Understanding Variations in Plant Species Diversity in Homegardens of Smallholder Farms in Limpopo, South Africa

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Abstract

Smallholder homegardens (HG) are perceived as important for *in situ* conservation of plant genetic resources and several ecosystem functions. Key to maintaining such functions is to understand the ecological, socioeconomic and management-related factors which influence the species diversity of HG. However, little is known about such factors, in particular for Southern Africa. This study first assesses plant species diversity of smallholder HG in the Limpopo province of South Africa and secondly examines its main determining factors. Six villages were selected across gradients of precipitation, wealth and access to infrastructures and services. A total of 127 households belonging to such villages were interviewed using semi-structured questionnaires to investigate their socioeconomic conditions and the management of the gardens. Additionally, an inventory was made of all "useful" plant species (including trees and ornamentals) of each HG and diversity indices were calculated. The effective number of species was then chosen as a measure of diversity and set as response variable in a linear mixed model investigating its determining factors. Likewise, the information from the household interviews was used to select a number of candidate explanatory variables encompassing climatic, socioeconomic and management-related aspects. Overall, 248 species were found, with maize being by far the most abundant crop (with a summed dominance ratio of 0.29) and indigenous species accounting for about 37.5 % of the total. Diversity was highest in the wealthiest villages and in those receiving the highest precipitation. Mean HG species richness of the surveyed villages ranged from 21 to 32, while Shannon diversity indices varied between 1.1 and 2.0, corresponding to mean effective numbers of species of 3.9 to 9.7 per garden. Among all the investigated factors, the most important determinants of diversity were irrigation intensity and monthly household income. In conclusion, improving household wealth and enabling an adequate access to water at the homestead, for example by providing electric pumps and promoting a responsible and efficient water use, seems to have a significantly positive influence on HG plant species diversity in Limpopo.

Keywords: Determining factors, homegardens, plant species diversity

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