Verified Living Income

White paper

Transforming Procurement for Improved Farmer Livelihoods

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Bellwether Coffee®

SUSTAINABLE HARVEST® RELATIONSHIP COFFEE

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Photo Courtesy of ASOPEP

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ABBREVIATIONS

Asociación de Productores Agropecuarios de Café Especial de Planadas/Association of Agricultural Producers of Specialty Coffee of Planadas (ASOPEP)

La Coordinadora Latinoamericana y del Caribe de Pequeños(as) Productores(as) y Trabajadores(as) de Comercio Justo/The Latin American and Caribbean Network of Fair Trade Small Producers and Workers (CLAC)

Cost of Production (CoP)

FOB (Free on Board)

Green Equivalent (GE)

Intercontinental Commodity Exchange (ICE; C-Market)

Living Income Benchmark (LIB)

Verified Living Income (VLI)

PARTICIPANTS

ASOPEP
Association of Agricultural Producers of Specialty Coffee of Planadas (ASOPEP) was founded in 2013 in Planadas, Tolima, Colombia. Even as a relatively young organization, ASOPEP is a leader. With 275 members, it is larger than any other association in Tolima, and the only cooperative with complete coffee infrastructure to control processing, quality control, transportation, and market access.

Bellwether Coffee
Bellwether Coffee is a tech company working to positively transform the coffee industry, making it more accessible and sustainable for our planet and our communities. Bellwether is the most sustainable coffee roaster in the world, both in air quality and energy use. Bellwether's roasting platform allows its customers to easily and responsibly source green coffee from incredible coffee farms around the world, expertly roast using artisan-crafted roast profiles (or create their own), and share fresh, delicious coffee just the way their customers like it.

CLAC
La Coordinadora Latinoamericana y del Caribe de Pequeños(as) Productores(as) y Trabajadores(as) de Comercio Justo/The Latin American and Caribbean Network of Fair Trade Small Producers and Workers (CLAC) co-owns the Fairtrade International system. CLAC is the network that represents all organizations certified as "Fairtrade" in Latin America and the Caribbean, as well as other organizations of fair trade; its mission is to represent and promote the interests, empowerment and development of its members and communities.

Heifer International
Heifer International is a global development organization that believes ending global hunger and poverty begins with agriculture. Since 1944, Heifer has worked with 36.9 million families to build sustainable food and farming businesses, strengthening rural economies and putting people on the pathway to a living income. Through interventions designed to increase social capital, economic growth and overall resilience, Heifer International connects farmers to new markets to increase their sales and incomes.

Sustainable Harvest
Sustainable Harvest is a specialty coffee importer whose mission is to improve the livelihoods of coffee-farming families around the globe through its Relationship Coffee model. Since its founding in 1997, the company has partnered with over 200,000 smallholder farmers, helping them gain access to premium markets and increased incomes. It became the first B Corp-certified company in coffee in 2008.

INTRODUCTION

Verified Living Income (VLI) is an initiative focused on developing a transparent and inclusive method of price discovery. With the goal of setting prices based on farmers' livelihood needs, VLI utilizes a sensitivity analysis model, developed by Heifer International, to calculate the farmgate[1] and associated Free on Board (FOB)[2] price required to meet living income standards.

In its simplest terms, VLI determines minimum green coffee prices that meet farmers' livelihood needs. These prices can be set on a micro-level, such as one specific supply flow representing a single or small group of farmers, or on a macro-level that encompasses broader regional or even national production.

This approach was designed to be farmer-centric, data-driven, and results-oriented.

To explore this price discovery methodology, Asociación de Productores Agropecuarios de Café Especial de Planadas (ASOPEP) worked in collaboration with The Latin American and Caribbean Network of Fair Trade Small Producers and Workers (CLAC) over the course of a year to collect comprehensive data from 38 farmers on the costs associated with producing coffee and maintaining their farms. In support of this effort, Bellwether Coffee and Sustainable Harvest made a commitment to use Heifer's Sensitivity Model to determine a living income-based price and use it as the basis to set contracts with ASOPEP. The results of the cost of production data,[3] overlaid with the Living Income Benchmark (LIB), yielded the following results:

ASOPEP (Tolima, Colombia) 2019-2020 VLI Price, Green Equivalent		
Cost of Production: $1.33 per pound	**VLI Farmgate:** $1.89 per pound	**VLI FOB:** $2.24 per pound

Key to this pilot's success was the active collaboration of multiple actors across the coffee value chain: farmer, cooperative, importer, roaster, and non-governmental organizations. With each actor committed to transparency, a foundation was laid for an inclusive approach to pricing.

[1] Farmgate defined as the prices producers receive for sale of product, excluding any separately billed local transport, milling, processing, warehousing, export, etc. costs included in the contract; the price received for (usually cherry or wet parchment) coffee at the 'farm's gate.'

[2] Free On Board, denoting all the costs associated with moving coffee from country of origin to country of consumption, including: local transport and milling, loading, oversea shipping, insurance, any drayage, customs, and overland freight costs incurred on arrival at destination.

[3] Cost of production is defined as the total expense (from start to finish, direct and indirect) incurred, in this case by a coffee grower at the farm-level, to produce a unit of goods. In addition to operating and overhead costs, it includes raw materials, supplies, labor, service, etc. that can be fixed or variable.

DRIVING FORCES BEHIND VERIFIED LIVING INCOME

Poverty in coffee producing communities is an enduring crisis, one that farmers have struggled with for generations. With substantial evidence demonstrating that systemically low prices are the predominant root cause and a key barrier to livelihood advancement, the call to pay higher prices has been building in the coffee industry for decades.[4] While the topic is not new and an extensive amount of research exists to support pricing reform, a model for equitable distribution of value is required to move from commitment to concerted action.

The prices received by farmers, referred to as the "farmgate price," are unsustainably low. Furthermore, they exist concurrently in an environment of mounting instability, including: deforestation, plant diseases, new and spreading pests, and the various impacts of climate change (temperature, precipitation patterns, extreme weather conditions, etc.). In 2020, COVID-19 and hurricanes Eta and Iota in Central America further stressed a fractured system, leaving many in coffee communities without access to healthcare, food, transportation, and education.

With the Intercontinental Commodity Exchange (C-market) consistently valuing Arabica coffee in a manner that isolates supply and demand from farmer realities, the stakes continue to increase. Meanwhile, inflation and other cost of goods and services are rising, currency continues to fluctuate, vulnerability of hired labor is intensifying, a shortage of migrant workers is growing, and, as a result, many are leaving coffee farming altogether to seek other work, often in other countries. As downward pricing pressure increases, crises continue to escalate for the world's 18 million coffee growing families– further threatening farmer livelihoods, rural development, and long-term global supply. This is not only true for the commercial coffee market, but also for higher quality coffee sold on the specialty market. As the Specialty Coffee Association's (SCA) Price Crisis Response Initiative published in their 2019 Summary of Work,

> "For many farmers, accessing these differentiated markets requires additional inputs and labor relative to the production of commodity-grade coffee, which results in increased costs of production. While these types of coffees may be sold for a premium, many specialty coffee pricing schemes still use the commodity-futures market price as a Reference [...] This means that while those farmers might get paid more for that coffee, their price will not necessarily cover their cost of production and will be subject to the same volatility as commodity coffee."

