

# Report of Ambient Air Quality & Noise Levels during Diwali Festival (2019 & 2020)



# Air quality monitoring

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# Details of monitoring

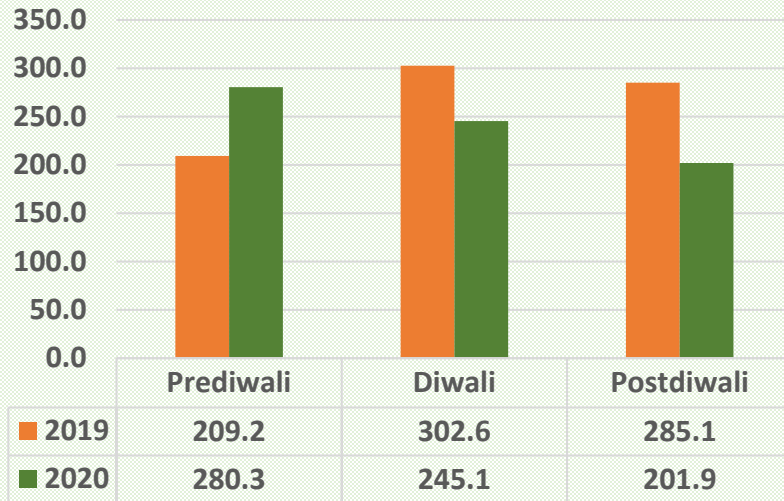
Name of the city	Name of the monitoring locations	Parameters monitored	Monitoring Agency
Lucknow	<ol style="list-style-type: none"> <li>1. Chowk</li> <li>2. Aliganj</li> <li>3. Talkatora</li> </ol>	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , Metals in PM <sub>10</sub> (Pb, Ni & As) and Metals in PM <sub>2.5</sub> (Ba, Al & Fe)	UPPCB (Central Lab) and ITRC (Ba & Al)
Kanpur	<ol style="list-style-type: none"> <li>1. Awas Vikas</li> <li>2. Jareeb Chowki</li> </ol>	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , Metals in PM <sub>2.5</sub> (Ba, Al & Fe)	UPPCB aand IIT Kanpur (Ba & Al)
Noida	<ol style="list-style-type: none"> <li>1. Golf Course</li> <li>2. Subros</li> </ol>	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , Metals in PM <sub>2.5</sub> (Ba & Al)	Outsourced agency
Greater Noida	<ol style="list-style-type: none"> <li>1. Holland</li> <li>2. Honda</li> </ol>		
Baghpat	<ol style="list-style-type: none"> <li>1. Sarvodaya Hospital</li> <li>2. Weavetex</li> </ol>		
Ghaziabad	<ol style="list-style-type: none"> <li>1. Khora</li> <li>2. Vinoba bhawe Park</li> </ol>		
Muzaffarnagar	<ol style="list-style-type: none"> <li>1. Lekhpal bhawan</li> <li>2. Sahara Parivar</li> </ol>		

# Details of monitoring

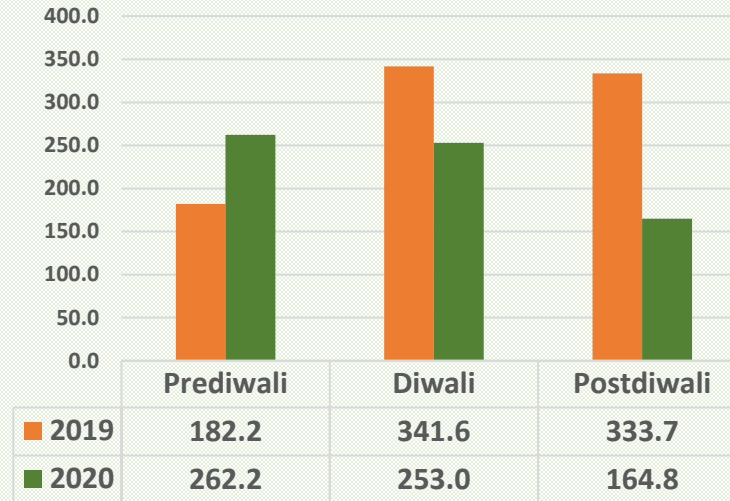
Name of the city	Name of the monitoring locations	Parameters monitored	Monitoring Agency
Agra	1. RO office Bodla 2. IA Nunhai	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> & NO <sub>2</sub>	RO Office UPPCB
Jhansi	1. Manik Chowk 2. Veerangana Nagar	PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>2</sub>	RO Office UPPCB
Gajraula	1. Indira Chowk 2. Raunaq Auto		RO Office UPPCB
Prayagraj	1. Laxmi Talkies 2. Bharat Yantra 3. Alopibagh 4. Rambagh 5. Johnstonganj		RO Office UPPCB

# PM<sub>10</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) during Diwali season in Lucknow (Central Lab) (2019-2020)

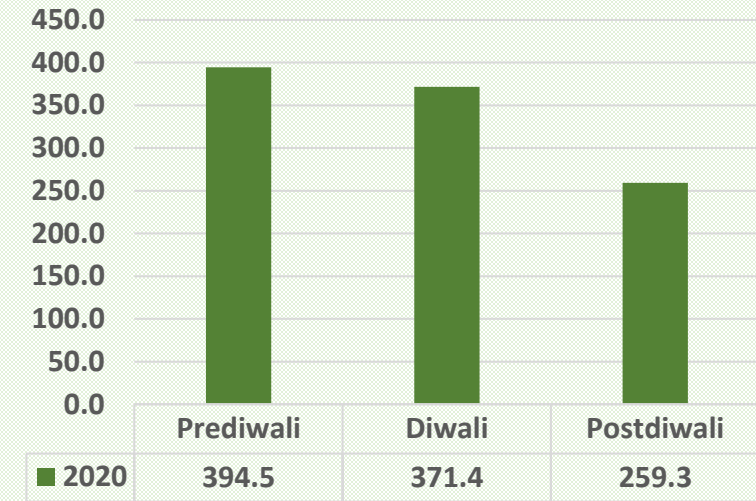
## Chowk



## Aliganj



## Talkatora



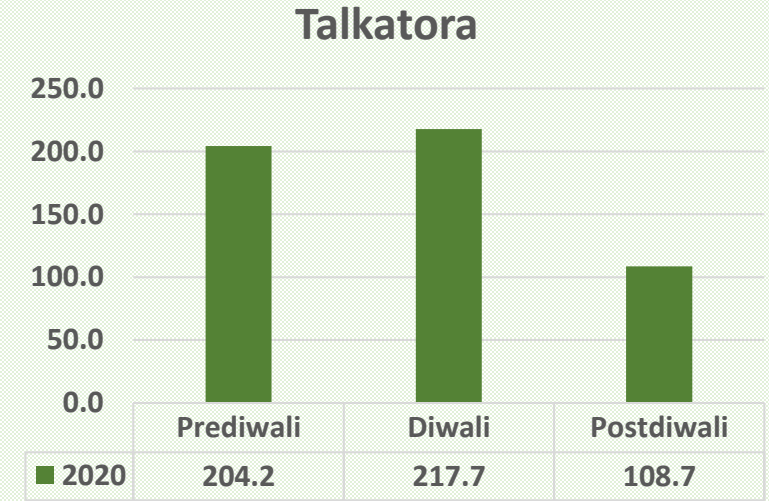
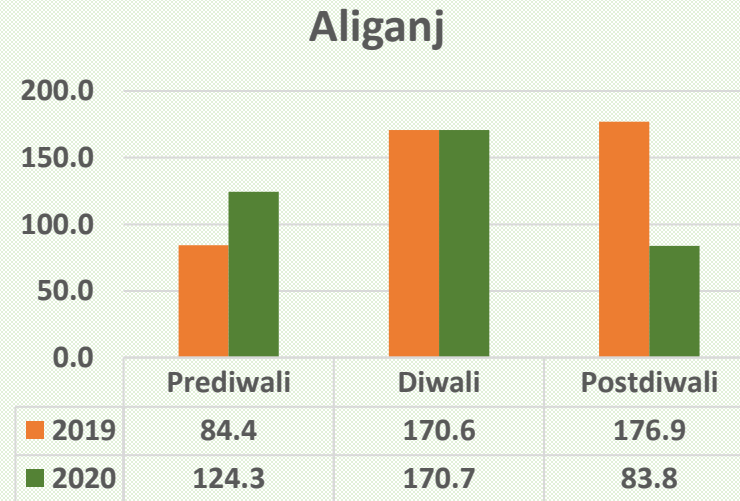
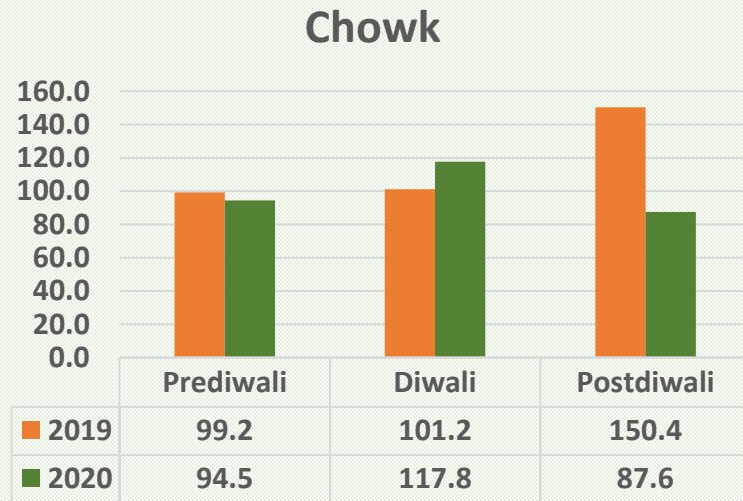
A decreasing trend in PM<sub>10</sub> concentration from pre-Diwali to post-Diwali during 2020.

Increase in pre-Diwali PM<sub>10</sub> concentration from 2019 to 2020

Decreasing trend from 2019 to 2020 in PM<sub>10</sub> concentration during post-Diwali

National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> - 100  $\mu\text{g}/\text{m}^3$

# PM<sub>2.5</sub> concentration (µg/m<sup>3</sup>) during Diwali season in Lucknow (Central Lab) (2019-2020)



**PM<sub>2.5</sub> concentration increased on the day of Diwali as compared to prediwali days decreasing again during post-Diwali.**

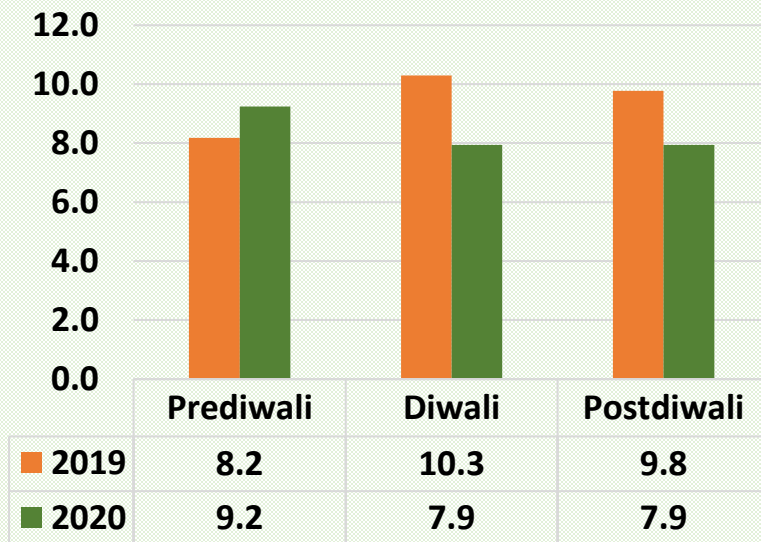
**Increase in prediwali PM<sub>2.5</sub> concentration from 2019 to 2020**

**Decreasing trend from 2019 to 2020 in PM<sub>2.5</sub> concentration during post-diwali**

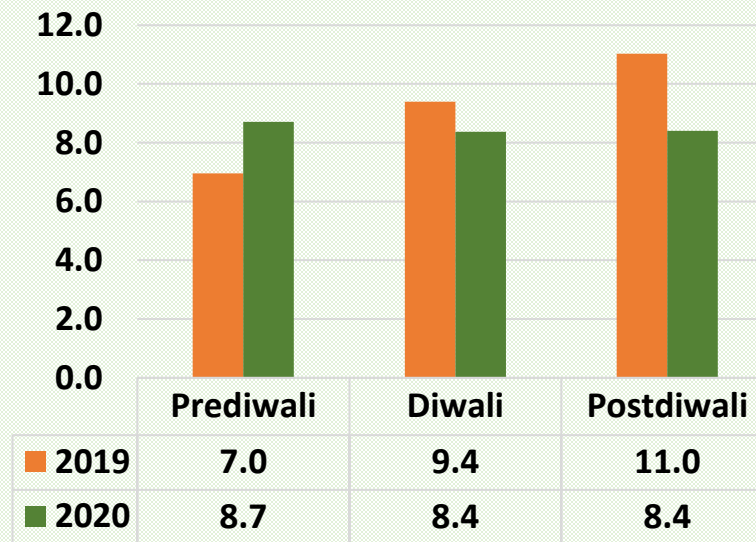
*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60 µg/m<sup>3</sup>*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) during Diwali season in Lucknow (Central Lab) (2019-2020)

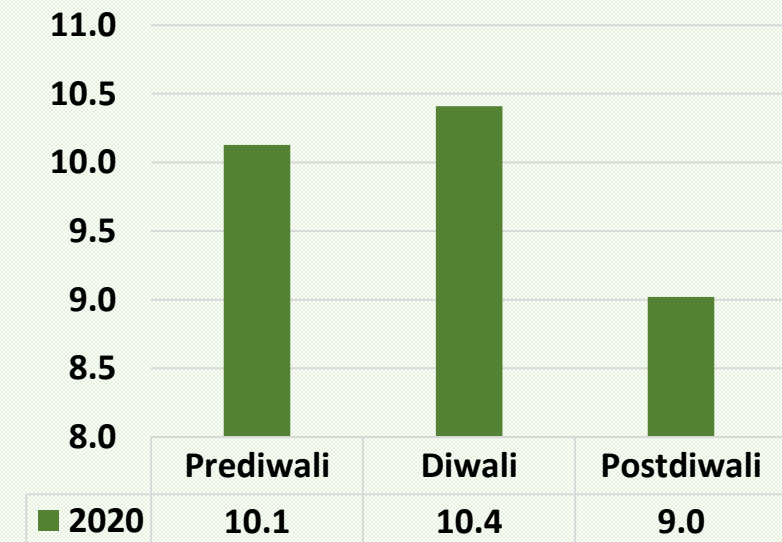
### Chowk



### Aliganj



### Talkatora



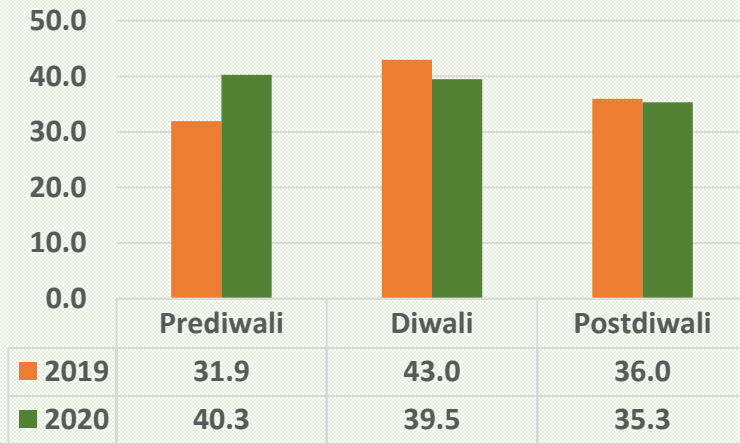
SO<sub>2</sub> concentration showed a decreasing trend from pre-diwali to post Diwali during 2020.

**Prediwali SO<sub>2</sub> concentration during 2020 is higher than 2019 while Diwali and post-Diwali SO<sub>2</sub> concentration is lower in 2020 as compared to 2019**

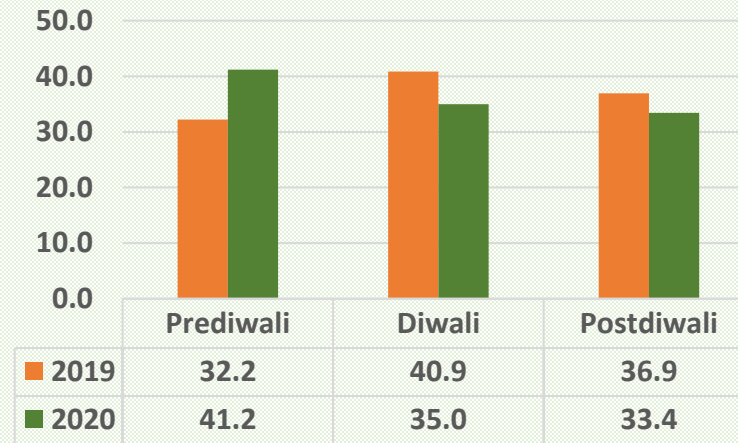
*National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) during Diwali season in Lucknow (Central Lab) (2019-2020)

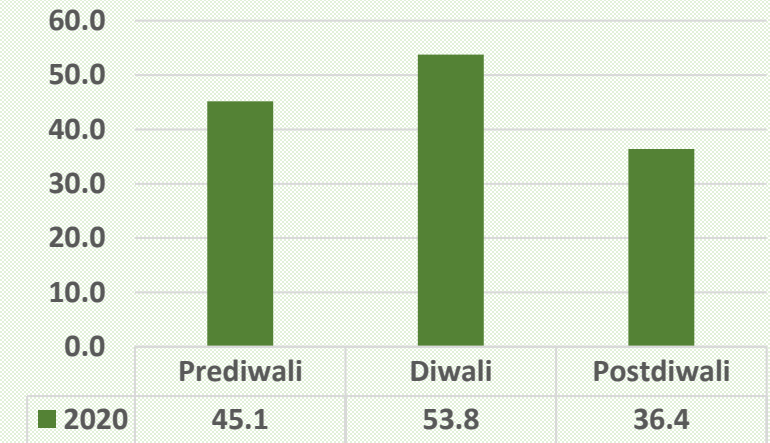
Chowk



Aliganj



Talkatora



NO<sub>2</sub> concentration showed a decreasing trend from pre-Diwali to post Diwali during 2020 at Chowk and Aliganj.

At Talkatora there was an increase on the day of Diwali which further decreased during Post-Diwali days.

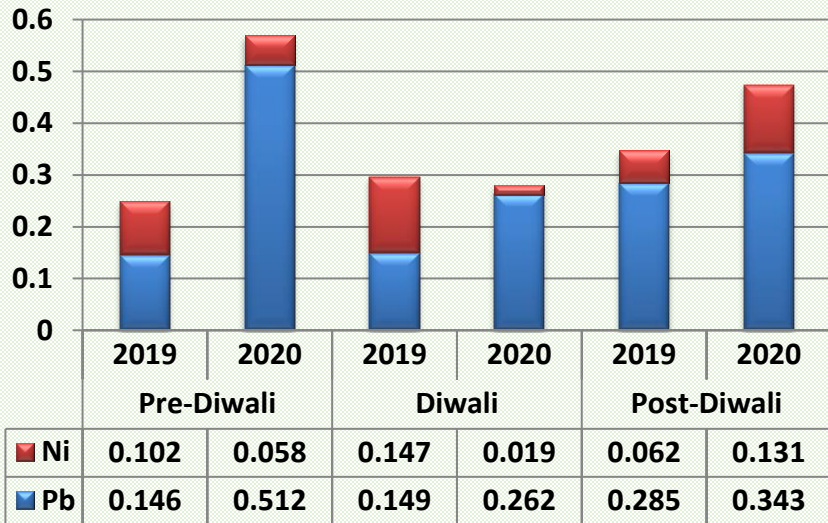
Pre-Diwali NO<sub>2</sub> concentration during 2020 is higher than 2019 while Diwali and Post-Diwali NO<sub>2</sub> concentration is lower in 2020 as compared to 2019

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

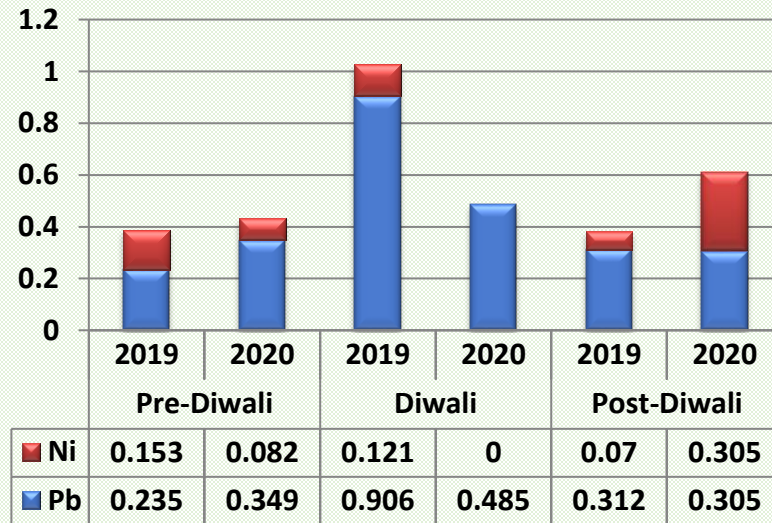


# Ni, Pb & As concentration ( $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{10}$ during Diwali season in Lucknow (Central Lab) (2019-2020)

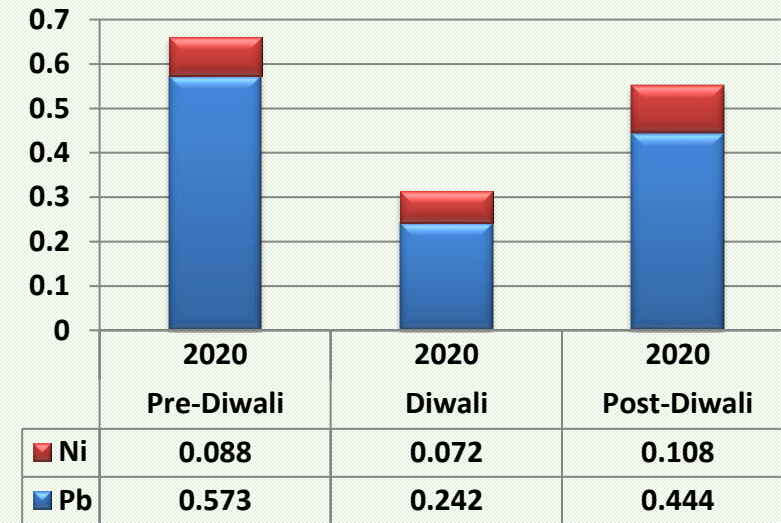
### Chowk



### Aliganj



### Talkatora



The concentration values for Ni and Pb were found within the limits during 2019 and 2020

Ni and Pb concentration values showed a decreasing trend in 2020 as compared to 2019

Arsenic (As) concentration values were below detection limit in 2019 as well as 2020

## Ba, Al and Fe concentration ( $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{2.5}$ during Diwali season in Lucknow (ITRC) (2019-2020)

The concentration values for Ba, Al and Fe is found below detection limits (BDL\*) , which is indicative of the reduction in bursting of firecrackers during this Diwali season in the Lucknow city. This can be attributed to the following factors :

- ✓ Public awareness & support
- ✓ Strict Ban on sale and use of firecrackers
- ✓ Strict compliance of directions of NGT order OA no. 249/2020 dated 05.11.2020 by the concerned departments like District administration, Uttar Pradesh Pollution Control Board (UPPCB), Police departments, Urban development department etc.

