

COFFEE FARMERS COALITION: REDEFINING A VALUE CHAIN

“The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings”

–Masanobu Fukuoka

Contents

- Introduction 2
- Coffee Industry: An Antiquated Supply Chain 2
- Decision Criteria: Stakeholders, Feasibility and New Markets 2
- Recommendation: Coffee Farmers Coalition (CFC) 3
- Implementation 3
 - Socioeconomic Empowerment 3
 - Partnerships and Traceability 4
 - Environmental Robustness 4
 - Biodiversification 4
 - The Coffee Cherry 5
- Financial Sustainability..... 6
 - Insurance:..... 7
- Measuring Impact and Success: 3, 5 and 10-year Benchmarks..... 7
- Conclusion: Closing the Loop 7
- Exhibits:..... 8
 - Exhibit 1: Evaluation of Alternatives 8
 - Exhibit 2: CFC Implementation Cycle 8
 - Exhibit 3: Facilitated Partnership through Supply Chain Changes..... 9
 - Exhibit 4: Financial Comparison through CFC Trade..... 9

Introduction

The coffee industry still suffers from an outdated supply chain that distributes value disproportionately between regions of consumption and production. Despite a growing demand for specialty sourced coffee worldwide, coffee growers still largely farm at the subsistence level and are highly vulnerable to market and environmental forces. We propose a holistic overhaul of the coffee industry's supply chain by introducing a self-sustaining coalition network that will empower the farmer socioeconomically, facilitate fair and direct partnerships between the farmer and distributors, and establish long-term mitigation strategies to target the inherent risks associated with monoculture.

Coffee Industry: An Antiquated Supply Chain

Coffee is a global multi-billion dollar industry with a serious problem. Farmers barely subsist on their income from coffee, and since the 1989 dissolution of the International Coffee Agreement, they are even more vulnerable to volatility of market prices and to buyer power. Since coffee is usually farmed as a monocrop, catastrophic weather events or pests could wipe out most, if not all, of that season's harvest. With a single harvest per year and inflexible crop cycles, farmers face a high degree of food insecurity and extreme poverty. With the third-wave of coffee expected to sweep the North American market, the demand for quality beans and appreciation of unique tastes will begin to add value to the product. Without any changes to the current supply chain however, this will only benefit a select number of recognized growers and middlemen who have bartering power and the ability to grade and resell at premium prices. Quality and traceability of bean origins are lost in the supply chain, as many farmers are forced to sell to cooperatives or local middlemen who mix bean supplies and do not reward quality. As coffee farming continues to be a low profit and unattractive industry, many children of farmers are moving away to the cities in search of better job prospects, leaving older parents who are often illiterate or lack formal education, to care for the farm. As we look at implementing changes to the supply chain, it will be critical to address all challenges faced by the producer, while maintaining value and incentive for all stakeholders involved.

Decision Criteria: Stakeholders, Feasibility and New Markets

In determining potential options to implement, we require that the selected plan improve farmer's livelihoods through financial and food security as well as provide traceability within the supply chain to allow for the exact farm origins of beans to be identified. Beyond this, we identified the key decision criteria as full stakeholder involvement, feasibility, and new market development.

We have identified 3 options: a global coffee control board, localized roasting conducted by the farmers and an international farmer coalition, as expressed in Exhibit 1. The global coffee control board would function as a monopsony, purchasing all of the green beans produced and controlling the supply to the roasters around the world. While it would meet the basic requirements, the global control board would be particularly weak with regards to feasibility, as international cooperation would be difficult given the history of the 1989 International Coffee Agreement and its dissolution due to variations in demand for particular countries. While localized roasting conducted by farmers seems more feasible, as the capital costs for roasting equipment could be shared through cooperatives, and many single farm Arabica roasts could be produced, this does not promote full stakeholder involvement as it would alienate the international firms engaged in global procurement and roasting. Finally, an international farmer coalition

would engage all stakeholders while providing excellent new market development opportunities with exceptional feasibility. We will now outline the details of such a coalition.

