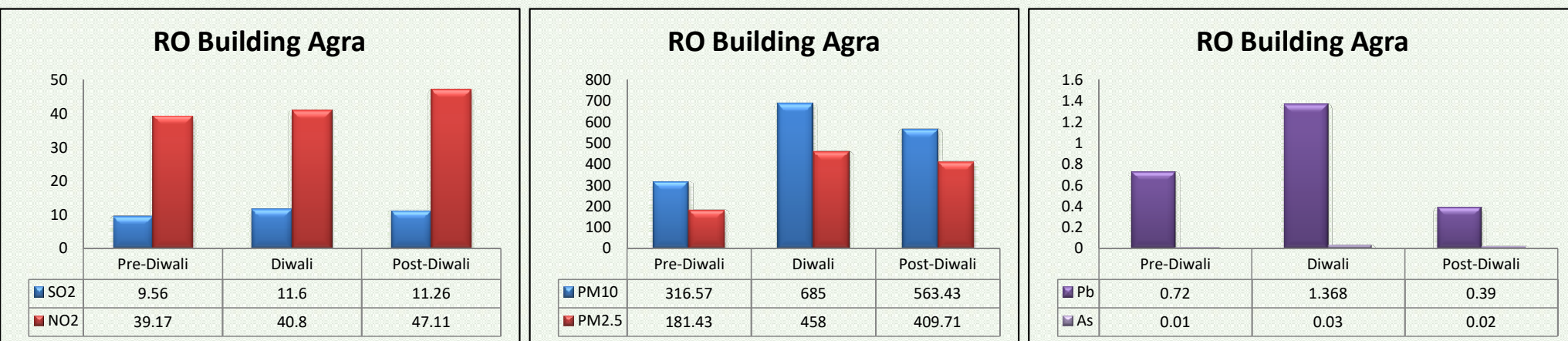
## PM<sub>10</sub> concentration (µg/m<sup>3</sup>) during Diwali in Bijnor (2021)



**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-34.8%) and post-Diwali (-34.0%) as compared to Diwali.

**National Ambient Air Quality standard (24-hour average) :**  
**PM<sub>10</sub> – 100 µg/m<sup>3</sup>;**

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in RO Building Agra (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-17.6%) & post-Diwali (-3.0%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-4.0%) & post-Diwali (-15.5%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-53.8%) and post-Diwali (-17.8%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-61.9%) & post-Diwali (-10.5%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during post-Diwali (-71.5%) & increased in pre-Diwali (-47.4%) as compared to Diwali. A decrease in As was observed during pre-Diwali (-66.7%) & post-Diwali (-33.3%) as compared to Diwali. Fe, Ni, Al & Ba were found ND (Not detected).

**National Ambient Air Quality standard (24-hour average) :**

PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

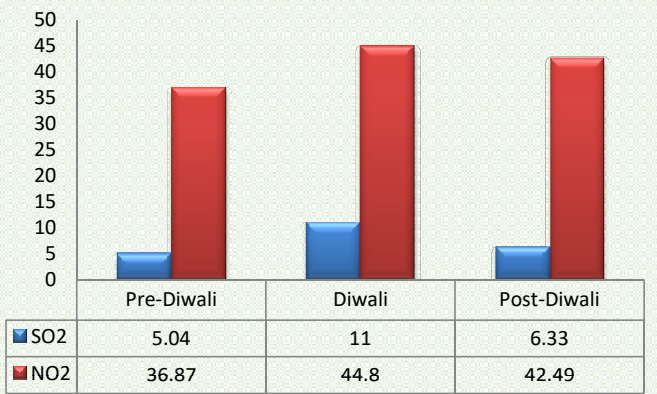
**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba – 4 µg/m<sup>3</sup>, Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

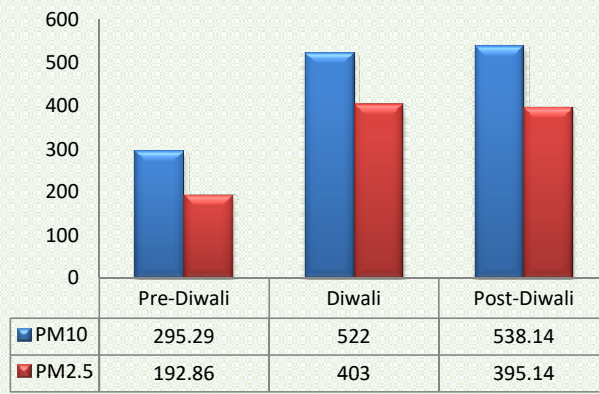


## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Ind. Area Agra (2021)