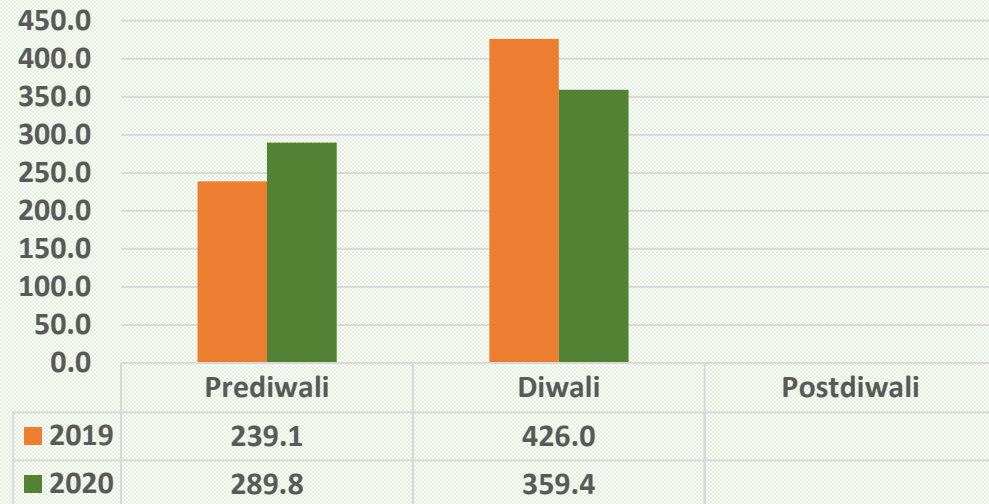
*\*BDL values (Source-ITRC) Ba - 20 ppt(parts per trillion) Al- 677 ppt Fe - 0.05 mg/L*

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

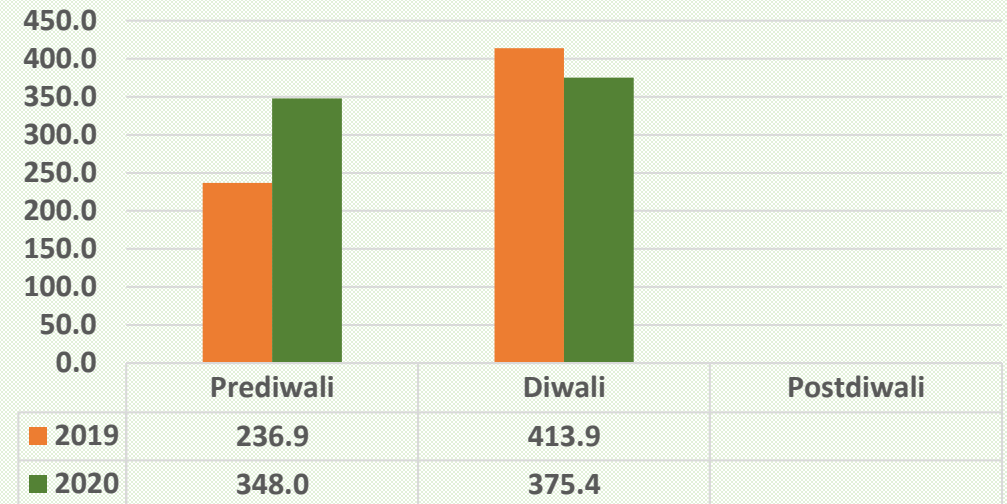
***Ba -  $4 \mu\text{g}/\text{m}^3$ , Al -  $40 \mu\text{g}/\text{m}^3$***

# PM<sub>10</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Kanpur (2019-2020)

Awass Vikas (PM10)



Jareeb Chowki (PM10)



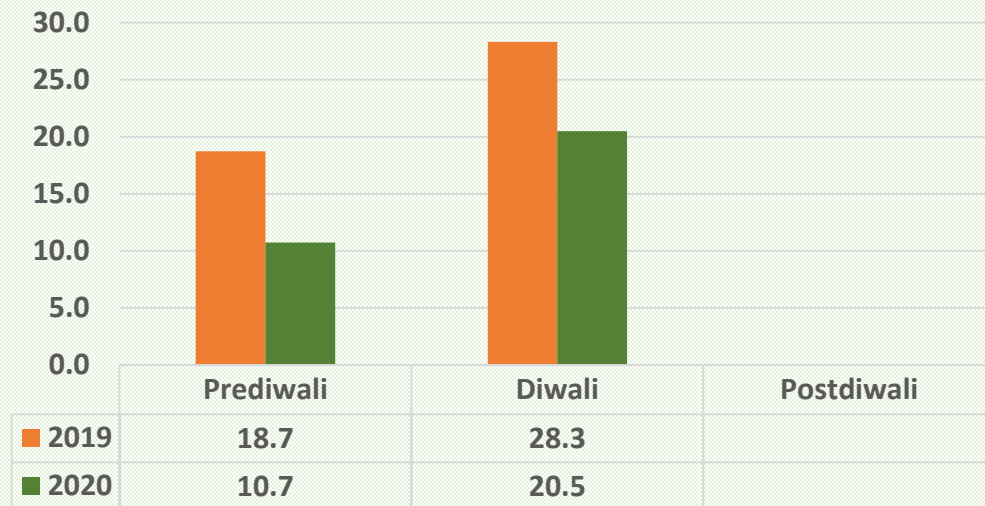
Decrease in PM<sub>10</sub> concentration values on the day of Diwali in 2020 from their respective values in 2019.

Increase in pre-Diwali PM<sub>10</sub> concentration from 2019 to 2020

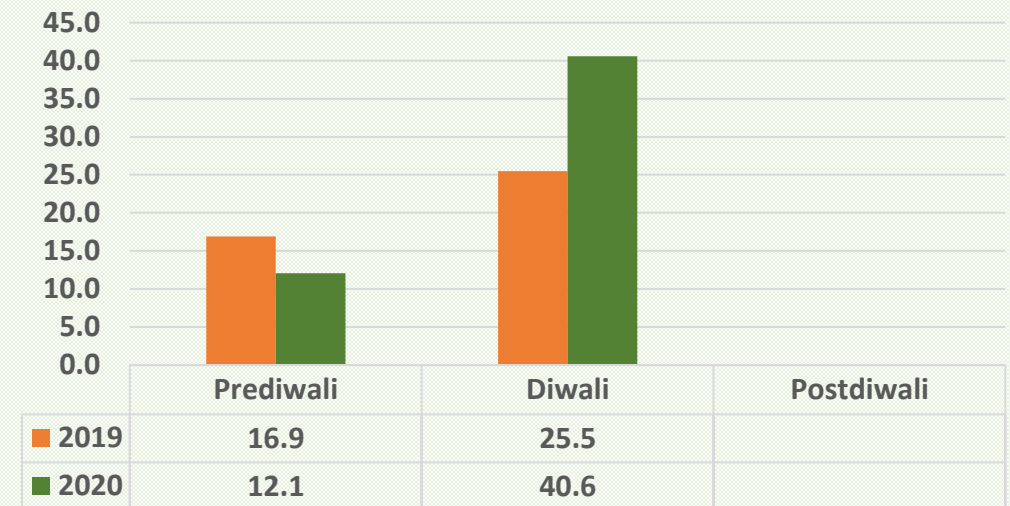
National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> - 100  $\mu\text{g}/\text{m}^3$

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Kanpur (2019-2020)

Awass Vikas (SO<sub>2</sub>)



Jareeb Chowki (SO<sub>2</sub>)



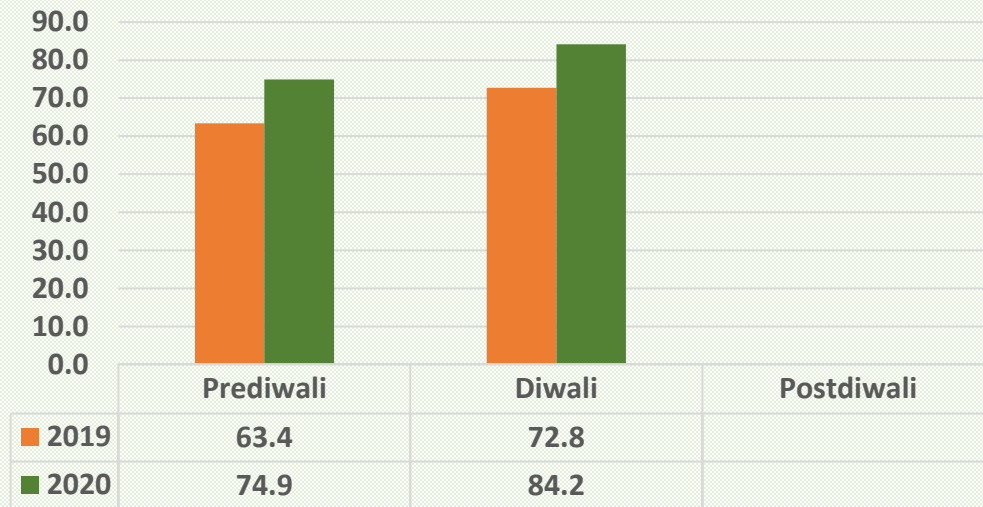
SO<sub>2</sub> concentration increased from pre-diwali to Diwali during 2020.

PreDiwali SO<sub>2</sub> concentration during 2020 is lesser than their respective values in 2019 at both the locations while Diwali concentration is higher at Jareeb Chowki in 2020 as compared to 2019

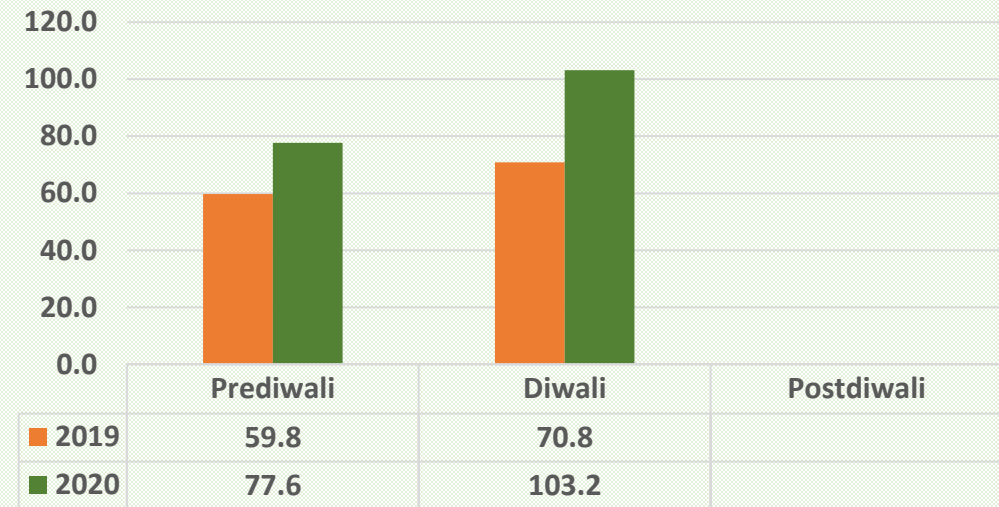
*National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Kanpur (2019-2020)

Awass Vikas (NO<sub>2</sub>)



Jareeb Chowki (NO<sub>2</sub>)

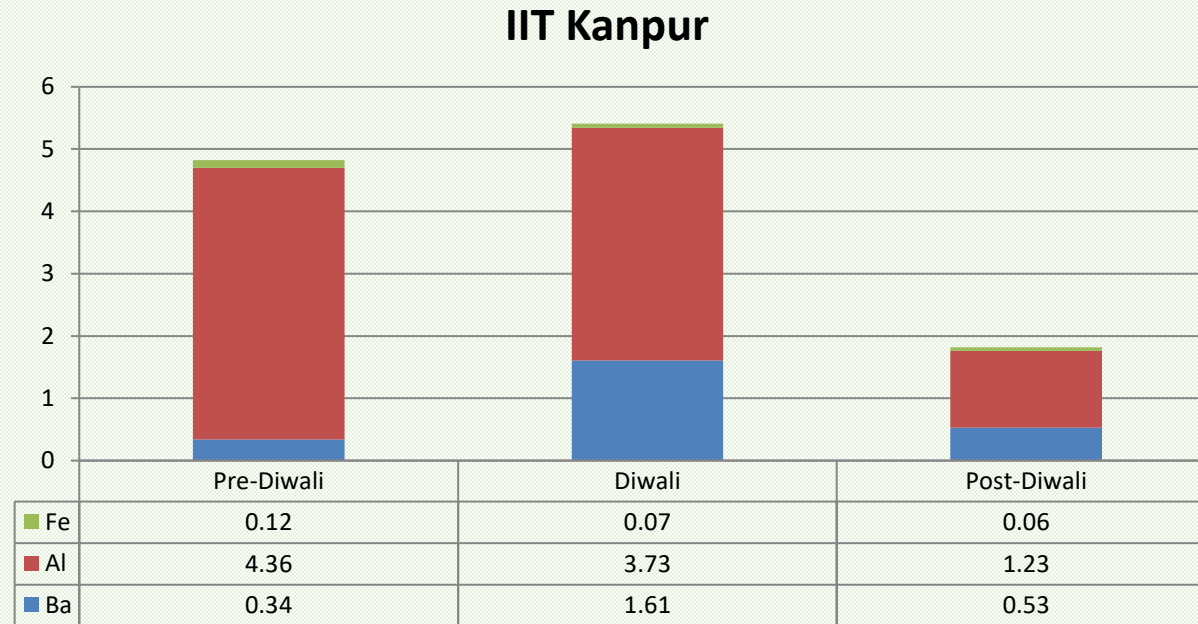


**NO<sub>2</sub> concentration showed an overall increase from pre-Diwali to post Diwali during 2020 at both the stations.**

**The concentration values of NO<sub>2</sub> are comparatively higher than the values in 2019**

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

# Contribution of elements Fe, Al & Ba (concentration in $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{2.5}$ during Diwali season(2020) in Kanpur



The concentrations of all the three ions (Fe, Al and Ba) were found well below the standard limits

There is a slight increase on the day of Diwali in overall concentration of metals on the day of Diwali which reduces back 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 -  $40 \mu\text{g}/\text{m}^3$*

# NCR Cities

**Noida**

**Greater Noida**

**Ghaziabad**

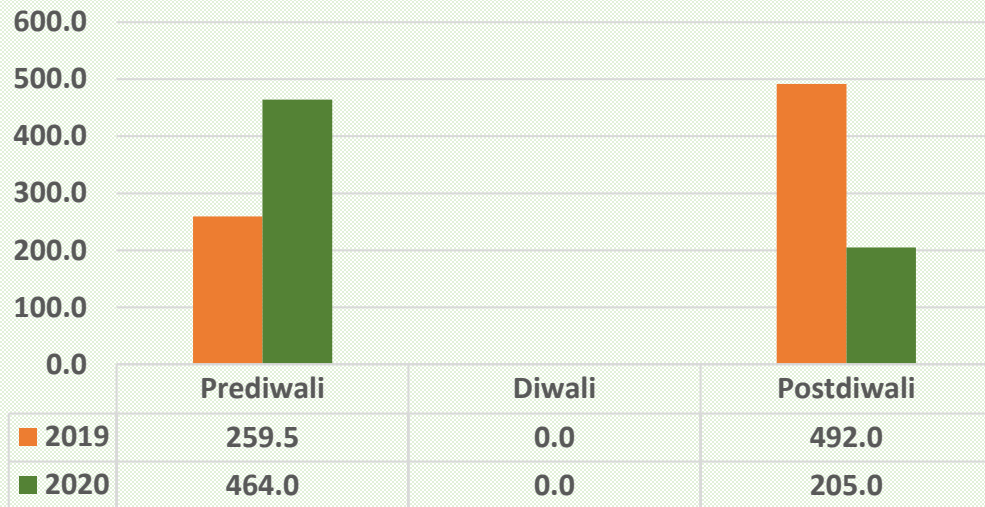
**Baghpat**

**Muzaffar Nagar**

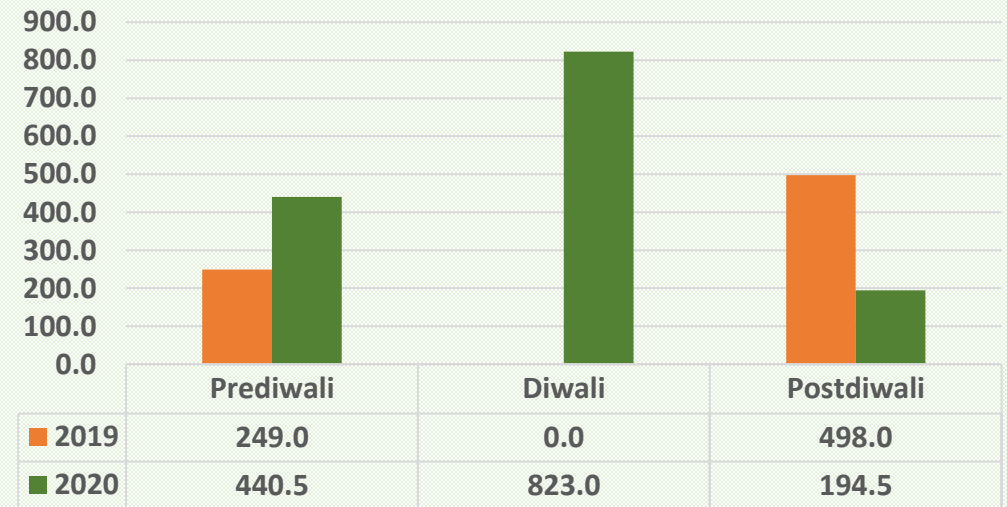


# PM<sub>10</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season In Noida (2019-2020)

Golf course (PM10)



Subros (PM10)



A considerable decrease (>50%) in PM<sub>10</sub> concentration from pre-Diwali to post-Diwali during 2020 at both the locations.

**Pre-Diwali PM<sub>10</sub> concentration increased in 2020 at both the locations**

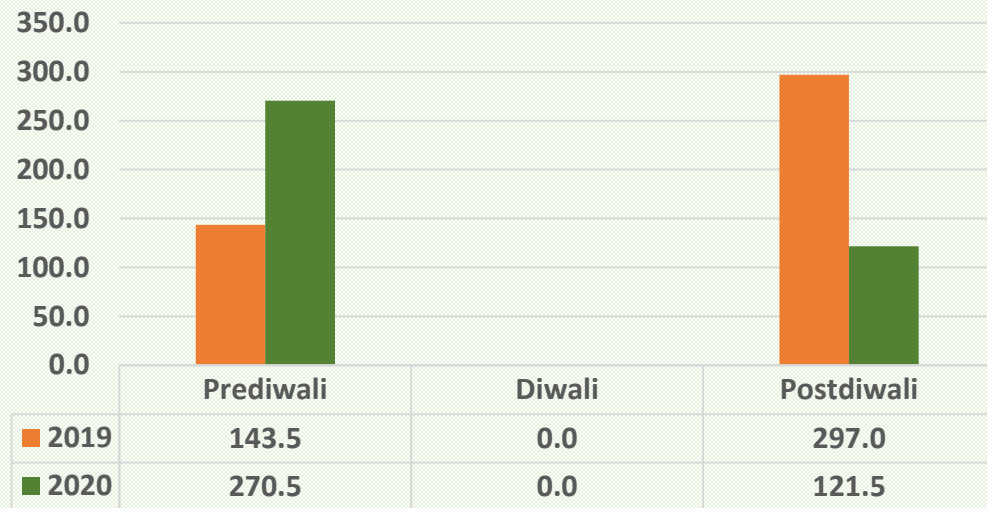
**Post-Diwali PM<sub>10</sub> concentration decreased in 2020 as compared to 2019**

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

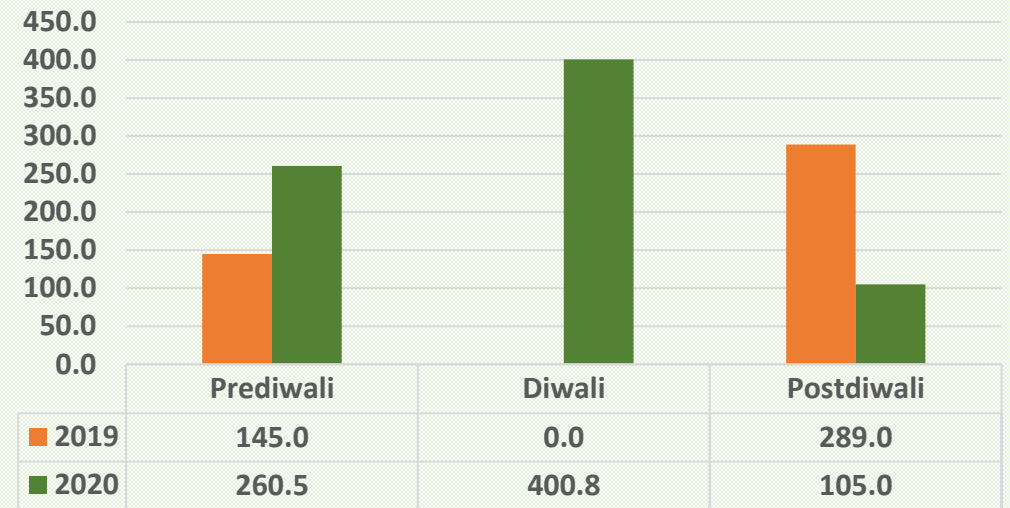


# PM<sub>2.5</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Noida (2019-2020)

Golf course (PM2.5)



Subros (PM2.5)



**During 2020 PM<sub>2.5</sub> concentration increased on the day of Diwali as compared to prediwali days at Subros decreasing again during post-Diwali.**

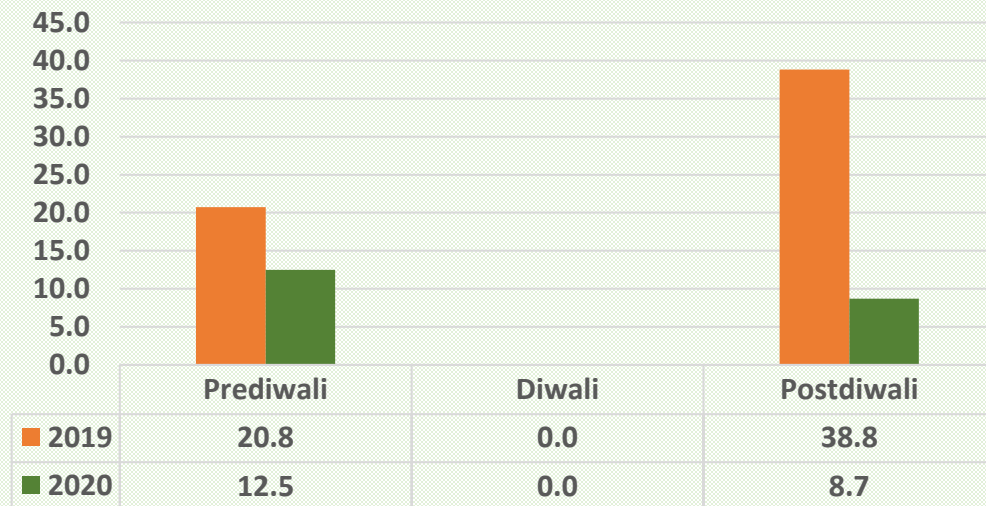
**Prediwali PM<sub>2.5</sub> concentration during 2020 is higher as compared to 2019 at both the locations**

**Post-Diwali PM<sub>2.5</sub> concentration was significantly lesser during 2020 than in 2019**

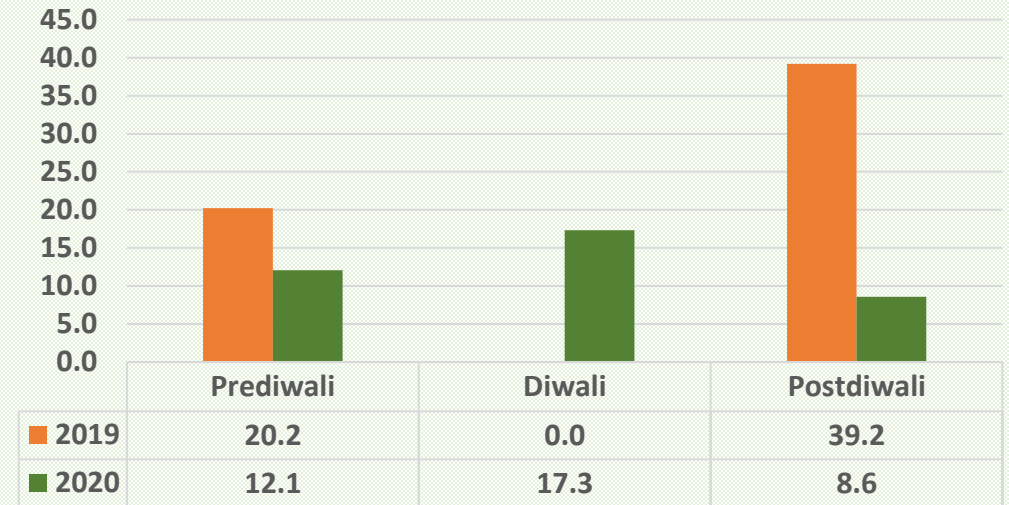
*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> - 60  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Noida (2019-2020)

Golf course (SO<sub>2</sub>)



Subros (SO<sub>2</sub>)



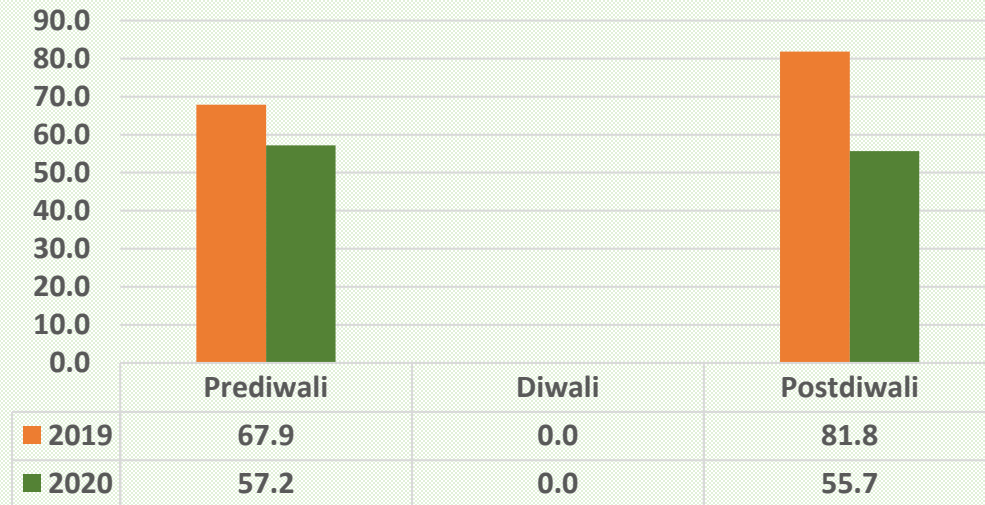
SO<sub>2</sub> concentration showed a decreasing trend from pre-diwali to post Diwali during 2020.

