

IMPACT OF COPPER-COBALT MINING ACTIVITIES ON KATANGAN ENVIRONMENT THROUGH REMOTE SENSING TECHNIQUES

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The mining areas of Tenke-Fungurume and Kolwezi in Katanga, Southeastern Democratic Republic of Congo, are being studied through analysis of remotely sensed data for evaluation of impact due to mining and related activities on the environment.

The comparison between different industrialisation periods covering a time span of about 30 years depicted through remotely sensed and other available data reveals that the face of the assessed areas changed progressively with the development of mining activities.

A detailed assessment of impact of mining changes in Land use-land cover (LULC) pattern and fragmentation on time and space has been undertaken. By mean of multi-spectral and multi-date remote sensing data processing and classification, the results show (1) an evolution from extensive large to small scale denudation patches can be observed from 1970's to 2000's (2) 3 observation types corresponding to vegetation cover regression in the 1970's, vegetation reclamation in the 1990's, then again a vegetation regression period in the 2000's. Moreover, the comparison of LULC maps and vectorised national protected park layers clearly shows that mining sites are increasingly overlapping vegetation localised in protected areas.

The observed vegetation changes in the vicinity of the mining sites are the results of (1) direct factors such as the evolution in the type of mining extraction and the variation of the ore production volumes and also to (2) factors indirectly derived from the mining activities such as demographic influx, economic growth, agriculture development, etc.

However, this activity does not only involve vegetation degradation but also water and soil pollution affecting the population attracted by economical factors. As preliminary results of pollution modelling, sources of pollution are being detected by remote sensing processing.

The gradual increase to mining and non-forest areas revealed the pressure of this activity on the surrounded landscape. However, most of the mining concessions and operational mining sites are located in governmental protected areas and surrounded protected buffer zones. It is evident that mining operation is detrimental to the vegetation and water pollution and it would be advisable to better regulate this activity to avoid further damage. Scientific mining advices should provide alternative operational methods for a better use of natural mineral resources by minimizing the damages.