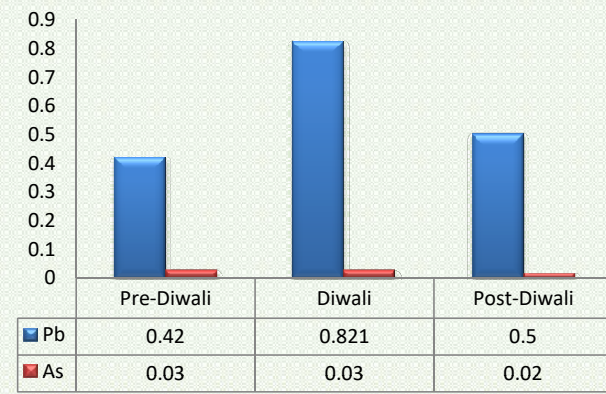
Ind. Area, Nunhai Agra



Ind. Area Nunhai Agra



Ind. Area Nunhai Agra



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-54.2%) & post-Diwali (-42.5%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-17.7%) & post-Diwali (-5.2%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-43.4%) and increased during post-Diwali (3.1%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-52.1%) & post-Diwali (-2.0%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-48.8%) & post-Diwali (-39.1%) as compared to Diwali. A decrease in As was observed during post-Diwali (-33.3%) & post-Diwali (-33.3%) as compared to Diwali. Fe, Ni, Al & Ba were found ND (Not detected).

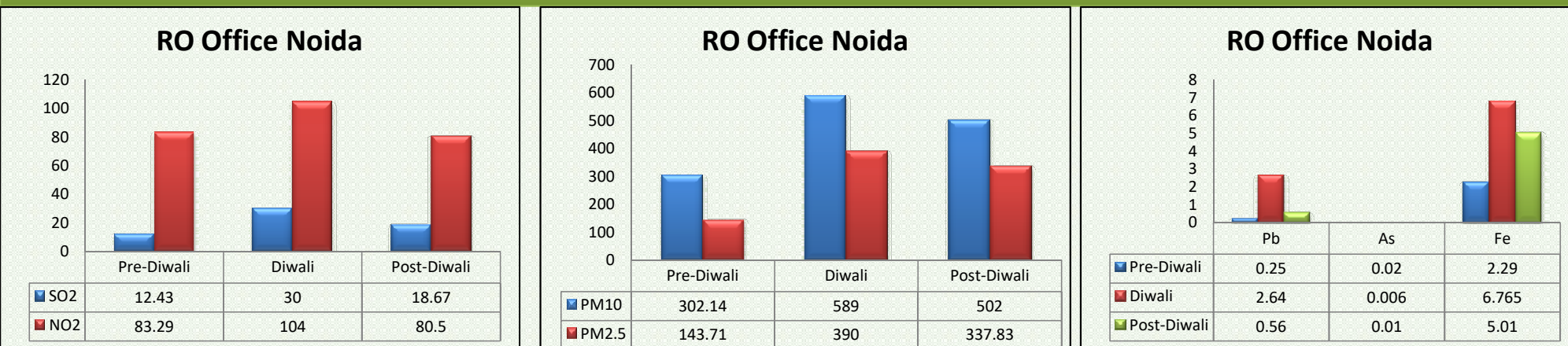
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup>, Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in RO Office Noida (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-58.6%) & post-Diwali (-37.8%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-20.0%) & post-Diwali (-22.6%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-48.7%) and post-Diwali (-14.8%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-63.2%) & post-Diwali (-13.4%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-90.5%) & post-Diwali (-78.8%) as compared to Diwali. An increase in As was observed during pre-Diwali (233.3%) & post-Diwali (66.7%) as compared to Diwali. Ni concentration was 0.12 µg/m<sup>3</sup> during pre-Diwali. Al & Ba were found ND (Not detected).

