



Quesungual and other Agroforestry Systems: Alternatives from Central America

Some improved approaches to soil management result from the fusion of traditional knowledge with new insights from science.

Such is the case with the Quesungual slash-and-mulch agroforestry system, which was originally promoted in the early 1990s by the Food and Agriculture Organization of the United Nations (FAO) with community-based organizations in Lempira Department, Honduras, as an alternative to slash-and-burn agriculture.

The system includes many species of trees scattered across cropland at a density of up to 1,000 per hectare. The roots act as anchors, stabilizing hillsides, minimizing soil erosion, and improving nutrient uptake from deeper soil layers. Farmers regularly prune most of the trees and use the cuttings as mulch to provide nutrients, increase soil organic matter, improve soil structure, and retain moisture – giving crops and soils some protection against dry spells, heavy rains, and climate change impacts. In addition to capturing carbon dioxide and retaining tree diversity in the landscape (see figures), many of the trees in the system fix nitrogen, thus improving soil fertility.

CIAT is conducting research on agroforestry systems with local partners and farmers to explore their considerable potential in Latin America for rehabilitating degraded soils and landscapes, enhancing ecosystem services, and improving rural livelihoods. The results inform planning and policies on sustainable land use, biodiversity conservation, and soil fertility restoration.

As a result of this work, farmers, researchers and other key actors have taken up silvopastoral and agroforestry systems in El Salvador and Nicaragua. The dissemination of these systems through farmer-to-farmer exchanges has helped to improve maize, bean and livestock production and restore the provision of other ecosystem services. Similar efforts are underway in Paraguay as well as the Colombian and Peruvian Amazon.

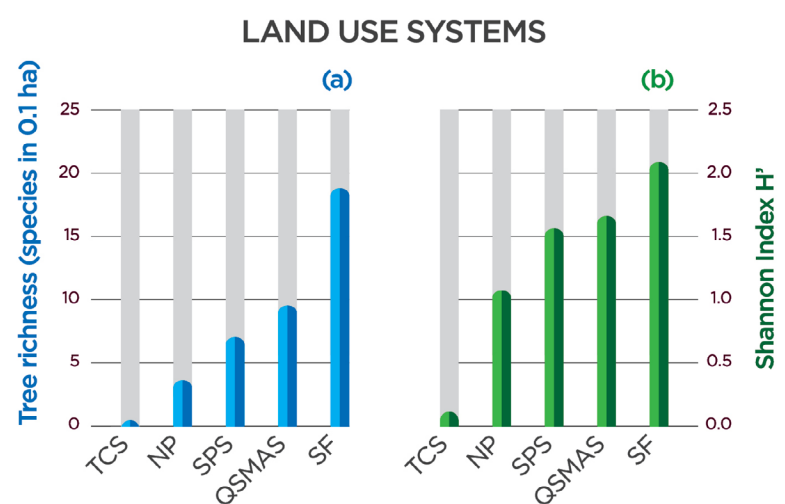


Fig. 1. Tree species richness and diversity (Shannon) for five land use systems: traditional crop system (TCS), natural pastures (NP), silvo-pastoral systems (SPS), Quesungual (QSMAS), and secondary forest (SF) in Nicaragua. Source: Siles et al. submitted.

Message: In terms number of tree species, secondary forests are richer, but in terms of diversity, this difference declines for SPS and QSMAS.

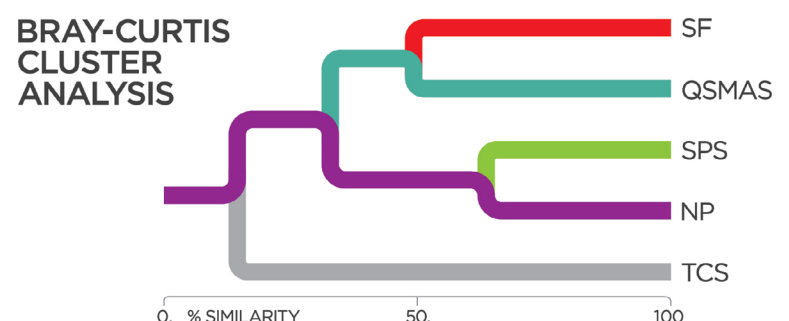


Figure 2. Similarity in terms of tree species composition for five land use systems: traditional crop system (TCS), natural pastures (NP), silvo-pastoral systems (SPS), Quesungual (QSMAS) and secondary forest (SF) in Nicaragua. Siles et al. submitted.

Message: QSMAS is more similar (>0.5) in terms of tree species to SF than other land uses.