Assessing Coffee Farmer Household Income

STUDY BY TRUE PRICE, COMMISSIONED BY FAIRTRADE INTERNATIONAL
2017

Authors and acknowledgements

About True Price

True Price is a social enterprise that aims to contribute to a circular and inclusive economy that creates value for all people by providing the information needed for such an economy. True Price helps organizations – multinationals, SMEs, NGOs, governments – quantify value and improve their economic, environmental and social impacts. True Price works directly with organizations by providing research services. In addition, True Price enables organizations to measure their impact by developing open source methods for impact measurement that are relevant, sound and inclusive.

www.trueprice.org

Cover image: Sobur, a Fairtrade certified coffee farmer in Indonesia. © Nathalie Bertrams

Table of Contents

1. Introduction

1.1 Motivation for this study

Fairtrade's ambition is to see small-scale farmers earning a living income that provides them with a sustainable, dignified livelihood, which is a core part of Fairtrade's 2016-2020 strategy. In order to better understand how much coffee farmers actually earn and what Fairtrade's potential impact is on farmers' household income is, the Pricing Unit of Fairtrade International commissioned a study to assess coffee farmer household income. The goal of this study was to improve strategy and policy development as well as to inform the Fairtrade Minimum Price (FMP) calculation by developing a method that is rigorous, yet sufficiently practical to be scaled up and used as a permanent tool together with the calculation of the Costs of Sustainable Production (COSP). The Fairtrade Minimum Price is the minimum that farmers' organizations are paid when selling their products through Fairtrade. It aims to cover the average costs of sustainably producing their crop and acts as a safety net when market prices drop.

At the same time, the study allows Fairtrade to build up knowledge on measuring farmer household income internally and potentially shape the international debate on this topic. Very few studies of this kind have been carried out to date, making the results particularly interesting both for Fairtrade and for the wider coffee community. This report synthesizes the findings of this study, which was executed by True Price, a social enterprise specialized in quantifying, valuing and improving impact of organizations.

1.2 Approach to this study

In this study a method to measure total farmer household income was developed and applied to the COSP data collection in 2016, thereby creating a baseline farmer household income database for Fairtrade smallholder coffee farms for seven countries (Rwanda, Tanzania, Uganda, Kenya, India, Indonesia and Vietnam), covering 465 individual farmers. The results of the study are entirely based on primary data collected on the COSP and farmer's household income and focus on the cash available to the farmer. The study started in October 2015 with developing the farmer household income method and data collection strategy. The method was co-developed by True Price and Fairtrade, based on True Price's expertise with producer income calculation models and Fairtrade's expertise with COSP calculation. Over the next few months a database was designed for collecting the data and calculating the results. Primary data was collected by Fairtrade's field staff from the Fairtrade Producer networks (PNs) and by the Coffee Research Institute (in Kenya) from February until August 2016. Afterwards, the data was cleaned and processed into the farmer household income model. The data was then reviewed and checked for data gaps and inconsistencies. Preliminary results were discussed with experts and local data collection partners for validation purposes.

1.3 Summary of this study

This section provides a short summary of the main results and takeaways from this study. More details on these results can be found in the rest of the report.

1.3.1 Key insights

The results of the study show that the extent to which Fairtrade coffee farmers are reliant on income from coffee production varies considerably between countries. For instance farmers in Indonesia rely highly on income from coffee production whereas farmers in Kenya rely mainly on other sources of income. On average about 50% of farmer household income results from coffee production. The other large contributors are income from other farm goods and off-farm wage income.

Furthermore, this study creates insight into the differences between countries with regards to farmer household income and the underlying drivers (such as coffee profitability). Indonesian and Vietnamese farmers have the highest farmer household incomes, which is mainly due to relatively high incomes from coffee. Indonesian farmers have the highest coffee profitability, which results from relatively low costs of production. Tanzanian farmers also have a high profitability per kilo of coffee, but this does not translate into high farmer household incomes due to relatively low coffee production volumes. Moreover, Tanzanian farmers have almost negligible in-kind farm income[1] and income from off-farm activities. While some Kenyan farmers are making a profit on their farms, the overall picture is very mixed, so that on average, Kenyan farmers make a loss on coffee production. More details on these results are provided in section 3.2 of this report.

Finally, the results of this study are placed into context by adding living income (and poverty line) estimates. This creates valuable insights on whether coffee farmers currently earn a living income from their total household income and from their coffee production. It is found that on average Indian, Indonesian and Vietnamese farmers earn a living household income, but only Indonesian farmers currently earn a living household income from coffee production alone. Twenty-five percent of Indian farmers, almost 50% of Indonesian and Vietnamese farmers and 100% of Kenyan farmers do not currently earn a living income. An additional ʻvalue added analysisʾ, showed that farmers are able to provide their households and their hired workers with a living income from coffee production in India and Indonesia. In Kenya − where farmers make a loss on coffee production − and Vietnam, this is not currently the case.

