



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:  
conflicts, controversies and resolutions”

## Local Forest Management Institutions and their Role in Conserving Woody Species Biodiversity: A Case Study in Tigray, Northern Ethiopia

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### Abstract

Traditional forest management institutions have a long history in Tigray, northern Ethiopia. However, little evidence exists regarding the nature of the local-level institutions and their role in conserving biodiversity. This study was undertaken to analyse the nature of local forest management institutions and their effectiveness in conserving woody plants biodiversity using a case study in the northern Ethiopian region of Tigray. The communal forest management institutions incorporate clear forest boundaries; defined users and use rules; monitoring procedures and sanctions; and conflict-resolution mechanisms. This study evaluates both the subjective perceptions of the people who manage and use communal forests and the objective conditions of communal and open access forests, and finds positive results for communal management based on both types of evidence. Three communal forests managed by communities under local forest management institutions and three adjacent free access grazing lands were selected to compare the vegetation composition. The communal forests and the adjacent grazing lands had similar vegetation cover in the past. In addition, they have similar geological parent material, altitude, rainfall and drainage conditions. Investigation of vegetation parameters was undertaken from 84 plots. Data from group discussions and a 120 household survey were also collected in order to analyse institutional arrangements and the perceptions of users. Results show greater forest health under indigenous communal institutions than under open access. For instance, a total of 30 indigenous woody species of trees were recorded in the three communal forests, while only six species were recorded in the three grazing lands. The diversity of woody species of trees in the communal forests was significantly different ( $p < 0.01$ ) from the free grazing lands. About 95 % of the respondents reported their preference for the local communal forest institutions to continue. In conclusion, the local forest management institution appears to be much more effective than the free access to grazing lands in conserving woody tree species diversity. The results imply that local forest management institutions can help in biodiversity conservation. The experiences of the three communal forests can shed light on the scaling up of such management arrangements.

**Keywords:** Biodiversity, conflict resolution, Ethiopia, local forest management institutions, open access