

ALARMING AIR QUALITY TRENDS NEAR VICTORIA

HOWRAH SURPASSES KOLKATA IN MEAN AQI



POLLUTION







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Introduction & Victoria is the next R.B.U. of Kolkata

Victoria's Status of AQI

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INTRODUCTION

Kolkata, often hailed as the City of Joy and the capital of West Bengal, continues to grapple with its unenviable status as the world's second-most polluted city, according to The Air Quality and Health in Cities report by the US-based Health Effects Institute and the Institute for Health Metrics and Evaluation's Global Burden of Disease Project. Recent revelations by The Indian Express on November 24, 2023, confirm an ongoing trend of heightened pollution levels in the city this year. This persistent deterioration in air quality demands urgent and comprehensive measures to address its adverse impact on public health and the environment, as highlighted by continuous monitoring from the Central Pollution Control Board and the West Bengal Pollution Control Board, along with insights from their previous year's assessments.

As the winter season commences, it becomes imperative to assess the air quality in the cities of Bengal. This blog, initiated by the research team at the SwitchON Foundation, aims to monitor the air quality status in the state capital and other cities. The information is gleaned from Continuous Ambient Air Quality Monitoring Stations (CAAQMs) on the CPCB portal.

VICTORIA IS THE NEXT R.B.U. OF KOLKATA

Victoria is attaining record-high Air Quality Index (AQI) levels, whereas R.B.U. is experiencing a relative decline.

In the past, the northern part of the city exhibited elevated pollution levels, primarily attributable to the presence of industrial zones. In 2021, the Rabindra Bharati University area, situated adjacent to Chitpur Yard, recorded the highest Air Quality Index (AQI) at 344, surpassing the average AQI during the winter months in the city. However, this figure has significantly decreased to a mean AQI of 255 in January of the current year.

In contrast, the air quality during the winter season in the vicinity of Victoria Memorial has witnessed a decline in recent years. In the winter of 2021-2022, the average Air Quality Index (AQI) recorded figures of 172 and 201 in the critical winter months of December and January, respectively. Comparatively, during the previous winter months, it spiked to 294 and 279 AQI, approaching the "very poor" category. **There was a staggering 70% increase in air quality increase between 2021 and 2022 December while it was only 4% at R.B.U.**



General Trend of Increase in Winter Air Quality of Victoria over the Years

General Trend of Decrease in Winter Air Quality of R.B.U over the Years



Immediate decline of AQI graph in the offset of winter at R.B.U. while Victoria is witnessing an upward trend even in monsoon.

Yet another factor putting the air quality of the Victoria region in jeopardy and displacing R.B.U. as one of the most polluted areas is the significant upward trend observed in the mean Air Quality Index (AQI) throughout almost every month in recent years. Despite the monsoon period typically being regarded as the least polluted season in the subcontinent, the CPCB monitors in this area indicate **a rising trend during the months of June (34%) and August (22%) at Victoria**.

Conversely, the Rabindra Bharati University region is witnessing a substantial decline in air pollution as winter sets in. In February 2021, the city's mean Air Quality Index (AQI) stood at 317, signifying very poor air quality, **the percentage of air quality improvement between February 2021 and 2023 is 57 per cent.** However, this year, it has decreased to 134 AQI, indicating moderate air quality in this particular area. Concurrently, both the monsoon season and the commencement of winter have exhibited lower levels of air pollution compared to previous years.

General Trend of Increasing Air Quality Index of Victoria in the Non-winter Months



General Trend of Decrease Air Quality Index of R.B.U in the Non-winter Months



Victoria's Status of AQI

Shift of highest AQI towards December

Analyzing the air pollution scenario through the mean Air Quality Index (AQI) of this station over the last three years reveals a significant shift. Traditionally, the peak of polluted air was experienced in January, the second half of winter in the city. However, recent trends show that December has now emerged as the month with the highest levels of poor air quality. During the winter season of 2021–2022, January '22 recorded a 201 (poor) AQI, while December registered a 172 (moderate) AQI. In the subsequent winter (2022–2023), December '22 AQI surged to 294, while January '23 AQI decreased to 279.