Significant reduction in both PreDiwali (~25%) and Post-Diwali (~40%) SO<sub>2</sub> concentration during 2020 compared to 2019

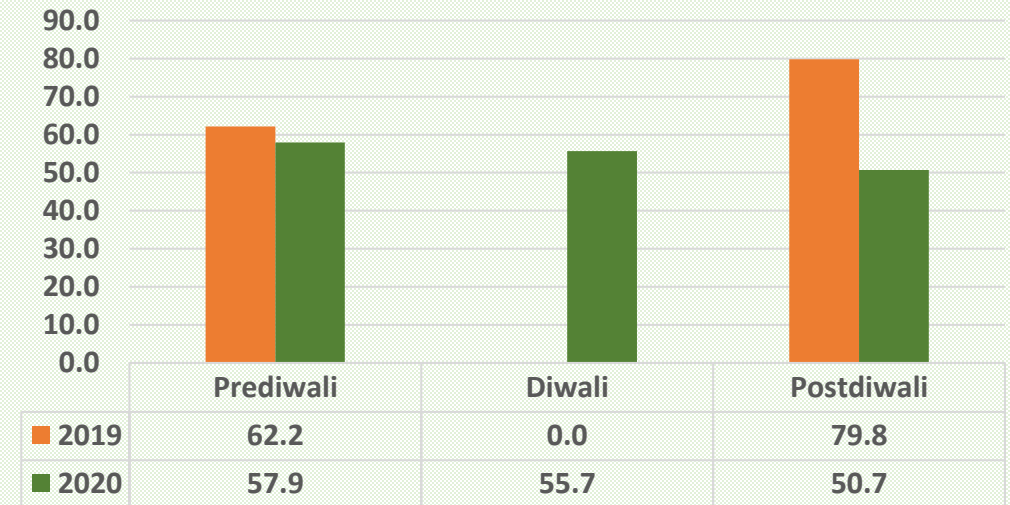
*National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Noida (2019-2020)

### Golf course (NO<sub>2</sub>)



### Subros (NO<sub>2</sub>)

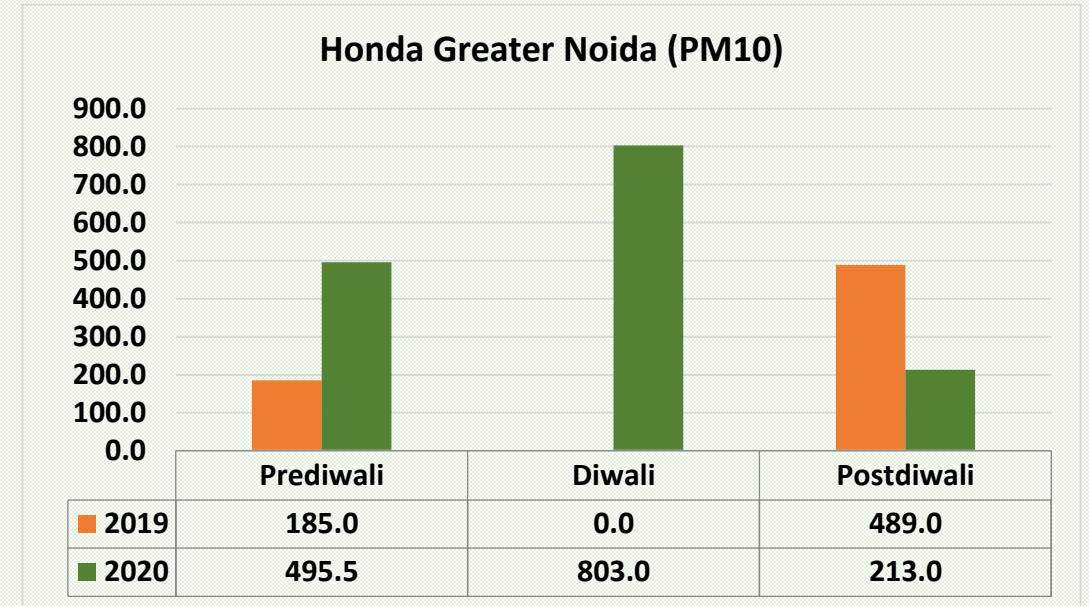
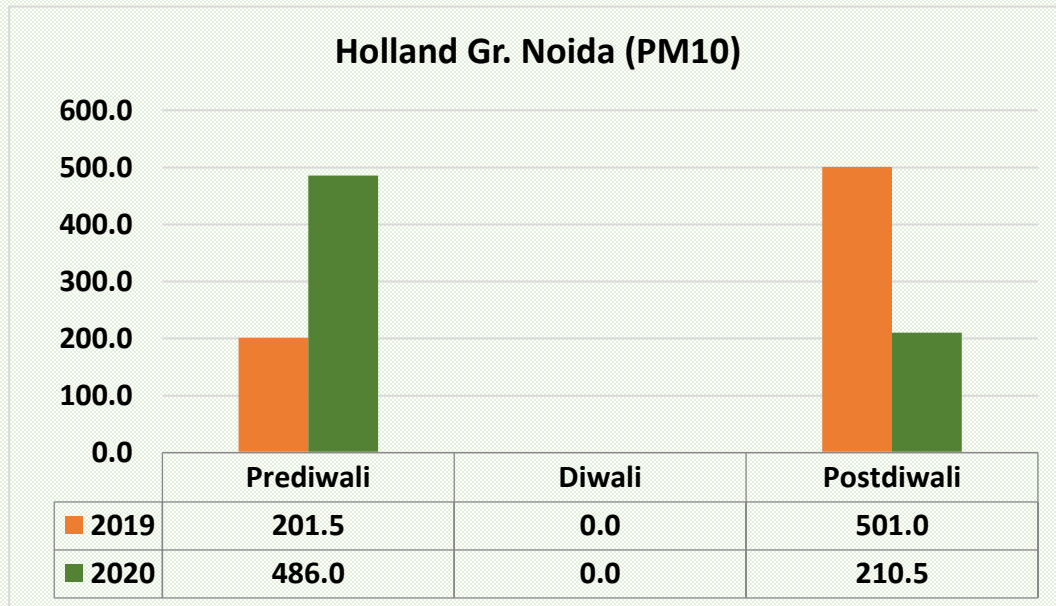


NO<sub>2</sub> concentration showed a decreasing trend from pre-Diwali to post Diwali during 2020 at both the locations

Reduction in NO<sub>2</sub> concentration at both the locations during pre-Diwali and post-Diwali in 2020 as compared from 2019

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

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Greater Noida (2019-2020)



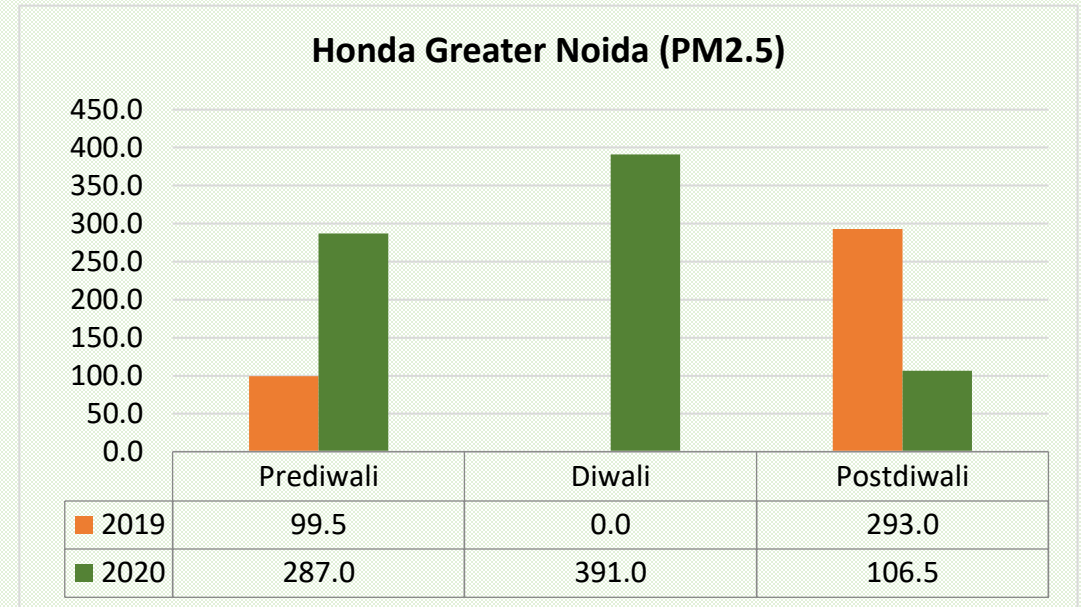
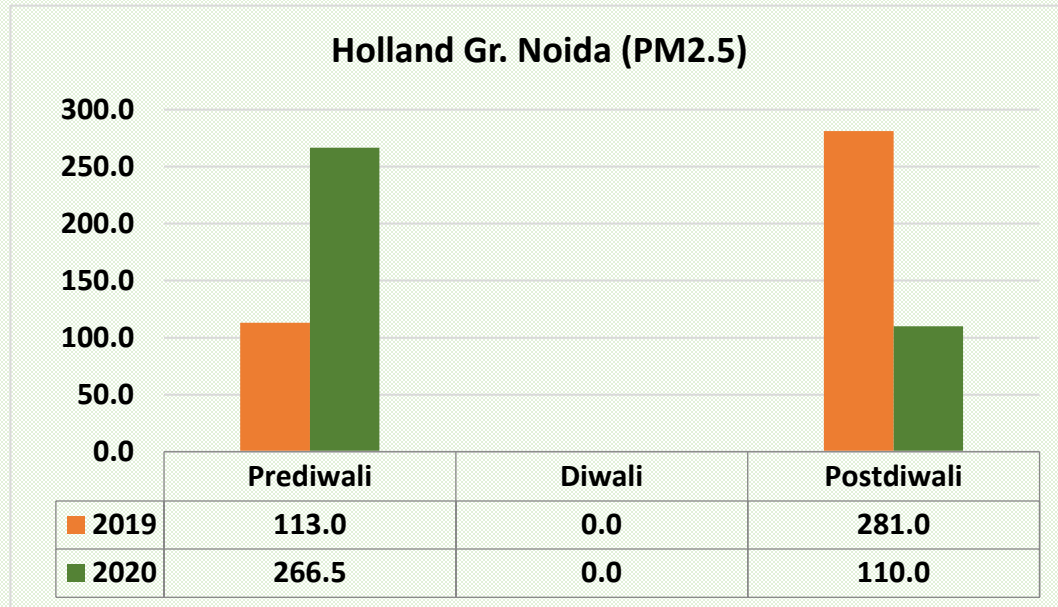
PM<sub>10</sub> concentration reduced by almost 55% from pre-Diwali to post-Diwali during 2020 .

Pre-Diwali PM<sub>10</sub> concentration at both the locations was significantly higher ( $\approx 140\%$ ) in 2020 as compared to 2019 while post-Diwali trend was opposite with a notable reduction of almost ( $\approx 140\%$ )

A sudden peak (almost 100%) in PM10 concentration on the day of Diwali at Honda Greater Noida.

*National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> - 100  $\mu\text{g}/\text{m}^3$*

# PM<sub>2.5</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Greater Noida (2019-2020)



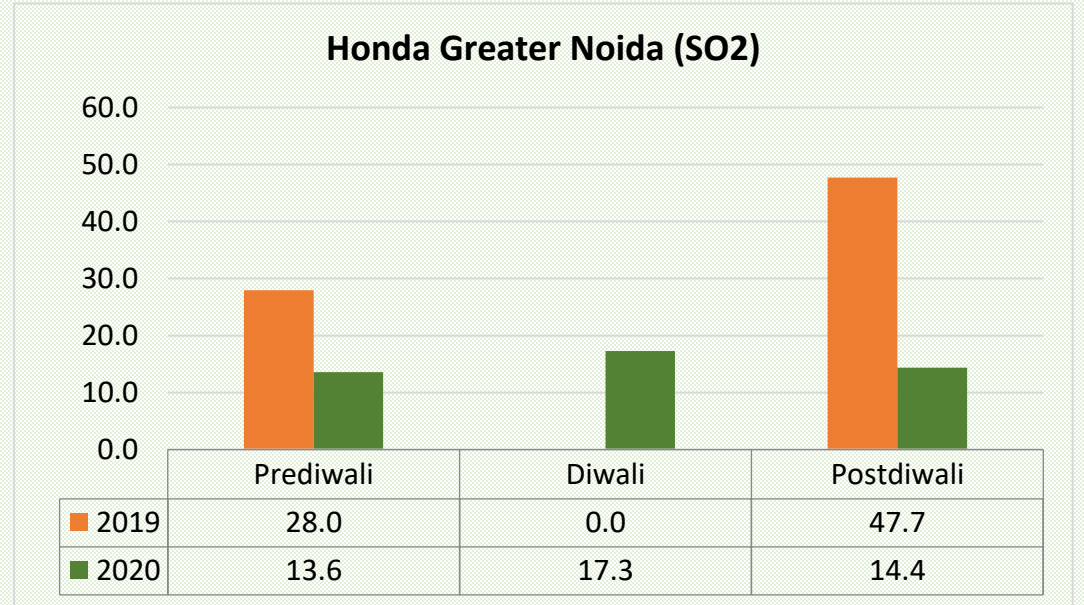
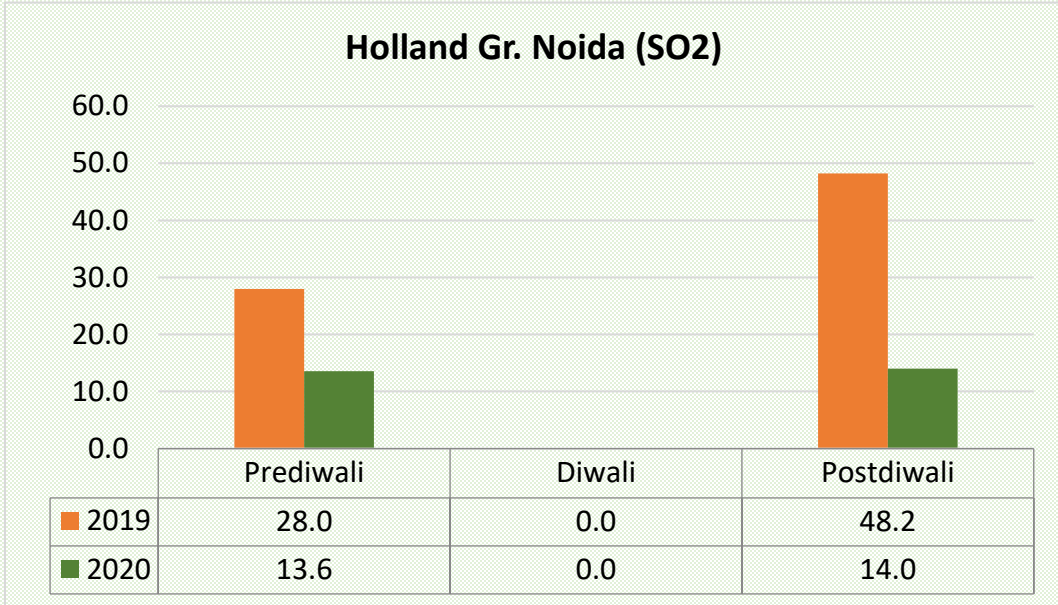
**PM<sub>2.5</sub> concentration increased on the day of Diwali as compared to preDiwali days at Honda Greater Noida decreasing significantly during post-Diwali.**

**PreDiwali PM<sub>2.5</sub> concentration during 2020 were higher as compared to 2019**

**PM<sub>2.5</sub> concentration significantly decreased during post-Diwali in 2020 compared to 2019.**

*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Greater Noida (2019-2020)

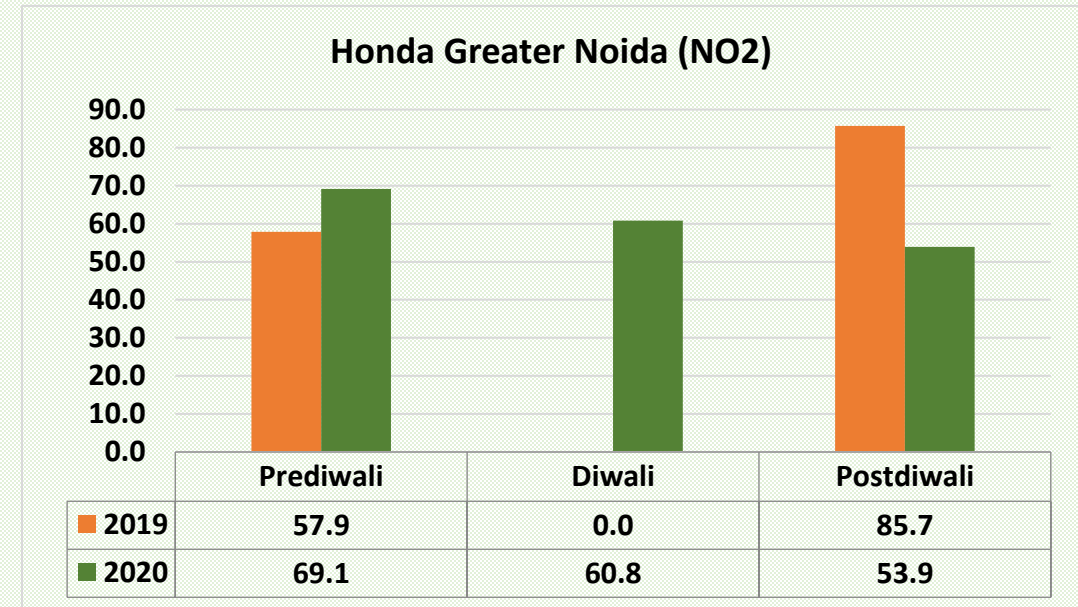
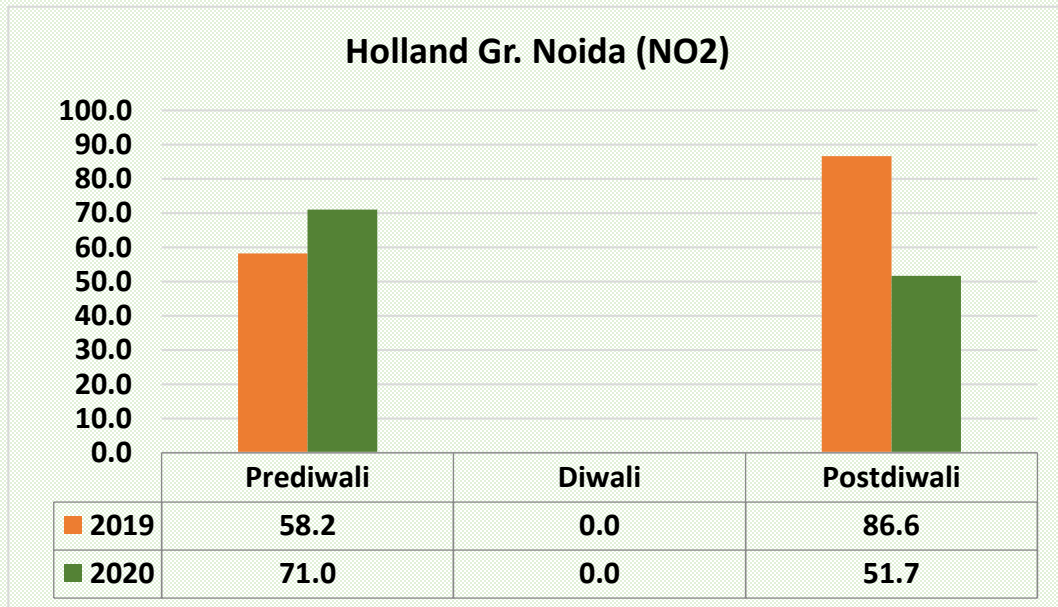


Remarkable reduction in SO<sub>2</sub> concentration from 2019 to 2020 during the whole period with an average decrease of 50-60%.

Slight increase in SO<sub>2</sub> concentration on Diwali day at Honda during 2020 reducing back during post-Diwali. However in 2019 SO<sub>2</sub> concentration during post-Diwali was higher than pre-Diwali.