Recommendation: Coffee Farmers Coalition (CFC)

As the governing body of global coffee trade organized by the United Nations, we recommend that the International Coffee Organization (ICO) work to gather consensus amongst producer countries, industry moguls and coffee farmers across the world to form the Coffee Farmers Coalition (CFC). The Coffee Farmers Coalition will be formed as a branch under the umbrella of the ICO. The CFC will provide socioeconomic empowerment to the farmers and facilitate partnerships between the farmers and the major international coffee distributors, all while increasing environmental robustness on the farm to create new sources of revenue throughout the supply chain. Biodiversification of the farm and the use of the whole coffee fruit will close the ecological loop, while developing an international market for the coffee berry in addition to specialty beans, adding to current offerings in the market (Exhibit 1).

As a sustainability development organization, the CFC will develop initiatives in collaboration with NGOs in target regions to provide education, financial services, trade skills and business development. As an independent governing body, the CFC will create and promote grading regulations, with the input of market leaders in the coffee industry.

Implementation

Socioeconomic Empowerment

The implementation of the supply chain overhaul will begin with a grassroots movement at the grower level, with the ultimate goal of enabling all coffee farmers to treat their farms as businesses rather than subsistence farms. We will elevate farmers' socioeconomic status and position in the supply chain, to gain bargaining power in the market through the coalition.

The CFC will begin with an outreach effort to farmers, focusing on smallholders in financial need. We propose a partnership with the International Fund for Agricultural Development (IFAD), who currently works to tackle millennium development goals such as food security, as an agency of the U.N¹. Interest-free microloans facilitated in partnership with the IFAD and regional governments are ideal for financing up-front expenditures such as fertilizers and farm equipment, so farmers can afford to wait for longer receivables at higher-margin farm gate prices. Over time, this will position farmers closer to the buyer, reducing dependency on local traders who typically pay below-market prices without regard for grading. The CFC will further reduce dependence on third party dealers by providing access to de-pulping machines that can be shared by coalition members to process their own beans. With de-pulping under grower control, they can also collect and repurpose the cherry pulp that would otherwise be disposed of as waste.

Education and training programs will take place year round, focusing on literacy, financial management, bookkeeping, and quality improvement, which will be critical components of basic training, with computer literacy classes depending on the availability of resources. Illy may be in a position to provide knowledge support in these areas as they already have the Clube illy do Cafè network and the Università

¹IFAD's Strategic Framework 2011-2015. (<https://www.ifad.org/who/sf/overview>). Accessed April 10, 2016

de Caffè in Brazil that provide similar programs. Similar to the Clube illy do Cafè, education programs will double as community support networks so that farmers may share resources and market intelligence. Marketing schemes and school subsidies in coordination with governments will target younger generations to encourage involvement in the farming industry, to support future security for aging farmers and continual modernization of farm management.

Partnerships and Traceability

In the current business model, futures contracts on coffee as a commodity and local middlemen who pre-purchase beans are the biggest hurdles to farmer wealth creation. Additionally, the local middlemen tend to block transparency within the supply chain, preventing the development of traceability. Current barriers to direct trade include lack of knowledge transfer and unreliability of individual small farmers' ability to supply. Formation of guaranteed contracts facilitated by local CFC chapters will allow direct trade with roasters and distributors, providing farmers with global credibility and significant improvements in wealth creation as seen in Exhibit 3.

With the growing consumption trends towards third wave coffee, roasters, distributors and retailers will benefit from traceability implemented into the supply chain. Similar to the eATTS system being launched in Ethiopia by the Ethiopia Commodity Exchange (ECX), a cloud-based solution would be utilized to geo-reference origins of beans all the way to the farm. While this would involve a large initial capital outlay, as eATTS required \$4.5 million to launch², given the industry investment involved with this project in Ethiopia, a similar contribution could be expected for a global rollout. Distributors benefit from the ability to identify excellent sources for monoarabica roasts and they can charge a premium to the consumer. The ECX cites an observed trend among commodity buyers' "willingness to pay for quality, environmentally-friendly, and origin specific commodities"³. Considering this potential market and the establishment of a farmer database, the CFC is well positioned to convey the unique stories of the farms from which they partner with, expanding and diversifying the unique offerings of the specialty market in North America.