1.3.2 Possible applications

The designed, applied and tested methodology and tools (such as the questionnaires, sample design tools and databases) can be used in future projects for efficiently assessing farmer household incomes. The added value analysis can be used to inform FMP setting in combination with living income data. The increased insights into the profitability of coffee vs. other farm products, the other revenue sources of coffee farmers and the labour productivity figures can inform Fairtradeʼs strategies and programs, such as the implementation of Fairtrade Premium Projects. In an effort to improve the livelihoods of coffee farmers, Fairtrade International may contribute to the international debate on living income and further research. This pilot is a valuable first piece of information towards a comprehensive view on coffee farmersʹ income and identifying the main constraints and potential enablers to improve it. Because the scope of this study was to establish a method to measure farmer household income, further research could complement this study by, for example, including a focus on farmer productivity and agricultural practices.

1.3.3 Data collection learnings

This study provides several insights on how data collection and tools can be improved in order to achieve more reliable and insightful results in a more efficient manner. For instance, the study sheds light on which data points are crucial to consistently collect on a granular level, which can be easily collected on an average level and less frequently and which need not be collected (not material) for future studies on farmer household income.

1.4 List of acronyms

Table 1 shows a list of acronyms that are used in this report.

---

[1] In-kind farm income refers to all income which is non-monetary, this is received or given as goods, farm goods, inputs or services.

Table 1: list of acronyms

CLAC	Coordinadora Latinoamericana y del Caribe de Comercio Justo (Latin American and Caribbean Network of Small Fair Trade Producers)
COSP	Cost of Sustainable Production
CRI	Coffee Research Institute (research institute on coffee in Kenya)
FMP	Fairtrade Minimum Price
FTE	Full Time Equivalent (the equivalent of one employee that works full time)
NAPP	Network of Asia and Pacific Producers (organisation working to secure a better deal for farmers and workers in Asia and Pacific)
PPP	Purchasing Power Parity (The purchasing power of a currency refers to the quantity of the currency needed to purchase a given unit of a good, or common basket of goods and services)
SPO	Small Producer Organization

2. Methodology

This section provides (1) an explanation of the underlying methodology of the farmer household income model and (2) information on the study's design, including the selection of sample sizes and the collection and processing of data.

2.1 Farmer household income

2.1.1 Overview farmer household income model
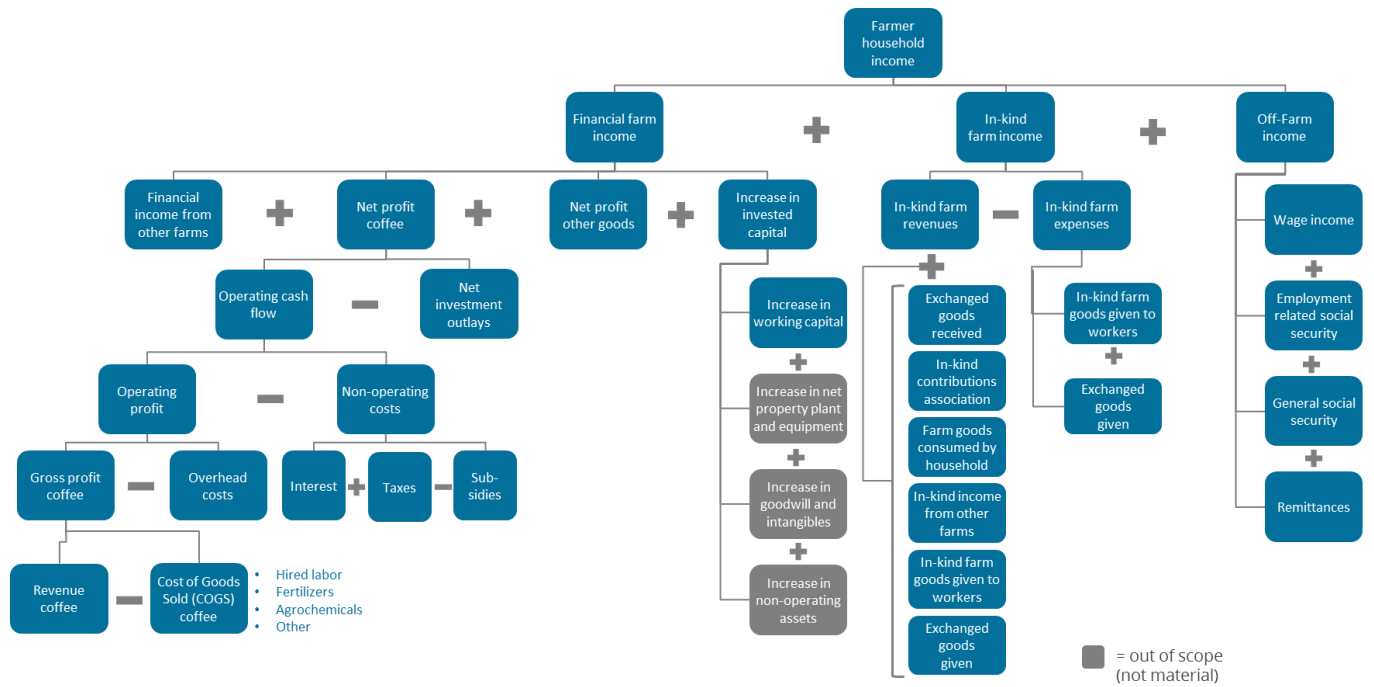
Figure 1: Farmer household income model

