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Promoting Agroforestry through Land and Benefit Sharing between Cocoa Mono-Croppers and Fruit Tree Producers (Cameroon)

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Abstract

Given higher yields compared to traditional cocoa production, a significant share of cocoa plantations in the Centre region of Cameroon have been converted to full-sun production systems in the past. However, compared to such systems the cultivation of cocoa under shade in agroforestry arrangements is associated with higher environmental benefits. Cocoa agroforestry also creates additional income from eco-certification programs such as Rainforest alliance or UTZ. While separated ownership of land and trees is common in this region, owners of cocoa plantations are hesitant to allow cultivation of fruit trees inside the cocoa farms as they are afraid of losing while sharing their land. This represents a significant limitation to the diffusion of cocoa agroforestry in Cameroon. Using the Coase Theorem approach, this study aims to compute the welfare gain and loss for cocoa mono-croppers and fruit producers as a function of the number of fruit trees planted on the shared land. From times series data collected in 15 villages between 2008 and 2019, we selected 215 cocoa farms, which integrated into their cocoa orchards the fruit tree species of safout (S; *Dacryodes edulis*), mango (M; *Irvingia gabonensis*) and/or ndjansang (N; *Ricinodendron heudelotii*). The results showed that, as the density of fruit trees increased, cocoa yield decreased and so did the cocoa mono-croppers' farm income, while fruit producers gained higher revenue. The socially efficient solution which satisfied both parties was achieved by growing 1111 cocoa plants ha⁻¹ and 150 fruit trees ha⁻¹, resulting in a yield of 393 kg ha⁻¹ for cocoa (C), 2580 kg ha⁻¹ for S, 3200 kg ha⁻¹ for M and 1175 kg ha⁻¹ for N. In a C+S association for instance, cocoa croppers recorded revenue of 393,000 FCFA ha⁻¹ (as compared to 600,000 FCFA ha⁻¹ under mono-culture) versus 719,000 FCFA ha⁻¹ for fruit tree producers. Revenues were increased in agroforestry systems composed of two or three fruit tree species. The paper discusses policy options to promote cocoa agroforestry while satisfying the interests of both cocoa mono-croppers and tree growers.

Keywords: Coase theorem, cocoa agroforestry, eco-agriculture, eco-certification, fruit trees, land sharing.