
Designing Cost of Production Tools for Coffee Growers in Latin America

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Introduction

The livelihood of a large number of smallholder coffee growers in Latin America depends on global coffee value chains [2]. Certification initiatives, e.g. Fair Trade USA, focus on integrating coffee growers into global specialty coffee chains by helping to establish direct,

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long-term trading partnerships between coffee roasters and smallholder farmers toward improving economical, social and environmental outcomes [1]. Consumers are willing to pay higher prices for sustainably-produced coffee, but the production practices are also more costly to the farmer. For example, organic coffee production imposes strict regulations over applying chemicals in the process, and shade-grown production means smaller plots and slower ripening cycles. Better insights into the cost of production is therefore important for all stakeholders in the coffee supply chain to help, for example, roasters define fair prices paid to growers, and grower cooperatives better negotiate contracts with coffee buyers.

Extensive efforts are already being applied toward understanding cost factors associated with sustainable coffee production: preparing the land, purchasing seeds, seeding, weeding, fertilization, picking coffee cherries, processing the cherries, drying the beans, and more. Through surveying farmers and cooperative representatives in Latin America – Colombia, Honduras, Peru, and Mexico – economists on our research team have identified the coffee growing cost factors and developed economic models using these factors.

The HCI side of the team is tasked to make these models available and accessible to stakeholders in the coffee supply chain. We partnered with Fair Trade USA to engage with coffee production community members

toward designing a user interface that farmers, cooperative technicians, Fair Trade representatives, and coffee buyers and roasters could use to calculate and understand the costs of sustainable coffee production.

Ongoing Work

We met in New York City with a cooperative economist from Sol & Café (Peru), and later via video-conferencing with three cooperative representatives from COMSA (Honduras). We present here some of our initial design insights from these meetings.

Current models for calculating production costs: while farmers consider running expenses (e.g., labor hours, seeds, farm operations), they are often unaware of fixed expenses that impact their profits (e.g., land prices and machinery). Our design should encourage users to enter both variable and fixed costs to more accurately calculate costs of the entire coffee production cycle.

Current tools for tracking production costs: similar to findings about farmer coordination practices [3], farmers and cooperatives vary widely in their practices of recording and monitoring their production costs, from simple notebooks to complex electronic spreadsheets. The details recorded in these tools are often derived from certification standards, and are considered a basic need for farmers in order to keep record of their costs, even for farms that are not officially certified. Our design would therefore follow standards already in use, increasing input efficiency through defaults and quick access to previous years' and seasons' data.

Socio-technical constraints: many farmers lack the technical knowledge and skills to monitor finances and inventory. Further, many farms are remote with limited

internet connectivity. We therefore decided to initially focus our design efforts on cooperative technicians as end users. They are often younger, educated family members of the farmers, who stayed in the coffee business but are not interested in growing coffee. They support farmers on many aspects of the farming business at the cooperative level, and are interested in accessing services such as coffee quality analysis and coffee marketing to exporters and importers.

Next Steps and Contribution to HCI

We are planning to visit farms and cooperatives in Colombia and Mexico. This will allow us to understand the end-users' emotions, values, needs, and goals in the context of the design problem, as well as to receive direct, unmediated, feedback on our designs.

In the long run, we will iteratively design and develop the interface based on users' needs and feedback we receive on the design. The interface will connect to the cost calculation model (also iteratively evolving) and to a backend database. The interface will then be distributed by Fair Trade USA to coffee farmers and cooperatives in Latin America, and as it further develops, to other stakeholders in the coffee supply chain.

Previous efforts of creating production cost calculation tools for sustainable farming [4] relied on the farmers' inputs for creating economic models, but left them out when designing the user interface to access the models. By placing end-users at the center of the interface design efforts, our work bridges the gap between applied economics and HCI design.

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