Figure 1 provides a breakdown of the farmer household income model as it was applied in this study. The grey boxes represent variables that were placed out of scope for this study due to a low expected materiality (relevance). These less-material variables all refer to increases in invested capital: (1) increases in net property, plant and equipment, (2) increases in goodwill and intangibles and (3) increases in non-operating assets. Table 2 provides an explanatory list of the depicted variables.

2.1.2 Explanatory list of variables

Table 2 provides an explanatory list of the variables in scope, as mentioned in figure 1.

Table 2: Explanatory list of variables

Financial farm income	Financial income from the household's farm(s)
Increase in working capital	Monetary value of coffee stock increase in last crop year
Net profit other goods	Revenues of goods besides coffee that are sold for cash minus the extra costs of these other goods (including costs of goods sold, overhead costs, non-operating costs and net investment outlays)
Net investment outlays	Investment costs on capital assets, spread out over the useful life years. This includes costs of structures, facilities, tools, materials, machinery and equipment and establishment costs of new coffee trees
Overhead costs	Overhead costs include book keeping costs, memberships fees to the SPO and other member organizations, insurance, pre-studies and analysis and possible other overhead costs (i.e. certification cost)
Interest	Interest costs on outstanding loans
Taxes	Government taxes
Subsidies	Subsidies in cash received from the SPO or other parties
Revenue coffee	Financial revenues of coffee sold for cash
COGS (costs of goods sold) coffee	Operational costs of coffee including input costs and hired labour costs; all costs from coffee crop management, coffee processing, coffee packing and storage and coffee transport
Financial income from other farms	Net profit from other farms than the primary farm
In-kind farm income	In-kind income from the household's farm(s)
Exchanged goods received	Monetary value of goods and services received from SPO or others in exchange for farm goods
In-kind contribution association	Monetary value of goods and services received from SPO or others not in exchange for farm goods
Farm goods consumed by household	Monetary value of farm goods that are consumed by the household
In-kind income from other farms	Monetary value of in-kind goods that are received from other farms
In-kind farm goods given to workers[2]	Monetary value of in-kind goods that are produced on the farm and given to the workers
Exchanged goods	Monetary value of farm goods given to SPO or others in exchange for

---

[2] This concerns only goods produced on the farm that are given to workers and are therefore used in the calculation as both in-kind revenue and in-kind expense

given	goods
Off-farm income	Income from sources other than the household's farm(s)
Wage income	Income from off-farm wages earned by the household members[3]
Employment related social security	Monetary value of social security benefits received from employer or SPO (including unemployment insurance, old age pension and health insurance)
General social security	Monetary value of social security benefits not received from employer or SPO, but for instance from the government (including unemployment insurance, old age pension and health insurance)
Remittances	Money or checks received from non-household members, either family or not family (usually internationally)[4]

2.1.3 Farmer household income methodology

The farmer household income model developed in this study is based on several methodologies. The methodologies described in Brealey & Myers (2013), Damadoran (2012) and Koller, Goedhart and Wessels (2015) were used for defining 'income' and assessing in which categories the income should be split. To tailor the methodology to income of smallholder coffee farmers amongst others the methodologies of COSA and INCAE were used. From these sources the standard comprehensive income model was used, which was adapted to farms with a focus on the cash available to the farmer. In this study the financial income is defined as accounting income and does not include opportunity costs, which would be the case if income would be defined in terms of economic profit. This methodology was chosen because economic profit is less relevant for farmers themselves than the actual profit. In addition, the operating profit is defined in cash terms and all non-cash items are categorized under changes in invested capital. This allows a clear identification of the cash available to farmers, which is most relevant to farmers. Moreover, a cash flow profit approach is less complex, time consuming and leaves less room for manipulation of numbers. This approach is in accordance with the approach of the European Union to farmers' income.[5]

