

Integrated termite management helps restore East African rangelands

Key message

Integrated termite management (ITM) can help rehabilitate degraded rangelands, enhance agricultural production and restore agro-ecosystem health in East Africa. Effective ITM requires a balanced mix of biophysical and socio-economic interventions. Adoption of ITM is a novel approach to increase agricultural water productivity.

Introduction

'Thousands homeless as termites turn Nakasongola into a desert'

This caption from Uganda's *New Vision* newspaper (24 June 2008) typifies the widespread belief that termites are a major threat to rural livelihoods and agricultural production. Is this true? How do termites affect agricultural water and land productivity? What practical options exist to reduce the apparent economic and human costs associated with perceived destructive behaviour of termites?

The CGIAR Challenge Program on Water and Food (CPWF) studied these questions as part of a Nile River basin wide collaborative research program extending from 2003 to 2012.

Results of this research suggest that vast quantities of water are lost through evaporation and excessive run-off in degraded rainfed agricultural areas of the Nile Basin. This depleted water does not pass through natural vegetation or food and feed crops. Consequently, livelihoods, agricultural production and environmental health suffer.



Figure 1. Typical degradation of rangelands in Uganda's cattle corridor

Land and water management practices that capture this otherwise depleted water and channel it through useful vegetation while crops hold great promise to enhance food production and rehabilitate natural ecosystems. Region-specific approaches are needed.

Termites in Uganda's cattle corridor

In Uganda's cattle corridor, soil erosion, sedimentation of water bodies, low water quality, and encroachment of low value woody plants have lowered livestock production to virtually nil. Most rainwater is lost before it can be used by plants. Livestock keepers suffer from low production and migrate in the dry season to the Nile River where animals are vulnerable to disease and harm riparian habitats.

The dominance of destructive termites aggravates pasture loss and undermines attempts to re-establish pastures. Some herders abandoned their land. Many farmers lost hope that termite control was possible. These degraded termite-infested rangelands appear to have passed a tipping point, locking the system into a highly stable but undesirable state of severe degradation. The fact that these same insects are beneficial and non-problematic in natural healthy savannahs suggests that the presence of destructive termites is most probably a symptom of human induced land degradation rather than the cause of it.

As part of the project, Makerere University developed and tested a method to overcome termite damage and restore pasture productivity in the cattle corridor. Previous efforts to reseed pasture and re-establish vegetation repeatedly failed because termites devoured the newly emerging grass, especially in the dry season.



Figure 2. Rehabilitated rangeland after night corralling of cattle and pasture reseeding

Application of manure prior to seeding by night corralling cattle appeared to cause termites to alter their feeding away from young grass seedlings to manure, allowing the seedlings to establish and flourish. Within one season, dry matter grass production increased from almost nil to about 3000 kg/ha and was sustained thereafter.

Moreover, the newly established vegetative cover controls downstream sedimentation of water harvesting systems used to provide domestic and animal drinking water. Water retained in the landscape remains accessible for plants.

Results show that improved integrated pasture and water management allows livestock keepers to access higher quality water for more days per year.

Sceptical livestock keepers who had witnessed failed attempts to control termites changed their opinions and actively embraced, invested in and adopted the technique of night corralling accompanied by reseeded of pastures. More importantly, farmers reported positive returns on their investments.

Termites in Ethiopia

The concept of feeding termites with manure to control the damage they inflict on pastures, crops, and fences originated with anecdotal evidence from Ethiopian farmers. Researchers from Uganda and Ethiopia now collaborate in a new project to apply the research findings more widely in East Africa.



Figure 3. Land degradation changes termite behaviour resulting in damage to crops as well as pasture and trees

The *Research into Use* (RIU) program of the CGIAR Challenge Program on Water and Food (CPWF) is financially supported by the CGIAR research program on Water Land and Ecosystems. In collaboration with the Nile Basin Development Challenge (NBDC), the RIU project 'uptake of integrated termite management for rehabilitation of degraded rangeland in East Africa' aims to improve the resilience of rural livelihoods of termite affected regions of the Nile River basin through a landscape approach to rainwater management.

For more information about the RIU, NBDC and CPWF please refer to <http://www.waterandfood.org> and <http://www.nilebdc.org>.

Research into use

Initial success in rehabilitating degraded rangelands led to the establishment of a new CPWF Research into Use (RIU) project 'Uptake of integrated termite management for rehabilitation of degraded rangeland in East Africa'.

Based in Nakasongola, Uganda and Diga, Ethiopia, the project aims to sustainably increase livestock and crop production and enhance livelihoods in selected rainfed agricultural systems. Specific objectives are to:

- better understand the relation among termites, land use, water and the ecosystem
- evaluate practical options for ITM in Ethiopia and Uganda taking into account both biophysical and socio-institutional aspects
- broker linkages among farmers, extension and development agents, and service and credit providers to further integrate 'best practice' ITM options within viable farming enterprises, and
- develop guidelines for scaling of ITM and encourage wider uptake of ITM in Eastern Africa.

The RIU project started in 2012, extends into 2014, and collaborates closely with Nile Basin Development Challenge (<http://nilebdc.org>). The project welcomes collaboration from like-minded organizations interested in promoting the update of integrated termite management.

References

Mugerwa, S. 2007. Effect of reseeded and cattle manure on pasture and livestock water productivity in rangelands of Nakasongola District, Uganda. MSc thesis. Kampala, Uganda: Makerere University.

Peden, D. et al. 2009. *Nile basin livestock water productivity*. CPWF Project Report. Colombo: CPWF. <http://cgispace.cgiar.org/handle/10568/3927>



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This activity on integrated termite management (ITM) is a collaborative project involving the International Livestock Research Institute (ILRI), Makerere University (Uganda), Wollega University (Ethiopia), and the International Water Management Institute (IWMI). More information about this research:

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