Environmental Robustness

The CFC's program will increase the biodiversity of the coffee farms, which will in turn reduce the farmer's risk of suffering the potentially dire consequences of a bad coffee harvest. The farmer should have the ability to generate income not only from the coffee bean, but also from the inherent ecosystem around it. Roughly 50% of the weight of the crop is currently being discarded; the farmer should diversify and repurpose the flesh of the coffee cherry in order to reduce waste and create another source of revenue.

Biodiversification

We are proposing a two-part diversification plan in order to hedge the farmer's risk of environmental effects on harvest. The plan must be easily implementable for the farmer and create enough of a positive impact so that the extra effort is warranted. The diversification plan should incorporate:

² Brown, Nick. *Ethiopia Commodity Exchange Launches \$4.5 Million Traceability System*. <http://dailycoffeenews.com/2015/11/12/ethiopia-commodity-exchange-launches-4-5-million-traceability-system/>. November 12, 2015. Accessed April 10, 2016.

³ Ibid

- Fruit and nut trees as canopy for the young coffee plants
- Bees, birds and bats as pollinators to increase coffee yields

The CFC will look to partner with Heifer International to provide honeybees and the training necessary for farmers to manage beehives and the gift can be passed forward to other farmers or local families in need⁴. These two solutions not only shelter the coffee plant and increase its yield, but also produce their own goods which can also be sold in order to diversify the farms' revenue streams.

Mango trees grow to an average height of 5.5 meters in Brazil⁵, which is a sufficient height to provide a canopy for the coffee plants underneath. Mangoes are important for export markets, and Brazil is the second largest producer and exporter of the fruit in the Americas behind Mexico, with 2.5% of the world's supply originating there⁶. The mango tree also flowers and produces a sweet fruit, which attracts honeybees and birds respectively.

The honeybees provide the farmer yet another layer of risk mitigation through product diversification. The farmer would now be generating revenue from the coffee itself, the canopy tree's fruit, and the honey from the bees; therefore, a bad coffee year may not devastate the farmer socioeconomically. With the enhanced and widespread pollination brought about by the honeybees coupled with the pest reduction associated with the birds and bats, the coffee plant is more resilient and as a result the farmers' income is more sustainable. Bees, birds, and bats also increase the yields of the coffee plant themselves. It was reported in 2014 by NatureWorld News in Kenya that "birds and bats provide more [coffee] cherries [while] bees and other pollinators ensure better quality"⁷. To mitigate any concerns when working in Brazil, due to the proximity of many farms to the Amazon rainforest, the CFC will approach Save the Rainforest to further develop knowledge about biodiversity specific to this region and the benefits of polyculture in the Amazon⁸.

The Coffee Cherry

For every 60 kilograms of green coffee beans, there are a potential 120 kilograms of dried coffee cherry⁹. The coffee cherry is normally discarded and is rarely utilized for profit generation by coffee farmers. If farmers were to sell the cherry, they would add considerable value to their operation (see Exhibit 4) and ultimately increase their standard of living. In order for the farmers to sell the cherries, there needs to be

⁴ Heifer International Website. <http://www.heifer.org/ending-hunger/our-approach/index.html>. Accessed April 10, 2016

⁵ Teixeira, Bastiaanssen, Soares, Ahmad. *Energy and water balance measurements for water productivity analysis in irrigated mango trees, Northeast Brazil*. http://journals1.scholarsportal.info/pdf/01681923/v148i0010/1524_eawbmfiimtnb.xml. May 7, 2008. Accessed April 10, 2016. Pp. 1524

⁶ Brown, Nick. *Ethiopia Commodity Exchange Launches \$4.5 Million Traceability System*. <http://dailycoffeenews.com/2015/11/12/ethiopia-commodity-exchange-launches-4-5-million-traceability-system/>. November 12, 2015. Accessed April 10, 2016. Pp. 1525

⁷ NatureWorld News. *Coffee Growers Get Help From Bees, Birds and Bats*. <http://www.natureworldnews.com/articles/5984/20140211/coffee-growers-help-bees-birds-bats.htm>. February 11, 2014. Accessed April 10, 2016

