ENVIS CENTRE, CHANDIGARH
Newsletter
Paryavaran - Patra
ISSN No. 0974-7087
Chandigarh State of Environment

Air pollution in Chandigarh and efforts taken to mitigate it

1. Introduction to air pollution

Air pollution can be defined as the contamination of air that changes its natural composition and also directly or indirectly impacts the health of living beings. The contamination of air can occur due to emission of different types of gases, particulates, aerosols, volatile organic carbons etc. These contaminants have been reported to induce various health impacts in the living beings such as, respiratory, carcinogenic, neural, visceral etc. India, being a developing nation, has experienced an exponential technological-development, in the recent past, owing to which emission of air pollutants from different industries, mining, vehicles etc., was also reported to increase. Subsequently, it has also been reported that 1.67 million deaths, in India, in the year 2019, were attributed to air pollution (Pandey et. al 2020). Further, recently, studies have also derived a significant relationship between air pollution and increased susceptibility to COVID-19 exposure. Therefore, considering the importance of dissemination of information related to air pollution and its health impact, this newsletter will enlighten the readers with the status of air pollution in Chandigarh and efforts taken by its administration to mitigate it.

Index

Paryavaran Patra

Pandey, A., *et al.* (2020) Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019. *The Lancet Planetary Health*. doi.org/10.1016/S2542-5196(20)30298-9.

2. Monitoring of air quality in Chandigarh

With a motive of regularly monitoring the air quality, the Chandigarh Administration has installed five ambient air monitoring stations around the UT. These five monitoring stations are located in Kaimbwala, Ind. Area, Phase-I, Sector 12, Sector 17, Sector 22, Sector 25 and Sector 39. These locations were chosen on the basis of the nearby source of air pollution i.e., industries, vehicles, biomass burning, landfill fires etc. The geographical location of Chandigarh, and its various air monitoring stations, is shown in Figure 1.