The long-term implications of such a prolonged period of low prices cannot be overstated. Far from an exercise in benevolence, paying living income-based prices for coffee is an investment in the future of a sustainable and diverse coffee industry. This leaves us with an important question: *How much should the industry be paying for coffee as an agricultural product, and on what parameters should that pricing be based?*

[4] For a detailed analysis of poverty in the coffee lands, including upstream and downstream impacts and identification of inequitable value distribution as its root cause, please see any (or all) of the following recent publications: 2020 Coffee Barometer, 2020 Specialty Coffee Transaction Guide, The Task Force for Coffee Living Income Report, Ensuring Economic Viability and Sustainability of Coffee Production, ICO's Annual Review 2018/2019 'Addressing the Coffee Price Crisis, SCA's Price Crisis Response Summary of Work.

LIVING INCOME DEFINED

The term 'living income' creates language around the practice of determining the financial needs for an individual or family to live with dignity, resilience, and self-reliance. As defined by the Living Income Community of Practice, a living income is: "The net annual income required for a household in a particular place to afford a decent standard of living for all members of that household." [5]

When referencing living income requirements, the following factors are considered: nutritious food, clean water, appropriate housing, education, healthcare, transportation, clothing, and other essential needs, including funds for emergencies or unexpected events.

Established net annual income requirements for a particular place can be referred to as Living Income Benchmarks (LIBs). [6] Typically based on The Anker Methodology,[7] developed by Richard and Martha Anker,[8] LIBs are established by determining the total cost per capita of a decent standard of living in a particular place, and scaling that figure to arrive at a wage, or income, to support the typical family size of a given area.

LIBs are developed by capturing household needs across four primary categories:

1. Nutritious, culturally-appropriate diet– 11 food groups that provide sufficient calories, as well as macro and micronutrients.
    - Calculations are based on a more rigorous and contextual standard than nutrition norms, aligning with local food preferences and shopping habits while extending well beyond a goal of caloric adequacy to include nutrient density.
2. Decent housing– shelter, adequate amount of space, and reasonable amenities, sanitary facilities, and other housing criteria deemed necessary to live a dignified life.
    - Costs are determined using both national and international standards for decency. This includes areas of safety and location outside of slums, toilets, electricity, water and space for children and parents can sleep separately.
3. Other basic needs– education, healthcare, transportation, clothing, communication, and cultural events.
4. Unexpected costs– a minimal level of savings needed to withstand shocks and unanticipated expenses.

This methodology of developing Living Income Benchmarks critically allows for different estimates in rural and urban areas, making it context specific. When benchmarks are developed rigorously, they exclusively reflect a specific region (a 'particular place') and need to be updated every few years to account for inflation or otherwise changing costs.

[5] The Concept of Living Income

[6] Living Wages Around the World: A Manual for Measurement

[7] Anker Methodology

[8] Living Wages Around the World: Manual for Measurement

VERIFIED LIVING INCOME

Living income has grown from a niche concept to a recognized term. The space for this VLI pilot is shared by actors previously or currently shedding light onto industry pricing standards and shortfalls, such as the continued work of the Ankers and organizations like the Living Income Community of Practice, Fairtrade International, Emory University and the Specialty Coffee Transaction Guide, the IDH's Task Force for Coffee Living Income, and the Coffee Barometer.

In the context of this pilot, VLI refers to the minimum price—farmgate or FOB equivalent—required to close the living income gap given current production realities. Calculated via a sensitivity analysis,[9] a Living Income Benchmark is overlaid onto full production costs, land size, and yields. The resulting price reflects the per-pound coffee price necessary to reach the designated VLI price. Currently, there is no established third-party certification for living-income based pricing. Therefore, 'verified' in this context refers to the execution of the price discovery methodology of this pilot.[10]

Pursuing such living income-based pricing allows us to see beyond the C-price and differentials, be they high or low at a given moment in time, to envision a future where coffee can lead to a self-sustaining livelihood for producers. It is a transparent, farmer-centric, and economically ethical way to source coffee that is firmly grounded in actualities at origin.

Looking at raw primary data from a group of farmers living in the same community and members of the same association provides unique visibility into the key factors—land size, yields, and expenses associated with cultivation—that can either hinder or enable farmers to reach a living income derived primarily from coffee.

[9] Based on the definition from Corporate Finance Institute, a sensitivity analysis is "used in financial modeling to analyze how the different values of a set of independent variables affect a specific dependent variable under certain specific conditions… also known as a What-If simulation exercise, it is commonly used to predict the outcome of a specific action when performed under certain conditions." In the VLI pilot, all data input categories were considered fixed, as the idea was to determine a procurement price based on current farmer realities. However, the model can also be used to better understand how each category could be adjusted, either in isolation or all-together, to close the living income gap.

[10] ASOPEP, Bellwether, and Sustainable Harvest are participants in the early steps of the application of the Fairtrade Living Income Reference Price methodology in the coffee sector as part of the Colombia Technical Roundtable, led by CLAC. Grounded in its living income methodology and the VLI construct, Heifer International is creating formalized offerings on living income-based price discovery for replication and adoption.

VERIFIED LIVING INCOME (Continued)

This allows for more nuanced, data-driven awareness of how pricing can and must play a key role in closing the gap, meeting farmers where they currently are in terms of output and expansion.[11] Going beyond meeting cost of production, identifying the goal of sustainable, living income-based pricing allows for a deeper understanding of what farmgate compensation is required to close the gap. As such, the team set out to establish a conceptual framework and practical methodology tying farmgate prices to living income as a pricing baseline.[12]

Rather than establishing one universal living income price, or a one-size-fits-all price floor, the objective of this partnership is to establish a means of reaching the appropriate prices across Bellwether Coffee's supply chains.

The economics of producing and selling coffee is subject to a variety of locally dependent factors; it not only varies by country, but also by community and cooperative (and even farm). To address this, the developed tool provides a base from which livable farmgate and FOB prices can be estimated with high confidence.

This way of approaching living income-based pricing addresses is essential to inclusive, equitable price discovery, as it represents three necessary shifts:

1. Equalizing power dynamics between buyers (traditionally price setters) and producers (traditionally price takers).
2. Evolving procurement practices to directly address economic sustainability at origin, rather than focusing exclusively on projects that do not materially confront prices.
3. Providing the economic infrastructure necessary for farmers to transition away from merely surviving to actively thriving.

In doing so, VLI intends to set an equitable, inclusive pricing standard. While each resulting price point will be specific to its supply chain, starting with living income-based pricing establishes a codified approach to data collection and analysis within the context of farmers' realities. This provides the industry an opportunity for concerted, clearly defined action in addressing fundamental disparities that threaten the coffee industry's longevity and success.

[11] For purposes of this pilot, only real-time output information was utilized, without applying sensitivity to productivity potential. Certain thresholds may need to be considered in future adaptations, for example, when crop output falls below reasonable expectations and can be sustainably lifted through accessible interventions.

[12] It is important to note such living income-based price discovery refers to the floor, not the ceiling; quality indicators, certifications/verification, positive social and/or environmental externalities all have their own incremental value. In this first pilot, quality differentials were not included as standardized premium structures had not yet been explored by the group; however, this will be an area of focus as VLI is replicated and scaled.

