REPLY to RC1

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- **RC1**: 'Comment on egusphere-2024-803', Anonymous Referee #2, 15 May 2024 reply

1. the paper averages out 10 different locations in Delhi and describes the particulate matter scenario and attributes the decrease to the measures taken by the government. It would be better if the authors chose the locations immediately impacted by these government measures, instead of averaging them out. The microenvironments are very different from each other, thus averaging them out wouldn't depict the true picture.

   We understand your concern about the potential variability in microenvironments across different locations. Our initial approach was to provide a broad overview of the overall impact of government measures on air quality by averaging data from multiple locations. This is because the government implemented measures citywide rather than targeting specific areas.

2. 2020 was in full lockdown for few months, followed by partial lockdowns. Similar statewide lockdowns were observed during 2021 as well. So including 2020 and 2021 will skew the results. the anomaly seen in 2020 and 2021 is substantial compared to the other years, thus it doesn't depict the true picture. Please include the following years 2022, and 2023 to see if the trend persists and to rule out the impact of lockdown.

   Four Lockdown (LD1 to LD4) phases (with a gradual reduction in restrictions from LD1 to LD4) with LD1, LD2, LD3 and LD4 correspond to March 25-April 14, April15-May 03, May 04–17, May 18–31, 2020 respectively. No lockdowns implemented in 2021 in Delhi to the best of our knowledge. Some restrictions (event specific mitigation plans) are usually implemented every year whenever air quality reaches very poor condition.

   In order to understand whether the trend during 2011-2021 is affected by including the data with lockdown period during March 25-May31, 2020, we have calculated anomaly of each year from the decadal mean (2011-2021) and depicted in Figure 2b. The negative anomalies of PM2.5 in 2019, 2020 and 2021 are almost the same; hence inclusion/exclusion of 2020 data hardly changes the annual trend for the period, 2011-2021.

   The decreasing trend is observed from 2016 onwards as illustrated in Figure 2a in the manuscript.

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   https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1991970

   The above link leads to the 'Report of Ministry of Environment, Forest and Climate change', reporting a decreasing trend in PM10 and PM2.5 during 2018-2023 even after excluding 2020 values.

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3. why was 2018 chosen as the meteorological base year for comparison?

The choice is based on certain facts. Delhi's 1st emission inventory was prepared in 2011. Revision of the same was done in 2018 and this is the same which was used in the current operational model. We could have taken 2016 but stopped short as we noticed that there is a kind of sharp drop in PM since 2016 while we analysed trend. Therefore, 2018 was chosen as a steady year to assess meteorological base. Further emissions data for this year are available in both the EDGAR and the local emission inventory SAFAR at the time of this manuscript preparation.