⁸ Save The Rainforest Website. http://www.savetherainforest.org/savetherainforest_006.htm. Accessed April 10, 2016

⁹ The Coffee Guide: Conversions and Statistics. *The Coffee Guide: Trade Practice of Relevance to Exporters in Coffee-Producing Countries*. <http://www.thecoffeeguide.org/coffee-guide/world-coffee-trade/conversions-and-statistics/>. Accessed March 10, 2016.

someone willing to buy them. The coffee cherry has many health properties, such as antioxidant levels of 65-70% contained in the cherry, husk, silver skin, and pulp. Levels of soluble and insoluble fiber in coffee by-products range between 16-35% and 18-64% respectively¹⁰. The coffee industry is effectively discarding a super-food that can be marketed to a more health conscious demographic in the United States. Coffee cherries could be powdered and incorporated in fruity beverages at a coffee chain for a low price to the end consumer. Though the price would be low, the margin for the coffee chain would be immense, and a percentage of the cherry powder 'shot' could be utilized by the CFC to further facilitate their initiatives. The CFC will utilize its relationships with the major coffee distributors to facilitate the creation of a new product category and demonstrate the potential of this super-food to consumers. A portion of profits from the coffee cherry sales will offset the investments from these industry partners in the development of the CFC, a value-add that can be marketed to consumers by inviting them to engage in sustainability conversations surrounding an ecologically beneficial product.

Financial Sustainability

Exhibit 4 shows scenarios of the current model of coffee sourcing as created by larger companies such as Nespresso, Nabob, and Starbucks, as well as scenarios as per our recommendation, which is a combination of direct sourcing along with other revenue streams. By utilizing the whole cherry, implementing CFC initiatives for traceability, development funds, endowment, education, insurance and retirement savings, our model demonstrates on a per hectare basis how lucrative the CFC initiative is for farmers. The CFC could approach TechnoServe¹¹ in an effort to learn how to teach best practices around building a sustainable business practice in this context. TechnoServe's ongoing support and expertise would allow for faster expansion into other coffee growing markets.

On average, a hectare of land produces 1800 pounds of coffee beans and 1800 pounds of wet pulp. The pulp has so far gone to waste and the 1800 pounds of beans are sold to middlemen to provide the farmers with ongoing working capital. These beans are then sold by the middlemen to roasters or distributors at threefold the prices. By the end of supply chain, the farmer makes a net income of \$762/hectare while retailers are averaging \$60,000 or more using the same product quantity. On average, a small coffee farmer in Brazil farms two hectares.

With the CFC, the middle man is removed and the farmers gain the value lost to the intermediary. Moreover, farmers can also sell the dried coffee cherries to firms who are part of the CFC in order to add an additional source of income. Exhibit 4 demonstrates how this would help farmers attain higher profit margins. Farmers' net income is higher even after paying back the loans, paying into insurance, saving for retirement and educational spending while earning up to 3-3.5 times their existing net income. TechnoServe, if willing to help, would only accelerate this process. This would not only help the farmers themselves, but would also improve the quality of life for their families and provide an incentive for their children to continue developing the business.

¹⁰ Murthy, Naidu. *Recovery of Phenolic Antioxidants and Functional Compounds from Coffee Industry By-Products*. http://journals2.scholarsportal.info/pdf/19355130/v05i0003/897_ropaafcfcb.xml. May 22, 2010. Accessed April 10, 2016. Pp 897.

¹¹ TechnoServe Website. <http://www.technoserve.org/>. Accessed April 10, 2016

Insurance:

The CFC will provide farmers with the option to buy into insurance services that are above and beyond the insurance already available to them through local financial or governmental institutions. This way, in the case of a regional crisis, farmers not only benefit from the insurance from their local financial institutions, but also from the CFC. This additional layer of insurance will allow farmers to stay in business and prepare them for a better crop during the next harvest. Please refer to Exhibit 4 for the financial breakdown of the proposed CFC insurance service.