PILOT RESULTS

Coffee Price to Reach Verified Living Income: ASOPEP (2019-2020, 84-85 points)	
Farmgate per pound (dry parchment)	$1.51
Farmgate per pound (green equivalent)	$1.89
Cooperative Administrative and Export Costs*	$0.35
FOB (green coffee)	$2.24
Data Inputs, ASOPEP Averages	
Farm Size (hectares)	3.43
Yield (pounds/hectare, dry parchment)	2,883
Cost per Hectare	$3,045
Cost per Pound (dry parchment)	$1.06
Cost per Pound (green equivalent)	$1.33
Totals	
Total Production Cost	$10,444
Total Income at VLI Farmgate Price	$14,932
Net Income from Coffee	$4,488
Living Income Benchmark	$4,464
*ASOPEP cost to process, store (using GrainPro) and export a coffee with a quality target of 84-86 points	

METHODOLOGY

Overview
This Verified Living Income pilot was conducted using a sample size of 38 smallholder farmers, all of whom are members of the cooperative ASOPEP based in Tolima, Colombia. The results are derived from primary data collected from each of the 38 participating members over the course of a full calendar year (2019-2020), which includes two harvests. All primary data was initially tracked and recorded in real-time by each farm family, using tools provided by CLAC and ASOPEP. ASOPEP assembled the data and provided additional cooperative-level information, including administrative, processing, and exporting costs. Finally, the data was analyzed by Bellwether, Heifer International, and Sustainable Harvest.

ASOPEP in Context
ASOPEP is a highly professionalized and innovative cooperative with strong membership support programs. The cooperative exclusively sells coffee scoring 80+ on the Specialty Coffee Association scale and maintains both Fairtrade and Organic certification. Amongst other benefits of membership, farmers have access to training on best agricultural practices and a streamlined value chain with strong market access links. The 38 data sets indicate that 80% of members plant under a shade canopy, and 75% of its total membership is Organic certified.

Generally speaking, ASOPEP's members place a concerted effort on maximizing production in terms of productivity and quality, funneling the majority of family resources (financial, time, labor, etc.) toward coffee cultivation. As a result, the 38 farmers participating in the pilot rely almost exclusively on the crop as a livelihood source, with more than 90% of reported household income coming from coffee. As such, the VLI price was calculated based on 100% income from coffee.

Tolima, the Department in Colombia where ASOPEP is located, has two coffee harvests each year, which is uncommon in the majority of the coffee producing countries. A second harvest may increase the total yield per hectare which, when compared to farmers in other countries with only one harvest season, would have skewed down the price per lb. necessary for ASOPEP farmers to reach the Living Income Benchmark. While in many ways, ASOPEP represents an ideal smallholder production scenario, assuming 100% of income can be derived from coffee is not universally true for all farmers. Thus, applying the VLI methodology in a different context may require a different approach to the percentage of income coming from non-coffee sources.

Cost of Production
When determining Verified Living Income, cost of production (CoP) is the most complex component, both from methodological and practical standpoints. For this pilot, all farmer participants were asked to track the entirety of their farm and household expenditures for one year, organizing their financial bookkeeping into distinctive categories and subcategories via a template. The VLI isolated household costs from farm costs, then coffee-specific farm costs from general farm costs.

The full scope of CoP categories and subcategories included are as follows:

Fixed Costs
- Equipment, Tools, and Infrastructure
- Administrative[13]
  - o Cooperative Fees (ASOPEP)
  - o Property Taxes
  - o Utilities and Supplies
    - – Electricity, weighted at 50%[14]
    - – Cell Phone
    - – Gasoline (for farm purposes, such as powering equipment, etc.)
    - – Transportation costs for coffee and fertilizer

[13] Certain Administrative expenses were not included in the calculations, due to challenges in consistent reporting of the data. In the case of ASOPEP, it was advised by the cooperative to disregard these costs, as they were insignificant. However, in other production regions they may represent a more impactful amount and ideally should be accounted for in the future, when applicable. Such expenses are legally mandated pensions, legally mandated insurance, and any endowments.

[14] Any expenditure which is partially, but not exclusively utilized for coffee production, was weighted at 50% to partially account for the cost.

METHODOLOGY (Continued)

In the case of equipment, tools, and infrastructure—ranging from smaller items like handheld tools to larger infrastructure such as drying beds—these items are generally not purchased yearly due to a multi-year lifespan. Rather than determining the market rate of each item for each farmer, either by applying a depreciation rate or dividing the purchase cost by the average number of years used, it was assumed the randomly selected sample size of 38 farmers accounted for the full spectrum of equipment needs, thus generating a representative figure for annual fixed costs.[15] In terms of renovation and rehabilitation, a parallel approach was taken to account for associated input costs and labor (as opposed to, for example, determining a yearly per-hectare expense related to renovation and rehabilitation based on an aspirational scenario of 10%-15% of plants replaced or rehabbed each year).

Variable Costs

- Inputs[16]
  - o Fertilizer (targets nutrient needs of plants to speed growth)
    - – Organic Matter
    - – Inorganic Matter
  - o Compost (creates a symbiotic food web within the soil)
    - – Purchased
    - – Homemade
  - o Pesticides/Weedicides/Fungicides (natural)
  - o Seedlings
  - o Water (for irrigation)

Because the majority of the farmers represented in the data set practice organic farming and agroforestry, with 75% reported to hold Organic certification, the data reflects a heavy reliance on biological inputs.

In instances where the natural input was bought as a product, such as a fertilizer like SuperMagro, Patentkali, or even extra cascara, expenditure assessment was straightforward. However, calculating the full costs of producing and utilizing biological inputs that are made on-farm rather than purchased externally was more difficult. For example, the cost of making an herbal pesticide would have required noting the cost of individual ingredients at minimum, and at most, a complicated record of production costs for all homegrown components. Similarly, holistically accounting for the use of chicken or cow manure as fertilizer would have necessitated determination and extrapolation of estimated expenses, i.e., 1.5% of the cost to raise a cow. That level of detail was not included in CoP due to an inability to make informed assumptions and calculations regarding inputs that were not recorded as directly related to coffee production.

It is noted that some inputs procured and distributed by ASOPEP may have been purchased at a lower rate than if they had been purchased by individual farmers, since cooperatives are able to access economies of scale which are often passed down to their members. However, this was considered a benefit of cooperative membership, which is received in exchange for recurring dues, which were reported.

[15] While government and corporate subsidies were tracked and recorded, none directly related to coffee production were allocated for the calendar year in which data was collected. However, this doesn't mean such subsidies or grants weren't disbursed in recent years for non-annual costs such as seedlings, drying equipment, etc. If included, this would have influenced the CoP result.

[16] It should be noted ASOPEP is largely an organic cooperative (75% of farmers are certified, 25% are conventional), which will impact costs and is not reflective of what a farmer growing conventional coffee would spend on chemical inputs such as fertilizers, pesticides, weedicides, etc. While purchase costs of organic inputs are often higher than their conventional counterparts, it is important to note usage is generally much lower and many biological inputs are made on-farm using existing and/or low-cost materials.