*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>) trend during Diwali season in Greater Noida (2019-2020)

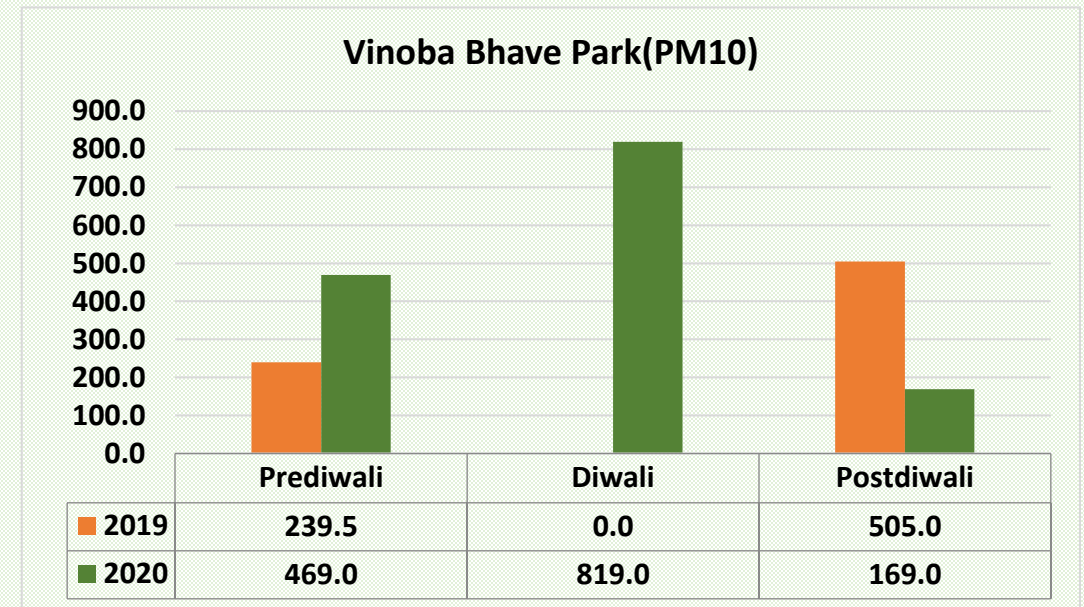
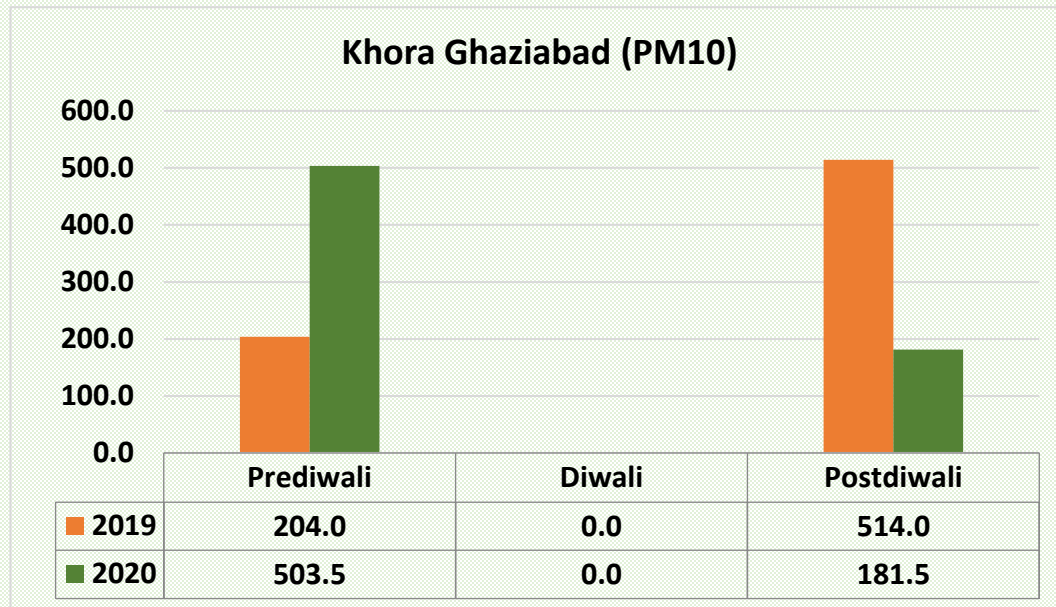


NO<sub>2</sub> concentration showed a decreasing trend from pre-Diwali to post Diwali during 2020 at both the stations.

**Pre-Diwali NO<sub>2</sub> concentration during 2020 is higher than 2019** while Post-Diwali NO<sub>2</sub> concentration is lower in 2020 as compared to 2019 at both the stations

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

# PM<sub>10</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season In Ghaziabad (2019-2020)



**Pre-Diwali PM<sub>10</sub> concentration during 2020 is higher than 2019 while Post-Diwali PM<sub>10</sub> concentration is lower in 2020 as compared to 2019 at both the stations**

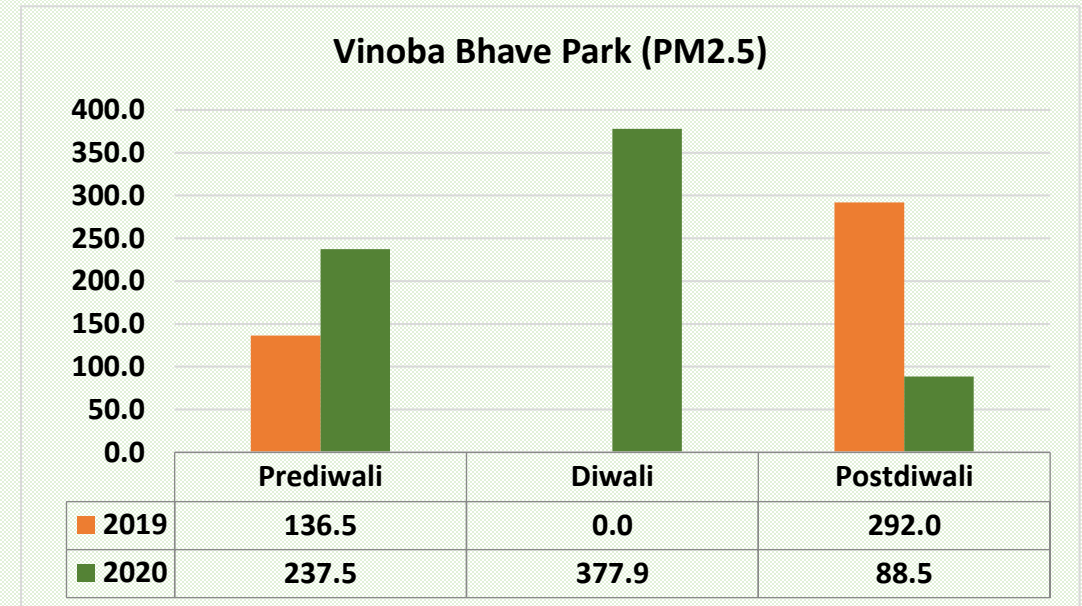
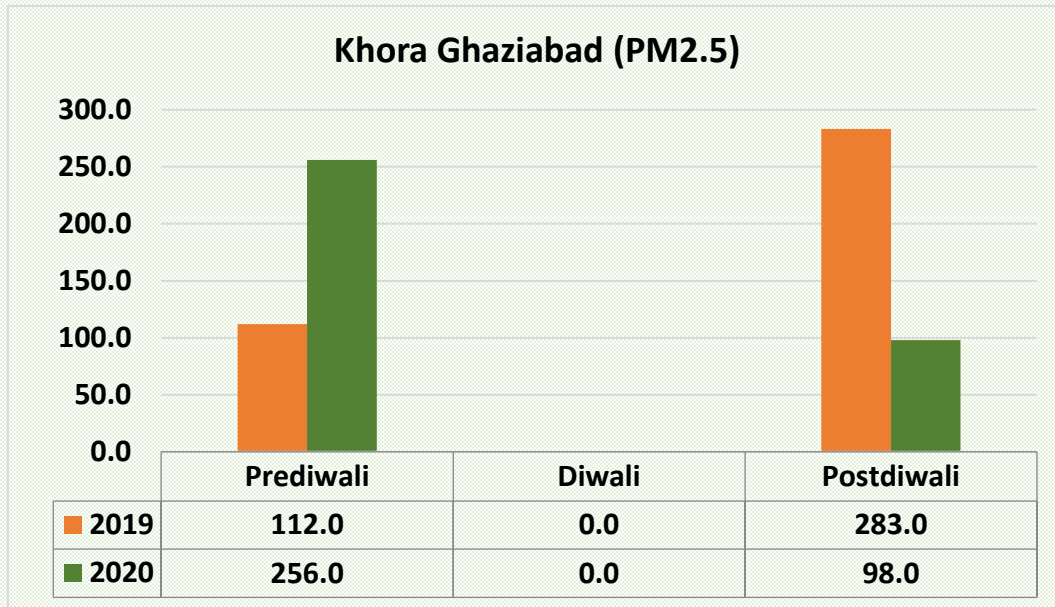
**IN 2020, there is a significant reduction in PM10 concentration during post-Diwali**

**At Vinoba Bhave Park sudden rise in the PM10 concentration on the day of Diwali**

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



# PM2.5 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Ghaziabad(2019-2020)



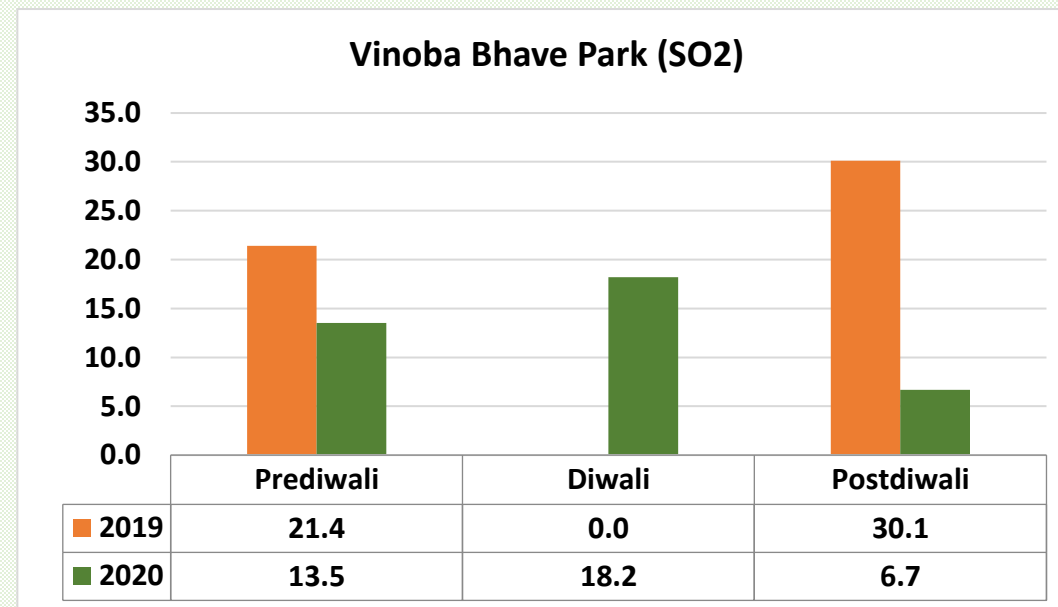
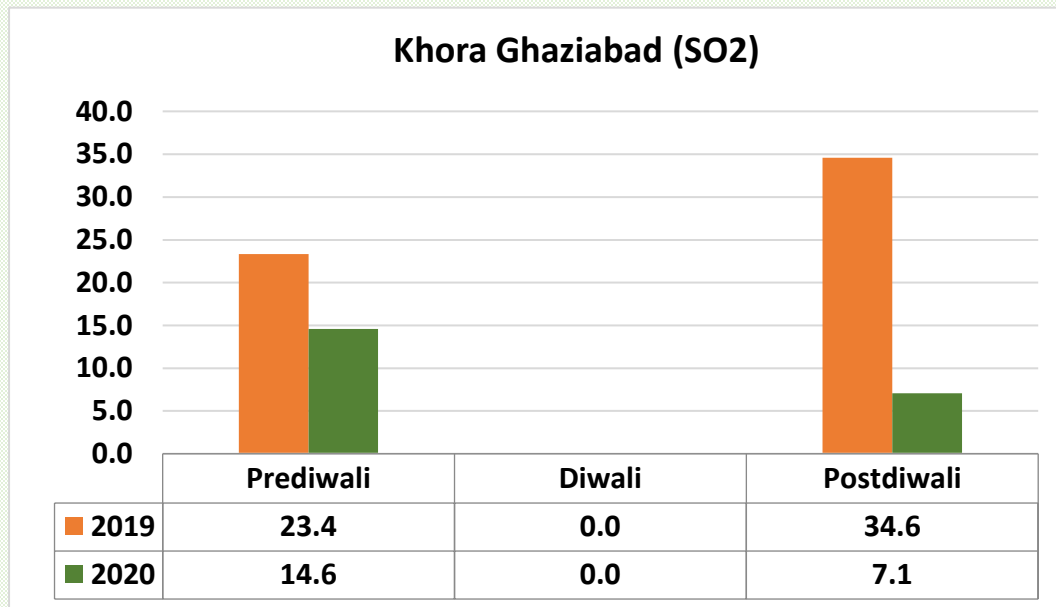
**Pre-Diwali PM2.5 concentration during 2020 is higher than 2019 while Post-Diwali PM<sub>2.5</sub> concentration is lower in 2020 as compared to 2019 at both the stations**

**In 2020, there is a significant reduction in PM2.5 concentration during post-Diwali**

**At Vinoba Bhave Park sudden rise in the PM2.5 concentration on the day of Diwali**

*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Ghaziabad (2019-2020)

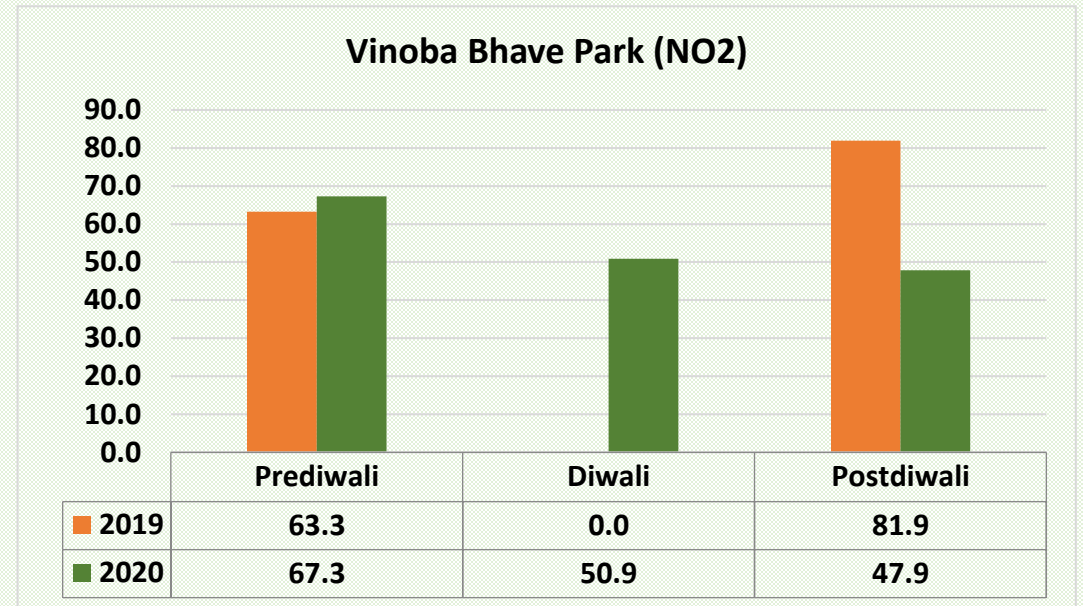
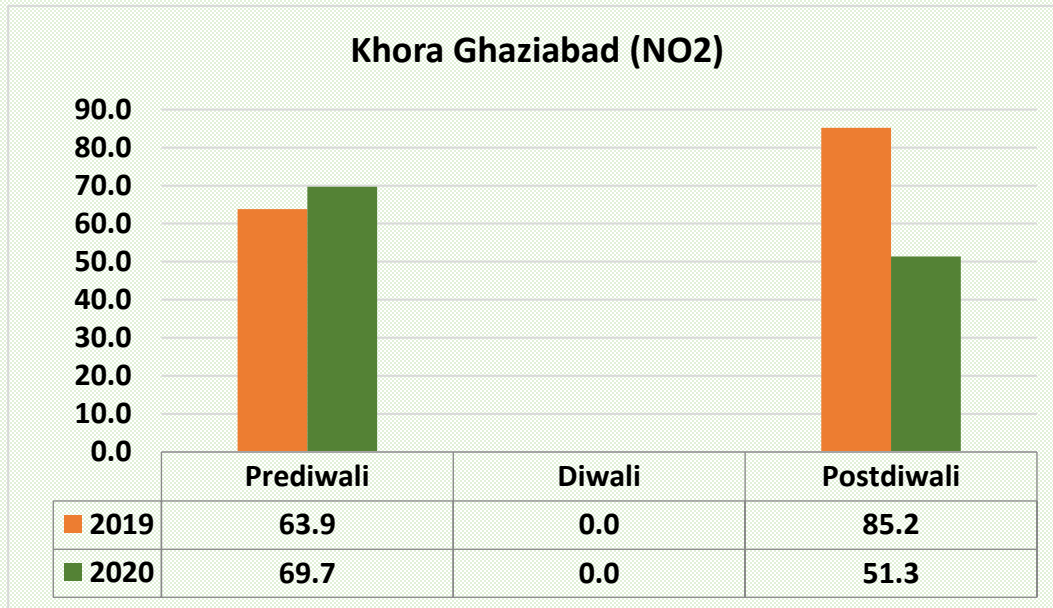


SO<sub>2</sub> concentration showed an overall decreasing trend from pre-diwali to post Diwali during 2020 with a slight increase on the day of Diwali at Vinoba Bhave Park.

Both PreDiwali & post-Diwali SO<sub>2</sub> concentrations are lesser in 2020 as compared to 2019

*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>) trend during Diwali season in Ghaziabad (2019-2020)

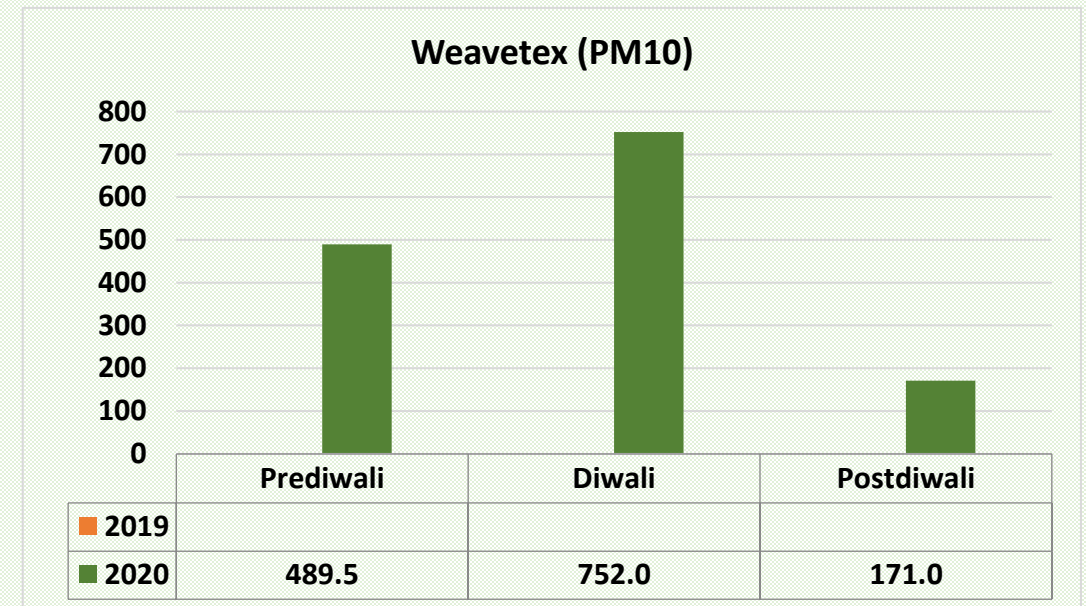
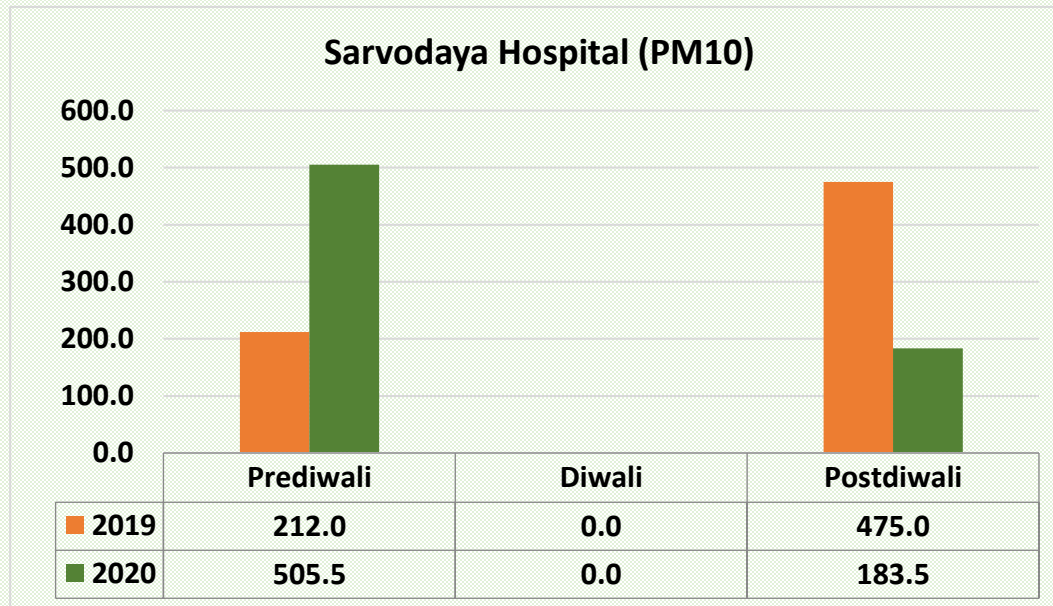


NO<sub>2</sub> concentration showed a decreasing trend from pre-Diwali to post Diwali during 2020 at both the stations.

