

THE USE OF TREE LAYER TO ASSESS IMPACTS OF COAL MINING ON BIODIVERSITY IN
MUKOMAWABANI AREA, MUTALE LOCAL MUNICIPALITY SOUTH AFRICA

By

TSHILANDE TSHILISANANI

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Supervisor: Prof Tshisikhawe MP

Co-supervisor: Mr Ligavha MH

ABSTRACT

Coal mining results in huge damage to biological communities and landscape. Plant communities get disturbed due to mining activities and following mining the habitat becomes degraded presenting a very rigorous condition for its growth. Nutrient shortages and sandy spoils that results from colonization are a very tardy process. South Africa exploits minerals in billions of tons per year specifically in Mpumalanga, Limpopo and North West provinces. The coal has been heavily extracted since ages in South Africa including in Tshikondeni coal mine. The environment is the greatest victim of these activities, which can be gauged from the depletion of plant diversity and vegetation health status in the surrounding area. As a results many parts of the area within the mining radius have been converted from the original high plant diversity to bare ground with disperse tree distribution, mono-species domination or clumpy vegetation composition and surface fragmentation.

The aim of this study was to determine the important species within the tree layer profile of Mukomawabani plant community. The other aim was to understand the ethnobotanical utilization of tree layer in the presence of mining impacts.

The Point-Centred-Quarter method was used to analyse the tree layer of the immediate surrounding plant community adjacent to a coal mine. Thirty two points were sampled yielding 128 individual plant species since four individuals were recorded at each point. Each point was sampled 50 meters from each other. From the results obtained seven tree species namely; *Colophospermum mopane*, *Commiphora pyracanthoides*, *Gardenia volkensii*, *Combretum apiculatum*, *Commiphora mollis*, *Terminalia prunioides* and *Grewia flava* were found to be having high relative density, relative cover, relative frequency and high Importance value. Importance determined assist in identifying the species that should be monitored in order to maintain the structure of the tree community.

Ethnobotanical utilization was documented with the use of a questionnaire. Leaves (23%), stem (23%) and roots (22%) dominated the parts utilization categories of preferred plant species. The tree layer of Mukomawabani plant community is composed of species that are very important in the structure of the vegetation and the livelihood of the local communities.

Keywords: Mpumalanga, Limpopo, Point-Centred-Quarter method, Importance value.