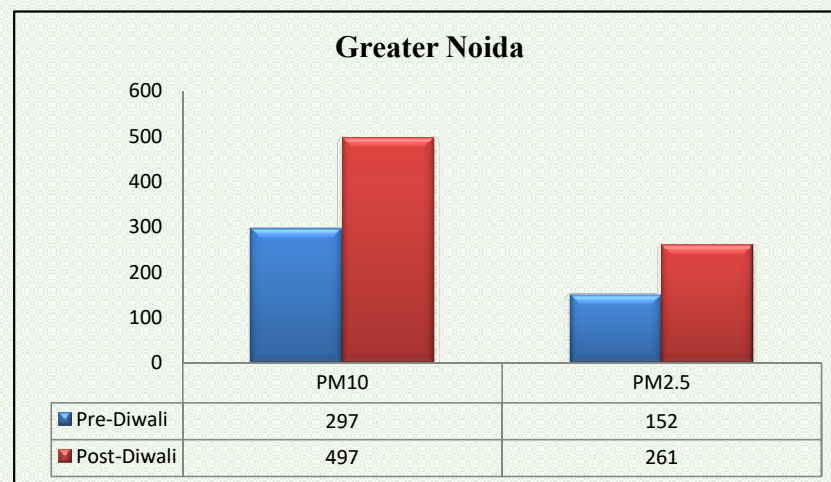
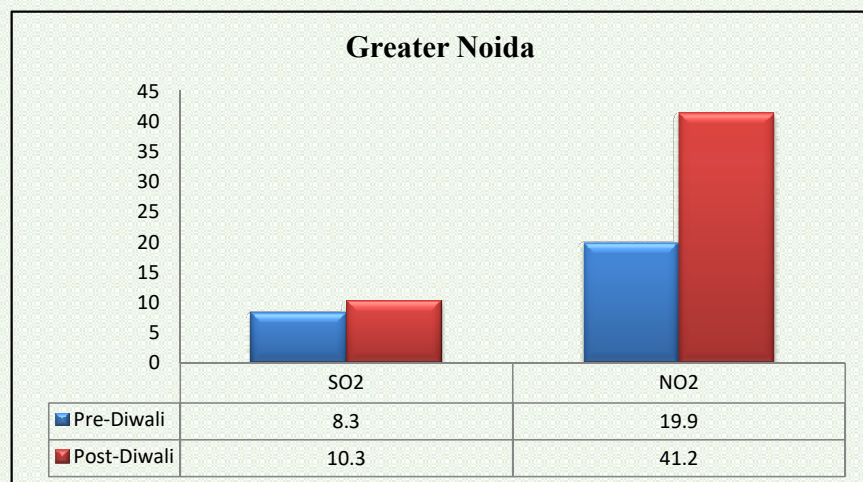
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup>, Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> & PM<sub>2.5</sub> concentration (µg/m<sup>3</sup>) during Diwali in Greater Noida (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-19.4 %) as compared to post-Diwali.

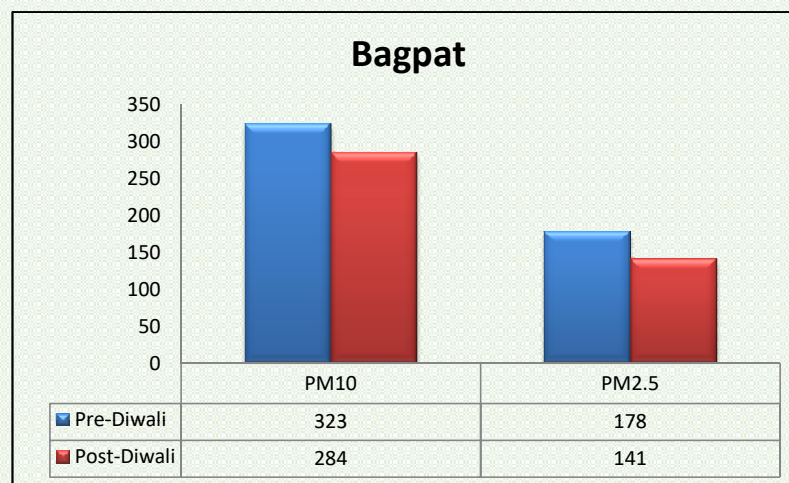
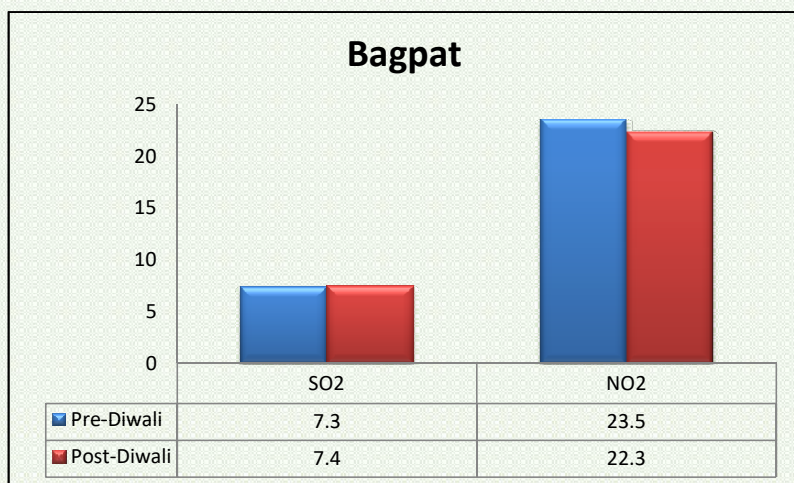
**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-51.7%) as compared to post-Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-40.2%) as compared to post-Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre- Diwali (-41.8%) as compared to post-Diwali.