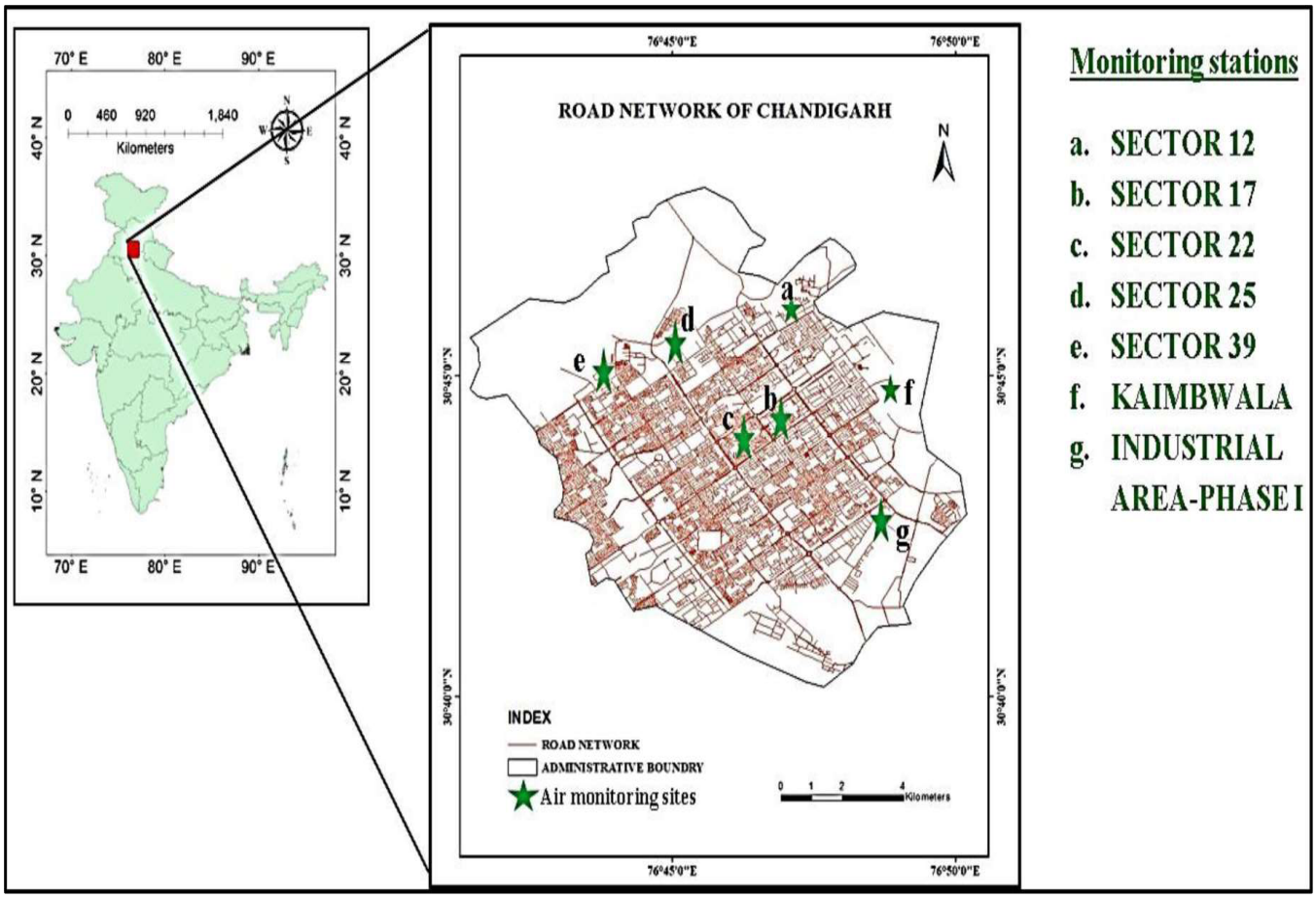

Figure 1. Geographical location of Chandigarh and its air monitoring stations

At these ambient air monitoring stations, the air quality of nearby areas is monitored daily. Using this data, the current newsletter will discuss the ambient air quality of Chandigarh for last four years i.e., 2018 to 2021.

3. Ambient air quality of Chandigarh

The daily data collected from the ambient air monitoring stations of UT Chandigarh, was averaged in four quarters of a year i.e., Q1 = March, April and May (MAM); Q2 = June, July, August and September (JJAS); Q3 = October, November and December (OND) and Q4 = January and February (JF). The division of months in four quarters was done in accordance with the monsoon seasons of Chandigarh i.e., summer and winter monsoons. The various air quality parameters,that will be discussed in this newsletter, include: Respirable Suspended Particulate Matter (RSPM), NOx and particulate matter (PM2.5). Subsequently, the quarterly ambient air quality of Chandigarh, is shown in Figure 2.

