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Crop-Diversity, Soil Fertility and Management of Homegardens in Central Sulawesi, Indonesia

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Abstract

Changing primary forest to agricultural production systems frequently used in an unsustainable manner has increased in Central Sulawesi as much as in other tropical regions. Forest margins are particularly concerned. Therefore, it is urgently necessary to promote sustainable production systems. Homegardens are generally regarded as a sustainable production system that additionally contributes to biodiversity conservation.

As part of the collaborative research program SFB 552 (STORMA — Stability of Rainforest Margins in Indonesia), 30 homegardens randomly selected from three villages were investigated for their crop diversity, soil fertility, and garden management. Overall 149 crop species were determined, about 25 of which were fruit, vegetable, spice, or medicinal plants, respectively. Among others, the remainder species were used for beverages and stimulants, staple food, firewood or building timber. More than half of the about 35 weed species occurring in the homegardens were used as medicinal plants. The spectrum of species cultivated in the homegardens was different among the three villages. The Shannon-Index was used for assessing crop diversity and comparing it between the three villages.

Soil fertility of homegardens was compared with that of adjacent agricultural areas. Soil pH and other soil fertility indicators, such as plant-available P and K as well as N_{total} and C_{org} , were determined. Soils from homegardens as compared to adjacent, rather acid agricultural soils mostly showed higher pH values as well as markedly higher contents of P. However, mean contents of K, N or C did not differ significantly. One of the villages contrasted strongly with the other two because of particularly low soil fertility of both homegardens and agricultural areas. Also, a significantly lower number of crop species was cultivated there. However, relations between number of crop species found in homegardens were not attributed to soil quality but largely also to socio-economic conditions of garden keepers.

Because of the long time of utilization (up to 38 years), high crop species diversity and the comparatively high soil fertility, homegardens of the region investigated can be described as a sustainable agricultural production system.

Keywords: Biodiversity, conservation, genetic resources, home gardens, Indonesia, soil fertility