



Tropentag, October 6-8, 2009, Hamburg

“Biophysical and Socio-economic Frame Conditions  
for the Sustainable Management  
of Natural Resources”

## Silviculture Contributions Towards Sustainable Management of Plantation Forests in the Highlands of Ethiopia

ANDREAS NENNINGER<sup>1</sup>, HANY EL KATEB<sup>1</sup>, MASRESHA FETENE<sup>2</sup>, REINHARD MOSANDL<sup>1</sup>

<sup>1</sup>Technical University of Munich, Institute of Silviculture, Germany

<sup>2</sup>Addis Ababa University, Department of Biology, Ethiopia

### Abstract

Besides heavily degraded natural forests dense plantations of exotic tree species form the forest landscape of the study area in Munessa, in the highlands of Ethiopia. Within management plans of plantation forests defined thinning concepts are neglected and scientific knowledge about the thinning effect on plantation stands is missing.

Therefore a silviculture experiment was implemented in plantation stands at the study area of Munessa in the highlands of Ethiopia. The overall goal of the experiment is to develop management concepts, how plantation forests of Ethiopia can be managed in a sustainable way on the basis of scientific knowledge. The silviculture experiment has a dual objective. Firstly, it aims for increasing the harvesting potential by mass and value. Secondly, it aims for identifying appropriate management practices to reconvert forest plantations into natural forest.

Three silviculture measures (control, intense promotion and conversion) were implemented at different age classes in plantation forests of *Pinus patula*, *Cupressus lusitanica* and *Eucalyptus saligna*. Promoting potential crop trees (PCTs) by removing competitor trees at different intensity levels form the basic idea of the silvicultural treatments. The impact of livestock on the forests is considered by including two different variants of protection (fenced and unfenced plots). In total 46 research plots were established in the study area and the silviculture measures were finalized in February 2008.

The effects of the silvicultural measures on mature stand, regeneration, ground vegetation and light climate are analysed in detail and repeated measurements are conducted annually. The first results, one year after implementation will be highlighted and possibilities will be demonstrated how this scientific information can be merged into the development of sustainable management concepts for plantation forests in Ethiopia.

**Keywords:** *Cupressus lusitanica*, Ethiopia, *Eucalyptus saligna*, forest fencing, *Pinus patula*, silviculture experiment, sustainable forest management, forest thinning experiment