**Pre-Diwali NO<sub>2</sub> concentration during 2020 is higher than 2019** while Post-Diwali NO<sub>2</sub> concentration is lower in 2020 as compared to 2019

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

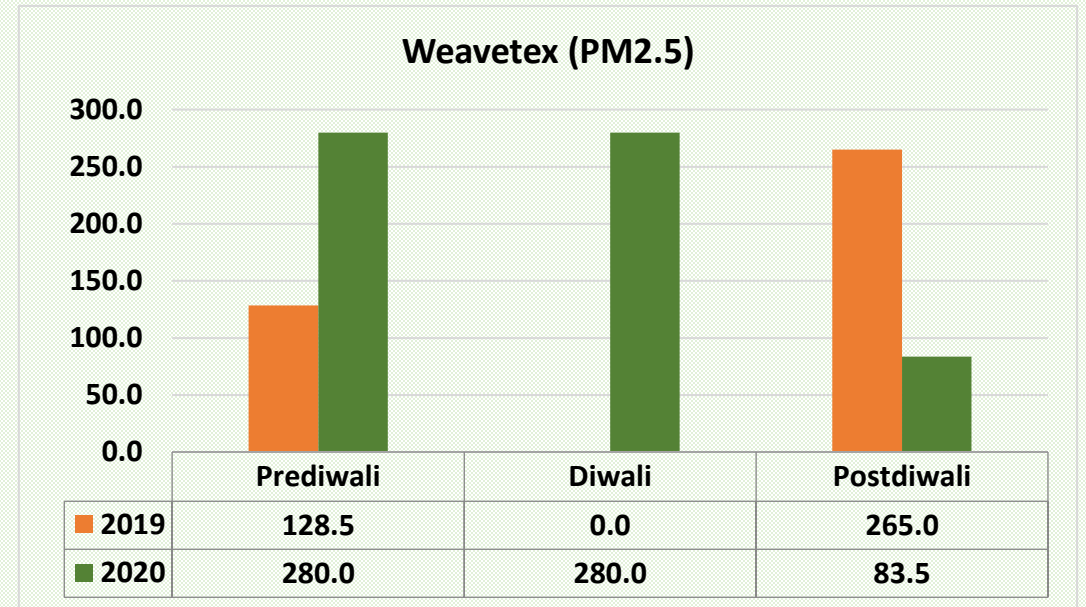
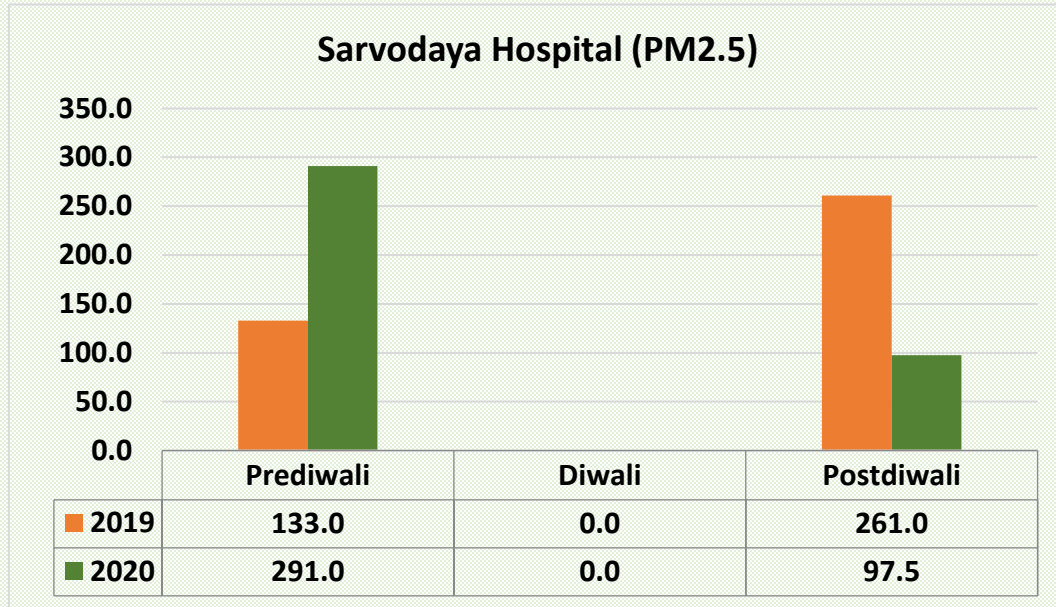
# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Baghpat(2019-2020)



Overall reduction ( $\approx 65\%$ ) in  $\text{PM}_{10}$  concentration from pre-Diwali to post-Diwali during 2020.

*National Ambient Air Quality standard (24-hour average) :  $\text{PM}_{10}$  -  $100 \mu\text{g}/\text{m}^3$*

# PM<sub>2.5</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Baghpat (2019-2020)

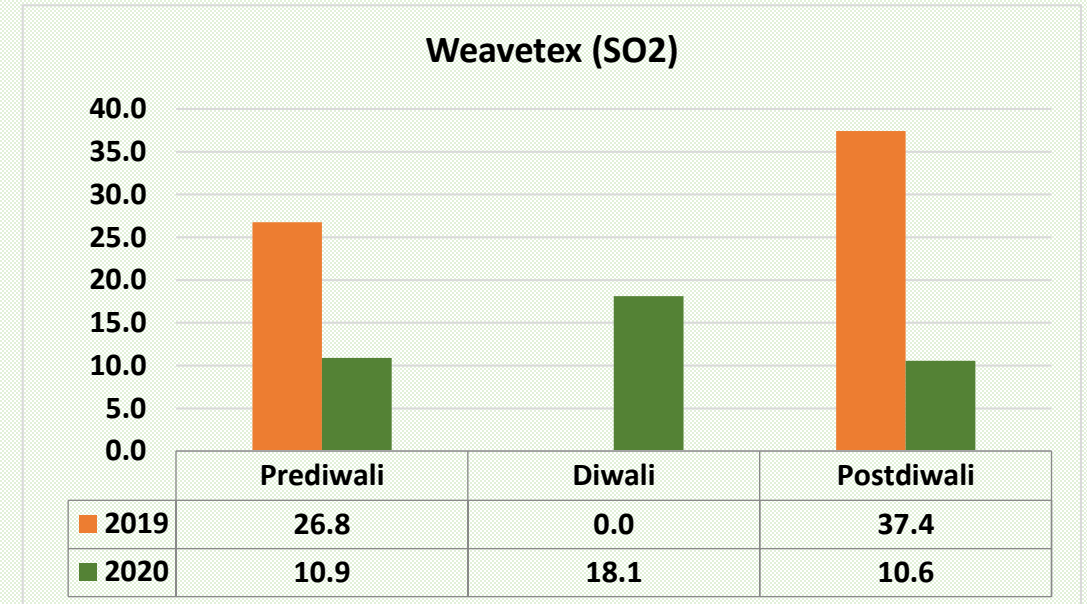
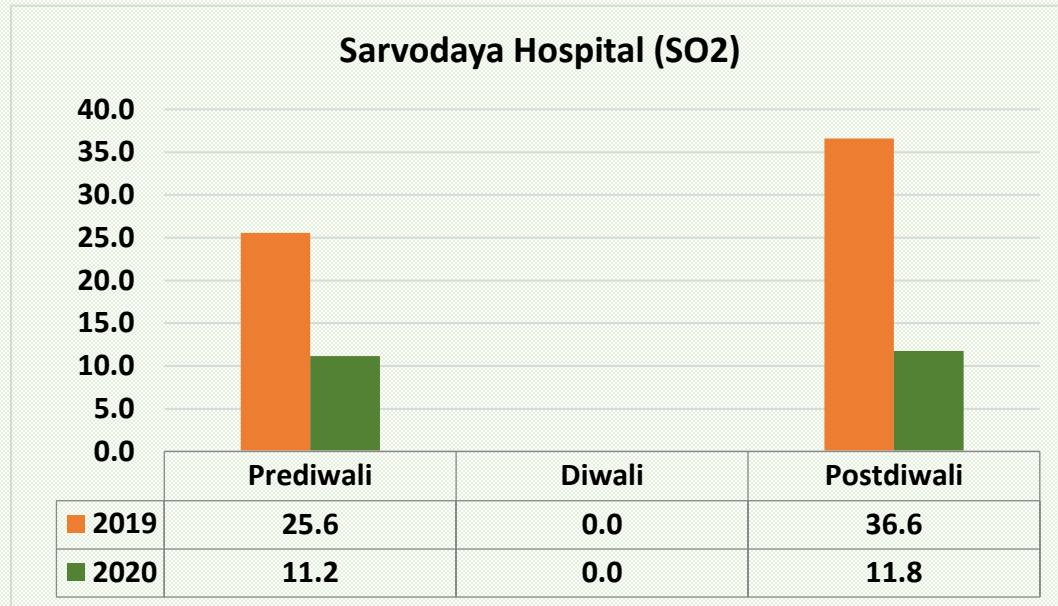


An overall decrease of ~70% in PM<sub>2.5</sub> concentration from prediwali to post-Diwali during 2020.

**Prediwali PM<sub>2.5</sub> concentration in 2020 was higher than in 2019** while the trend became opposite during post-Diwali.

*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Baghpat (2019-2020)

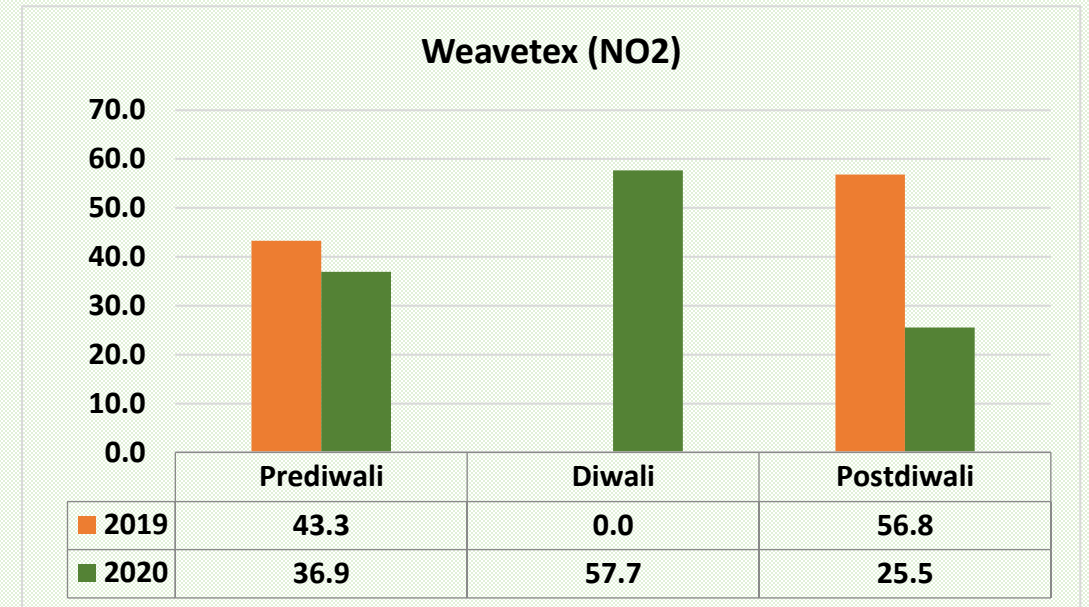
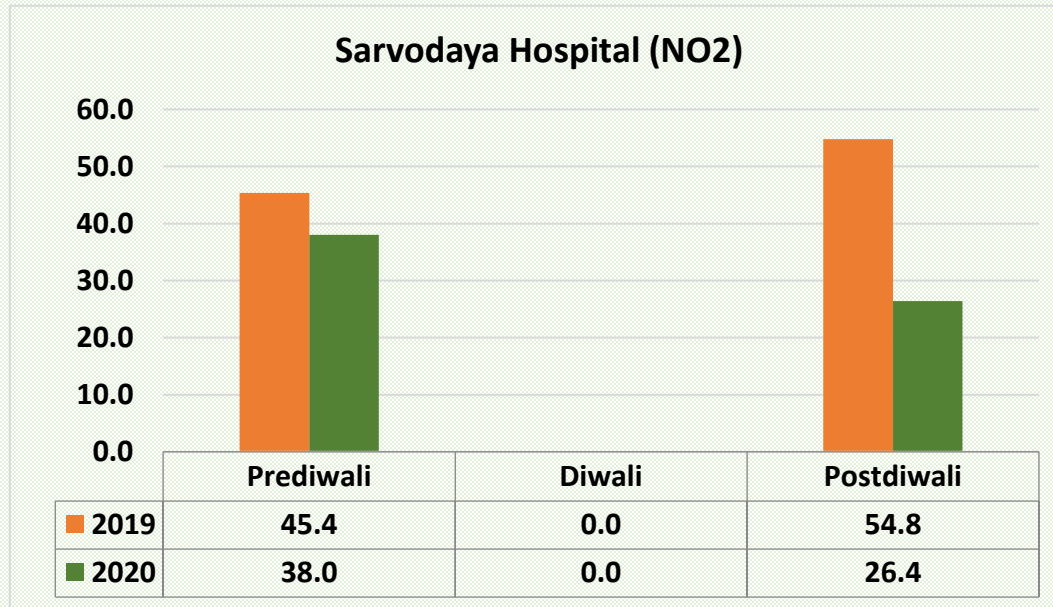


Almost no change in SO<sub>2</sub> concentration from pre-Diwali to post Diwali except for a sudden rise on the day of Diwali at Weavetex monitoring station.

Significant reduction in SO<sub>2</sub> concentration during the Diwali season from 2019 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>) trend during Diwali season in Baghpat (2019-2020)

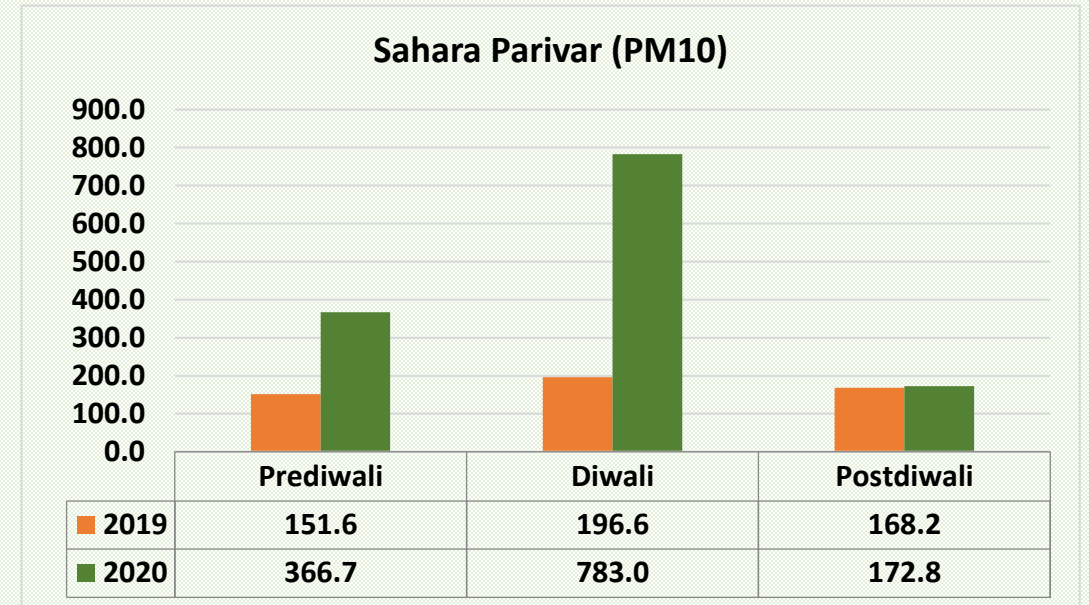
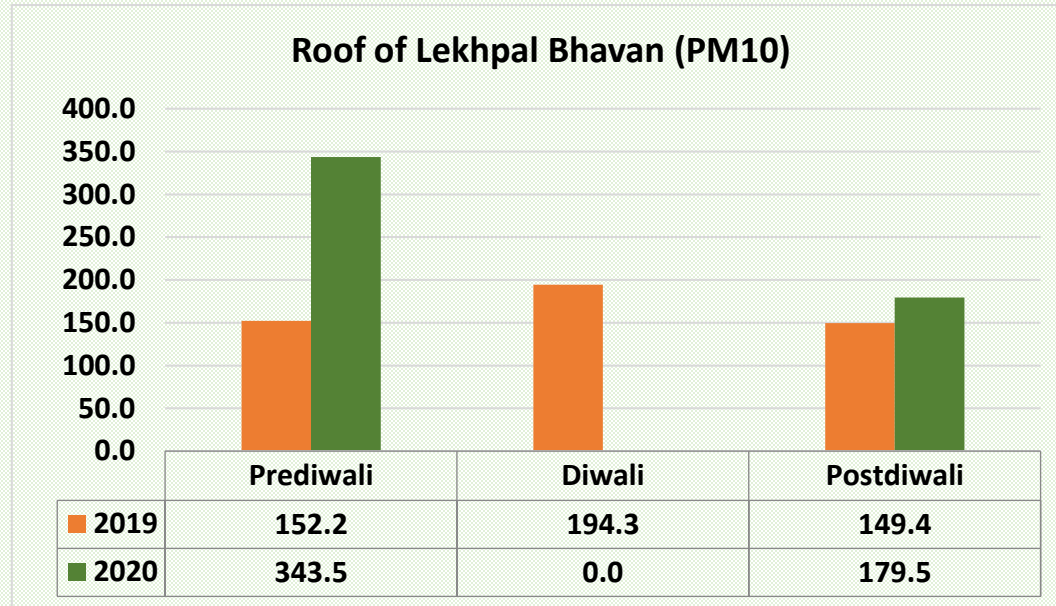


NO<sub>2</sub> concentration showed a decreasing trend from pre-Diwali to post Diwali during 2020 at both the stations.

Overall reduction in NO<sub>2</sub> concentration during the Diwali season from 2019 to 2020

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

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Muzaffarnagar(2019-2020)



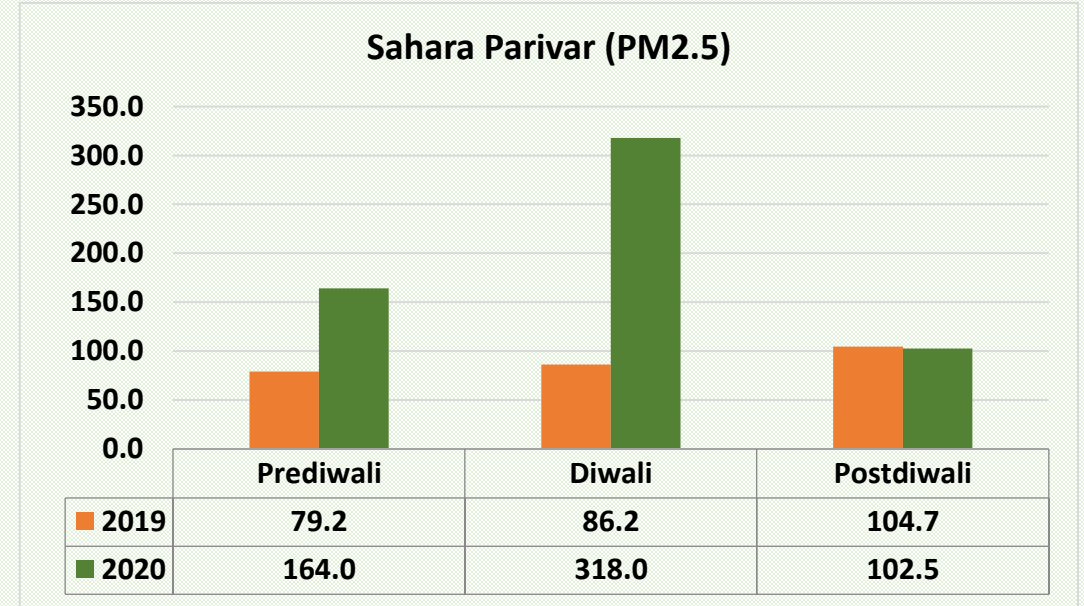
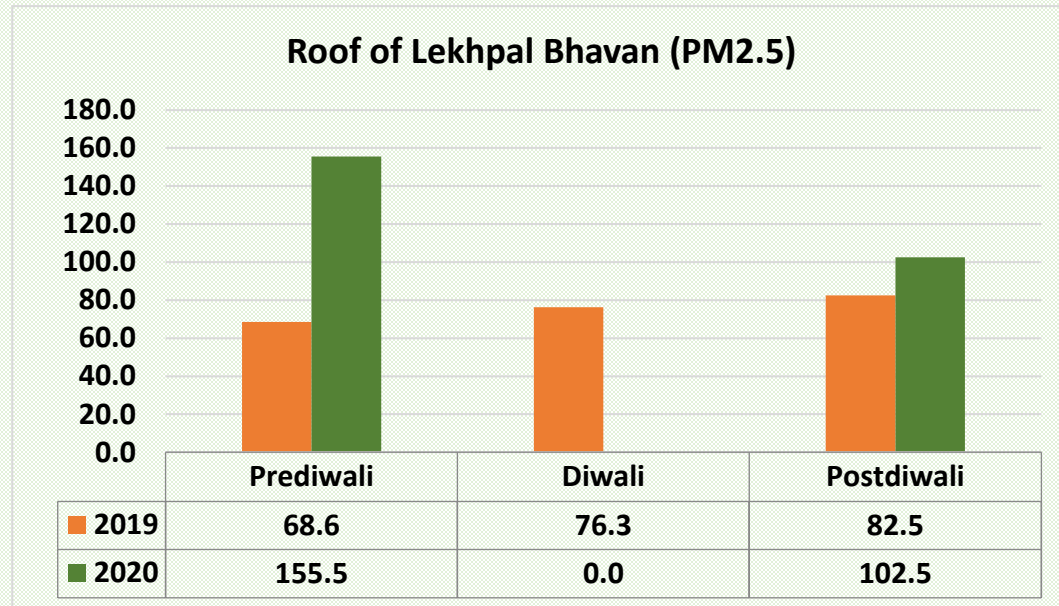
A decreasing trend in  $\text{PM}_{10}$  concentration from pre-Diwali to post-Diwali during 2020 with **sudden peak on the day of Diwali.**

**An overall increase in  $\text{PM}_{10}$  concentration from 2019 to 2020 at all the respective days (Pre-Diwali, Diwali and Post-Diwali)**

*National Ambient Air Quality standard (24-hour average) :  $\text{PM}_{10}$  -  $100 \mu\text{g}/\text{m}^3$*



# PM<sub>2.5</sub> concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Muzaffarnagar (2019-2020)

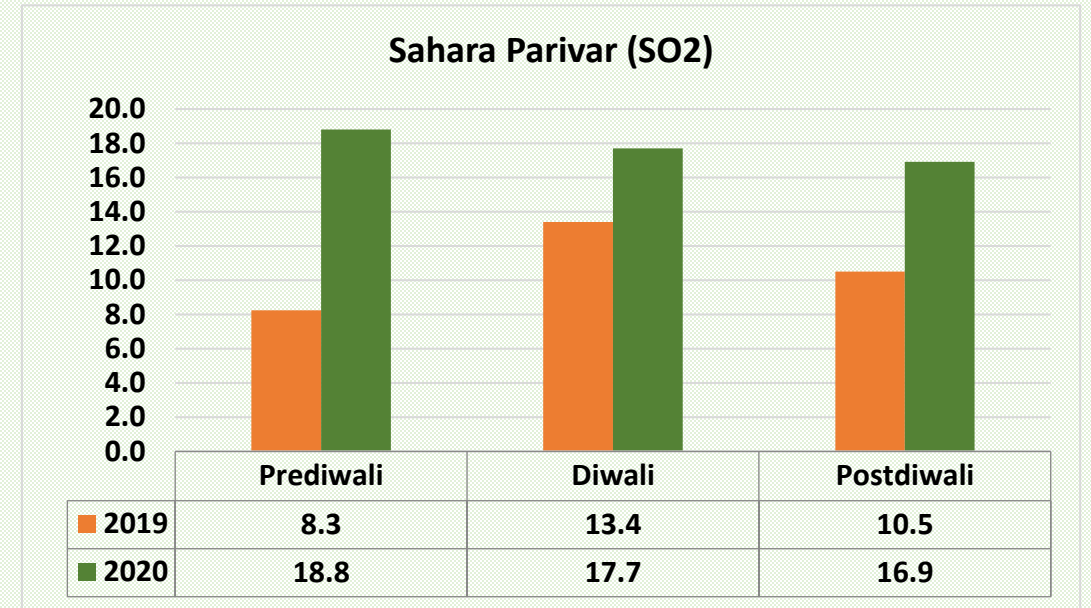
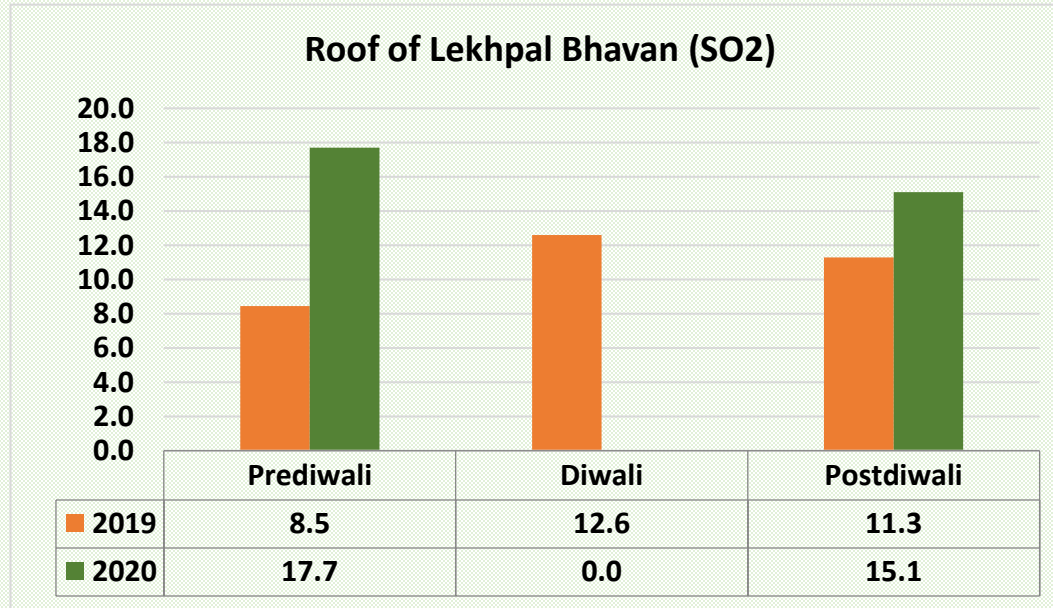