METHODOLOGY (Continued)

Variable Costs

- Labor
  - Harvest Labor
    - Paid (Cash Outlay)
    - Family (Paid Equivalent)
  - Maintenance Labor
    - Paid (Cash Outlay)
    - Family (Paid Equivalent)

While paid labor is fairly straightforward to track in terms of cash outlays, when calculating cost of production, there is a lack of consistency on if and how to account for unpaid family labor. Because the methodological approach of this pilot was to better understand and assign a dollar value to how much it costs this group of smallholder farmers to produce one pound of specialty green coffee, whether those costs were externalized as cash or internalized as physical capital, it was decided to translate all unpaid labor into its monetary value (in real terms). This was achieved by ensuring farmers were tracking the total number of days each family member spent devoted to either harvest or maintenance of coffee, then multiplying each day worked by a paid equivalency based on the actual labor rates paid to contracted workers.

This is one way of accounting for critical hidden labor costs, in a scenario that closely mimics the situational reality and essentially qualifies all labor at equal worth: if paid workers earn X/hour and Y/kilo, then those hours and kilos would have also cost X and Y if the family needed to outsource that labor. What it doesn't do is question the labor rate status quo, which is generally below a livable benchmark (often as a result of smallholders' own pricing-related financial constraints).[17] In addition to the paying of contracted workers, farmers were also providing workers with meals and, in many cases, with temporary living accommodations.

Living Income Benchmark

The Living Income Benchmark (LIB) was the only data input not sourced by primary collection. Instead, the LIB for the rural Colombian coffee-growing regions of Caldas, Cauca, and Nariño was utilized, as established in 2019 by CIAT and Sustainable Food Lab.[18] The lack of an available LIB for Tolima, as well as for many other coffee-growing regions, stresses the importance of continuing to develop benchmarks. Though there are similarities amongst rural coffee communities, LIBs can be used most accurately to develop living income-based pricing when they are tailored to the realities of a given region. In the future, VLI will strive to conduct primary benchmarking based on Heifer International's method of calculating living income, which is grounded in the Anker approach and is tailored to reflect the realities of rural smallholder farmers.

Sensitivity Model

Heifer International has developed a Sensitivity Model[19] as a core living income-based price discovery tool. The Sensitivity Model explores the relationships between four primary data input categories:

1. Farm Size
2. (Coffee) Yields, per hectare
3. Production Costs, per pound[20]
4. Living Income Benchmark

Identifying a Living Income Benchmark as the desired end result (goal), the model simply and objectively calculates the necessary farmgate price farmers need to close the living income gap through net profit from coffee.

In order to distill all 38 data sets into a final number, each farmer data template was scrubbed of personally identifiable information, then aggregated to determine the average for each category. Those final four averages (farm size, yields, costs/hectare, and Living Income Benchmark) were then entered into the model.

[17] A next step that should be explored in the next iteration of this initiative is CoP discovery that includes converting contracted labor to more sustainable rates—such as the National Minimum Wage or a Living Wage—to help determine the true cost of coffee production when it is not subsidized or artificially deflated by unpaid, undervalued, or exploited labor.

[18] IDH Strategy Handbook

[19] A Sensitivity Model is a tool designed to conduct sensitivity analysis.

[20] Based on an inclusive methodology which accounts for full, long-term economic costs of sustainable production

METHODOLOGY (Continued)

Farmgate and Free On Board
To determine the living income-based farmgate price, dry parchment was utilized as the unit of measure (meaning the VLI Farmgate Price is identified as $1.51/lb. dry parchment). For translation to FOB, two conversions were made. First, dry parchment was converted to green equivalent based on 25%[21] weight loss. Next, $0.35/lb. was applied to account for the administration, storage,[22] and exporting costs, per ASOPEP's records, to process a specialty lot with quality expectations of 84-86 points per Specialty Coffee Association (SCA) cupping protocols.

Outliers
Many methodological standards include eliminating outliers from data, e.g., removing the highest and lowest 5%, to decrease variability. However, as was the case in this data set, the coffee production landscape is highly variable, characterized by huge diversity in farm sizes, output levels, and farm management. It was critical to reflect such variances in the data analysis, particularly when all participants are members of the same cooperative; this is especially true given a fairly small sample size of only 38. As such, it was determined not to remove data that fell outside the distribution curve.[23]

Opportunity Costs
Opportunity costs are multifaceted, reflecting the complexity of balancing the cost of producing coffee with other income-generating activities that may be available, including but not limited to employment opportunities outside of coffee (and prevailing market rates for labor in nearby municipalities), land use potential, and amortized establishment costs. Each of these factors have their own philosophical and practical implications. Importantly, aside from an objective cost-benefit analysis of employment or other income-generating opportunities, coffee production holds cultural significance that cannot be quantified.

From a practical standpoint, while there is a case to be made for increasing farmer income through diversification, there is a distinction between supporting farm profitability with additional revenue streams and simply subsidizing unsustainably low coffee prices through the sale of other products. For this group of 38 farmers, more than 90% of their recorded income is derived from coffee sales. Thus, as previously addressed, an anticipated price overlay representing a percentage of income from non-coffee sources was not applied in the pilot results. However, in a context where yields are lower or other factors influence the reality or stability of coffee production, diversification could be a prudent strategy to reduce economic insecurity.

Exchange Rates & the Flow of Coffee
The FOB price paid for coffee at the time of shipment does not necessarily inform the value of the farmgate price. Coffee contracts are set in USD per pound and are traditionally paid to the exporting entity against shipping documents; however, smallholder farmers (including ASOPEP's members) are generally paid upon delivery of their coffee in cherry [24] or parchment, where it is then classified and processed for shipment. The time elapsed between delivery and shipment is often a few months, during which time the value of the USD is in flux. This means that much like the C-price, the exchange rate at the time of delivery may differ from the exchange rate at the time of shipment. So, while the price paid for the coffee stays the same for the buyer (assuming they are paying in USD), that price might have a higher or lower value to the seller based on the exchange rate at the time of export.

In the case of this VLI pilot, all currency conversions were based on the Colombian Peso's value at time of data analysis in December 2020.

[21] Depending on a variety of factors, moisture loss can be anywhere from 20%-25%

[22] In this case, usage of GrainPro bags contributed to roughly 12% of FOB costs at $0.04/lb.

[23] Interestingly, the outliers did not impact the final results significantly. For example, in terms of land size, when scrubbing out the highest 5% (the two largest lots, which were notably outside the distribution curve), the median was only a 0.4 hectare difference than when averaging all 38. Similarly, when eliminating the highest and lowest 5% yields/hectare, the averaged difference was only 107 pounds/hectare less than the median of the full data set.

[24] The coffee plant's fruit, which contains (usually two) seeds, encased by pulp and an outer skin.

ANALYSIS AND IMPLICATIONS

Farm Size and Yield
As demonstrated in both Figure A and Figure B, there are participants who deviated from the mean farm size and/or yields, as well as some clear outliers in regard to Farm Size and Yield per Hectare.

Though this distribution is normal in a data set, in the context of living income, it is important to address that such disparities have real implications for farmer income. Assuming producers are only receiving income from coffee in a given year, Figure A demonstrates those in this study who, given their land size and/or total yield, would be at risk of not earning enough to meet living income standards. For example, a farmer with a land holding of 1.3 hectares (the average for smallholder coffee farmers in Colombia), compared to our sample size average of 3.43 hectares, would require a farmgate VLI for parchment would be $2.33 per lb. as opposed to the $1.51 resulting from the data set average.