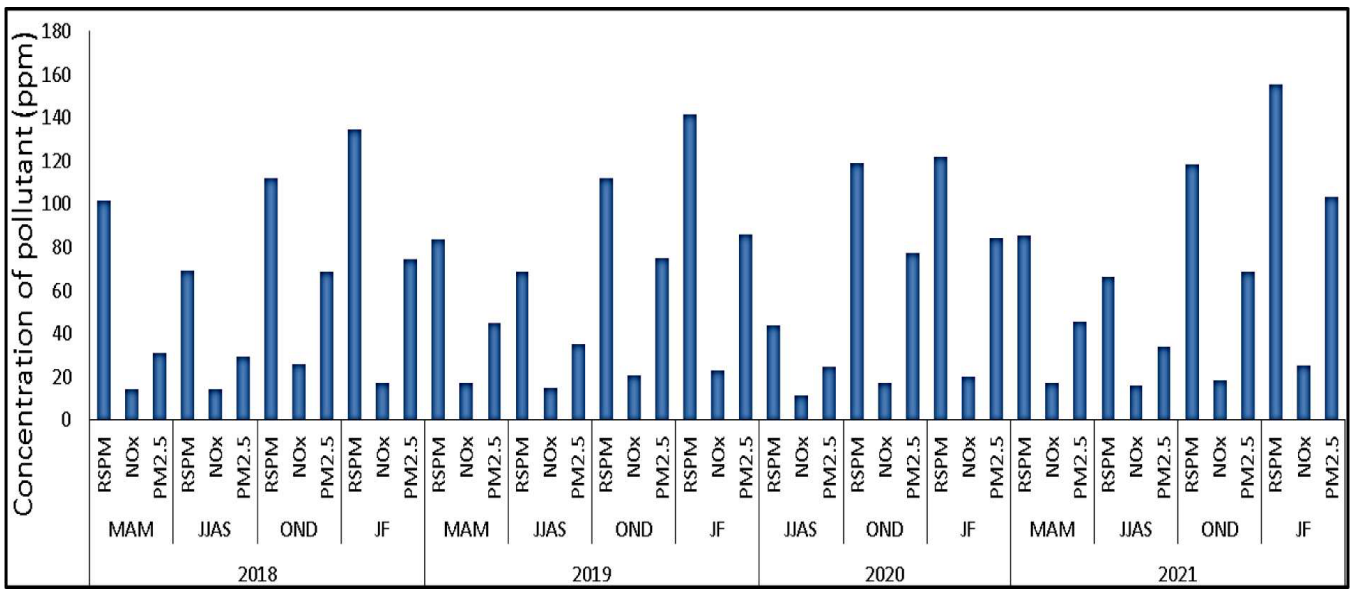

Figure 2. Ambient air quality of Chandigarh

RSPM and PM2.5:These pollutants represent the particulate content of the ambient air. From Figure 2, it can be illustrated that during 2018 to 2021, the order of their concentration, in the ambient air of Chandigarh, was observed to be JF < OND < MAM < JJAS. The lowest concentration of RSPM and PM2.5, in the JJAS quarter, can be attributed to the settling of particulates with precipitation. Similarly, increase in concentration of the RSPM and PM2.5, during winters, was due to the decrease in dispersion of pollutants, owing to lowering of

inversion layer and contribution from various anthropogenic emissions such as, burning of crackers, stubble burning, vehicular emissions etc. In this way, the concentration of RSPM and PM2.5 was observed to be beyond their permissible limits i.e., 100 ppm and 60 ppm, respectively, during the OND and JF, quarters of the year.

NOx: Oxides of nitrogen are the pollutants that are emitted during industrial combustion, biomass burning, vehicular emissions etc. As depicted in case of the particulate matters, the order of concentration of NOx was also observed to be JF < OND < MAM < JJAS. However, the concentration of NOx was never observed to increase beyond the permissible limits i.e., 80 ppm.

4. Diwali and air pollution

The festival of Diwali is normally celebrated during the OND-quarter of the year and the burning of crackers during this festival may significantly contribute in the lowering the air quality. Therefore, the Chandigarh Administration estimate the ambient air quality of Chandigarh just before and during Diwali, as shown in Figure 3.