A decreasing trend in PM<sub>2.5</sub> concentration from pre-Diwali to post-Diwali during 2020 with **sudden peak on the day of Diwali.**

**An overall increase in PM<sub>2.5</sub> concentration from 2019 to 2020 at all the respective days (Pre-Diwali, Diwali and Post-Diwali)**

*National Ambient Air Quality standard (24-hour average) : PM<sub>2.5</sub> – 60  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Muzaffarnagar (2019-2020)

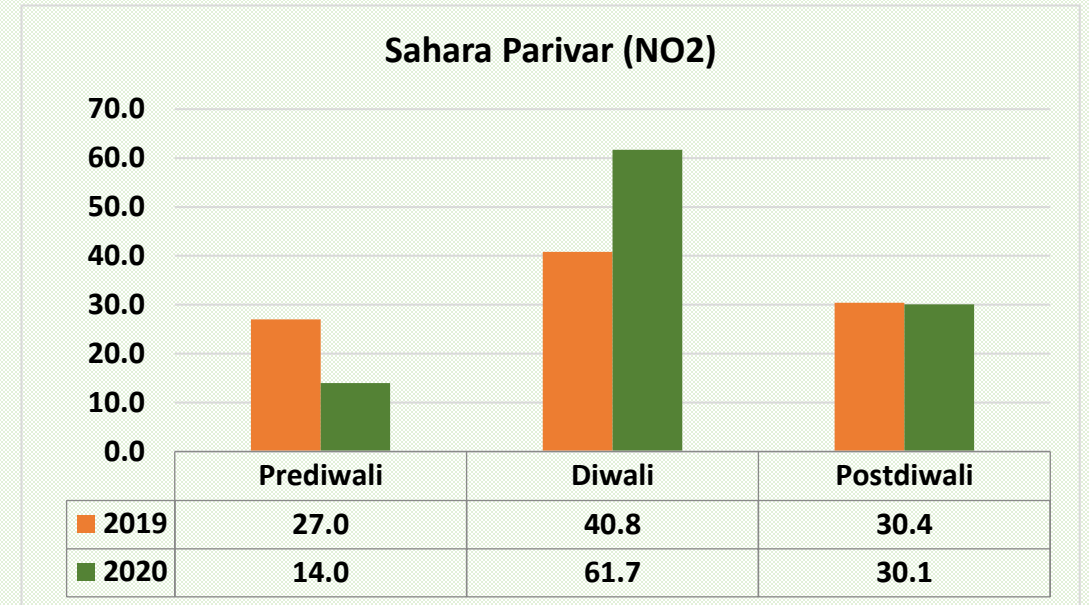
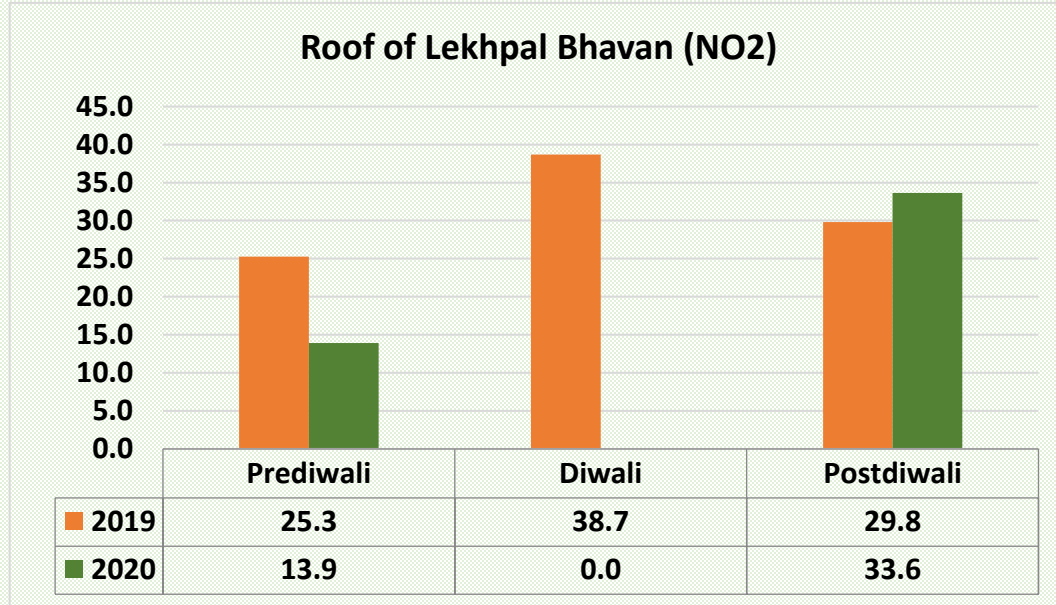


SO<sub>2</sub> concentration is comparatively higher in 2020 during pre-Diwali, Diwali and post-Diwali at both the locations .

Slight reduction in SO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 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>) trend during Diwali season in Muzaffar Nagar(2019-2020)



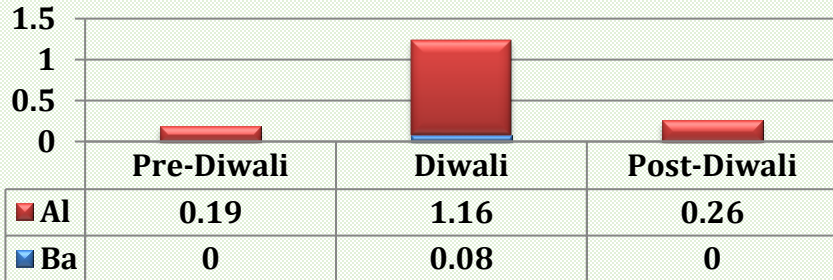
NO<sub>2</sub> concentration is comparatively higher in 2020 during pre-Diwali, Diwali and post-Diwali at both the locations .

AN overall increase in NO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 2020

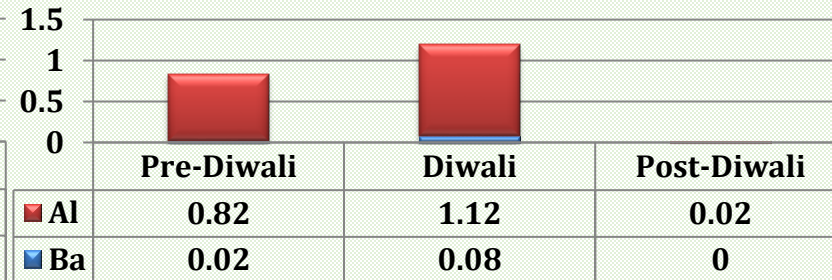
*National Ambient Air Quality standard (24-hour average) : NO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# Contribution of elements Al & Ba (concentration in $\mu\text{g}/\text{m}^3$ ) in $\text{PM}_{2.5}$ during Diwali season(2020) in NCR cities

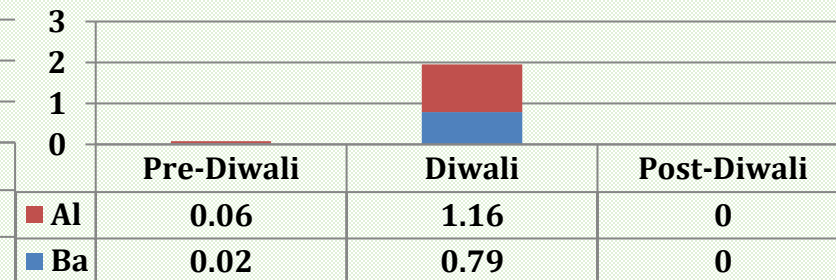
**Sucrose Limited, Noida**



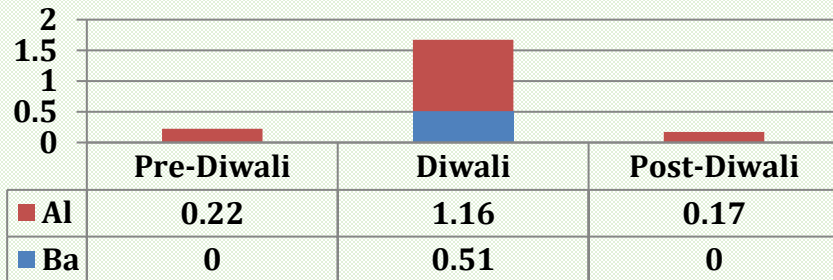
**Honda Power, Gr. Noida**



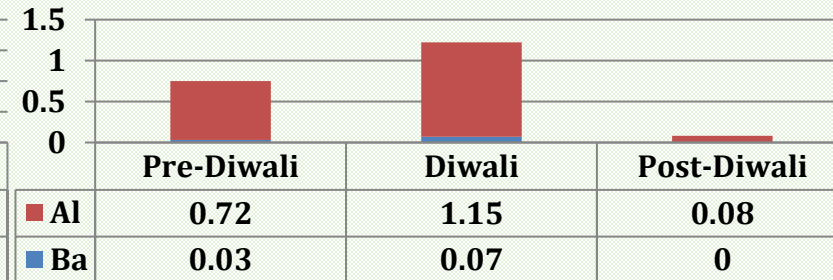
**Weavetex Overseas, Baghpat**



**Vinoba Bhawe Park, Ghaziabad**



**Sahara Parivar Office, Muzaffarnagar**

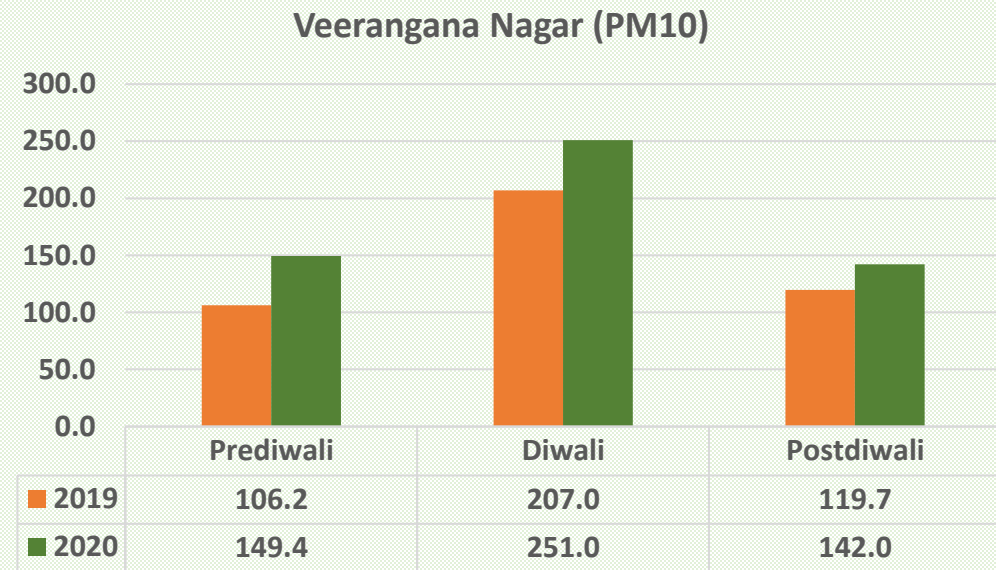
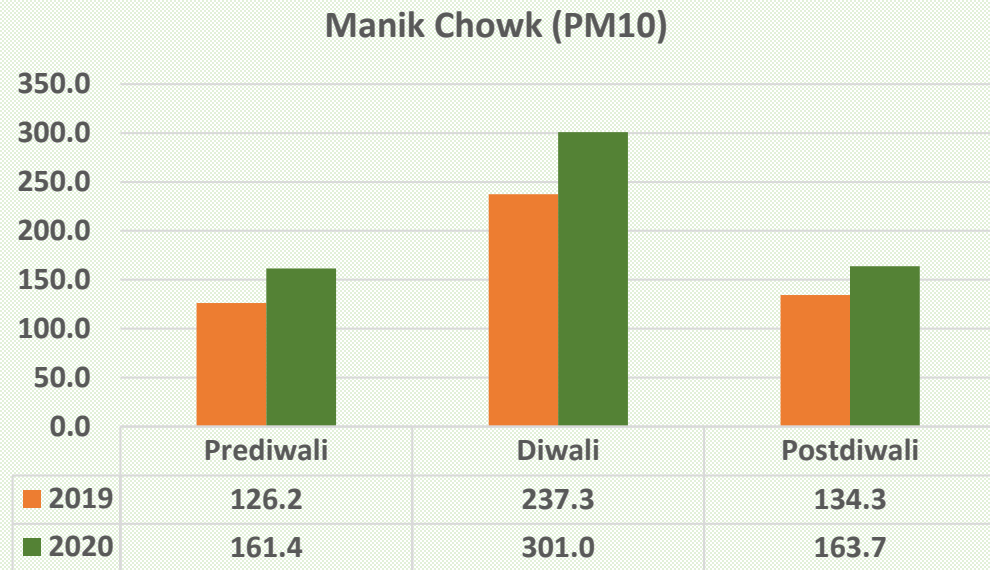


**Both Al and Barium concentration values were found under the standard limits**

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

**Ba -  $4 \mu\text{g}/\text{m}^3$ , Al -  $40 \mu\text{g}/\text{m}^3$**

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Jhansi (2019-2020)



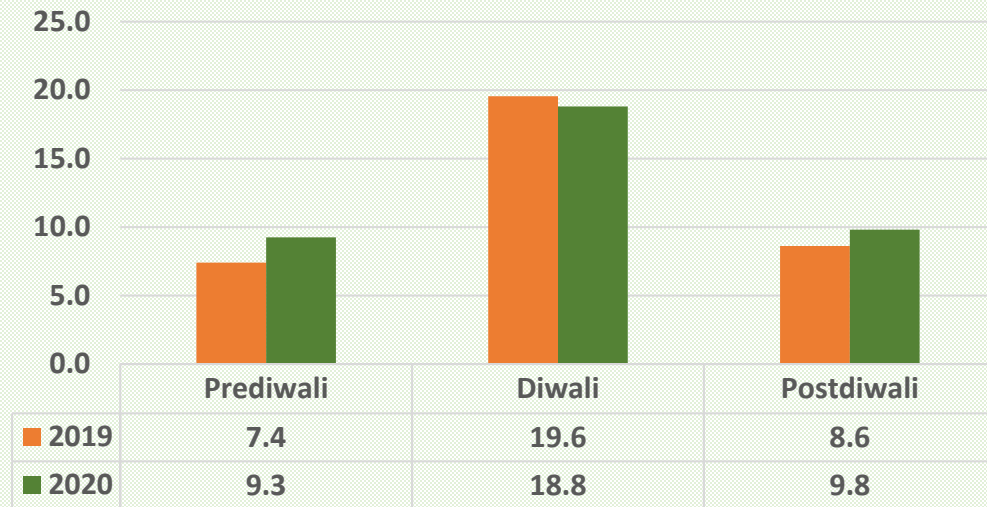
In 2020 there is almost no change in  $\text{PM}_{10}$  concentration from pre-Diwali to post-Diwali except for a sudden increase on the day of Diwali at both the stations.

An overall increase in  $\text{PM}_{10}$  concentration from 2019 to 2020 at all the respective days (Pre-Diwali, Diwali and Post-Diwali)

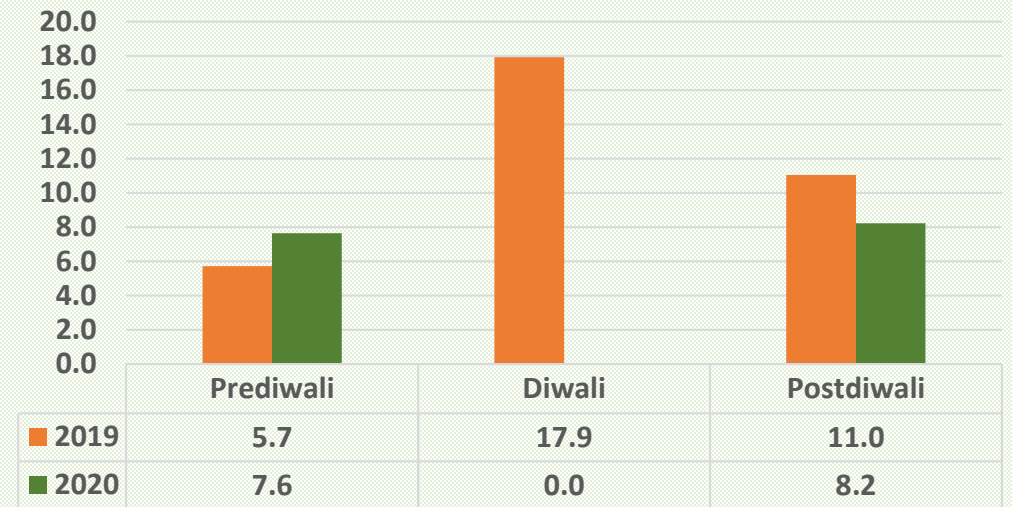
*National Ambient Air Quality standard (24-hour average) :  $\text{PM}_{10}$  -  $100 \mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Jhansi (2019-2020)

### Manik Chowk (SO<sub>2</sub>)



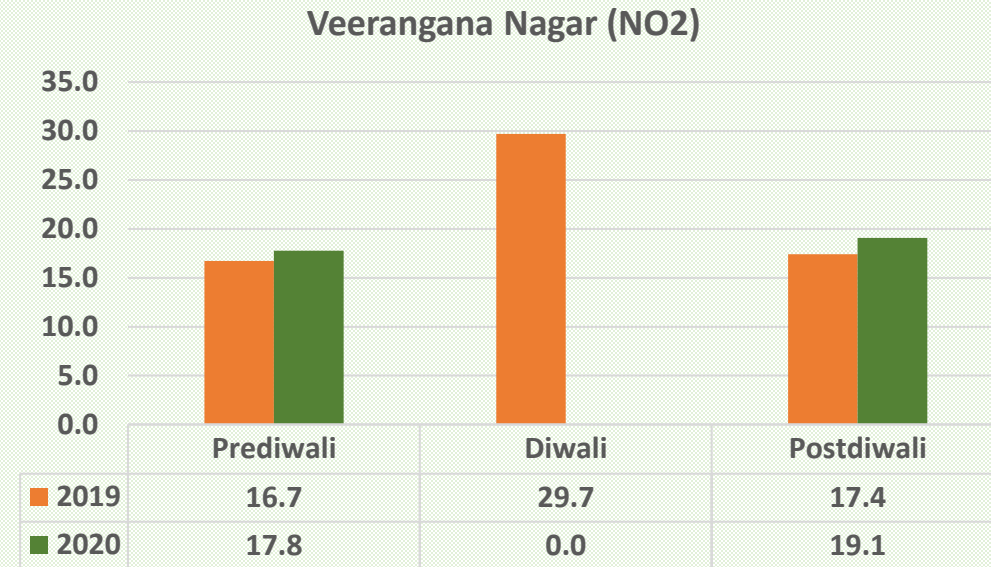
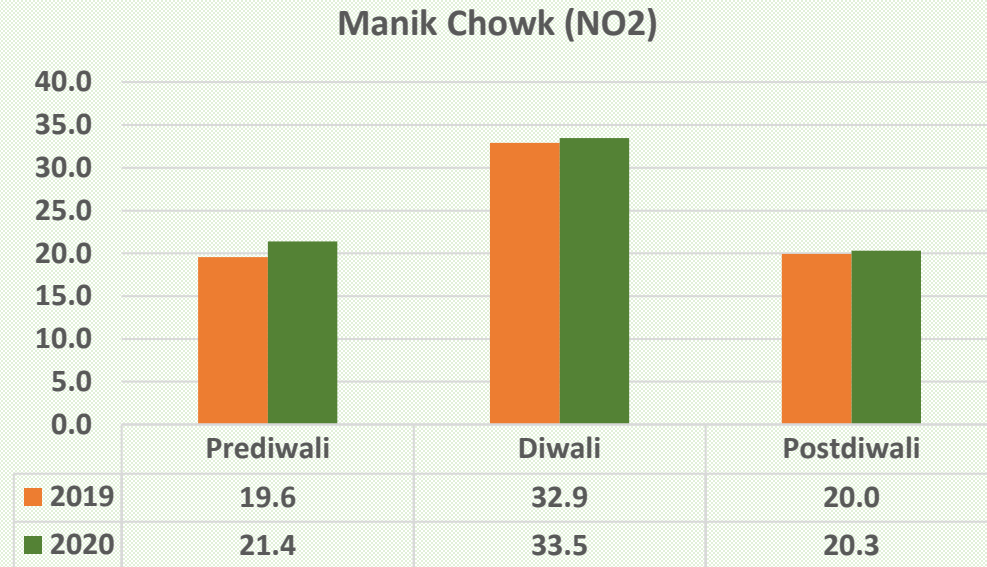
### Veerangana Nagar (SO<sub>2</sub>)



Slight change in SO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 2020 with a sudden peak on the Diwali day.

*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>) trend during Diwali season in Jhansi (2019-2020)

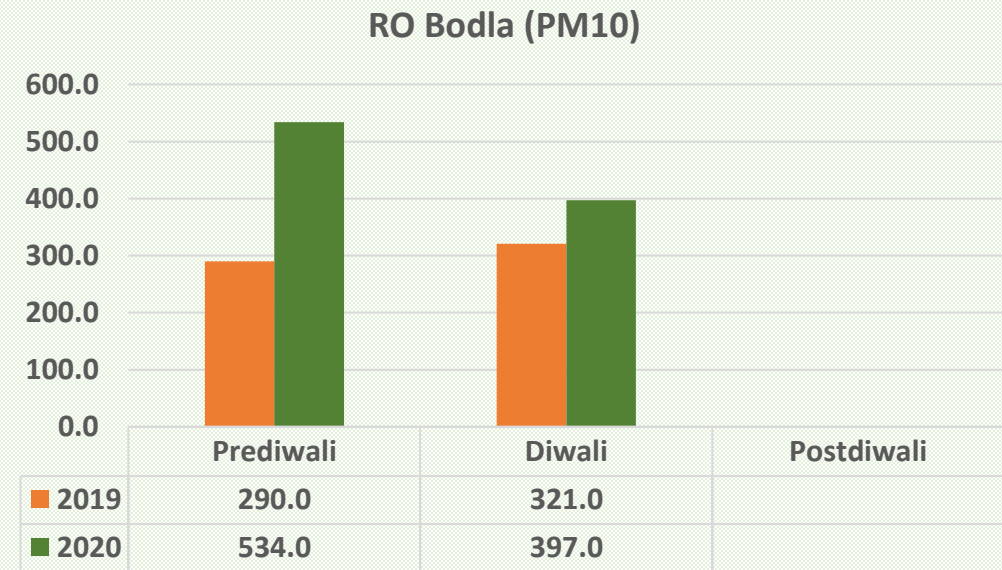
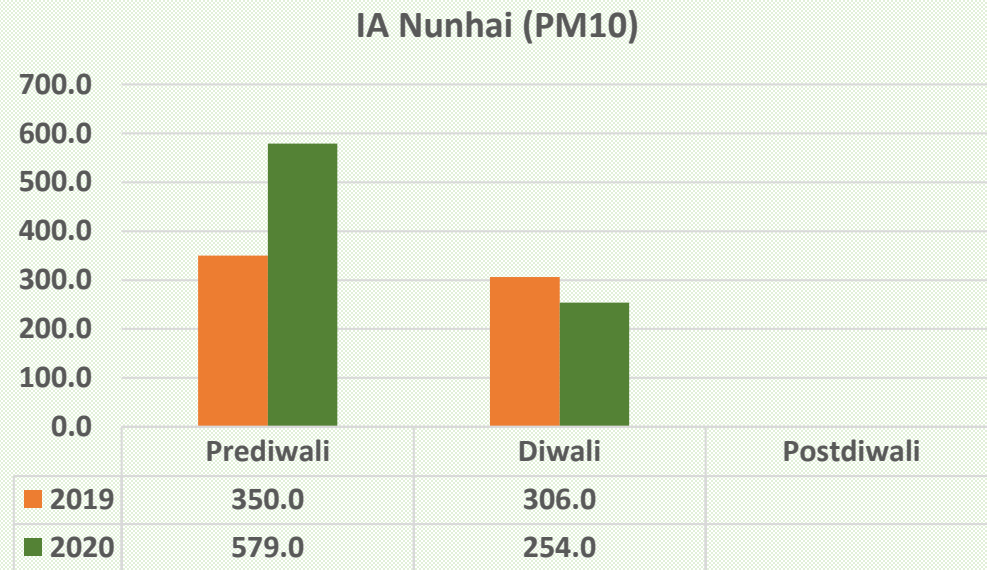


Slight change in NO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 2020 with a sudden peak on the Diwali day.