Figure A

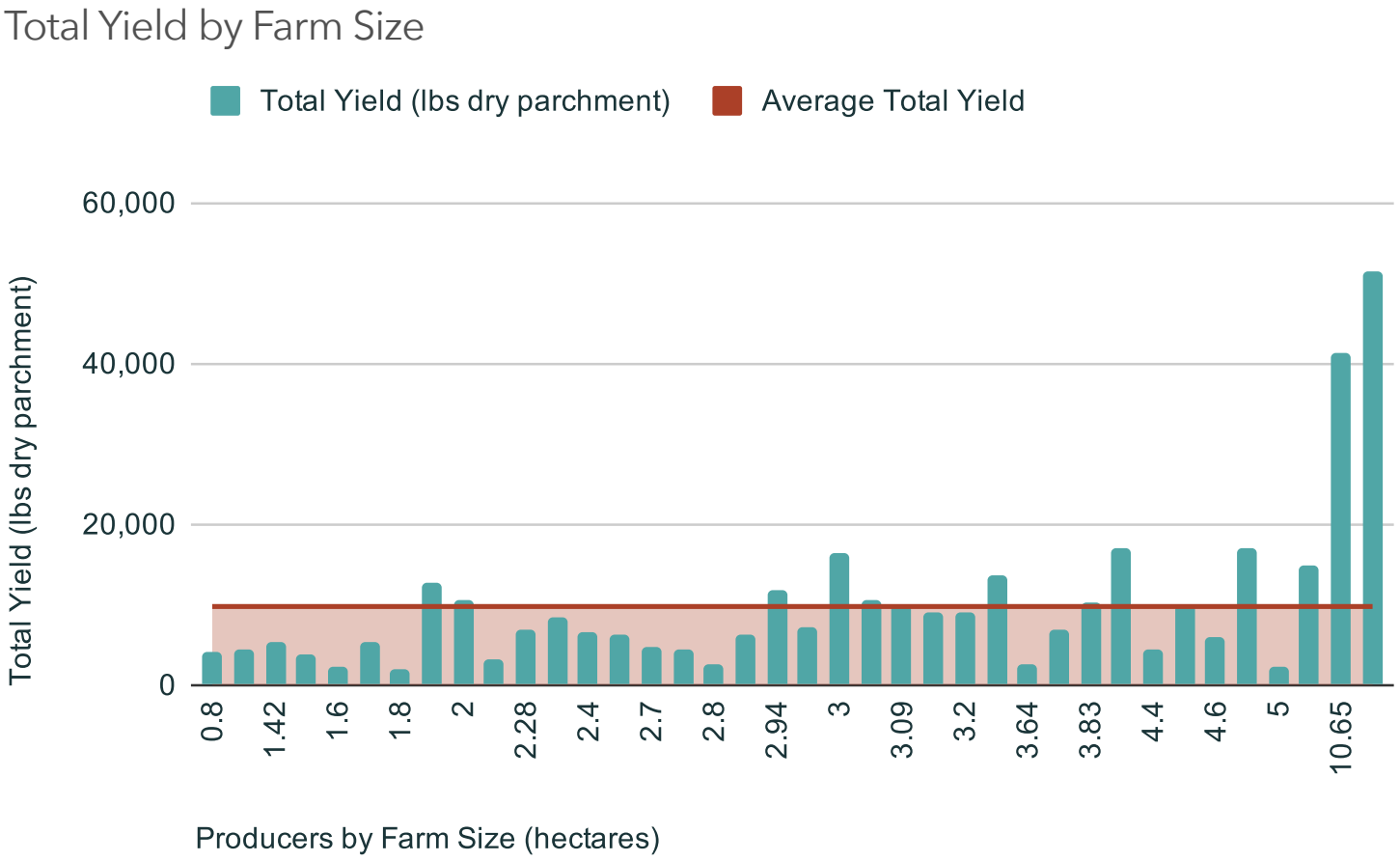
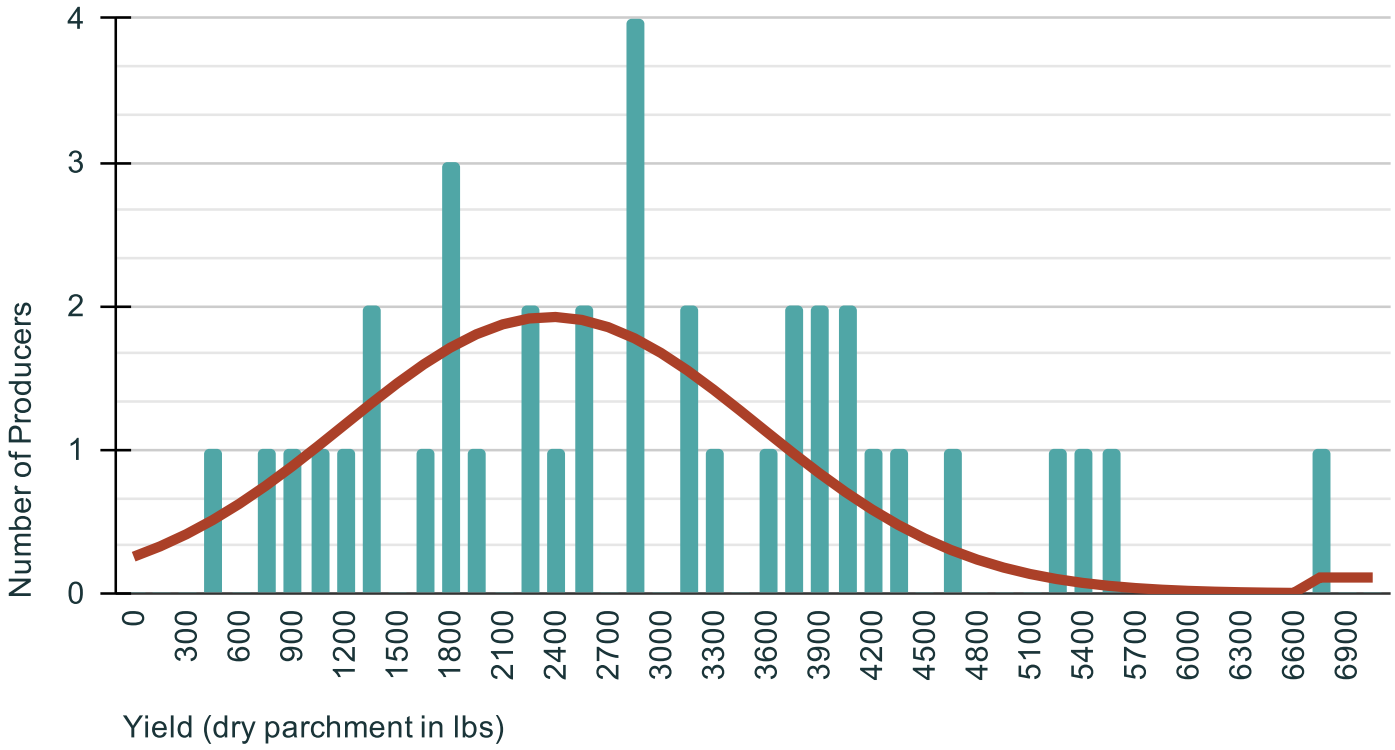


