



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Tree Diversity in Cacao Agroforestry in San Alejandro, Peruvian Amazon

HANA VEBROVÁ¹, BOHDAN LOJKA¹, THOMAS P. HUSBAND², MARÍA ELENA CHUSPE ZANS³,
ALEXANDR ROLLO¹

¹*Czech University of Life Sciences Prague, Dept. of Crop Sciences and Agroforestry in the Tropics and Subtropics, Czech Republic*

²*University of Rhode Island, Dept. of Natural Resources Sciences, United Kingdom*

³*National Intercultural University of Amazon, Dept. of Ecology and Botany, Peru*

Abstract

Cacao cultivation that maintains higher proportions of shade trees in a diverse structure (cacao agroforestry) is progressively being viewed as a sustainable land-use practice that complements the conservation of biodiversity. Our basic hypothesis was that cacao agroforestry systems can support relatively high tree diversity compared to primary and secondary forest. The objective of this study was to assess the impacts of forest conversion on tree communities by comparing tree species richness, diversity and composition between natural primary and secondary forest and cacao agroforestry systems. In total we collected data in 30 (25 × 25 m) plots on three land-use systems (20 in cacao agroforestry, 5 in secondary forest and 5 in primary forest) in San Alejandro, Peruvian Amazon. All trees were identified to species, and their height and DBH recorded. Cacao farmers were also interviewed to document their knowledge about association of cacao with trees. Our results support the hypothesis that cacao agroforestry contains relatively high tree species richness and diversity comparable to secondary forest. Although we found higher tree density in primary and secondary forest compared to cacao agroforestry. The species richness was found the highest in the primary forest. According to the species diversity indexes, the species composition of cacao agroforestry is higher than in secondary forest. Farmers have very good and extensive knowledge about advantages that trees provide for cacao, soil improvement and biodiversity conservation. However, we also found that tree species cultivated in cacao agroforestry are very different from the species found in primary forest, so there is a question if the relatively high tree diversity and richness is able to support some of the original faunal diversity found in natural forest. In this context our study forms a good scientific background for the further monitoring of ecological changes in human modified landscapes in the Amazon region.

Keywords: Cacao agroforestry, Peruvian Amazon, primary forest, secondary forest, species diversity, species richness