The effect of *Acacia Mearnsii* removal on water table fluctuations in the Tsomo valley Eastern Cape of South Africa

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Introduction

Invasive trees alter and utilize more water compared to indigenous trees because of their higher transpiration rates per unit leaf area (Enright 1999). Recent climate-soil-vegetation modeling suggests that, given the same soil type between forested and bare soil conditions, forested soils have higher moisture losses (about 30% more) from evapo-transpiration than bare soils (Zhang and Schilling 2006). This results in forested soils producing less groundwater recharge than bare soils.

Introduced vegetation changes the surface characteristics of habitats through altering plant to plant interactions (Dye and Jarmain 2004). They significantly influence soil water balance as they increase in dominance (Le Maitre et al. 2000); and alter soil water balance through shifts in phenological schedules (Lukon and Thieret 1997).

In semi-arid savanna ecosystems, the suppressive effect of an increase in woody plant density on herbaceous plants, mainly grasses, is largely through competition for soil water (Smit and Rethman 1999). If a plant is introduced in an ecosystem, it will have seasonal pattern of canopy formation and physiological activity differing from the native species in the community (Enright 1999). Such differences lead to degradation of ecosystem resources. Invasives are very competitive as shown by Melaleuca quinquenervia which is a very prolific rooter regardless of competing vegetation in the Netherlands (Lopez-Zamora et al. 2004). *Melaleuca quinquenervia* develops root densities greater than many mature native species at an early age and in the soil surface during soil drying periods, even while competitive grasses are dying out (Lopez-Zamora et al. 2004).

Salt cedar (*Tamarix ramosissima*) is a great consumer of water in Russia; a single large plant can absorb 100 liters of water a day (Friedmann 2000). This results in the lowering of the ground water, drying up of springs and marshy areas, as well as reduction in water yield of riparian areas. Experiments aimed at assessing the effects of clearing on groundwater have not been adequately integrated with other components of the hydrological cycle in modeling of groundwater dynamics (DWAF 1997).

The reasons for increased water use and whether such increases should be expected from all species of invading alien trees under all environmental conditions are not well understood (Calder and Dye 2001). The few South African catchments and evaporation studies that have yielded water use data so far are too few to provide an adequate foundation for the countrywide estimation of evaporation in invaded regions (Calder and Dye 2001). The objective of the study was to quantify the water table fluctuations due to presence of *Acacia mearnsii*. 

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the business operation.

The development of the project is largely due to the

interchange of ideas between various sectors and the
collaboration of different teams involved in the

project. The process, however, is not straightforward
and requires constant communication and
monitoring.

Conclusion

The project has achieved its objectives and has
presented several challenges that have been
overcome through collaborative efforts.

Recommendations

In order to improve future projects, it is
recommended to:

- Enhance communication channels between

  different teams.
- Develop a more robust project management

  system.
- Increase awareness of the benefits of

  collaboration.

Discussion