This study does not only look at the costs of (sustainable) coffee production but also at the income that the farmer receives on a member level, costs and revenues of other goods, in-kind income and off-farm income. As such, the farmer household income is defined as all income that a farmer can have, both on and off-farm and both financial and in-kind, minus all financial and in-kind costs the farmer has for the production of coffee and other farm goods. Labour costs of household members are excluded as the farmer household income is considered to provide for the household and should therefore not be reduced by an additional wage income for household members. A household is

---

[3] This may include income from small off-farm businesses

[4] This variable does not include family inheritance

[5] 'When attempting to devise practical indicators for the standard of living it is conventional to use disposable income of the household or the average per household member, as this represents their potential command over the consumption of goods and services', quote from EU study: Comparison of Farmers' Incomes in the EU Member States (Berkeley & Bradley, 2015)

defined as the family members for which the farm has to provide and who live permanently in the farmer's household. This is in line with the definition of a household of OECD.[6]

The increase in net property, plant and equipment is assumed to be not material for this study. Measuring changes in the value of net property, plant and equipment is demanding for smallholder farms and requires additional data. The justification for leaving this out of scope is that it is plausible that on average over all the farmers, net investment outlays are approximately the same as depreciation of property, plant and equipment. Finally, in the model, coffee waste or losses are not considered as a separate expense, as they are indirectly covered by a reduction in revenues from coffee sales.

2.2 Study design

This section describes the methodology that was used in this study to select the research sample and collect and process the data.

2.2.1 Sample design and data collection

In order to define the research population of Fairtrade-certified coffee farmers for this study, three initial filters were applied:

1. Only coffee farmers from 15 countries (Brazil, Colombia, Costa Rica, Ethiopia, Honduras, India, Indonesia, Kenya, Mexico, Nicaragua, Peru, Rwanda, United Republic of Tanzania, Uganda and Vietnam);
2. Only coffee farmers that are members of Small Producer Organizations (SPOs) that became Fairtrade certified before 2014 (two years in the system) and that had transactions in 2014 (Fairtrade sales);
3. Only coffee farmers which are members of SPOs that had full certification status in 2015 (as of August).

After applying the filters, a list of 283 SPOs remained, out of nearly 500 SPOs. It was assumed that this full list is representative of Fairtrade coffee production.

From the list of 283 SPOs a selection of around 54 SPOs was made, focusing to cover a representation of:

1. Robusta and Arabica production
2. SPOs with a trader status
3. Organic and Conventional production
4. 2nd and 3rd grade organizations[7]
5. Washed, Semi-washed and Dried/Natural processing systems

By using the criteria above, 54 SPOs were chosen, distributed among the 15 countries.

---

[6] https://stats.oecd.org/glossary/detail.asp?ID=1255

[7] A 1st-grade (producer) organization describes a small producer organization whose legal members are exclusively individual small farmers. A 2nd-grade (producer) organization describes a small producer organization whose legal members are exclusively 1st-grade organization affiliates. A 3rd-grade (producer) organization describes a small producer organization whose legal members are exclusively 2nd-grade organization affiliates.
http://www.fairtrade.net/fileadmin/user_upload/content/2009/standards/documents/2012-07-11_SPO_EN.pdf

After discussions and assessment of resource capacities for data collection, the CLAC/Red Café[8] decided not to participate in this study at this stage. In the case of Ethiopia, many challenges were encountered for the data collection; therefore Ethiopia also had to be excluded from the sample as well. This reduced the sample population to members from 12 SPOs in seven countries. According to data of actual transactions reported to FLOCERT, the 12 SPOs in the sample represent 3.2% of total worldwide sales and 28.5% of sales in the two regions (Asia and Africa). [9]

Once the selection of the SPOs was finalized, the following steps were taken in order to select farmers:

As a first step, the farmer sample size was defined per country, using the following formula:

$$SS = (\frac{t_{90\%}\sigma}{c})^2$$

Where:

- SS: sample size;
- c: desired margin of error (mean of expected result multiplied by the allowed error % on the result)
- σ: population standard deviation
- $t_{90\%}$: t-value for a 90% confidence level (1.645)

As disaggregated country-specific data on farmer household income was unavailable for the countries in scope, the coefficients σ and c were estimated based on labour cost data from coffee farming studies in Nicaragua, Nepal and Kenya. This resulted in an estimated coefficient of variation (standard deviation over mean) of 1.5. An allowed error % on the result of 30% was applied in Rwanda, Tanzania, Uganda, India, Indonesia and Vietnam. For Kenya, an allowed error % on the result of 20% was applied, as more local resources were available to collect data. For Vietnam, the member sample size was further adjusted for small population size (Levine et al, 2013). This resulted in required sample sizes of 153 for Kenya, 56 for Vietnam and 68 for the other countries in scope. The members to be selected were divided over the SPOs in each country proportionate to the amount of members in each SPO.

