

Use of Data from Space to Identify NO_x, SO_x Emissions Over Industrial and Anthropogenic Agglomerates in the State of Jharkhand, India

Shubham Singh¹ and Richa Sharma¹

¹*Department of Remote Sensing, Birla Institute of Technology Mesra
Ranchi, Jharkhand, India
E-mail: phdrs10006.20@bitmesra.ac.in*

Abstract—The State of Jharkhand is also known as the “Ruhr of India”. It houses many opencast as well as underground coal mines. The pattern of the anthropogenic and industrial agglomerates around this mineral is but a natural consequence. One of the most striking example is the settlement town of Jamshedpur, where the steel plant began production in the early 1900s. Some of these coal mines are smothering slowly under ground for more than a century, especially in the Jharia region in the district of Dhanbad which leads to incomplete combustion. Coal, the primary ore in this region, contains sulphur as one of its constituent. Associated with these mining and industrial activities, and during unregulated mining, coal may even be extracted sometimes overlooking some of the strict regulatory measures. SO₂ emissions into the air or NO₂ emissions are a part of the industrial and anthropogenic activities in the vicinity of coal mines. These impact both local air quality and regional ecosystems. The present paper investigates the role of the satellite data acquired through the state-of-the-art Tropomi instrument capable in mapping a multitude of trace gases on board the Sentinel 5P satellite.. In this study emission sources of effluent trace gases i.e. SO₂ and NO₂ over these areas were identified from the data obtained by this sensor. The results thus obtained were mapped during Covid-19 period, (2019 and 2020) on monthly basis and were also categorized according to varying seasons including pre and post monsoon periods.

Keywords: Tropomi instrument, Sentinel 5P, SO_x and NO_x emissions