Assessment of nitrogen oxides concentration in non-attainment areas of Maharashtra, India

(インド, マハーラーシュトラ州の環境基準値未達成地域における窒素酸化物濃度の評価)

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National Clean Air Programme (NCAP) was launched in India by Ministry of Environment, Forest, and Climate Change from January 2019 with a purpose to reduce the air pollution by 20-30%. NCAP has the list of no-attainment cities, which were declared by Central Pollution Control Board of India with respect to the short falls in pollution control, based on National Ambient Air Quality Standards over the period of five years (2011-2015). Out of total 122 non-attainment cities, 18 are itself in the state of Maharashtra which makes the state with highest number of non-attainment cities. Maharashtra being consisting of densely populated cities increases the risk of health hazards cause by pollutions. So, it's essential to study pollutants in most affected areas which are non-attainment cities. In this study, out of nitrogen oxides pollutant we focus on Sentinel-5P data of nitrogen dioxide concentration in the areas of non-attainment cities of Maharashtra. Computing those nitrogen dioxide data during the time of COVID-19 lockdown and dividing in two phases i.e., Lockdown phase and Unlock phase (restrictions gradually getting relaxed) has produced some staggering trends of result during the time of Lockdown phase. Even if there was complete shutdown of activities during Lockdown phase not all cities nitrogen dioxide pollution level went completely down, except Akola and Jalgaon all other cities have shown upward trend, to determine the trend Mann-Kendall trend test method is used. In Nagpur area the nitrogen dioxide has increased by 337% from start of lockdown to end of lockdown phase, which is highest whereas in Solapur there is lowest increment i.e., 12%. Akola and Jalgaon have reduce nitrogen dioxide pollution by 45% and 39% respectively. This study also highlights the specific regions of high concentration of nitrogen dioxide pollution in non-attainment areas through map visualisation and categorising the regions to display hazardous areas. This will help for future studies to focus on those regions.