



University of Venda

**Development of guidelines for dealing with morphological and environmental impacts of sand mining along the Nzhelele River, Limpopo Province of South Africa**

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## ABSTRACT

The demand for construction sand is increasing in many parts of South Africa and the rest of the world due to rapid economic development and subsequent growth of construction activities. This has resulted in the indiscriminate mining of sand from stream channels and floodplains, whose major impact is significant alterations to the river basin environment. The dearth of research scholarship and resultant lack of adequate information on the environmental impacts of sand mining is a major challenge in the regulation of sand mining in South Africa.

This study aims at developing guidelines for dealing with the impacts of sand mining on the morphology of Nzhelele River. The study employed a more objective approach in developing guidelines for sand mining. The Binary Logistic Regression Model was employed to determine morphological and environmental factors that determine observed changes in the river system as a result of sand mining activities. Participatory Rural Appraisal methodology was used in developing questionnaires and interviews to gather community perspectives on sand mining. The Influence and Importance Matrix technique was used to determine various stakeholders to be involved in developing guidelines and implementation of the proposed guidelines. The study revealed that sand mining affects all spheres of the community. Floodplain mining has more threat to the community than instream mining. This was revealed by the interviews and questionnaires administered in the field. Severe infrastructural damage, channel degradation and some cases of livestock and children drowning in the open excavations were noted during this study.

It was recommended that, even though there are no specific guidelines on sand mining operations, it is advisable that local municipalities develop bylaws to help preserve their ecological beauty of their areas. The Department of Water Affairs (DWA) and Environmental Affairs (DEA) need to implement the proposed guidelines to prevent any form of environmental change as a result of sand mining. All the relevant stakeholders should be involved in developing the guidelines. It was further recommended that environmental awareness training be conducted for the communities in the vicinity of the extraction sites. This will help in monitoring and enforcement of the bylaws developed.

*Key words: Sand mining, Participatory rural appraisal, channel degradation, binary logistic regression model*