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Economic Botany of Small-Scale Cocoa Farms in Sulawesi, Indonesia

Kristyna Vydrova, Barbora Tumova, Agnes Deno, Zbynek Polesny, Vladimir Verner, Lukas Pawera

Czech University of Life Sciences Prague, Fac. Tropical AgriSciences, Dept. of Crop Sciences and Agroforestry, Czech Republic

Abstract

In Sulawesi, the largest cocoa producing area in Indonesia, subsistent smallholder cocoa farmers generally cultivate their cocoa in complex agroforestry systems. These systems, layered with a diverse array of plant species, are believed to replicate the structural and functional elements of natural forests. Besides the positive environmental value of these systems, the non-cocoa useful plants provide products that can be used for own consumption, or sold in local markets. These supplementary products allow smallholder households to sustain their diet and income in the event that the cocoa price or farm production decreases. Despite the socio-economic and ecological importance of cocoa agroforests in Sulawesi, very few studies have investigated them. This research aimed to explore the relationship between cocoa farms, livelihoods and biological and cultural diversity in West Sulawesi. In order to do so, the study examined useful plant diversity, ethnobotanical knowledge of particular species, farmers' species prioritisation, and the impact of this biodiversity on the household economy. A total number of 65 useful plant species belonging to 32 botanical families were encountered during field surveying. Species were proven to be multipurpose, 59 % of the species reported could be used in two or more ways. The most common and most valued species were *Gliricidia sepium*, *Musa* spp., *Lansium domesticum*, *Durio zibethinus* and *Cocos nucifera*. Agrobiodiversity represented by the Shannon-Weiner index ranged from 0.14 to 2.08, while species richness calculated with Margalef's index varied between 0.29 and 2.56. Agrobiodiversity and number of cultivated species varied among the areas surveyed. Farms in remote villages that had less access to local markets tended to cultivate a significantly higher number of species, due to the need to be self-sufficient. The gross margins per ha ranged from -108 USD to 5,030 USD. The contribution of non-cocoa crops on gross margin ranged from 0 %, when farmers did not sell any products, to 34 %. Even though the results showed the neutral or positive impact of increased biodiversity on household income, further research focussed on relationship between the levels of agrobiodiversity and farm profitability needs to be done.

Keywords: Agrobiodiversity, agroforestry, cocoa, gross margin, Shannon-Weiner index, traditional knowledge

Contact Address: Zbynek Polesny, Czech University of Life Sciences Prague, Faculty of Tropical AgriSciences, Kamýcká 129, 16500 Praha - Suchdol, Czech Republic, e-mail: polesny@ftz.czu.cz