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A Remote Sensing Approach to Assess the Impact of Mining Subsidence on Native Vegetation

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Abstract

Energy is a very basic and essential need for any activities to be performed in the universe and this demand is fulfilled by conventional non-renewable as well as very innovative unconventional renewable energy approaches. Mining industry plays a major role in fulfilling today's basic energy needs through coal exploitations and other related explorations. This study aims to evaluate the effect of an underground coal mining subsidence on the growth of native vegetation. For this study, an underground coal mine of Singareni Collieries Company Limited (SCCL), India was selected. Changes in vegetation indices were analyzed using three remote sensing data of the previous 11 years. Three period's Landsat 8 image data were used to calculate Normalized Difference Vegetation Index (NDVI) of the years 2000, 2005 and 2010 in QGIS environment. The study showed that the local grassland and forest were affected by the mining exploitation and subsidence but those effects were not significant to have an adverse impact on the same. The short term mining was having an impact on the vegetation growth but the effects gradually disappeared with the gradual stabilization of the subsided land and in absence of human interference, vegetation recovered well. In long term, subsidence was not having a major impact on the vegetation growth. Thus, coal resources exploitation and subsidence of the said mine of SCCL did not bring out an adverse impact on a wide range of forest and grassland ecosystems, and these ecosystems could carry the partial destruction and ultimately stabilized ecosystems by self-repair.