Looming Ozone threat in India: Should non-attainment cities list be revisited?

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Non-Attainment Area:

According to the US EPA, an area is termed as 'non-attainment area' if air quality exceeds the national ambient air quality standards (NAAQS). An area can be in the list of 'nonattainment' for a regulated pollutant and might not be for others. Simply put, each pollutant will have a list of nonattainment areas of their own. Currently around 209 and 232 counties in the US are declared as non-attained for Ozone and $PM_{2.5}$, respectively. The nonattainment counties come up with control plans to control the corresponding pollutant and this in turn is reflected in the country's clean air action plans.

China- As an example:

While the concept of nonattainment cities has been in implementation since couple of decades in countries like the US, it has been relatively new is highly polluted countries like China and India. For example, one of the most successful clean air action plans was launched by the Chinese government i.e. Air Pollution Prevention and Control Action Plan (www.gov.cn/zwgk/2013-09/12/content_2486773.htm) in 2013. This plan divided the country into airsheds and devised strategies to control anthropogenic emissions such that the country in future would no longer be non-attained for PM. This plan could reduce ambient $PM_{2.5}$ concentrations ~34% by the end of 2017 [1]. However, on the contrary a significant increase (~20%) in Ozone concentrations were observed during this period [1, 2]. This increase in Ozone has forced the Chinese government to revisit their action plans.

Status in India:

To control the severe air pollution in the country, the government of India has been coming up with many clean air initiatives in the recent past. More recently, the National Clean Air Programme (NCAP) a five-year action plan was launched in 2019 with a goal of reducing PM by 30% nationwide. As a part of it more than 120 nonattainment cities were identified in India based on PM. This largely makes sense as in most of the cities in India, PM is the dominant pollutant.

Using lockdown as a warning:

Restricted human activities during the lockdown in India has given enormous hope to the governing bodies and the citizens regarding clean air in India. Lockdown resulted in ~40% decrease in $PM_{2.5}$ concentrations in 22 Indian cities[3]. However,

to the contrary an increase in Ozone concentrations have been observed. Furthermore, it was also interpreted that a significant reduction in PM loadings similar to lockdown period in India can result in Ozone instead of PM being a dominant pollutant in at least four cities.

Thus, it looks like India whose action plan is very similar to that of China, i.e. more focus on restricting anthropogenic $PM_{2.5}$ emissions, and could face a problem of severe Ozone pollution in future. Therefore, more focus on combination of NOx and VOC emission controls to overcome the effect of decreasing $PM_{2.5}$, is required, and one way is to identify potential nonattainment cities based on Ozone concentrations.

References:

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3. Sharma, S., et al., *Effect of restricted emissions during COVID-19 on air quality in India.* Science of The Total Environment, 2020. **728**: p. 138878.