**National Ambient Air Quality standard (24-hour average) :**  
 PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, & PM<sub>2.5</sub> concentration (µg/m<sup>3</sup>) during Diwali in Bagpat(2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-1.4%) as compared to post-Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during post-Diwali (-5.1%) as compared to pre-Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during post-Diwali (-12.1%) as compared to pre-Diwali.

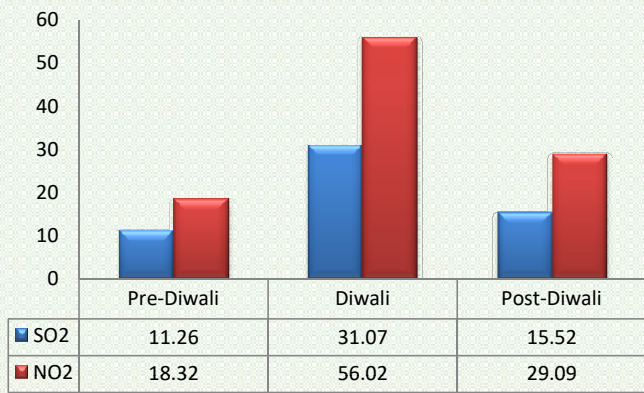
**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during post-Diwali (-20.8%) as compared to pre-Diwali.

**National Ambient Air Quality standard (24-hour average) :**  
 PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

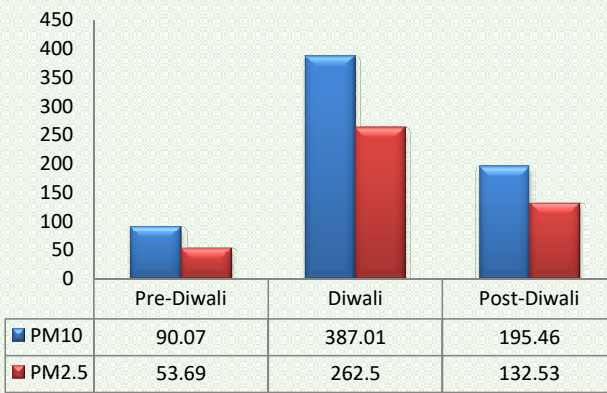


## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Bareilly (2021)

**Bareilly**



**Bareilly**



**Bareilly**



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-63.8%) & post-Diwali (-50.0%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-67.3%) & post-Diwali (-48.1%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-76.7%) and post-Diwali (-49.5%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-79.5%) & post-Diwali (-49.5%) as compared to Diwali.

**Metal:** A decrease in As was observed during post-Diwali (-56.5%) as compared to Diwali. Pb, Fe, Ni, Al & Ba were found ND (not detected).

