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# High Diversity Agroforestry Model for Coffee in Nicaragua

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**Abstract**

Arabica coffee cultivation in Nicaragua is becoming increasingly threatened by climate change effects such as rising temperature, droughts, heavy rainfalls, landslides and hurricanes. Thus, the suitability of coffee production is projected to decrease in the coming decades. The Nicaraguan NGO Aldea Global has the goal of improving coffee producers' situation by helping them build resilience through the implementation of highly diverse agroforestry systems, with the support of the International Center for Tropical Agriculture (CIAT). Data for this research project was collected by interviewing 309 coffee producers in the department of Jinotega. From this data, coffee production and profitability indicators such as yield, costs, income, net revenue and shading effect were analyzed. The results showed that the mean net revenue from coffee production was overall positive, but some had a net loss. Around a quarter of the coffee plots were already highly diverse and the most popular shade species is by far Musa spp. Neither the species nor the density of shade species had a significant influence on the coffee yield.

For some producers, especially on lower altitudes, incremental adaptation measures might not be enough anymore, and they might be forced to shift to alternative cash crops such as Robusta coffee or cocoa. To implement climate change adaptation strategies, producers need support from the government and NGOs, as well as financial support and extension services, for example in shade tree management to achieve high quality timber and fruits.

To lift producers out of the vicious circle of "low input – low income", sustainable intensification and diversification of the coffee agroforstry system – in accordance with effective climate change adaption strategies – could be a promising approach to increase producers productivity, efficency, profitability and climate change resilience.

**Keywords:** Adaptation strategy, agroforestry, arabica coffee, climate change, Nicaragua, producers survey, socioeconomics

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