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Profitability of small-scale cocoa production in Ecuador

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Abstract

The cocoa industry in Ecuador is an essential source of livelihood, generating income for more than 100,000 families. Cocoa is Ecuador's fourth-largest export crop and the country is the world's leading exporter of premium cocoa, accounting for 54% of the world market share. While cocoa in Ecuador is produced predominantly by small-scale farmers, they receive a small share of the final chocolate price. However, to reduce the risks associated with market fluctuations, to boost the economic condition of small-scale cocoa producers, and later to ensure the future supply of (fine or flavor) cocoa from Ecuador, understanding and improving smallholder cocoa profitability is essential. This research focusses on assessing the profitability of small-scale cocoa production and identifying influencing factors in Ecuador. The analysis was based on a data set with farm-level economic data from 172 cocoa producers in northwest Ecuador. Descriptive statistics, Net Present Value (NPV), Benefit-Cost Ratio (BCR), and Multiple Regression Analysis were the major analytical tools applied for this research. Results indicate that cocoa production in northwestern Ecuador is not profitable (average NPV of -248 USD per ha, mean BCR 0.73). The duration of membership within the corporate sustainability program, the share of cocoa revenue, the number of family laborers per hectare, the total cocoa area, the produced cocoa variety, and use of fertilizer were identified as factors significantly influencing the profitability of cocoa production in the study area. The results indicate that small-scale cocoa producers in northwestern Ecuador are in a penury situation, and chocolate companies and other stakeholders involved in the supply chain could consider improving their effort to lift cocoa farmers out of poverty.

Keywords: Ecuador, cocoa, profitability, smallholder, Net Present Value, Benefit-Cost Ratio

Introduction

Cocoa farmers have been confronted with several problems like poverty, child labor and deforestation for decades now (Fountain & Hütz-Adams, 2020). Numerous campaigns, media, and newspaper articles have highlighted the issue of poverty among cocoa producers and have blamed chocolate companies for not improving the economic situation of their supplying farmers (Fountain & Hütz-Adams, 2015). Chocolate companies in industrialized nations are increasingly held accountable for their cocoa supply chains. As a response, many companies have started to pay higher prices (e.g., through voluntary certification like Fairtrade) (Voora et al., 2019), or initiated their in-house programs to increase farmers' sustainability performance and incomes through e.g., diversification of income sources on the farms (Hütz-Adams et al., 2016). However, poverty issues among small-scale cocoa producers persist and most companies do not fully understand the economic situation of the farmers in their supply chain, which is essential for the design of suitable programs and interventions. In order to inform these corporate interventions as well as public responses, it is thus highly important to generate insights into the profitability of smallholder cocoa farms and understand the factors influencing profitability.

A profitability assessment of small-scale cocoa production in Ecuador has, to the best of my knowledge, not yet been carried out. However, as the largest producer of cocoa in Latin America and the global pioneer in fine or flavored cocoa production (Van der Kooij, 2013), understanding and improving smallholder cocoa profitability is essential for the future supply of (fine flavor) cocoa from Ecuador. Therefore, this study aims to fill this knowledge gap by conducting a profitability analysis of small-scale cocoa producers in Ecuador. For this, this study addresses the following research questions:

1. Are smallholder cocoa production systems in northwestern Ecuador profitable?
2. Which factors mainly influence profitability of small-scale cocoa production in northwestern Ecuador?

Material and Methods

A data set with farm-level economic data from 172 cocoa producers in Ecuador (collected by FiBL in the SusChain research project) was used to analyze the profitability of farms that engage in cocoa production. Some assumptions had to be made in the economic analysis due to the nature of the data, which was collected at farm level, not at plot or crop level. As most of the respondents produce cocoa in intercropped agroforestry systems, it was difficult to precisely allocate production costs to each crop, e.g., application of fertilizers and pesticides, energy consumption, and labor. In consideration of these difficulties two different profitability estimation were done: First, the whole farm income and the whole farm cost were considered to calculate the profitability of the cocoa farm in general. Second, to compare the findings, the profitability of cocoa farms producing cocoa as the main crop (cocoa area > 50% of the farm) was determined, assuming that all production costs can be attributed to the production of cocoa. All the necessary cash inflows and outflows were taken into consideration to calculate the profitability of small-scale cocoa production. This study analyzed the data by using different Cost-Benefit analysis methods: Net Present Value (NPV) and the Benefit-Cost Ratio

(BCR) to observe the net profitability of the farms as well as the relative costs and benefits relationship. I did two analyses, one including family labor as cost and one excluding. In order to identify factors that influence profitability, I chose to conduct a multiple regression analysis. For this, I prepared the data in Microsoft Excel software and then calculated regression models using Windows version 4.0.3 of the R software package (R Core Team, 2017).