Members were instructed to be selected in a random manner by the SPOs with the help of Fairtrade's and the producer network's field staff. In Rwanda, Tanzania and India, member selection was executed in a fully randomized manner. In Kenya, member selection was executed in a fully randomized manner for some SPOs and partially randomized for other SPOs. In Vietnam, Uganda and Indonesia, member selection was not executed in a randomized manner. For the countries where random member selection was difficult, SPOs were advised to select members with expected high variabilities in cost efficiency (i.e. different types of coffee produced, different expectation on costs per kg produced).

Data was collected mostly via individual interviews and in some cases via member group discussions.

---

[8] CLAC/Red Café refers to the members of Red Café, the responsible body to steer the strategies for the development of Fairtrade in the coffee sector in Latin America and the Caribbean.
[9] FLOCERT, Transactions data (FLOTIS), 2014.

	Rwanda	Tanzania	Uganda	Kenya	India	Indonesia	Vietnam
Amount of farms in sample	66	50	60	155	26	60	48
Amount of focus group discussions (amount of members in focus group)	4 (13/14)	0	0	1 (5)	0	8 (6/8)	1 (34)

Figure 2: sample sizes and data collection method for the 7 countries in the sample

Figure 2 provides an overview of the final sample sizes for which data was collected and the amount of member group discussions per country.

Data was collected via two member-specific questionnaires: the COSP questionnaire and the farmer income questionnaire. In Indonesia member group discussions were used for filling out the COSP questionnaire, whereas the farmer income questionnaires were filled out individually. In all other countries the data collection approach was the same for both questionnaires.

The COSP questionnaire used for this study was based on Fairtrade's existing COSP questionnaire but adjusted and complemented to fit the goal and scope of this research. Additionally, a new farmer income questionnaire was developed which focused on the revenues of farmers as well as the in-kind farm and off-farm income. Both questionnaires were reviewed and signed off by Fairtrade International and the producer networks involved in this project (Fairtrade Africa, Network of Asia & Pacific Producers - NAPP). In the case of the Latin American producer network, CLAC, several exchanges took place with their representatives and their recommendations were valued and considered to finalize the questionnaires, in particular for the COSP questionnaire. After the data collection and processing of the first SPO, the questionnaires were once more adjusted to better fit the data needs. The field staff, employed by the various producer networks, was trained by Fairtrade on how to use the questionnaires and apply them in the field. For the COSP questionnaire, a comprehensive guidance document was made available for users. In Kenya, additional data collection was executed by the Coffee Research Institute.

2.2.2 Data processing
Data verification and validation processes were applied to the collected data.

- Data verification
  - Data screening and cleaning
  - Error checking and correction: key expected data errors were checked with the field staff and, if needed, recollected from the members
  - Missing data and imputation: key missing data were checked with the field staff and, if needed, recollected from the members
- Data validation
  - Cross-referencing within model: certain key data points were cross-referenced within the model by building in (semi-)overlapping questions into the questionnaires
  - Cross-referencing outside model: a desktop search was executed to cross-reference key data points from the various countries

3. Assumptions & Limitations

3.1 Assumptions

In this section, an overview is given of the main assumptions of this study.

- Whenever a member did not answer a question (blank cell), the answer was assumed to be zero.
- The farmer and the household workers do not pay themselves any wages and are as such not included in the costs of coffee production, but just receive the net farm income (profit) as household income.
- All the wages that are paid by the farmer to his workers are reported as gross wages and all the wages received by the household members for off-farm work are reported as net wages.
- It was assumed that in-kind goods given to workers are farm produce. Therefore they are included in the farmer household income as in-kind costs (assuming that otherwise the workers had to be financially compensated) and in-kind revenue (otherwise the products could have been sold).
- The increase in invested capital (goodwill, intangibles and non-operating assets) was assumed to be negligible. Moreover, it was assumed that on average over all the farmers, net investment outlays are approximately the same as the increase in property plant and equipment.
- The local data collection partners explained that in Tanzania and Vietnam, farmers sell a percentage of their coffee directly to private buyers (55% and 40% respectively). They receive a lower price for this coffee than when they sell to the SPO (5% lower in Tanzania, and 10% lower in Vietnam). These volumes were not reported in the farmer income questionnaire. Therefore, the production volumes reported were revised using the percentages proposed.
- The assumption was made that the reported net investment outlays only concern coffee production and that the reported total costs of other goods include non-operating costs and net investment outlays of other goods.

