Managing miombo woodland for biodiversity, ecosystem service provision and agricultural productivity in South-West Tanzania

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Abstract

Increasing pressure to use land for food production is leading to an urgent need for more effective landscape-scale management strategies which enable productive agriculture while simultaneously avoiding significant impacts on biodiversity and ecosystem services. Managing land for these multiple benefits necessitates that the current status of the landscape and future requirements for its use are better understood.

This research project assesses options for land management in miombo woodlands in South-West Tanzania. Miombo woodlands cover much of Sub-Saharan Africa, and support over 100 million people through agriculture, ecosystem services and food security. They are some of the largest remaining intact woodlands in the world, containing many endemic species and providing carbon storage and vital habitat, particularly as corridors between protected areas.

In order to understand how biodiversity and ecosystem services change under different land uses surveys were conducted at various agricultural intensities present across the landscape. In addition, the surrounding villages participated in qualitative studies designed to understand how land use may be required to change in the future.

Analysis of tree data for species richness and carbon storage suggest that although areas of undisturbed woodland have high carbon storage and species richness, this does not decrease significantly in areas which contain a mix of agriculture and woodland. In areas that are predominantly agricultural, both species richness and carbon storage are much lower. This suggests that an effective management plan could support mixed areas of agriculture and woodland. However, further analysis of the qualitative village study data (particularly the demands of the major cash crop tobacco) and biodiversity data (mammals, birds, butterflies and bees) is likely to show that final land management scenarios will result in trade-offs as well as benefits for biodiversity, ecosystem services and agricultural productivity.

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