Results and Discussion

When the cost of the family labor is included in the profitability calculation, the NPV of cocoa production in the study area had a negative value, indicating that cocoa was not a profitable investment. The average NPV was -248 USD per ha, and the mean BCR was 0.73 for the entire farm profitability analysis and respectively -659.1 USD per ha and 0.47 for the subsample of farmers with cocoa as their main crop (>50% of the farm area). However, the profitability analysis without considering the cost of family labors showed that the production of cocoa was a profitable investment with an average NPV of +376.3 USD per ha and mean BCR of 2.2 when looking at the entire farm. This observation is also true for farms with cocoa as main crop with +287.9 USD per ha NPV and a BCR of 1.95. The duration of membership within the corporate sustainability program, the share of cocoa revenue, the number of family labors per ha, the area of cocoa, the production of the Nacional variety, and use of fertilizer were identified as factors that influence the profitability of the cocoa production in Ecuador.

My results therefore are in line with Gockowski et al. (2011), who analyzed the economic return of cocoa production in the Ashanti region in Ghana by including the cost of the family labor and reported that the production of low-input bulk cocoa variety had a negative NPV of -79 USD per ha and a BCR of 0.97. This study was conducted 10 years ago, and farmers are still facing the same issues. The findings of this study showed that farm income in the study area is mainly derived from the production of cocoa, which represents on average 54% of the total farm income for the entire farm sample. This result is confirmed by the results of Neptune & Jacque (2007), who examined the competitiveness of cocoa production in Trinidad and Tobago. They found that the income from cocoa accounted for 58% of the total farm income, and the remaining 42% of the revenue was from banana. A study by Rusman et al. (2018) on the household income of cocoa farmers in Cote d'Ivoire, found that cocoa was the primary source of income and accounted for 72% of total revenue, indicating that farmers in Ecuador are more diversified.

Farmer's age, total farm size, and farming experience did not play a major role in influencing the profitability of cocoa production in this study. However, studies like Yahaya et al. (2015), which examined the profitability of cocoa production in eastern Ghana, identified the total farm size, farming experience, age of the farmer, and other costs excluding worker costs as significant factors in determining profitability. Also Fadipe et al. (2012), who analyzed the profitability of cocoa production, found that farm size, age of the farm, chemical inputs, and access to credit are significant factors influencing the profitability of cocoa production in Nigeria's Oyo state. Those studies were carried out in Africa and, thus, the findings varied from those in Latin America due to differences in agriculture practices, farm structure, labor, technology level, and policy settings.

Conclusions and Outlook

As far as the first research question is concerned, this study has generated two major findings. First, when family labor is included as an opportunity cost, small-scale cocoa production in northwestern Ecuador is not a profitable investment. Second, when excluding family labor from the cost of production, cocoa production in the study area is a profitable investment since family labor is the main cost and, contributes almost two- thirds of the total cost of cocoa production. Concerning the second research question on this thesis, the findings showed that: (1) The duration of membership within the corporate sustainability program, the area of cocoa, and fertilizer use are the significant factors that positively influence the profitability of cocoa production. (2) The share of income generated by cocoa, the number of family laborers per hectare, and the production of the Nacional variety are the significant factors that have a negative influence on the profitability of cocoa production in the study area. In general, the findings of this thesis revealed that cocoa production is not a profitable investment, which could have far-reaching consequences for the future cocoa supply chain. If cocoa prices remain low and cocoa farmers are unable to cover their production costs, they may switch to more lucrative crops. This will distort the entire system, putting the global cocoa supply in jeopardy. Finally, to improve the economic condition of cocoa farmers and maintain global cocoa supply, all actors in the cocoa supply chain must act proactively. As global cocoa market prices rise, farm gate prices rise as well, and cocoa farmers' desire to continue producing cocoa increases. Hence, chocolate companies should bear the highest responsibility for maintaining higher cocoa prices for farmers and bringing them out of poverty.

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