NO<sub>2</sub> concentration values are almost similar during 2019 and 2020 for both the stations

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

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Agra (2019-2020)



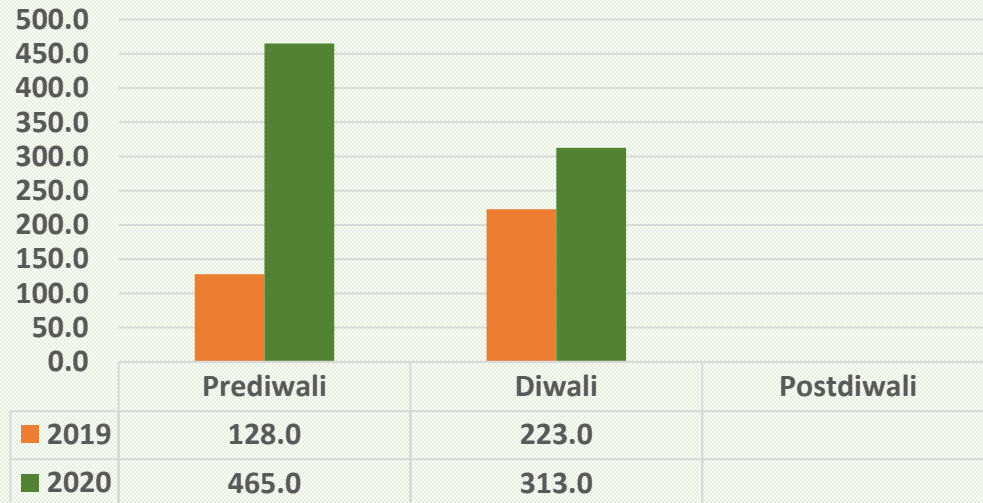
PM<sub>10</sub> concentration decreased pre-Diwali to Diwali during 2020 by almost 56% at IA Nunhai and by 25% at RO office Bodla.

*National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> - 100  $\mu\text{g}/\text{m}^3$*

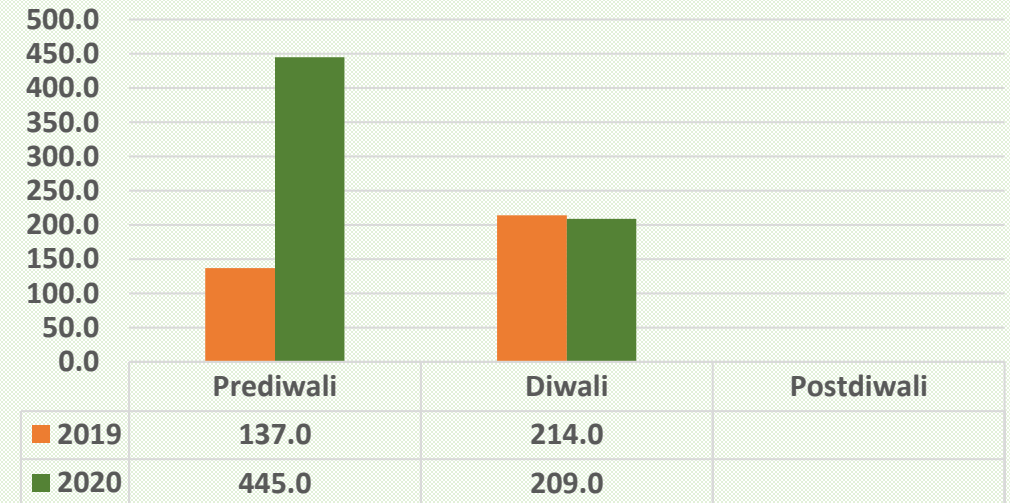


# PM2.5 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season in Agra (2019-2020)

### RO Bodla (PM2.5)



### IA Nunhai (PM2.5)



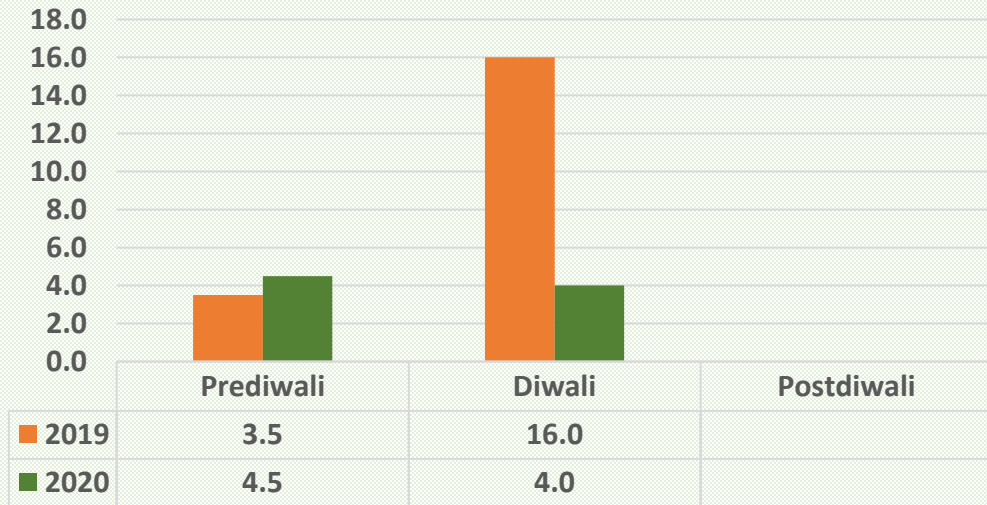
A decreasing trend in  $\text{PM}_{2.5}$  concentration from pre-Diwali to Diwali during 2020

An overall increase in  $\text{PM}_{2.5}$  concentration from 2019 to 2020 at all the respective days (Pre-Diwali & Diwali )

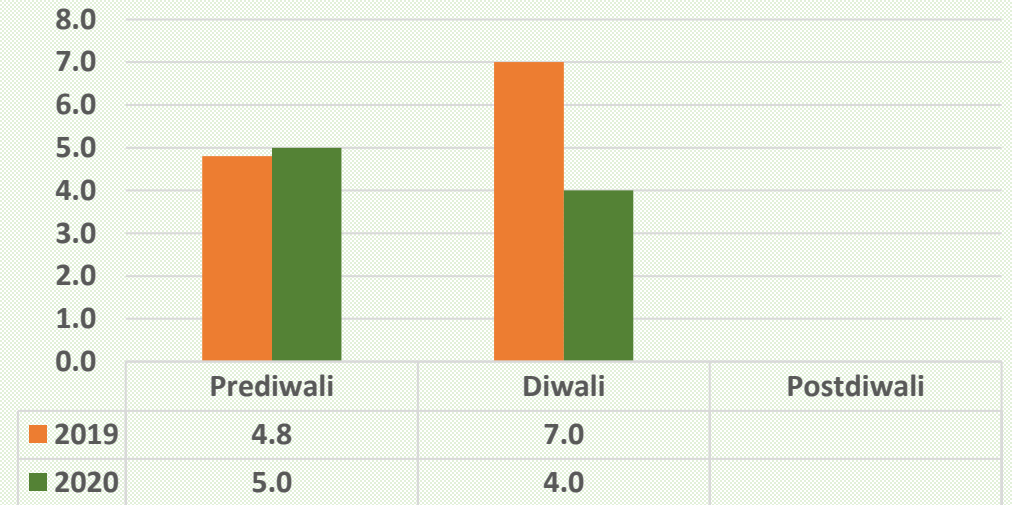
National Ambient Air Quality standard (24-hour average) :  $\text{PM}_{2.5}$  -  $60 \mu\text{g}/\text{m}^3$

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Agra (2019-2020)

ROB Bodla (SO<sub>2</sub>)



IA Nunhai (SO<sub>2</sub>)



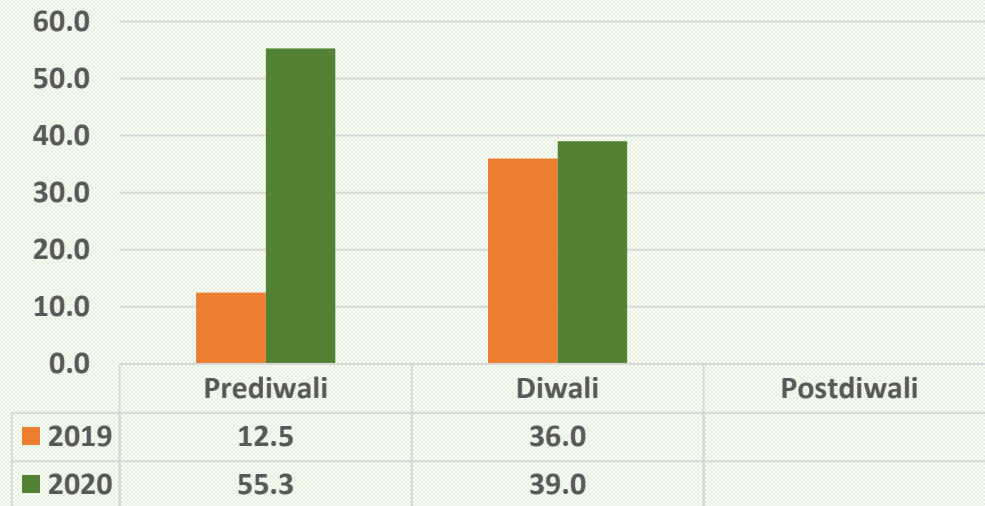
SO<sub>2</sub> concentration is comparatively lower in 2020 as compared to 2019 on the day of Diwali at both the locations .

Slight reduction in SO<sub>2</sub> concentration from Pre-Diwali to Diwali in 2020

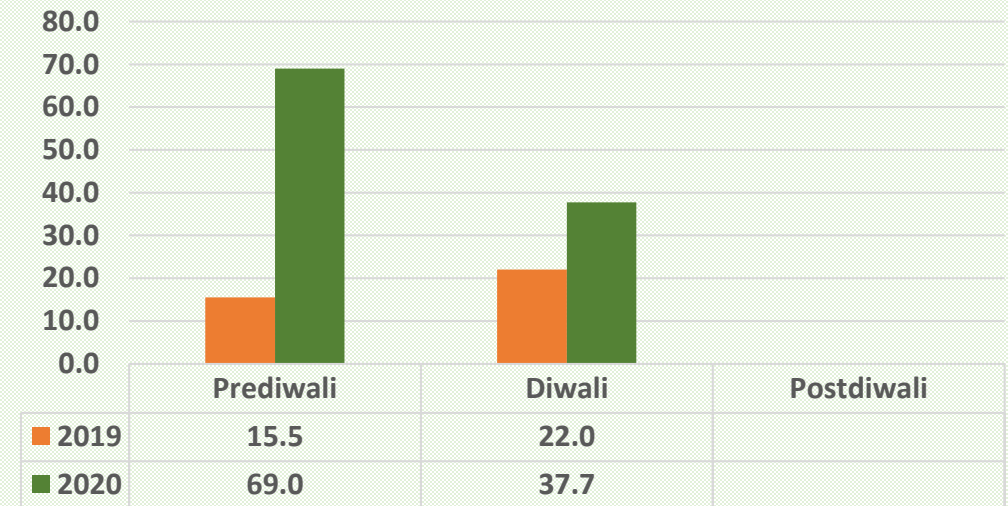
*National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Agra (2019-2020)

RO Badla (NO<sub>2</sub>)



IA Nunhai (NO<sub>2</sub>)



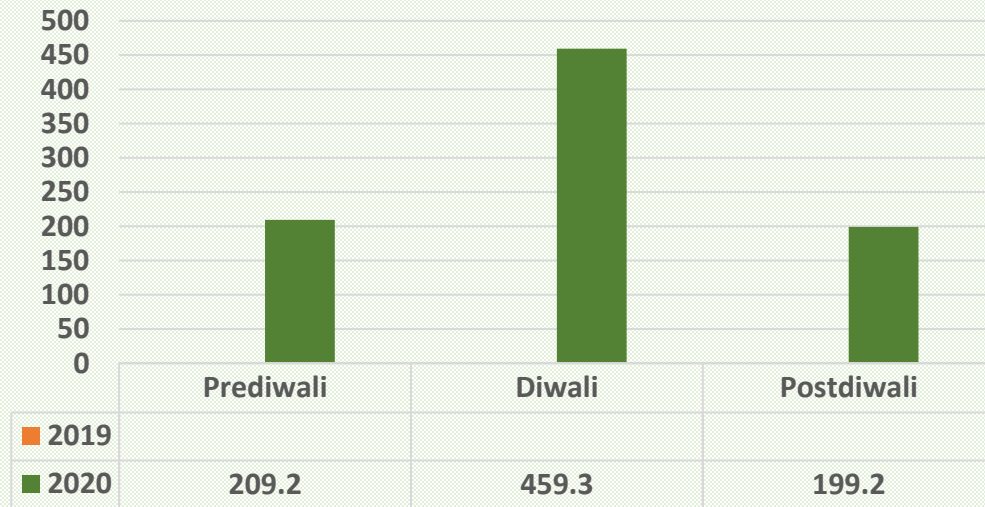
**NO<sub>2</sub> concentration is comparatively higher in 2020 than in 2019 during pre-Diwali and Diwali at both the locations.**

**An overall decrease in NO<sub>2</sub> concentration from Pre-Diwali to Diwali in 2020**

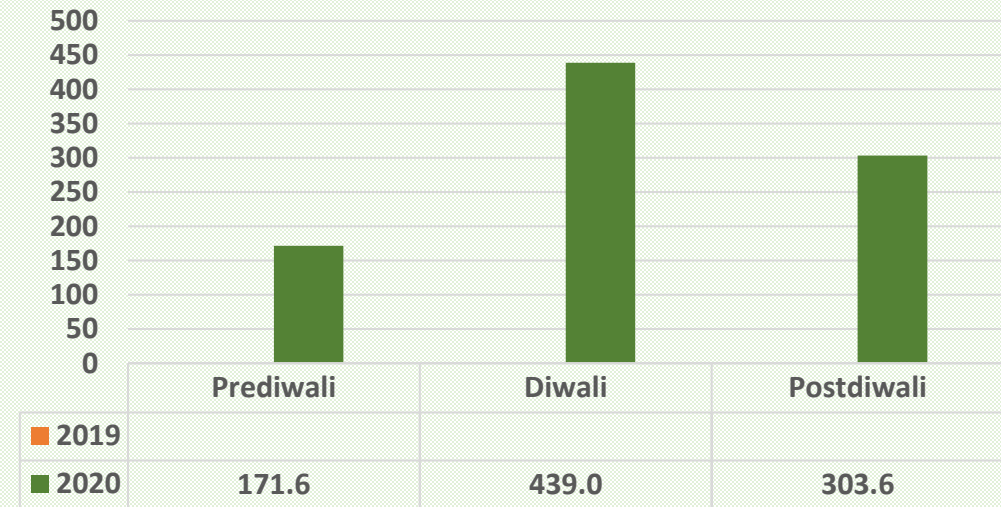
***National Ambient Air Quality standard (24-hour average) : NO<sub>2</sub> – 80 µg/m<sup>3</sup>***

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Gajraula (2019-2020)

### Indra Chowk (PM10)



### Raunaq Auto (PM10)

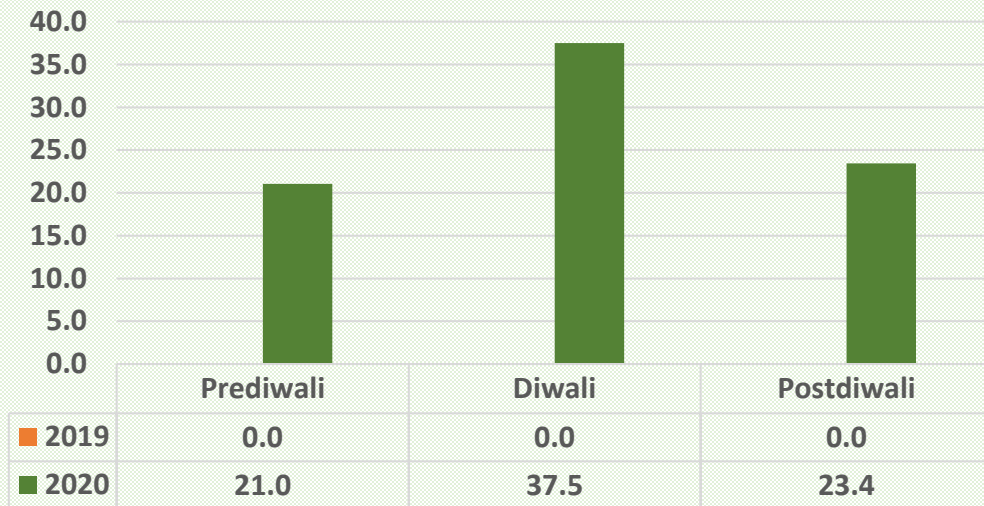


**PM<sub>10</sub> concentration increased from Pre-Diwali to Diwali by almost 120% at Indra Chowk and by almost 156% at Raunaq auto monitoring station.**

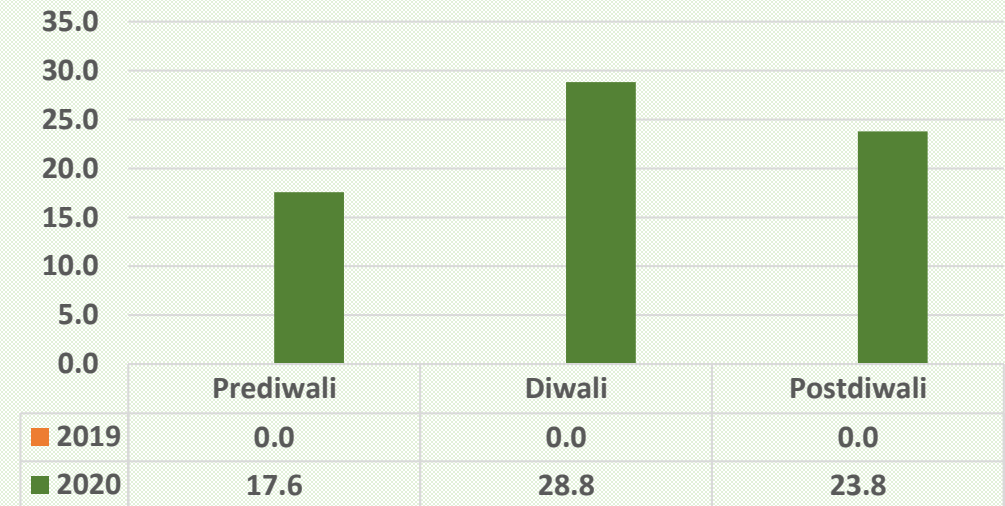
*National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> – 100  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Gajraula (2019-2020)

### Indra Chowk (SO<sub>2</sub>)



### Raunaq Auto (SO<sub>2</sub>)



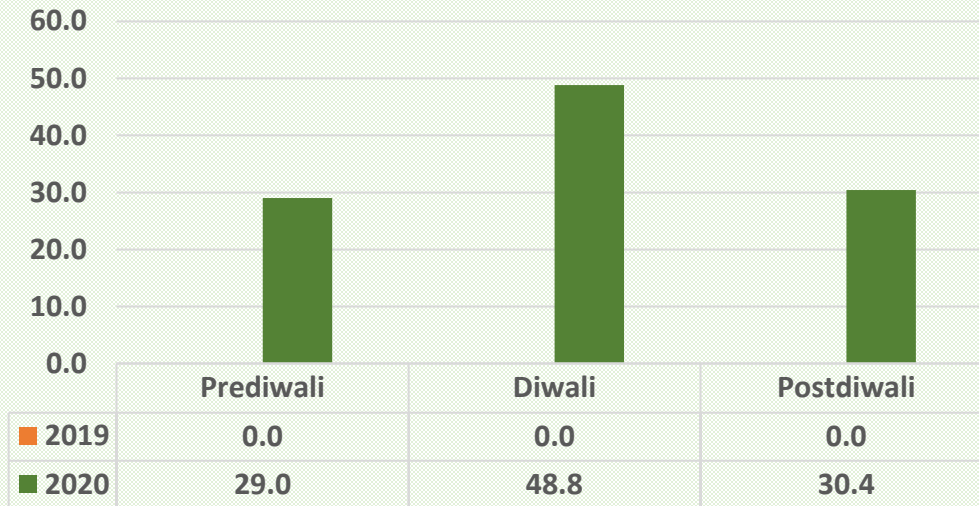
**SO<sub>2</sub> concentration increased from pre-Diwali to Diwali by almost 78% at Indra Chowk and by almost 64% at Raunaq Auto monitoring station.**

**Overall increase in SO<sub>2</sub> concentration from Pre-Diwali to post-Diwali is almost 11% at Indra Chowk and 35% at Raunaq Auto monitoring location.**

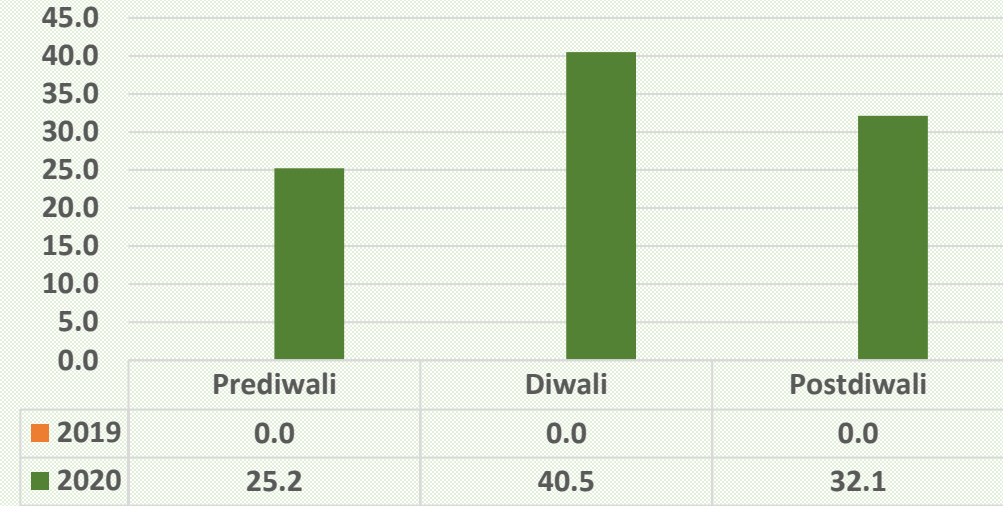
***National Ambient Air Quality standard (24-hour average) : SO<sub>2</sub> – 80 µg/m<sup>3</sup>***

# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Gajraula (2019-2020)

Indra Chowk (NO<sub>2</sub>)



Raunaq Auto (NO<sub>2</sub>)



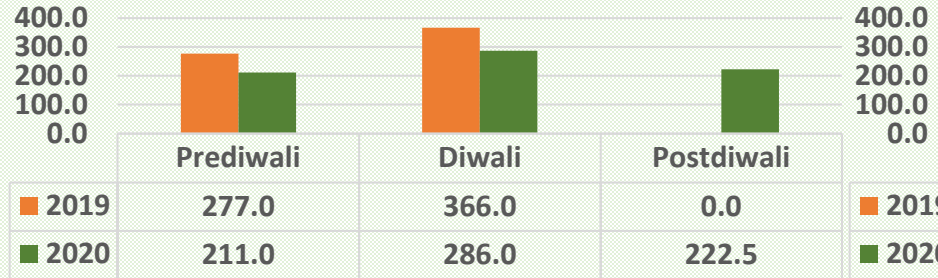
NO<sub>2</sub> concentration increased from pre-Diwali to Diwali by almost 65% at Indra Chowk and by almost 61% at Raunaq Auto monitoring station.