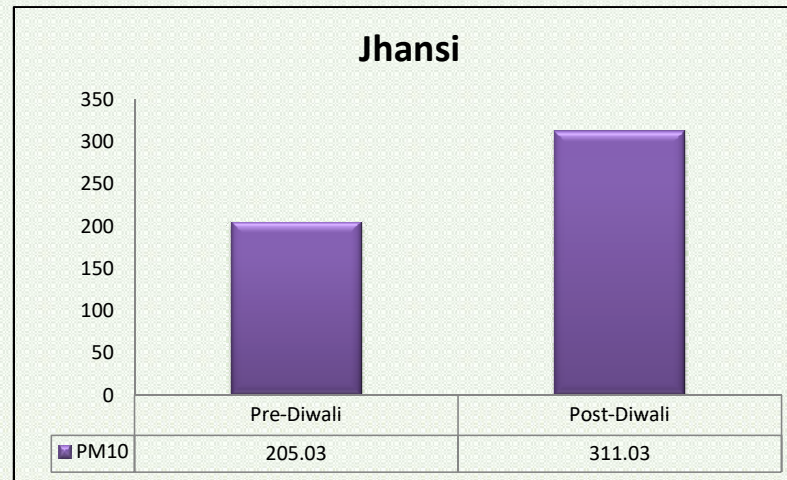
**National Ambient Air Quality standard (24-hour average) :**

PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup>, Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

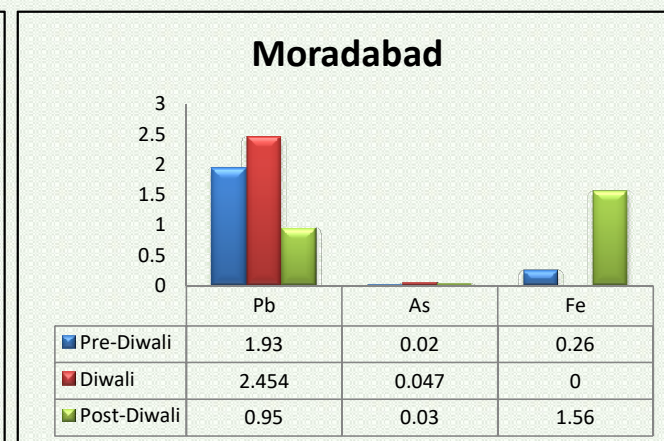
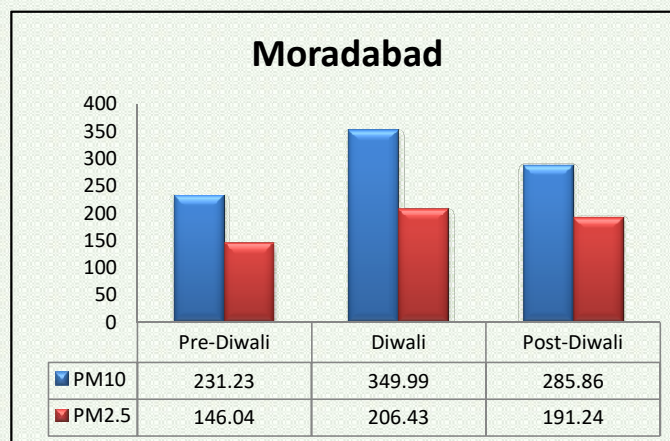
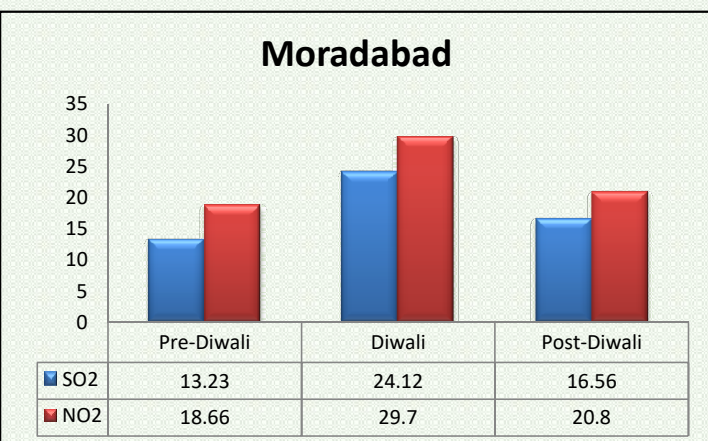
## PM<sub>10</sub> concentration (µg/m<sup>3</sup>) during Diwali in Jhansi (2021)



**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during post-Diwali (-34.1%) as compared to pre-Diwali.

**National Ambient Air Quality standard (24-hour average) :**  
PM<sub>10</sub> – 100 µg/m<sup>3</sup>;

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Moradabad (2021)



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-45.1%) & post-Diwali (-31.3%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-37.2%) & post-Diwali (-30.0%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-34.0%) and post-Diwali (-18.3%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-29.3%) & post-Diwali (-7.4%) as compared to Diwali.

