

‘Lockdown decreased Aerosol Concentration in atmosphere’ states

Dr. Yashwant Katpatal of VNIT Nagpur

In their recent breakthrough research, Dr. Yashwant B Katpatal, Professor, Department of Civil Engineering Visvesvaraya National Institute of Technology (VNIT) Nagpur along with his M.Tech students Mr. Vikas Patel and Prakash Taksal has concluded that the concentration and depth of Aerosols in the atmosphere over pan India has significantly decreased during the lockdown period. Using three satellites data obtained from NASA, and using spatial modelling, Dr. Katpatal and his team have shown that during **25th March to 25th April** in 2016 to 2019, the aerosol concentration was very high as compared to same period in 2020. The aerosols are tiny droplets, dust particles, bits of fine black carbon, and other gases and pollutants present in the atmosphere which affects the climate and pollution levels. Aerosols can be natural or man-made. Examples of natural aerosols are fog, geyser steam, volcanic dust while examples of man-made aerosols are haze, dust, particulate air pollutants and smoke.

The aerosol concentration is measured by estimating the Aerosol optical depth using the satellite sensors. Aerosol optical depth (AOD) is less when its concentration is less in the atmosphere and AOD is more when the concentration of particles is more.

In this research, Mr. Vikas Patel along with Mr. Prakash Taksal both M.Tech (Env. Engg) students working under the guidance of Prof. Yashwant Katpatal measured Aerosol Optical Depth (AOD) and Aerosol Index (AI) using data from NASA for three Earth Observation Satellites (EOS) during 25 March to 25 April. Lockdown was imposed from 24th March 2020 night and it was complete till 3rd May 2020.

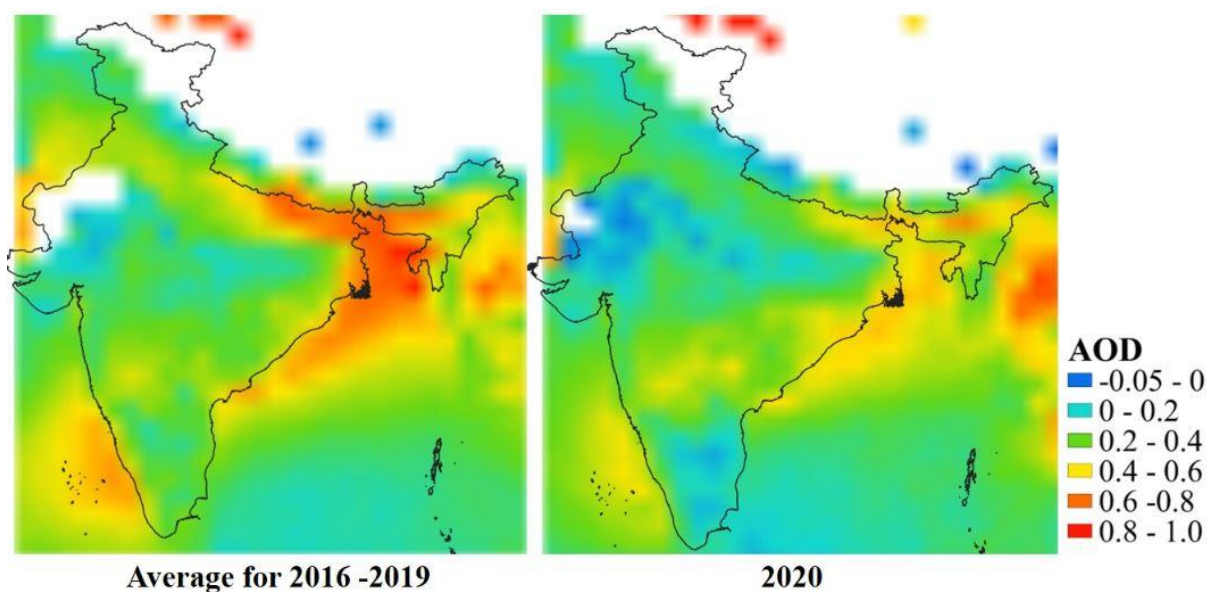


Fig.1. Comparison of Aerosol Optical Depth (AOD) during 25 March to 25 April for 2016-2019 and during lockdown of 2020.

The study estimated aerosol optical depths (AOD) for years 2016 to 2019 and average of these years was generated for India. This average image was then compared with AOD estimated for the lockdown period during 25 March to 25 April of 2020. A significant difference can be observed in the Fig 1 which shows decreased AOD especially in Rajasthan, North India, East part of India, south India and central India. Less difference is observed in the western parts.

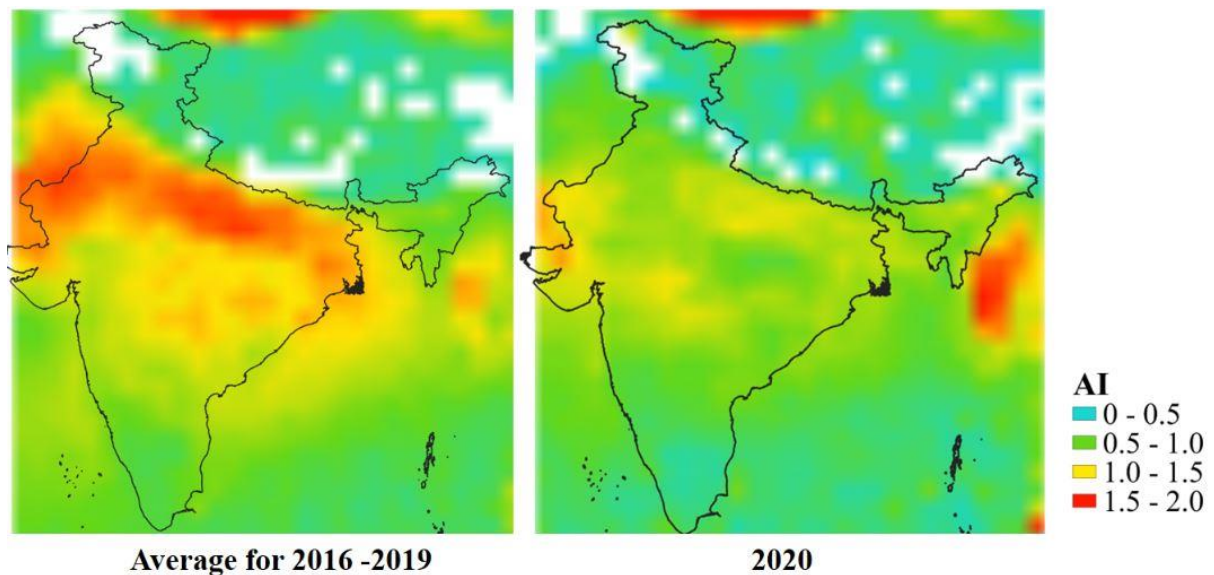


Fig.2. Comparison of Aerosol Index estimated during 25 March to 25 April for 2016-2019 and during lockdown of 2020.

Similarly, the Aerosol Index, another measure of aerosol concentration, is also seen reduced significantly (Fig.2) pan India especially in north India and central India. Aerosol Index is more closely related to air pollution. The research has also estimated phase wise aerosol levels in India. The study also estimated aerosol concentrations in context of global climate change. The study indicates that if human activity is less, it directly affects the aerosol concentrations which are directly related to pollution and climate.