CAN LAND DEGRADATION BE PREDICTED? A CASE STUDY OF QOQODALA IN THE EASTERN CAPE, SOUTH AFRICA.

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Land degradation is a global problem affecting many countries including South Africa. Due to its negative impact on the environment and quality of life, land degradation is an important global issue. In South Africa extensive degradation can be related to the apartheid history of unjust land policies and exploitation of land. In the post- apartheid era a need for more knowledge on the extent and nature of degradation is required. This will assist the government in taking the necessary precautions required for the reduction and prevention of land degradation.

The first aim of this study was to apply spatio-temporal data to asses the extent and nature of land degradation, while the second aim was to predict future extent of degradation. To address these aims a time series analysis using GIS and Remote Sensing together with interview techniques was conducted on the years 1984, 1993, 1996, 2000 and 2002. The Unsupervised ISODATA Classification of each image date produced a result of 5 classes which were described as follows: dense vegetation, moderate vegetation, grassland, degraded or stressed grassland and bare ground. These classes were based on the land cover classes developed by the Council for Scientific and Industrial Research of South Africa. The land cover classification resulted in 80% accuracy with the dense vegetation and bare ground classes as the selected land degradation indicators for this study. The relationship of slope geology and rainfall with classified land cover classes was analysed. The results of the time series analysis showed an increase of vegetation and bare ground cover with steady increase of rainfall. However the increase of vegetation cover was not related to land rehabilitation. Through interviews, it was revealed that vegetation cover increase is a sign of land degradation. This is due to the encroachment of indigenous dense vegetation cover by an alien species called *Euryops*.

Although the study was successful in using spatio-temporal data variation to examine the extent and nature of land degradation, the prediction of future land degradation extent remained a challenge. It is therefore recommended that several variables (like the rate of top soil loss through surface water erosion) need to be incorporated in order to predict future land degradation status.