3.2 Limitations

There are a few limitations to this study, which are further explained here. In order to reduce possible uncertainty in the results, they have been validated by a group of experts.

- The total cost of production of all goods is a large determinant of the farmer household income calculation, even though it is a very difficult variable to estimate for farmers. This causes significant uncertainty on this result. For instance, 33% of the estimations provided by farmers on the total costs of production of all goods were too low (i.e. lower than the total costs of coffee production, which is not possible).
- The small sample sizes for certain countries result in less robust results. For some countries, the robustness of the results is also negatively influenced by the fact that some members fill out the questionnaire as a group, which incurs a lack of randomness of the data collection.
- For some countries the in-kind benefits contribute significantly to the farmer household income. These in-kind benefits consist mostly of in-kind income from other farms and in-kind

farm goods consumed by the household. However, the value of the in-kind benefits is not based on actual prices but on their value as estimated by the farmer.

- The data was not always collected in a fully random manner, which can result in a bias for Vietnam, Uganda and Indonesia. In order to minimize the bias, these SPOs were advised to select members with expected high variabilities in cost efficiency. Furthermore, the data for these countries (as for the other countries) has been validated for correctness by experts.

- There exists a degree of uncertainty on whether certain aspects of the farmer income were reported by the members. It is uncertain whether farmers included income from other non-farm businesses they might own, such as small shops, as wage income. Moreover, there was no 'other source of income' included in the questionnaire, which could include revenues from family inheritance.

- The data was not always collected in a disaggregated manner, but in focus group discussions. This was accounted for in the calculation of the confidence intervals.

4. Results

This section contains the main results of this study. First, the sample information is summarized. Then the results are visualized and discussed in six formats: distribution of the average farmer household income, farmer household incomes at country level, distribution of farmer household income at country level, coffee profitability at country level, value added on coffee at country level and yields and coffee profits per hectare at country level. To conclude this section, the results of the analysis on the Fairtrade Premium Projects are provided. All the results mentioned in this section refer to coffee farmers that are Fairtrade certified. The results in this study are averaged over the total amount of producers and not weighted by means of farm size or production volume.

4.1 Key sample information[10]

Figure 3: key sample information for the 7 countries in the sample

An overview of the key sample information for each country is provided in figure 3.

	Rwanda	Tanzania	Uganda	Kenya	India	Indonesia	Vietnam
Average farm size (hectare) / average area of coffee production (hectare)	1.00 / 0.43	0.96 / 0.96	1.09 / 0.57	0.71 / 0.23	1.31 / 0.66	1.17 / 1.17	1.90 / 1.90
Average yield (kg dried cherry/hectare)	1.625	688	702	1.959	1.559		
Average yield (kg green coffee/hectare)	812	344	351	980	779	1.720	5.193
Average yield (kg parchment/hectare)	1.015	430	439	1.224	974	4.217	6.491
Average total sales (USD/farm)	$1.446	$703	$496	$1.608	$2.406	$7.598	$15.112
% of total sales revenues from coffee	50%	80%	65%	36%	36%	97%	79%
% of revenue from coffee sold as Fairtrade	100%	45%	75%	7%	64%	83%	55%
Household FTE/hectare	2.85	1.73	3.82	1.23	0.29	0.99	1.03
Hired FTE/hectare	1.62	0.63	0.38	2.00	0.52	0.44	0.47
Average household size	4.8	5.52	5.68	3.35	4.35	4.15	4.06

---

[10] Yields were reported in dried cherry, parchment or green coffee. However, for comparability reasons, all yields in this table in row 2 were converted to dried cherry, in row 3 to green coffee and in row 4 to parchment. The most reported units were green coffee for Rwanda, dried cherry for Tanzania, dried cherry for Uganda, green coffee for Kenya, dried cherry for India and parchment for Indonesia and Vietnam. The conversion ratios that were used were 1,6 for dried cherry to parchment and 2 for dried cherry to green coffee. Tanzania, Uganda, India and Vietnam are reporting for Robusta and Indonesia, Kenya and Rwanda are reporting for Arabica. In the semi washed process in Indonesia the coffee is processed from fresh cherry to dried parchment and then to green bean. The amount of dried cherry has not been reported in Indonesia and Vietnam and the figure shows profit per kg of parchment. The conversion from parchment to green bean is 0.41. The percentage of revenue from coffee sold as Fairtrade in Tanzania was provided by the local partner (expert) and was not obtained directly from the questionnaires. One FTE represents a Full Time Employee which consists of 48 weeks/year, 5 days/week, 8 hours/day. The FTE's reported here are the FTE's working on coffee production only. All average yields are per hectare of area of coffee production. The FTE's reported here are the FTE's working on coffee production only.