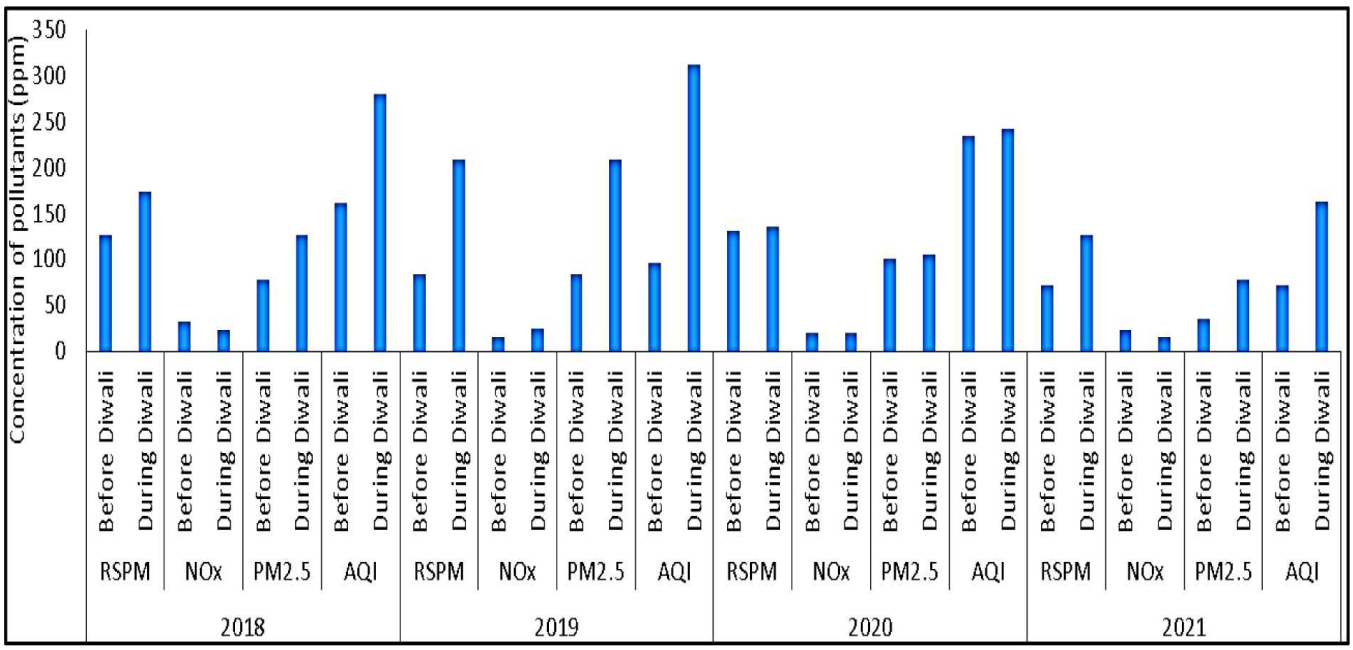

Figure 3. Air quality of Chandigarh before and during Diwali festival

From Figure 3, it can be seen that from 2018 to 2021, all the concentration of all the air quality parameters was observed to increase during the Diwali festival. Also, the concentration of RSPM and PM2.5 increases beyond its permissible limits during Diwali festival. Owing to the increase in these pollutants, the Air Quality Index (AQI) of Chandigarh also increases. Therefore, in order to sustain the air quality of Chandigarh, its Administration has made significant efforts and the results can be seen in Figure 3, which clearly shows decrease in concentration of air pollutants from2018 to 2021.

5. Efforts made by Chandigarh Administration

5.1. Management of road dust

The Chandigarh Administration has procured state-of-the-art technology in order to prevent the dispersion of road dust. Some of the equipment bought under this step include: 1. Mechanical street sweeper; 2. Water sprinklers, as shown in Figure 4. These equipment reduces the concentration of particulate matter in the ambient air. Also, these equipment use tertiary treated water to clean/wash footpaths, market areas and road berns.

Figure 3. Water sweeper and water sprinkler

5.2. Greening and paving activities

Under National Clean Air Programme (NCAP), the Chandigarh administration has planted small shrubs/ plants along the road in many sectors with an aim to reduce air emissions generated out of vehicles pollution by acting as a barrier along the roads.

5.3. Installation of display boards

In order to aware it citizens and enhance their participation in the mitigation of air pollution, the Chandigarh Administration has installed big display boards in six locations i.e., Paryavaran Bhawan Sector 19, Sector 17, PGIMER Sector 12, Railway Station, ISBT Sector 43 and Sukhna Lake Sector 6. The display boards are shown in Figure 5.

Figure 5. Air quality display boards

5.4. Installation of Continuous Ambient Air Quality Monitoring Stations

The Chandigarh Administration installed two CAAQMS in Sector 25 and Sector 22, which monitors 13 parameters on real time basis along with the prevailing meteorological conditions, as shown in Figure 6. One more CAAQMS, will soon be commissioned in Sector 53. This will upgrade the monitoring network in the city to act wisely while formulating policies in this regard.

