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"Development on the margin"

Socio-economic Factors and Garden Size Affect Plant Species Richness and Diversity of Homegardens of the Nuba Mountains, Sudan

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Abstract

Biodiversity can have a positive influence on agro-ecosystem resilience and productivity. Homegardens are claimed to harbour a particularly high level of agrobiodiversity, but little is known about how market-orientation may reduce their plant species richness and diversity in arid and semi-arid regions, particularly of eastern Africa. This study therefore aimed at an inventory of plant species in homegardens (locally called 'jubrakas') in the Nuba Mountains, Sudan, and to assess socio-economic and structural factors determining plant diversity with a special focus on fruit tree species (FTs). In 61 randomly selected homegardens of four villages, richness and abundance of all useful plant species (excluding ornamentals) were recorded and diversity indices calculated. Gardeners were interviewed about their uses of plants and to gather basic socio-economic household data. Multiple regression analysis was applied to detect factors influencing plant diversity. A total of 111 plant species were grown in the homegardens, of which 53 were ligneous. Thirty-two FTs were cultivated for their fruits, including 24 indigenous species. Mean species richness was 23 per garden (range 6–47) including 5 FTs. Mean Shannon index was 1.45 (range 0.49–2.41) and mean evenness 0.48 (range 0.15–0.85). Species richness was sinificantly higher in market-oriented than in subsistence gardens ($p = 0.047$) while Shannon diversity and evenness was similar. Gardens of the indigenous Nuba people had slightly higher species richness, but significantly lower diversity and evenness than gardens of non-Nuba households ($p = 0.009$ and $p = 0.004$, respectively). Regression analysis indicated that garden size affected species richness positively, but evenness negatively. Also market orientation had a positive influence on species richness. Location of the four villages played an additional important role; higher diversity and evenness were found in the village with the best market access as compared to the most remote village (t-test; $p < 0.001$ for both variables). In conclusion, market-orientation had no negative effect on richness and diversity of useful plants in the surveyed homegardens, while market access, ethnic group and size of the garden significantly effected species diversity.

Keywords: Agroforestry, evenness, fruit trees, Jubraka, Shannon index

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