4.2 Results

4.2.1 Distribution of farmer household income

Farmer household income (USD/yr)

¹ The in-kind income consists of in-kind farm goods consumed by the household, exchanged goods given and received, in-kind contributions from the SPO, not-sold farm produce and in-kind revenue from other farms. In-kind farm goods given to workers are also included but they are neutralized as they can be considered both revenues as costs

² Fairtrade premium projects are not included in the household income

Figure 4: Distribution of farmer household income, divided in financial farm income, off-farm income and in-kind farm income

In figure 4 the average distribution of the farmer household income over all countries is given. The figure shows that the financial farm income contributes 70% to the total farmer household income and 65% from this financial farm income comes from profit on coffee production, 25% from profit on other goods and 10% from financial income from other farms (which might also be coffee producing farms)[11]. The other farm goods that contribute most to the net profit from other goods are milk (35%) and pepper (29%). Country specific information on the types of other goods produced can be found in table 3. Wage income from off-farm work contributes 12% to the total farmer household income, remittances 5% and in-kind farm income 11%. The COGS of coffee consist for 41% ($389/year) of labour costs.

---

[11] Only 25% of the farms receive financial income from other farms. For the farms that do receive financial income from other farms, this makes up 23% of their total farmer household income.

Furthermore, figure 4 shows that 16% of the costs of coffee are net-investment outlays, consisting of the costs for structures, facilities, tools, materials, machinery and equipment and establishment costs of new coffee trees. The increase in working capital is not shown in this figure as it was found to be zero. An overview of the income distribution per country, including the costs and revenues, is given in the appendix section 6.7.

Table 3 provides an overview of the key other goods that are produced and sold on the farms, the contribution of these other goods to the total revenues from other goods and the percentage of cultivated land that is specifically used to produce other goods. It should be noted that this percentage was calculated by subtracting the 'area of coffee production' from the 'total cultivated area'. For some countries both variables were similar which results in a value of 0%. In these cases, it might be that farmers make use of intercropping and do not have any land that is dedicated solely to the production of other goods.

Table 3: Overview of the key other goods produced per country, the contributions of these other goods to the total sales of other goods and the percentage of land area that is solely dedicated to the production of other goods

Country	*Good 1 (% of sales revenues from other goods)*	*Good 2 (% of sales revenues from other goods)*	*% of land area for cultivation of other goods*
Rwanda	Beans (51%)	Maize (31%)	57%
Tanzania	Bananas (59%)	Avocado (14%)	0%
Uganda	Bananas (51%)	Cows (27%)	47%
Kenya	Milk (55%)	Tea (10%)	67%
India	Pepper (86%)	Nuts (6%)	49%
Indonesia	Chilli (49%)	Avocado (32%)	0%
Vietnam	Pepper (100%)	-	0%

4.2.2 Farmer household income per country

Farmer household income (USD/yr)

Average household size	4.8	5.52	5.68	3.35	4.35	4.15	4.06

1. Bars represent averages and lines represent 95% confidence intervals. Member-specific data collection and a large enough sample size are key to reducing the confidence interval
2. True Price research (2015); This living household income consists of a basic living basket (food, housing, clothing, health care & transportation) and education, taxes, social security, insurance and pension

- Living household income Kenya $2927[2]
- Living household income India $1911[2]
- Living household income Indonesia $4132[2]
- Living household income Vietnam $6392[2]

Figure 5: The farmer household income per country (including 95% confidence intervals for the mean) and the living household income for Kenya, India, Indonesia and Vietnam

In figure 5 the farmer household income for each country is shown. The green circles in the graph indicate living household income estimates from earlier True Price research. A living household income is the income that a household should earn to provide for a decent living. The living household incomes as shown in the graph are corrected for the average household size of the countries as shown below the graph. Further explanation and sources are given in the appendix. These living household income estimates were not in the scope of this study, but have been provided to place the numbers in context.

The graph shows that coffee farmers in Indonesia and Vietnam have the highest average farmer household income, whereas coffee farmers in Tanzania and Uganda have the lowest average farmer household income. The relatively large farmer household incomes in Indonesia and Vietnam can be explained by relatively high revenues on coffee in both countries (see figure 9). The relatively low farmer household incomes in Tanzania and Uganda can be explained by relatively low coffee revenues as well as almost negligible off-farm and in-kind income in these countries (see figure 9). The relatively high farmer household income in India is largely due to income from other farm goods, financial income from other farms and off-farm wage income (see further). More details on this graph and the underlying drivers of these differences is provided later in the report.