Figure B

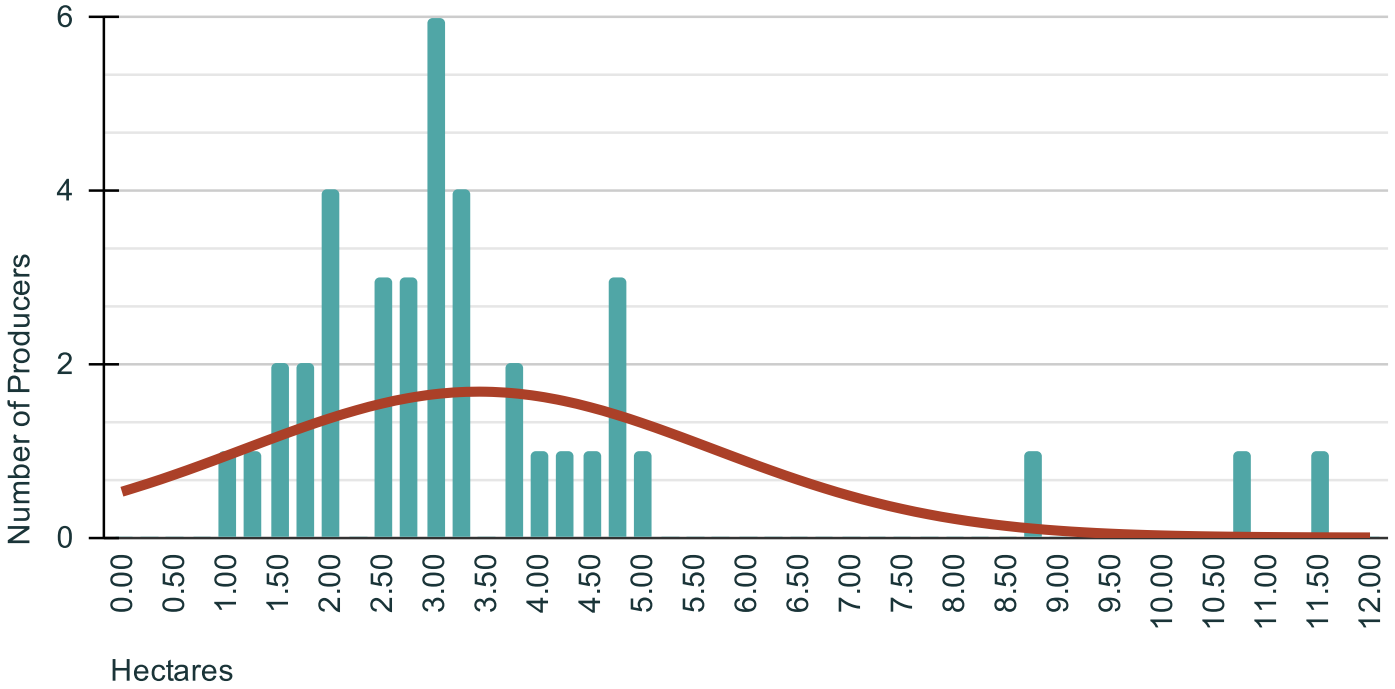
Yield per Hectare



As demonstrated in both Figure B and Figure C, there are participants who deviated from the mean farm size and/or yields, as well as some clear outliers in regard to Farm Size and Yield per Hectare.

Figure C

Distribution of Farm Size



ANALYSIS AND IMPLICATIONS (Continued)

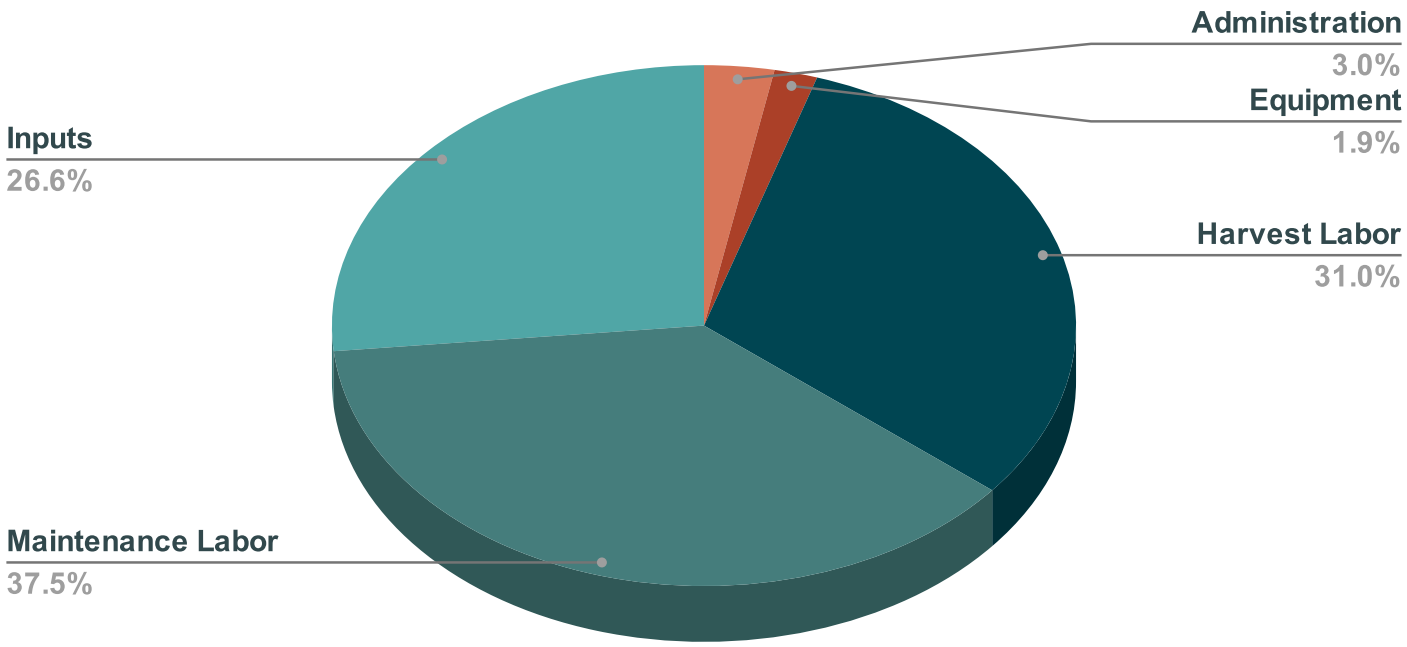
Distribution of Costs

As demonstrated by Figure D, labor proved to be the largest expense, followed by inputs, administration, and equipment. The labor component is a notable expense not only in terms of implications for landowners and the laborers who rely on seasonal and/or hourly work to secure their living, but the largely under-valued and unrecognized contributions of unpaid family labor.

The proportion of costs dedicated to inputs is also significant, especially considering that the majority of participating farmers practice organic cultivation, which is generally regarded as less capital-intensive than conventional farming practices. Such results indicate that operating an organic farm does not necessarily translate into a minimal cash outlay burden for farmers, especially when factoring in the added cost of maintenance labor.