Measuring Impact and Success: 3, 5 and 10-year Benchmarks

Impact will be measured on three levels: Farmers, the supply chain, and consumers. Within 3 years we expect to see increased net income for individual farms through improved yield and quality. Record keeping through the CFC's traceability system will provide metrics for quality, yield, number of farmers with savings accounts, number of farmers involved in community classes, and overall profits. Product quality will be graded by cupping, with the potential to approach Illy to be a tasting authority to share grading and quality control standards prior to exporting. Success in supply chain management will be indicated by decreased delivery time from farmer to consumer, and traceability through barcoding. Monitoring changes in price of coffee at instant, ground, and per cup sales will also indicate price effects of downstream changes. In 5 years we expect to see higher insurance penetration for CFC farmers, and further increases in coffee variety, yield, and environmental resiliency. Prices for roasters and buyers will be re-evaluated along the supply chain. By this time, we will also measure product creation by variety and consumption of new coffees and cherry pulp products. Traceability systems will also allow for product tracking and permeation of coffee in consuming markets.

In the event of weak performance indicators, the CFC will assess strengths and weaknesses of the program and address issues accordingly. For example, in the most dire case where consumer prices rise and farmers experience poor coffee harvests, the CFC will focus on risk mitigation through continued small-scale community support strategies. With positive results, the CFC will begin to scale up to prominent global coffee markets, and by year 10 will be exploring feasible coffee growing markets in other farming regions. At this time, effect of generational retention schemes can also be measured by visiting farms to determine involvement of younger generations and overall farm health.

Conclusion: Closing the Loop

A holistic overhaul of the coffee industry's supply chain through the socioeconomic empowerment of the farmers, facilitated partnerships between coffee farmers and distributors, and the environmental robustness of the farmstead will create more value throughout the entire supply chain. The symbiotic relationship between the farmers and distributors will create more wealth for the former through a diversified plantation and higher quality coffee. It will simultaneously allow the distributor to capitalize on current market trends around physical fitness and wellbeing, sustainability initiatives, and third-wave coffee drinkers in North America. While there is still much more work to be done, we believe that by launching the CFC initiative through Brazilian monoarabica subsistence farmers, the ICO will be able to increase the standard of living of these farmers while providing a valuable product to the North American coffee culture. This initiative could be easily replicated and scaled to any area of the globe where coffee farmers are being exploited by the unfair prices imposed by the middlemen.

Exhibits:

