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## Determining the relationship between gully characteristics and environmental factors at sub catchment level using GIS and remote sensing in Zimbabwe

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GIS and remote sensing techniques were used to identify and monitor gully erosion, and its relationship with selected Genvironmental factors in Zhulube in Zimbabwe. The results showed that gully characteristics are significantly explained by soil characteristics, environmental factors, slope gradient, sediment loadings and the erosive power of streams. There was an evident, significant (p<0.05) relationship between gully depth and bulk density at r2=0.873. The soil clay content was another soil property that showed a significant relationship with gully development with its related minerals, indicating a decline in erosion with an increase in proportions. A significant relationship between gully depths and slope gradient showed a resultant increase of r2=0.62. There was a significant relationship between gully development and the erosive power of stream while sediment loadings of the streams indicated a non-significant effect on the gully depth with an r2=0.02. The susceptibility of soils to detachment and transport by various erosive agents was a function of soil properties including, among others, physical and chemical soil properties. The effects of each soil property were different between sites, thereby influencing the degree of vulnerability of any given soil to destructive erosion forces. The interactive effects of the topography, vegetation cover and rainfall factors greatly influenced erosive agents. Soil erodibility assessment using simulated stream erosive forces and sediment loadings revealed that sediment yield or the erosive power of the streams in the study area increased with increasing slope gradient depending on the clay content of the soil.

## **Biography**

F Dondofema is currently a Chief Technician in the School of Environmental Sciences at the University of Venda, South Africa. He has completed his BSc in Agriculture specializing in Animal Science in 2000 from the University of Zimbabwe, BSc in Applied remote sensing and GIS from the University of Fort Hare in 2004, MSc in Pasture Ecology from the University of Fort Hare in 2004 and MSc in Integrated Water Resource Management (IWRM) from the University of Zimbabwe in the year 2007. He has published several articles in agriculture, ecology, GIS, remote sensing and water management. He is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions.

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