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Diversity Determinants of Indigenous Fruit Trees in Homegardens of the Nuba Mountains, Central Sudan

MARTIN WIEHLE¹, SVEN GOENSTER¹, KATJA KEHLENBECK², JENS GEBAUER¹, ANDREAS
BUERKERT¹

¹University of Kassel, Organic Plant Production and Agrosystems Research in the Tropics and Subtropics,
Germany

²World Agroforestry Centre ICRAF, Tree Genetic Resources and Domestication, Kenya

Abstract

Indigenous fruit trees (IFTs) play an important role for nutrition and cash income of rural communities in East Africa, particularly for children and women. While the occurrence of IFTs in the natural vegetation is threatened by over-use, agroforestry homegardens offer an opportunity for cultivating these trees, thus contributing to their *in situ* conservation. Quantitative data on IFT diversity in homegardens is lacking for most of East Africa. The present study aims to inventory IFTs in homegardens (locally called ‘jubraka’) in the Nuba Mountains, Central Sudan, and to assess socioeconomic and ecological factors determining IFT diversity.

In 36 randomly selected homegardens of two villages in the southwest (Sama) and southeast (Kalogi) of the Nuba Mountains, richness and abundance of IFTs were recorded and diversity indices calculated. Garden sizes were measured and socioeconomic household data gathered.

A total of 13 IFT species were cultivated in 36 gardens. Mean IFT species richness per garden was not significantly higher in Sama than in Kalogi (2.5 versus 1.3, $p = 0.107$), while other IFT diversity indices did so (Shannon index 0.82 versus 0.31, $p > 0.001$; Shannon evenness 0.74 versus 0.35, $p = 0.017$). Multivariate regression analysis indicated that IFT species richness was determined by the location Sama ($p = 0.007$, $\beta=0.387$), number of household members older than 67 years ($p = 0.014$, $\beta=0.389$) and size of homegarden ($p = 0.036$, $\beta=0.329$). The Shannon index was also correlated with the location ($p = 0.001$, $\beta=0.460$), number of old household members ($p < 0.001$, $\beta=0.537$) and the level of commercialisation ($p = 0.002$, $\beta=0.451$). The Shannon evenness depended on location ($p = 0.001$, $\beta=0.536$), ratio of children to adults ($p = 0.002$, $\beta=0.498$), number of old household members ($p = 0.005$, $\beta=0.469$) and garden size ($p = 0.025$, $\beta=-0.366$). The variables gender and education of the gardener, poverty level and average age of adults of the household, possession status of the garden and garden management techniques such as use of pesticides and organic fertiliser did not seem to affect IFT richness and diversity.

The data indicate that large commercial gardens of households with old members and many children are most suitable for *in situ* conservation of IFT species in the study area.

Keywords: Agroforestry, *in situ* conservation, Shannon index, home gardens