Exhibit 1: Evaluation of Alternatives



Exhibit 2: CFC Implementation Cycle

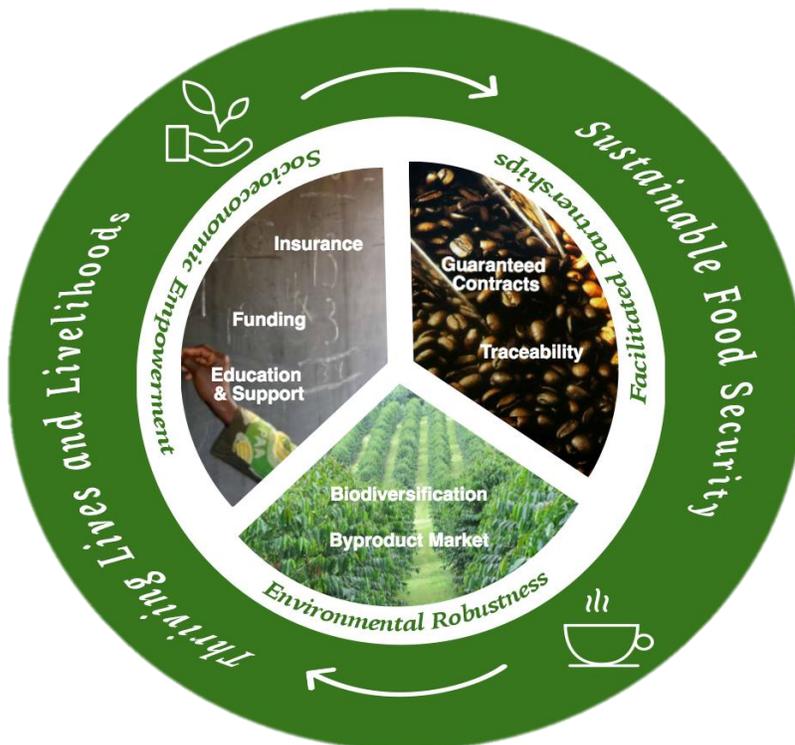


Exhibit 3: Facilitated Partnership through Supply Chain Changes

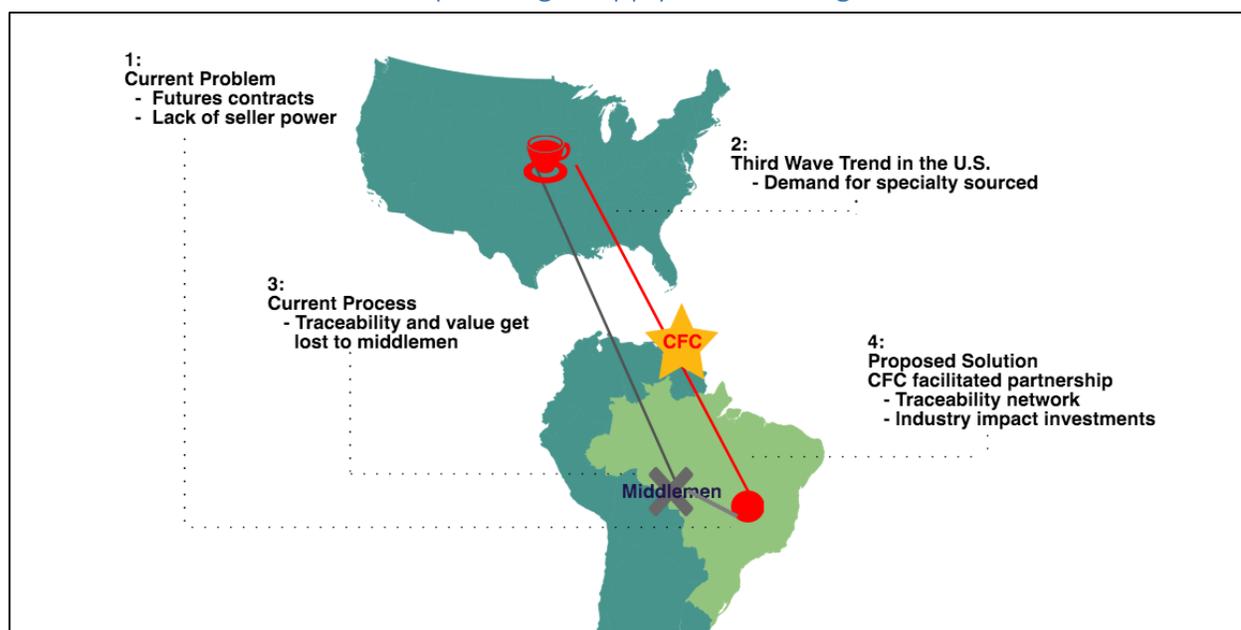


Exhibit 4: Financial Comparison through CFC Trade (Estimated Income Statement)

	Direct Trade	Proposed Solution	
		Low	High
Coffee Yield / Hectare	1,800	1,980	1,980
Farmer price / lb	\$1.09	\$1.09	\$1.50
Coffee Revenue / Hectare	\$1,962.00	\$2,158.20	\$2,970.00
Dried Cherry Pulp / Hectare	-	990	990
Pulp Revenue / lb	-	\$0.50	\$1.50
Pulp Revenue / Hectare	-	\$495.00	\$1,485.00
<u>Total Revenue / Hectare</u>	<u>\$1,962.00</u>	<u>\$2,653.20</u>	<u>\$4,455.00</u>
Farmer Expenses / Hectare	\$1,200	\$1,200	\$1,200
Crop Insurance / Hectare	-	\$23.50	\$23.50
Loan repayment	-	\$400	\$400
Retirement Savings Plans	-	\$150	\$300
Cost of Education	-	\$100	\$100
<u>Total Expenses / Hectare</u>	<u>\$1,200</u>	<u>\$1,874</u>	<u>\$2,024</u>
<u>Farmer Profit / Hectare</u>	<u>\$762.00</u>	<u>\$779.70</u>	<u>\$2,431.50</u>

* This model assumes that biodiversity improvements in our proposed solution produces a 10% increase in yield.