On-farm diversification and food security and sovereignty in smallholder coffee farms of Chiapas, Mexico

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Introduction

Smallholder shade coffee farmers in Mesoamerica conserve and produce important ecosystem services and are key actors in the global coffee commodity value chain (Perfecto and Vandermeer, 2015). Despite their valuable contributions, these farmers face persistent livelihood challenges common to many smallholder farmers around the globe, including seasonal food insecurity and climate change (Jaffee, 2014). Evidence suggests that on-farm diversification is an important agroecological strategy for farmer households to enhance their food security and sovereignty, diminish dependency on commodity crops, and adapt to climate change (Gliessman, 2015; FAO, 2018). In this study, we analyzed on-farm diversification among coffee farmer households in Chiapas, Mexico, focusing on four diversification strategies : (1) coffee, (2) coffee and staple crops (corn and/or beans), (3) coffee and beekeeping, (4) coffee, staple crops and beekeeping. We examined some of the potential outcomes of these strategies in terms of food security and income sufficiency. This research has been published in Anderzén et al. (2020).

Methods and Analysis

- As part of a three-year, participatory action research (PAR) project, our research team conducted a household survey with 167 member farmers of the Campesinos Ecológicos de la Sierra Madre de Chiapas S. C. (CESMACH) cooperative in 2017. We complemented the primary data with qualitative data (focus groups, key informant interviews, and participatory observation).
- We summarized and analyzed the data in R version 3.5.1, through one-way ANOVA tests (followed by Tukey HSD tests), Pearson Chi-squared tests, and Spearman correlations (r_s). The qualitative data allowed us to triangulate results.

Results

Using the 'Months of Adequate Household Food Provisioning' (MAHFP) indicator, we found that **71.9 % of all respondents experienced at least one month of food insecurity** ('thin month'). On average, coffee farmer households reported 2.5 'thin months', and a maximum of 8 months.

Thin months principally occurred during **the rainy season**, when physical access to food markets is reduced by landslides and bad-quality roads, self-produced maize/beans reserves have been consumed, and income from coffee sales is running low (Figure 1).

Farmers combining **coffee with beekeeping and production of staple crops** reported fewer food insecure months than other households (Figure 2). The same group of farmers was also more likely to perceive their annual income as sufficient (Figure 3).

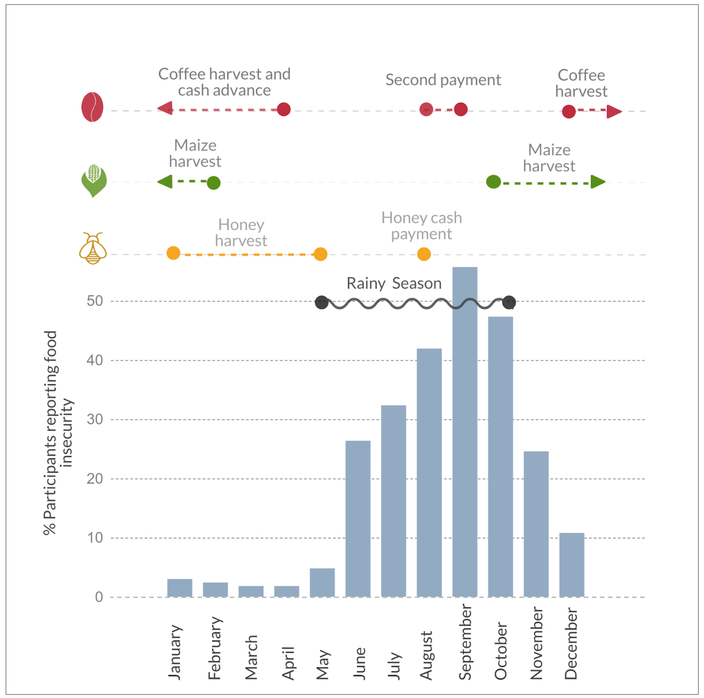

Figure 1. Seasonal trends in 'thin months' reported by coffee farmer households.

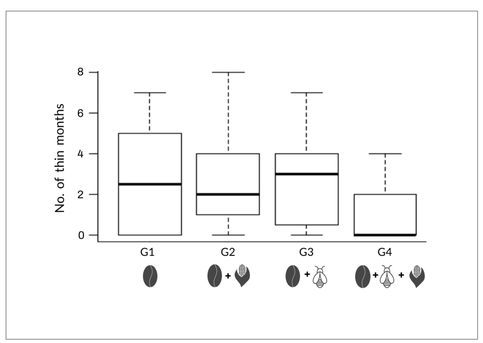

Figure 2. Coffee farmers growing staple crops and practicing beekeeping reported fewer months of food insecurity than other groups.

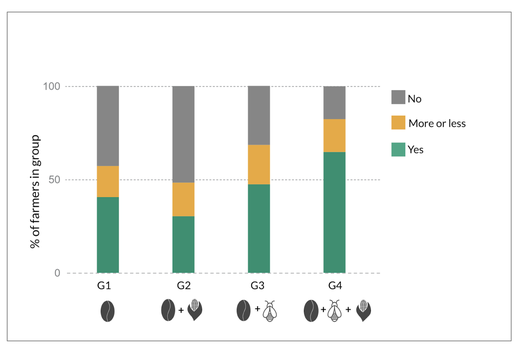

Figure 3. Perception of the sufficiency of annual income to cover basic household expenses.

Conclusions

Our results suggest that diversified coffee farmers producing staple crops (maize and/or beans) and having alternative on-farm income sources in addition to coffee (e.g., honey) may be more food secure and economically resilient than other households. Moreover, staple crop production, especially in diversified *milpas*, is important for maintaining and enhancing food sovereignty in rural communities. Our findings are relevant for coffee farmer organizations as well as for other actors along the coffee value chain, who seek to support sustainable livelihoods and food sovereignty for smallholder coffee producers.

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