Impact of vegetation clearance on the hydrology of Luvuvhu River Basin in Soutpansberg area using Working for Water as a case study

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ABSTRACT

This dissertation focuses on the impact of vegetation clearance on hydrology of Luvuvhu River using Working for Water as a case study. Working for Water Programme (WFW) is a multi-departmental initiative led by the Department of Water Affairs and Forestry and its main aim is enhancement of water security by clearing alien vegetation. Alien vegetations are plants that do not occur naturally in an area and many are classified as weeds. Invasive alien species, particularly tree species, often have increased water usage compared with native vegetation, especially where the latter is short. The study examines how increased water use by alien tree species impact on the hydrology of a river basin.

The study attempts to determine the impacts of alien vegetation on hydrology by analyzing temporal hydrological trends up to 1995 and after 1995 when Working for Water Programme was initiated. Rainfall data, stream flow data and evaporation data have been used in the analysis of temporal trends before and after the working for water programme started their alien vegetation clearance activities. Standardized Precipitation Index (SPI) was used to analyse the rainfall data. This involved computing the SPI values for the rainfall time series data. Flow duration curves were used to determine the percentage of time flows stays in the river and changes in flow magnitudes.

The results of the study though determined from the limited hydrological data sets available indicated that the changes in stream flow were due to alien vegetation clearance and global warming. The study recommends improvement in monitoring the hydrological components in order to have accurate, reliable and continuous information that can be used to determine the hydrological impacts associated with alien vegetation.