5.5. Installation of Air Purification Tower

Chandigarh Pollution Control Committee has installed one Air Purification Tower at Transport Chowk, Sector 26, Chandigarh, as shown in Figure 7.It is one of the busiest cross-section of the roads to trap the air pollutants which may otherwise contribute to the high AQI in the city.

Figure 7. Air purification tower at Transport Chowk, Sector 26, Chandigarh

5.6. Promoting cycling and e-vehicles

With a motive of encouraging the use of bicycles, for travelling, Chandigarh Administration laid ~200 km bicycle track around the UT. Further, to facilitate the public, travelling on bicycles, more than hundred bicycles stands with bicles are installed around Chandigarh. Also, in order to motivate the use of E-vehicles, the Chandigarh Administration honours the owners of E-vehicles. The glimpses of these activities are shown in Figure 8.

Figure 8. Promotion of cycling and e-vehicles by Chandigarh Administration

5.7. Green Diwali Campaign

The Chandigarh Administration along with Yuvsatta-NGO, launched a fortnight long 'Green Diwali Campaign'. In this initiative, Artists dressed as Sri Ram, Mata Sita&Laxman, presented masks and sanitizers to general public. Also, the NSS students of Home Science College students along with volunteers of Yuvsatta carried placards with message of Green Diwali Awareness Campaign and Swacch Bharat Abhiyan to further spread the message of 'Cleanliness is next to Godliness'. As a result, more and more people started considering bursting firecrackers as environmentally irresponsible form of entertainment. The glimpses of this event are shown in Figure 9.

Figure 9. Glimpses of Green Diwali Campaign 2021

5.8. Carbon Watch app

The Mobile app "CarbonWatch" has been developed by the Department of Environment, Chandigarh Administration for the residents of City Chandigarh to assess their Carbon Footprint and steps to reduce it in order to make them Climate-Smart Citizens. This Mobile App works on all Android supporting smart phones. Apart from Chandigarh resident's other can also make their account on the "Carbon Watch" and calculate their Carbon footprint. Interested can download this app by scanning the QR Code, shown in Figure 10, or by accessing url https://play.google.com/store/apps/details?id=com.carboneye.

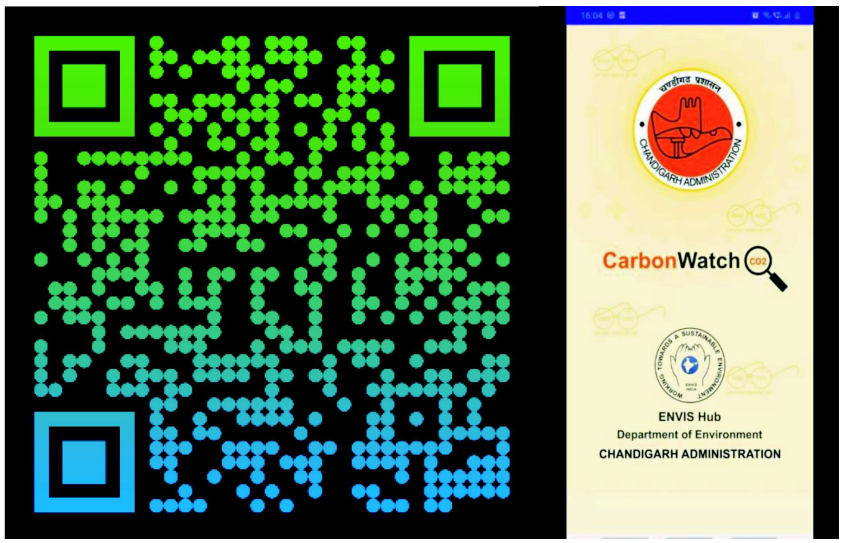

Figure 10. QR code for installing CarbonWatch app

From:
ENVIS Centre
Department of Environment
Chandigarh Administration
3rd Floor, Paryavaran Bhawan,
Madhya Marg
Sector 19B,
Chandigarh - 160019

Ph. No: 0172-2700065, 0172-2770998
Email: ch@envis.nic.in
Website: www.chandigarhenvis.gov.in

To,