**Metal:** A decrease in Pb was observed during pre-Diwali (-21.4%) & post-Diwali (-61.3%) as compared to Diwali. A decrease in As was observed during pre-Diwali (-57.4%) & post-Diwali (-36.2%) as compared to Diwali. In Fe metal, decreased concentration was observed during pre-Diwali (-83.3%) as compared to post-Diwali. Ni, Al & Ba were found ND (not detected).

**National Ambient Air Quality standard (24-hour average) :**

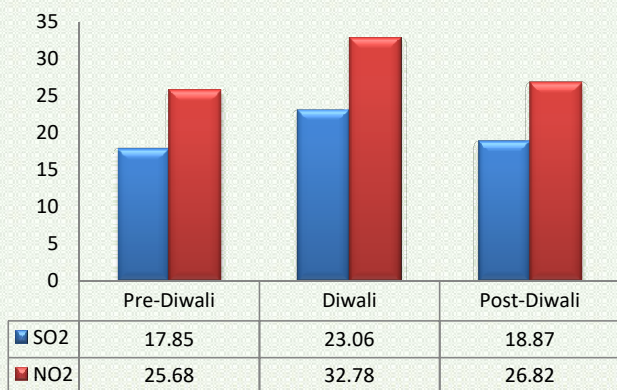
PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

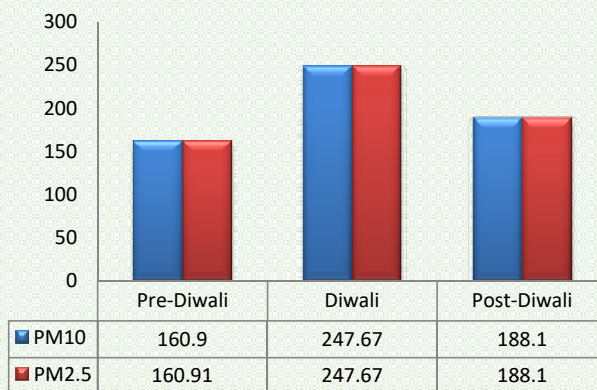
Pb– 1.0 µg/m<sup>3</sup> Ni- 20 ng/m<sup>3</sup> As- 6 ng/m<sup>3</sup> Ba - 4 µg/m<sup>3</sup> , Al – 40 µg/m<sup>3</sup> & Fe – 40 µg/m<sup>3</sup>

## SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> & metal concentration (µg/m<sup>3</sup>) during Diwali in Sonbhadra (2021)

**Sonbhadra**



**Sonbhadra**



**Sonbhadra**



**SO<sub>2</sub>:** A decrease in SO<sub>2</sub> was observed during pre-Diwali (-22.6%) & post-Diwali (-18.2%) as compared to Diwali.

**NO<sub>2</sub>:** A decrease in NO<sub>2</sub> was observed during pre-Diwali (-21.7%) & post-Diwali (-18.2%) as compared to Diwali.

**PM<sub>10</sub>:** A decrease in PM<sub>10</sub> was observed during pre-Diwali (-35.0%) and post-Diwali (-24.1%) as compared to Diwali.

**PM<sub>2.5</sub>:** A decrease in PM<sub>2.5</sub> during pre-Diwali (-35.0%) & post-Diwali (-24.1%) as compared to Diwali.

**Metal:** The concentration of Pb was observed 0.29 µg/m<sup>3</sup> during pre-Diwali. Ni & As were found ND (not detected).

**National Ambient Air Quality standard (24-hour average) :**

PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>; PM<sub>10</sub> – 100 µg/m<sup>3</sup>; SO<sub>2</sub> – 80 µg/m<sup>3</sup> NO<sub>2</sub> – 80 µg/m<sup>3</sup>

**Standard Critical Ambient Air Quality Concentration Values CAAQCV (24-hour average)**

Pb– 1.0 µg/m<sup>3</sup> Ni– 20 ng/m<sup>3</sup>, As– 6 ng/m<sup>3</sup>





**THANK YOU!**