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Kriging Interpolation Approach for Monitoring of Ambient Air Quality in Opencast Iron Ore Mining Region of Keonjhar District, Odisha, India

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Abstract

Joda- Barbil region of the Keonjhar District, Odisha is blessed with vast natural resources especially, high-grade iron and manganese ore deposits, dueto which it has occupied a vital position in the mineral map of India. Mining of minerals resources is an important commercial activity indispensable for the economic development of a nation. Opencast iron ore mining and other ancillary activities influence the adjoining ecology and environment. Numbers of environmental issues are arising due to unscientific widespread opencast mining activities and have a direct impact on other natural resources like land, water, soil, air, flora and fauna. Ambient air gets severely affected due to the addition of fugitive dust and other pollutants directly or indirectly at every stageof mining activity starting from exploration, exploitation and mineral beneficiation. All forms of pollutants reduce the ambient air quality and enhance thehealth risk of the people living nearby villages. Increasing air pollution levels in the mining region can have immediate effects on the health of indigenouscommunity and also on flora. A Kriging interpolation method has been applied to monitor the ambient air quality in opencast iron ore mining region of Keonjhar district. This practice is very useful for sustainable and eco-friendly mining as it is cost-effective and time-saving techniques and can interpret the spatial dispersion of pollution levels in un-sampled regions. Kriging interpolation analysis revealed that the ambient air quality level during the year 2005 to2008 were high around Barbil, Thakurani and Noamundi.

Keywords: Ambient Air Pollutants, Opencast Mining, Kriging Interpolation, Keonjhar District

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