Winter AQI at Victoria Memorial



Day-wise comparison of AQI Category days

As the mean Air Quality Index (AQI) in the region demonstrates an increasing trend over the years, it is noteworthy that, in comparison to other parts of the city, the occurrence of poor, very poor, and severe air quality days is relatively high. In the previous year, Ballygunge recorded 124 unfavourable days, R.B.U. had 106, and Victoria had a comparatively lower count of 77 bad days. However, in November 2023, both Victoria and Ballygunge witnessed 42 days of poor air quality, marking the highest among the seven CPCB CAAQMS stations in the city. Simultaneously 13 good days were reduced from 2021 to 2022 at Victoria.



Good, Moderate & Satisfactory Days in Kolkata (2021 - 2022)

Month

Poor, Very Poor & Severe Days in Kolkata (2021 - 2022)



Diurnal Comparison of Mean AQI in November at Victoria Station



High AQI record in the morning

The November 2023 data from the Central Pollution Control Board (CPCB) distinctly indicates that air quality is notably worse in the early hours of the day, precisely when individuals engage in their morning walks, registering as "Poor." Between 10 am to 5 pm, when vehicles crisscross the thoroughfares of the city, the air quality goes up to the "Moderate" category with an Air Quality Index (AQI) of 149. During the night, lower temperatures contribute to the downward movement of suspended pollutants, and the reduced ground-level air movement results in the stagnation of pollutants in specific areas. This seems to be a major problem for the health enthusiasts coming daily morning in this area.

Weekends are less polluted at Victoria

The air quality status of Victoria Station in November reveals slightly higher air pollution on weekdays compared to weekends. One potential explanation for the "Poor" (206) Air Quality Index (AQI) during weekdays could be attributed to the vehicular traffic from officegoers observed at the Maa Flyover. The disparity in AQI between weekdays and weekends amounts to a 23-point difference.

Average Air Quality in Weekday & Weekend at Victoria in November 2023





AIR QUALITY IS MORE SERIOUS FOR THE TWIN CITY, HOWRAH

Increasing Poor and Severe AQI days in Howrah

Howrah, an industrial city situated on the western bank of the Hooghly River in West Bengal, exhibits a more alarming air quality scenario compared to Kolkata. While Kolkata has seen a decrease in "Very Poor" Air Quality Index (AQI) days from 10% in 2021 to 8% in 2022, Howrah's proportion in this category is notably higher and has seen an increase from 21% in 2021 to 27% in 2022. Conversely, as Kolkata observes a steady rise in "Good" AQI days, Howrah experiences a decline, and the occurrence of "Severe" AQI days has slightly increased. Notably, the state capital on the eastern bank has not encountered a single severe day during the same period.

Percentage Share of AQI Category Days in Howrah (2021 - 2022)



Percentage Share of AQI Category Days in Kolkata (2021 - 2022)



Comparatively Higher Mean AQI at Howrah in Winter

December and January months at Howrah have shown a "Very Poor" mean AQI over the past two years. At this time, the highest calculated mean AQI were 362 and 341 AQI in 2021 and 2022 respectively, which is higher than any of the single stations at Kolkata as well as it is also higher than the mean AQI at Kolkata in the same period. highest calculated mean AQI in Kolkata was 220 and 265 in the respective years, demonstrating "Poor" air in the city in comparison to Howrah's "Very Poor" AQI.



Winter AQI of Howrah

Winter AQI of Kolkata



WAY FORWARD

Climate change has remained a foremost concern globally for decades. Constantly deteriorating air quality due to continuous exposure to pollutants especially from the third world nations. World Health Organisation (WHO), has defined air pollution as the contamination of the environment, indoors or outdoors, by chemical, physical, or biological agents altering the natural atmosphere. South Asian countries, especially India and its cities have remained mostly highlighted due to their sheer presence in contributing to air pollution and its impact can be apprehended from regional to global level (The Hindu, 13th November 2023).

- Researchers need to find out the reason behind the sudden hike in air pollution near Victoria Memorial, near the Lungs of Kolkata.
- Air pollution mitigation measures need to come out for Howrah city
- Based on continuous monitoring of AQI, frequent assessment of the air quality status of the cities of Bengal is highly required.



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