Figure D

Cost of Production



CHALLENGES AND LIMITATIONS

Data & Collection
The main challenge of discovering the VLI price, as well as a scalable framework for repeating this exercise in other contexts, begins with the lack of available primary data on cost of production for smallholders and the difficulty in collecting such data. The time, knowledge, and skill it takes to accurately and systematically record and collect information on cost of production, or general costs associated with farm management is significant. As with most facets of production, the responsibility of data collection and reporting often falls entirely or disproportionately on farmers and farmer organizations.

Particularly as coffee plants have 20-30 year lifespans and require different kinds of care at different stages, it is not possible to extrapolate one year's worth of expenditure to decades of cultivation. This hurdle exacerbates that of accounting for long-term investments across plant establishment, equipment, and infrastructure in a singular data collection cycle. Tracking as comprehensively as was done in this pilot—seeking to quantify long-term, full economic costs—is recommended as a best practice. This will allow the industry as a whole to gain better visibility into long-terms costs and provide a more holistic understanding of how cost of production reporting may vary from year-to-year.

Accounting for Labor
As introduced previously, it is common for contracted workers to be inadequately compensated, with local market rates often falling below even local minimum wages. Notably, this can be traced back to financial constraints at the farm level, where downward pricing pressure is experienced most severely by the most vulnerable links in the value chain. However, to ensure that living income-based price discovery methodology includes living wages for contracted workers, day labor or per-kilo rates would likely need to increase.

By converting actual wages to benchmarked wages, such as a national minimum wage or a living wage, two additional VLI price points could have been developed that would correspond to livable income for all value chain actors. However, while established minimum wages and living wages can be accurately broken down into daily or even hourly amounts, the heaviest labor lift in coffee comes from harvesting, which is generally paid by the amount, or weight, of cherry picked. The tenuous nature of translating per-volume payment to an hourly or day rate posed a challenge to methodological confidence. While ultimately, the decision was determined not by philosophy but by practicality, reconciling this incongruity will be a priority as VLI moves forward. Such an approach, though difficult to achieve due to the often temporary or transient nature of contracted farm labor, would be more representative of the true cost of coffee production when it is not artificially or otherwise deflated by unpaid, undervalued, or exploited labor.

Using Averages
Applying averages to attributes like farm size, yield per hectare, and labor needs, even within the relatively small sample size of 38 farmers, does have its drawbacks. Not only do averages not represent all farmers (or all smallholder farmers in a given geographic area), but they may also fail to inclusively represent all those in the sample size itself. Though establishing an average from the data set indicates how the group will fare under said conditions, it does not ensure closing the living income gap on an individual basis. Those farmers with productivity per hectare and/or land size that fall below the average will not earn a living income from this pilot's resulting VLI price, just as farmers with above-average land or yield will surpass the LIB with such a price.

CONCLUSION & RECOMMENDATIONS

There are undeniable negative externalities of paying low prices for coffee, which have both tangible and intangible costs. Current mainstream methods of price discovery are inadequate to close the living income gap, particularly because they tend to oversimplify cost of production, assume (or demand) unviable productivity, ignore farmgate capture, and critically decouple quality or country-based differentials from farmer needs. The status quo perpetuates low prices while undermining industry social, environmental, and long-term supply goals. As such, the need to focus on living income-based pricing as not only a strategic investment but as the foundation to a more sustainable, stable coffee industry cannot be underscored enough.

While there may be no perfect method of determining contracts that meet the needs of all involved all of the time, it is possible to use a data-driven and evidence-backed approach to set prices to ensure that profitability is promoted throughout the value chain. Doing so requires a commitment to understanding farmer realities, recognizing full costs of production, and sharing risk and rewards. Further, zeroing in on context-specific supply flows mitigates oversimplified generalizations regarding cost models, price floors, and premiums, which have the potential to exclude the majority of farmers from the conversation and disregard their livelihood requirements. Ultimately, transforming procurement to center on living income as a path to improved farmer livelihoods is key to not only alleviating economic instability in the coffee lands, but to creating the stability necessary for coffee production to be viable for farmers, allowing it to continue for generations to come.

With this in mind, and to be consistent in a collaborative approach that engages actors across the coffee value chain, interim recommendations to the industry are as follows:

Farmers:

- Consider farm financial management a necessary step to prosperity. Track and analyze all expenses and returns, then benchmark against household needs.

Cooperatives:

- Provide digital financial management tools to members, empowering them to take ownership of their farm economics by standardizing and streamlining the process.
- Support informed decision-making, farm-level cost analysis and comparisons as well as collective bargaining power from results of data collection.
- Utilize data analysis to determine any necessary areas of investment, such as technical trainings or infrastructure improvements.
- Determine and leverage Verified Living Income as an element of price negotiation.

Importers:

- Provide full transparency in contracts, educating roasters on how FOB prices relate to farmgate prices, and how these compare to living income needs.
- Support the building of business acumen at the cooperative-level, including fluency in utilizing financial management tools.
- Build long-term stable relationships with farmers and farmer groups to minimize their market access uncertainty, focusing on collaborative decision making.
- Educate roasters on origin realities, providing insight into how certain sourcing objectives or market demands may exacerbate or mitigate risk, vulnerability, and/or profitability.

Roasters:

- Use farmgate price as the starting point to set FOB prices.
- Embed farmer profitability into procurement, recognizing they are complementary forces which must work together to meet larger commitments and objectives.
- Make living income a core objective in sustainability commitments, backed by accountability and an active path to progress.
- Eliminate arbitrary terms such as "fair," "sustainable," and "ethical" unless they are clearly and concretely defined, ideally in a way that includes living income-based pricing.
- Facilitate two-way transparency by sharing valuable consumer, sales data, and/or financial data with farmers and/or cooperatives.

Non-Government Organizations & International Development Community:

- Be bold in advocacy work, directly addressing economic sustainability as key to development.
- Require purchase contracts as part of corporate projects, ideally with living income-based price discovery as a prerequisite.
- Facilitate tracking and determination of long-term full economic costs of production as a standard farm management practice, amplified by digitization of data collection and analysis.
- Support collective bargaining and price negotiation.

While the recommendations listed above are positive steps forward, transformative pricing reform is necessary to coffee's collective success and longevity over the long-term.

CALL TO ACTION

In December 2020, Bellwether renewed their annual contracts with ASOPEP above the Verified Living Income Price of $2.24 FOB, increasing their price by 20% when compared to the previous contracting cycle. Starting with Latin America, Bellwether has committed to implementing living income-based pricing throughout their supply chain.

We call on the industry to join Bellwether in adopting the VLI methodology and committing to living income-based pricing as a core procurement approach within their respective supply chains.

