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“Filling gaps and removing traps
for sustainable resource management”

The Impact of ICRAF Tree Germplasm Distributions: *Calliandra calothyrsus* and *Gliricidia sepium* in Kenya

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Abstract

Tree-based production systems provide numerous ecosystem services that are important in sustaining the life of vast plant and animal populations. Although the optimisation of these services is contingent on sufficient tree diversity, drivers of change such as population pressure and related agricultural expansion have significantly contributed to tree diversity loss, with adverse consequences on ecosystem functionality. The realisation of this fact has led to significant efforts to conserve tree genetic diversity, in which the International Centre for Research in Agroforestry (ICRAF) plays a key role. This study investigates the impacts from the use of the two most popular species sourced from the ICRAF genebank, namely, *Calliandra calothyrsus* and *Gliricidia sepium*, among smallholder farmers. The study also examines the factors affecting agroforestry adoption, given the limited uptake of agroforestry interventions. A user survey was used to investigate the impacts of use, whereas Key Informant Discussions were employed to investigate constraints to adoption. Concerning constraints to adoption, we find that limited access to high quality germplasm, poor technical skills in producing high quality germplasm, and inadequate market incentives to produce high quality germplasm have indeed presented serious impediments to the scaling up of agroforestry interventions. We also find that fodder-specific tree aspects have contributed to differential success rates of adoption among the two fodder trees. Adoption of *Gliricidia sepium*, as compared to *Calliandra calothyrsus*, has been constrained by challenges associated with viability, palatability and non-immediate economic return. Concerning the impacts of use, we find that improved food security and incomes, increased milk production, and reduced vulnerability to drought were identified as the main benefits linked to the use of *Calliandra calothyrsus*. Improved food security, higher incomes and enhanced soil fertility were cited as the main use impacts associated with *Gliricidia sepium*. The findings demonstrate the important role of the genebank in conserving and distributing unique, high quality germplasm.

Keywords: Genebank, impacts, tree diversity