Overall increase in NO<sub>2</sub> concentration from Pre-Diwali to post-Diwali is almost 4% at Indra Chowk and 27% at Raunaq Auto monitoring location.

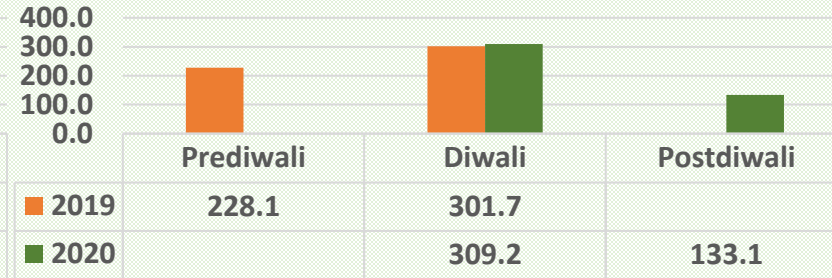
*National Ambient Air Quality standard (24-hour average) : NO<sub>2</sub> – 80 µg/m<sup>3</sup>*

# PM10 concentration ( $\mu\text{g}/\text{m}^3$ ) trend during Diwali season In Prayagraj (2019-2020)

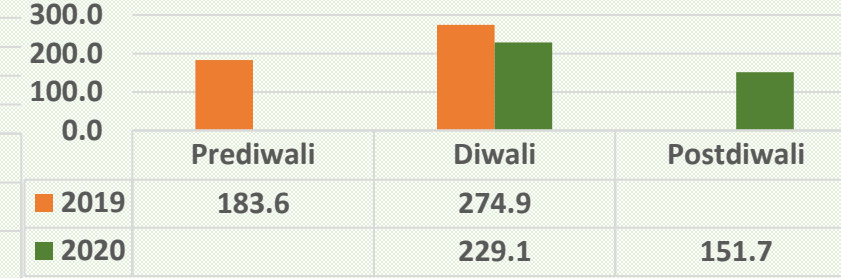
### Laxmi Talkies (PM10)



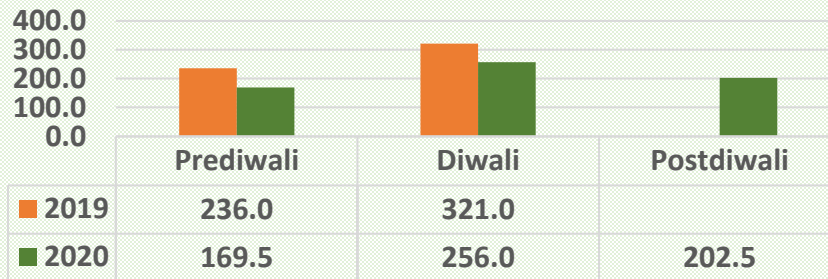
### Alopibagh (PM10)



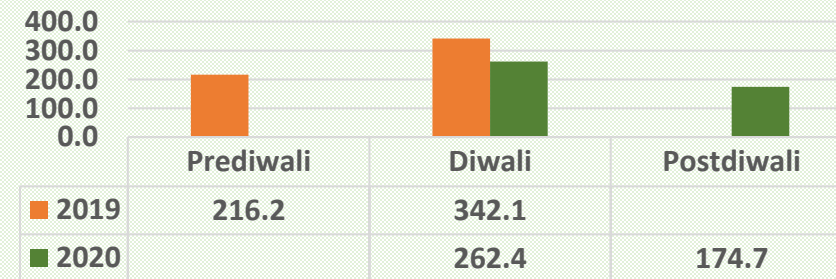
### Johnstonganj (PM10)



### Bharat Yantra (PM10)



### Rambagh (PM10)

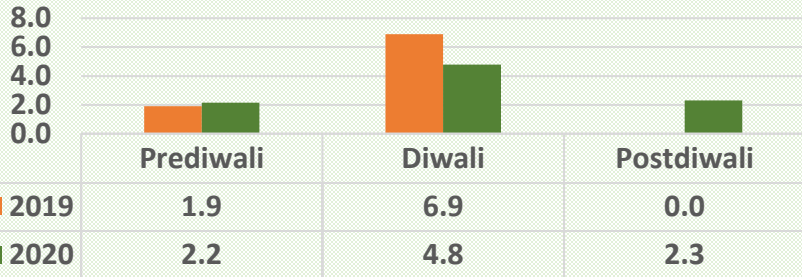


PM<sub>10</sub> concentration values reduced during 2020 from their respective values in 2019

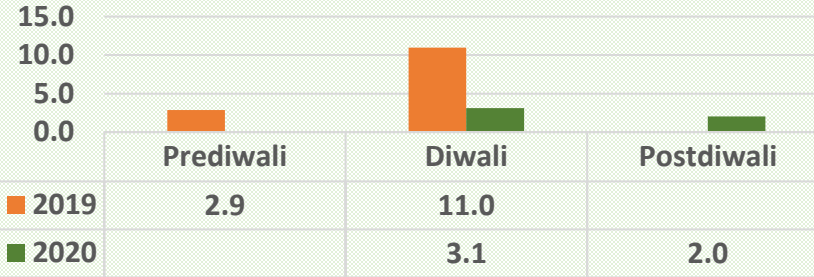
*National Ambient Air Quality standard (24-hour average) : PM<sub>10</sub> - 100  $\mu\text{g}/\text{m}^3$*

# SO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Prayagraj (2019-2020)

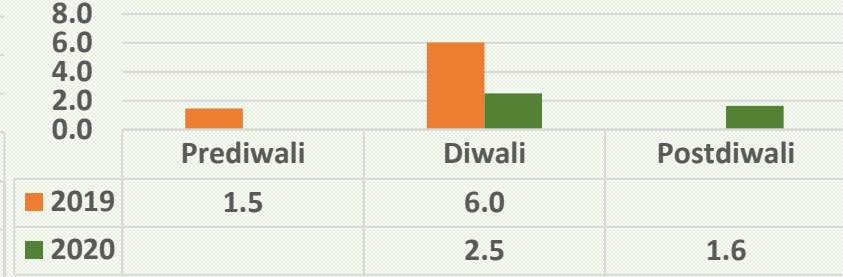
Laxmi Talkies (SO<sub>2</sub>)



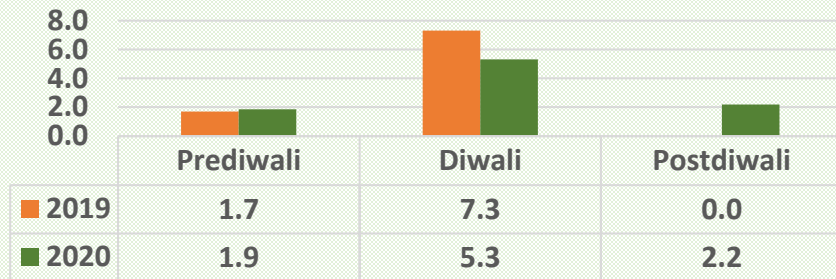
Alopibagh (SO<sub>2</sub>)



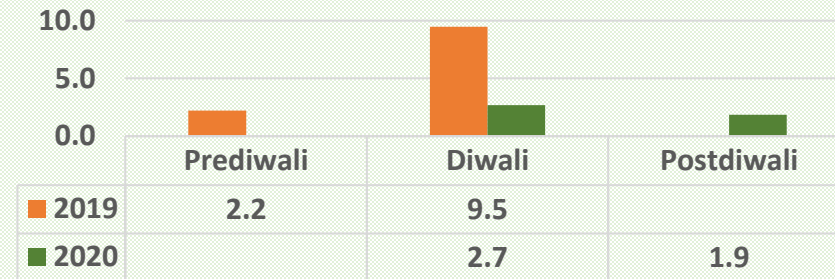
Johnstonganj (SO<sub>2</sub>)



Bharat Yantra (SO<sub>2</sub>)



Rambagh (SO<sub>2</sub>)



SO<sub>2</sub> concentration on the Diwali day is comparatively lower in 2020 than their respective values in 2019 at all the locations .

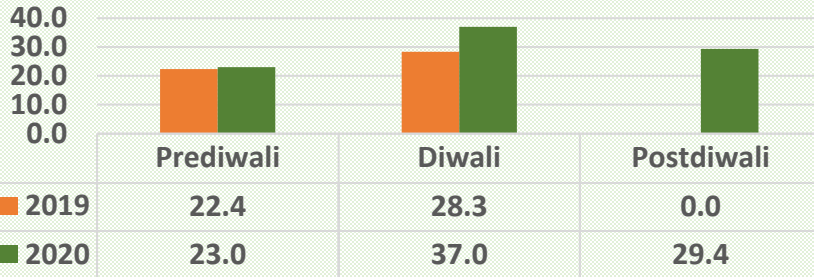
Slight or no change in SO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 2020

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

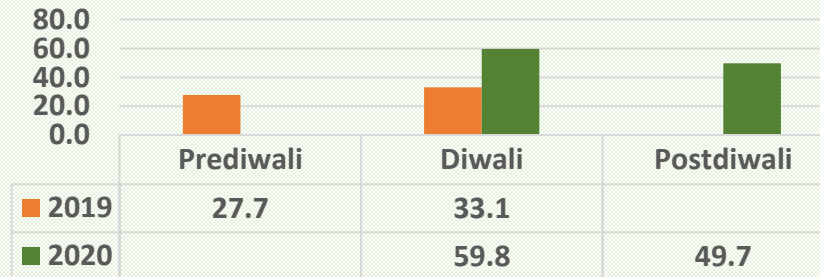


# NO<sub>2</sub> concentration (µg/m<sup>3</sup>) trend during Diwali season in Prayagraj(2019-2020)

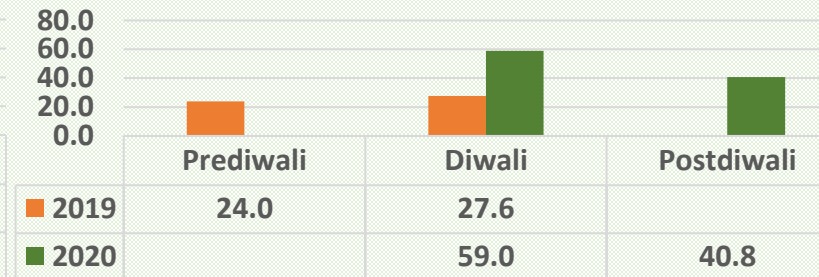
### Laxmi Talkies (NO<sub>2</sub>)



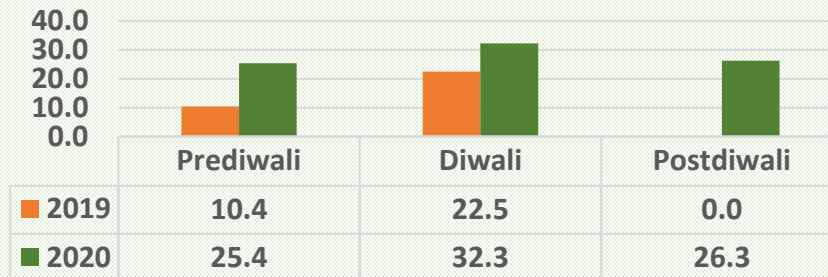
### Alopibagh (NO<sub>2</sub>)



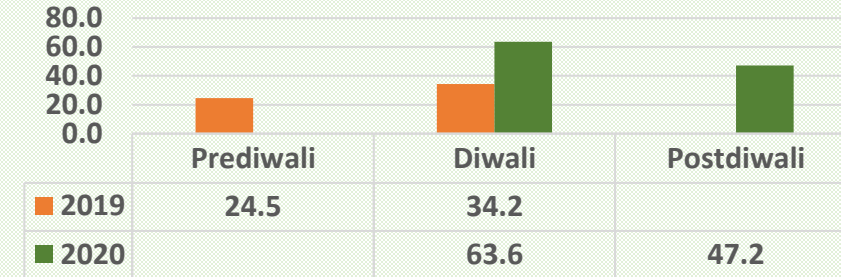
### Johnstonganj (NO<sub>2</sub>)



### Bharat Yantra (NO<sub>2</sub>)



### Rambagh (NO<sub>2</sub>)



**NO<sub>2</sub> concentration is comparatively higher in 2020 during pre-Diwali, Diwali and post-Diwali at all the locations .**

**Slight or no change in NO<sub>2</sub> concentration from Pre-Diwali to post-Diwali in 2020**

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



# Noise monitoring



# Details of Noise Monitoring

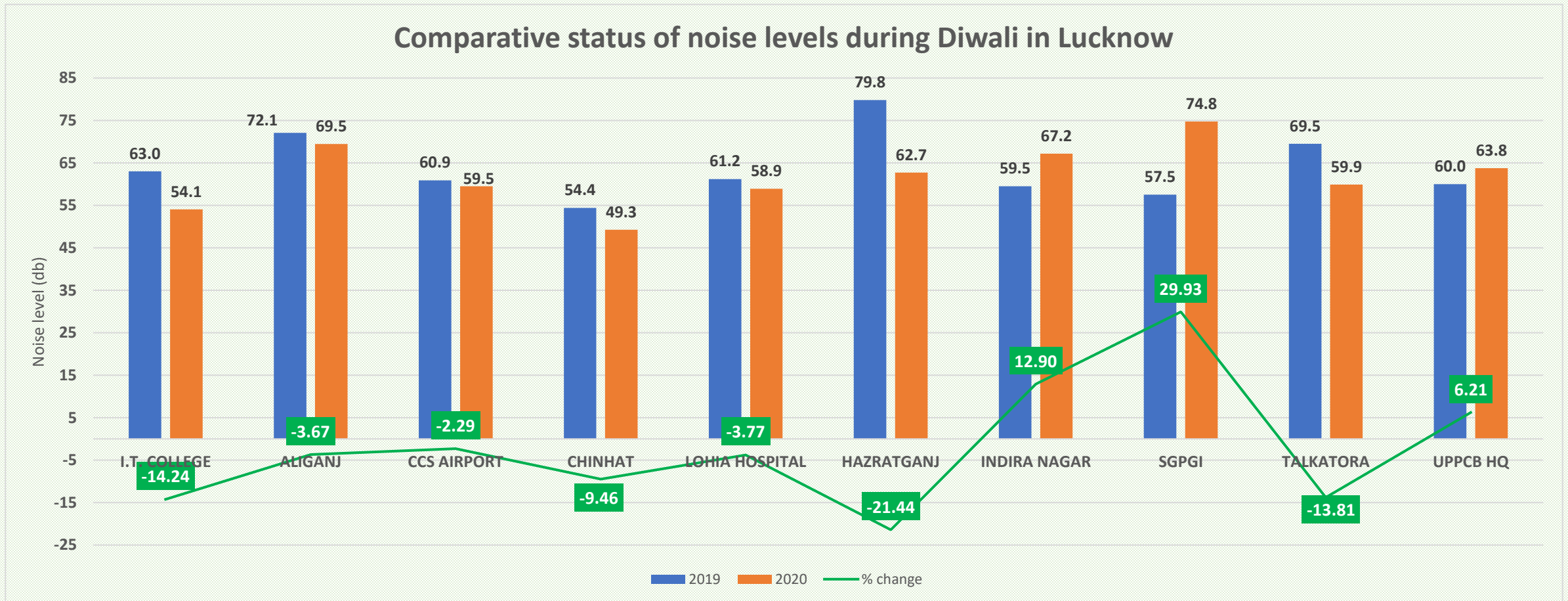
<b>Name of the city</b>	<b>Number of the monitoring locations</b>	<b>Names of Locations</b>
<b>Lucknow</b>	<b>10 (real time monitoring stations )</b>	<b>IT College, Aliganj, CCS Airport, Chinhath, Lohia Hospital, Hazratganj, Indira Nagar, SGPGI, Talkatora, UPPCB HQ</b>
<b>Kanpur</b>	<b>2</b>	<b>Awas Vikas, Jareeb Chowki</b>
<b>Noida</b>	<b>1</b>	<b>Sector 1</b>
<b>Meerut</b>	<b>8</b>	<b>Cantt. Hospital, Collectorate, Railway Road, Begum Bridge, Thapar Nagar, Shastri Nagar, Cantonment board</b>
<b>Ghaziabad</b>	<b>2</b>	<b>Vasundhara Sec 16, Model Town</b>
<b>Muzaffarnagar</b>	<b>6</b>	<b>Kamla Colony, Shiv Chowk, Sri Shadi Lal Hospital, Gandhi Colony, Mahavir Chowk, District Hospital</b>
<b>Moradabad</b>	<b>2</b>	<b>Kashi Ram Colony, UPPCB Budhhi Vihar</b>
<b>Firozabad</b>	<b>3</b>	<b>Sadar Bazaar, Suhag Nagar, Nagla Bhau</b>
<b>Unnao</b>	<b>1</b>	<b>Krishna Nagar</b>

# 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>			

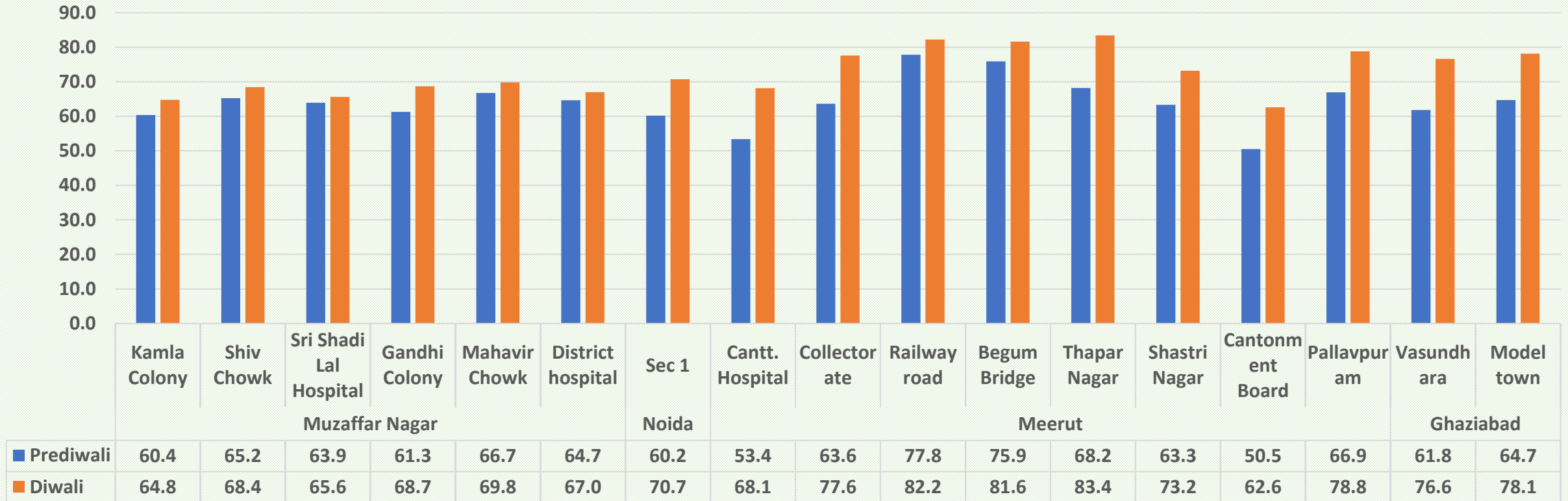
# Comparative analysis of Noise monitoring in Lucknow (2019-2020)



- Average noise level has decreased at 7 out of 10 locations
- Average noise level has increased at 3 locations

# Comparative analysis of Noise monitoring during Prediwali & Diwali (2020)

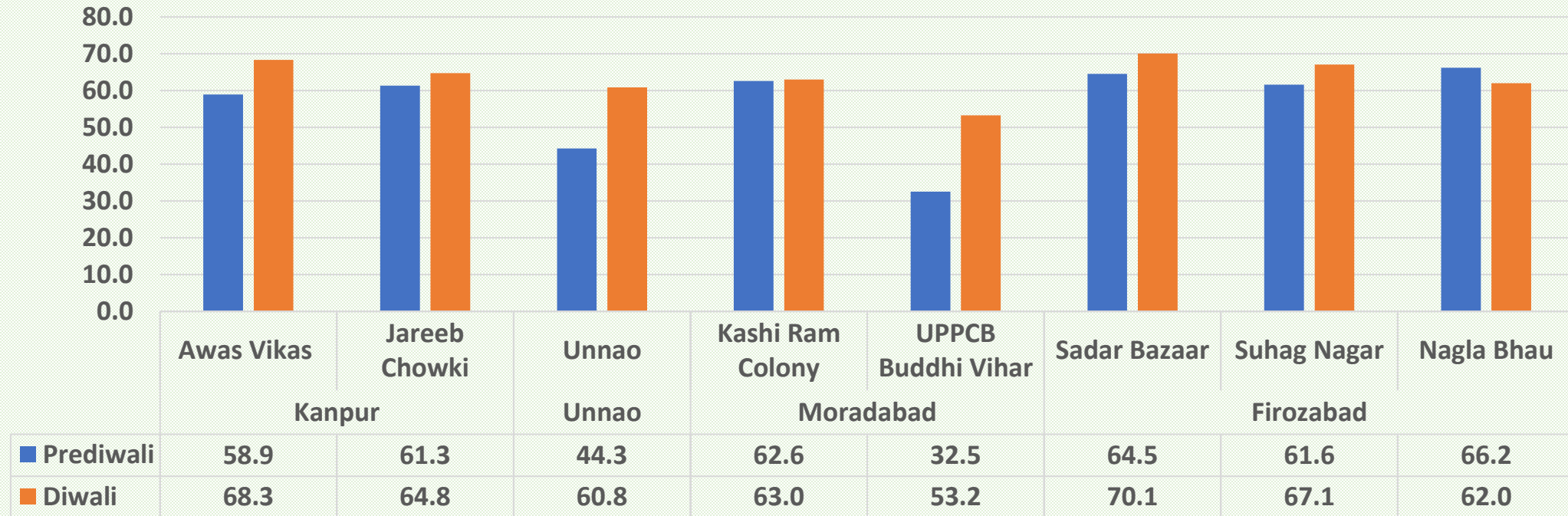
## Noise levels in NCR cities



- Average noise level has increased at all the locations on Diwali and is found to be exceeding the prescribed standard limits

# Comparative analysis of Noise monitoring during Prediwali & Diwali (2020)

Noise levels in cities other than NCR



- Average noise level has increased at all the locations on Diwali
- Prediwali noise levels are found to be exceeding the standard limits except in Unnao and Moadabad (UPPCB Buddhi Vihar)