APPENDIX

Conversions:
Exchange Rate (COP to USD): 0.00027
Kilogram to Pound: 2.2
Dry Parchment to Green Equivalency: 1.25

Raw Data Set (redacted)

Farm Profile

Farm Distribution	Lot Size	Land Use	Intercrop	Year Planted	# of Trees	Conventional or Organic	Production Type	Production Volume (kilos)
1	0.400	Coffee	n/a	2008	2000	Organic	Agroforestry	1800
2	0.200	Coffee	n/a	2008	1000	Organic	Agroforestry	700
3	0.300	Coffee	n/a	2008	1500	Organic	Agroforestry	1200
4	0.360	Coffee	n/a	2008	1800	Organic	Agroforestry	1600
5	0.200	Coffee	n/a	2008	1100	Organic	Agroforestry	800
6	0.100	Coffee	n/a	2008	500	Organic	Agroforestry	300
7	0.240	Coffee	n/a	2008	1200	Organic	Agroforestry	800
8	0.200	Coffee	n/a	2008	1000	Organic	Agroforestry	900
9	0.219	Conservation	n/a					
10	0.50	Fallow	n/a					

On-Farm Compost					
Date	Ingredient	Unit	Quantity	Cost per Unit (Colombian Pesos)	Total Cost (Colombian Pesos)
-	Cal	Package	10	$11,000	$110,000
-	Chicken Manure	Package	5	$16,000	$80,000
-	Coffee Cherry	Package	25	$0	$0

Production Costs: Inputs and Equipment

Fertilizers (Coffee Production)					
Date	Ingredient	Unit	Quantity	Cost per Unit (Colombian Pesos)	Total Cost (Colombian Pesos)
October-19	patentkali	Package	20	$101,000	$2,020,000
December-19	patentkali	Package	20	$110,000	$2,200,000
February-20	fosforito 28	Package	20	$28,000	$560,000
April-20	patentkali	Package	20	$121,000	$2,420,000
August-20	patenkali	Package	20	$120,000	$2,400,000
June-20	SuperMagro	Liter	40	$1,400	$ 56,000

Other Inputs (Coffee Production)					
Date	Ingredient	Unit	Quantity	Cost per Unit (Colombian Pesos)	Total Cost (Colombian Pesos)
July-19	bioxinis	Pound	3	$12,000	$36,000
October-19	bioxinis	Pound	3	$12,000	$36,000
January-20	bioxinis	Pound	3	$12,000	$36,000
March-20	bioxinis	Pound	3	$12,000	$36,000
December-20	SuperMagro	Liter	1	$1,400	$1,400
December-20	SuperMagro	Liter	1	$1,400	$1,400
December-20	bauveria	kilo	1	$16,000	$16,000
January-20	bauveria	kilo	1	$16,000	$16,000
March-20	SuperMagro	Liter	1	$1,400	$1,400
March-20	bauveria	kilo	1	$16,000	$16,000
March-20	SuperMagro	Liter	1	$1,400	$1,400

Equipment					
Date	Type	Quantity	Cost per Unit	Life of Product (years)	Total Cost
January-20	Motor Pump	1	$780,000	3	$260,000
March-20	Scythe	1	$950,000	7	$135,714
April-20	Fumigator	1	$864,000	4	$216,000

Cost of Production: Labor

Family Labor, Unpaid			
Date/Period	# Days worked in coffee	Gender	Activities
October19	7	Male	Subscription
October-19	4	Male	Phytosanitary control
November-19	8	Male	Phytosanitary control
December-19	8	Male	Phytosanitary control
January20	7	Male	Phytosanitary control
February-20	7	Male	Weeding
March-20	5	Male	Subscription
March-20	12	Male	Harvest
April-20	15	Male	Harvest
May-20	12	Male	Harvest
June-20	8	Male	Harvest
July-20	7	Male	Post-Harvest
August-20	8	Male	Subscription
September-20	9	Male	Maintenance
Total # of Days Spent Working in Coffee	117		

Family Labor, other crops or productive infrastructure (not compensated)				
Date/Period	# Days worked in coffee	Gender	Crop	Activities
September-20	2	Male	Avocado	Sowing
Total days worked in other crops	2			

Paid Labor, Maintenance					
Time/Period	# Days	Day Rate (Colombian Pesos)	Additional benefits	Cost (Colombian Pesos)	Activity
October-19	7	$37,000	Plant nutrition	$259,000	Fertilizing
Augus-19	9	$30,000	Plant nutrition	$270,000	Weeding

Paid Harvest Labor					
Date	Unit of Measurement	Units Picked	Payment per Unit (Colombian Pesos)	Additional Benefits	Total Labor Costs (Colombian Pesos)
March-20	Kilo	4800	$700	Food and lodging	$3,360,000
March-20	Kilo	700	$700	Food and lodging	$490,000
March-20	Kilo	1500	$700	Food and lodging	$1,050,000
April-20	Kilo	1000	$700	Food and lodging	$700,000
April-20	Kilo	3600	$700	Food and lodging	$2,520,000
May- 20	Kilo	1900	$700	Food and Lodging	$1,330,000

Production Costs: Administrative

Date	Type	Cost (Colombian Pesos)
September-19	Electricity	$21,000
September-19	Cell phone	$46,000
September-19	ASOPEP coop support fee	$82,900
September-19	Gas (equipment)	$100,000
October-19	Electricity	$22,000
October-19	Cell phone	$46,000
October-19	Gas (motorcycle, coffee transport)	$90,000
November-19	Electricity	$22,000
November-19	Gas (motorcycle, coffee transport)	$100,000

Production Costs: Administrative Continued

Date	Type	Cost (Colombian Pesos)
December-19	Electricity	$22,000
December-19	Cell phone	$46,000
December-19	Gas (motorcycle, coffee transport)	$100,000
January-20	Electricity	$20,000
January-20	Cell phone	$46,000
January-20	Gas (motorcycle, coffee transport)	$100,000
February-20	Electricity	$22,000
February-20	Cell phone	$46,000
March-20	Electricity	$23,000
March-20	Cell phone	$46,000
March-20	Gas (motorcycle, coffee transport)	$80,000
April-20	Electricity	$22,000
April-20	Cell phone	46,000
May-20	Electricity	$22,000
May-20	Cell phone	$46,000
June-20	Electricity	$22,000
July-20	Electricity	$23,000
July-20	Cell phone	$45,000
July-20	ASOPEP coop support fee	$87,800
August-20	Electricity	$22,000
August-20	Cell phone	$46,000
September-20	Electricity	$22,000
September-20	Cell phone	$46,000
September-19	Electricity	$21,000
September-19	Cell phone	$46,000
September-19	ASOPEP coop support fee	$82,900
September-19	Gasolina (Equipment)	$100,000
October-19	Electricity	$22,000
October-19	Cell phone	$46,000
October-19	Gas (motorcycle, coffee transport)	$90,000
November-19	Electricity	$22,000
November-19	Gas (motorcycle, coffee transport)	$100,000

Production Costs: Administrative Continued

Date	Type	Cost (Colombian Pesos)
December-19	Electricity	$22,000
December-19	Cell phone	$46,000
December-19	Gas (motorcycle, coffee transport)	$100,000
January-20	Electricity	$20,000
January-20	Cell phone	$46,000
January-20	Gas (motorcycle, coffee transport)	$100,000
February-20	Electricity	$22,000
February-20	Cell phone	$46,000
March-20	Electricity	$23,000
March-20	Cell phone	$46,000
March-20	Gas (motorcycle, coffee transport)	$80,000
April-20	Electricity	$22,000
April-20	Cell phone	$46,000
May-20	Electricity	$22,000
May-20	Cell phone	$46,000
June-20	Electricity	$22,000
July-20	Electricity	$23,000
July-20	Cell phone	$45,000
July-20	ASOPEP coop support fee	$87,800
August-20	Electricity	$22,000
August-20	Cell phone	$46,000
September-20	Electricity	$22,000
September-20	Cell phone	$46,000