If the results for every country are corrected for country specific costs of living by applying Purchasing Power Parity (PPP) rates, the order of farmer household incomes between countries does not change. The graph that shows the PPP-adjusted results is provided in the appendix (section 6.5).

The farmer household income estimates are most robust for India and Indonesia, whereas the estimate for Rwanda has a high uncertainty. This is due to a relatively small sample size in Rwanda (as focus group discussions are considered as one data point for the confidence interval calculation and Rwanda only had five large focus group discussions). Vietnam also has a relatively large confidence interval due to one focus group discussion with 34 farmers.

Finally, figure 5 shows that in Vietnam, India and Indonesia the average farmer household income lies above the living income. In Kenya, however, the living income is more than twice as high as the average farmer household income. This implies that, on average, Kenyan coffee farm households do not earn a living income.

	Rwanda	Tanzania	Uganda	Kenya	India	Indonesia	Vietnam
Poverty line $PPP/year /household	2.155	2.025	2.077	1.692	1.303	1.418	1.608
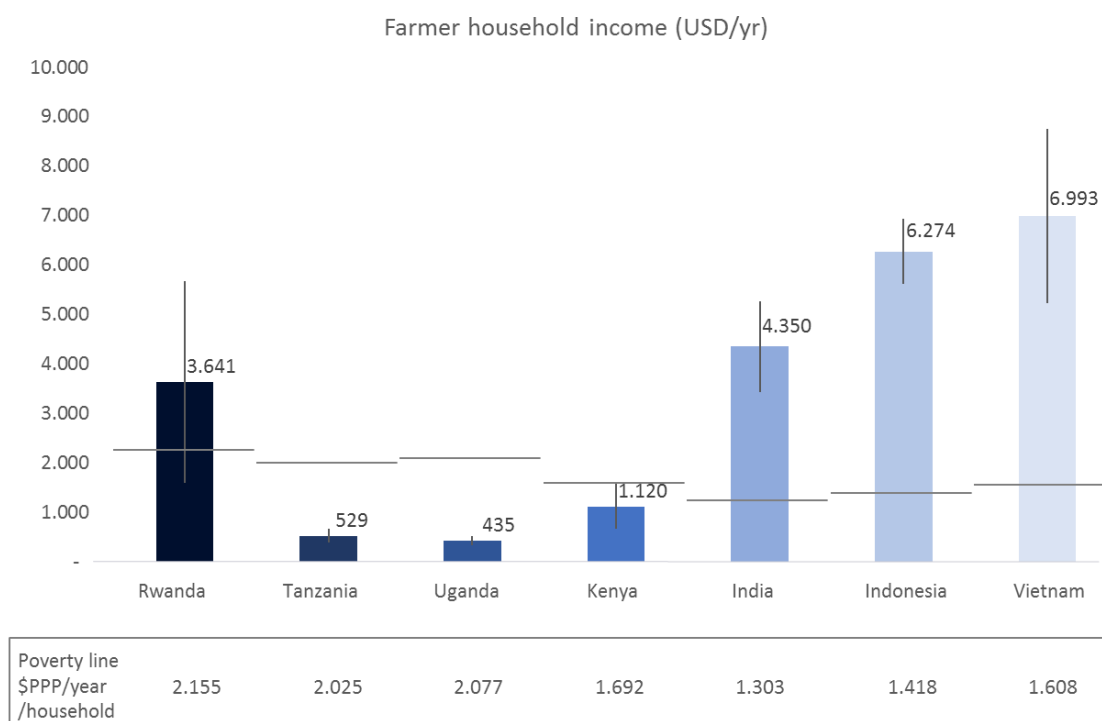
Figure 6: Farmer household income and PPP-adjusted poverty lines per country

In order to compare the income level of all countries, the global PPP-adjusted poverty line is provided in figure 6. This poverty line has been set by the Worldbank at $3.10 per person per day. [12] For this figure, the poverty line has been adjusted for the average household size in each country. The figure shows that in Tanzania, Uganda and Kenya farmers on average earn less than this poverty line. It should be noted that the interpretation of the poverty line is very different from the living income. The poverty line gives a rough estimate of expenses needed in order to not live in poverty. The living income estimates are much more country specific and provide an indication of what a family needs in order to have decent living circumstances.

---

[12] http://data.worldbank.org/indicator/SI.POV.2DAY

Figure 7: Explanation of the Box-and-Whisker graph

Figure 7 explains the box-and-whisker graph as shown in figure 8. This kind of graph provides insight into the distribution of the data: 50% of the data points lie above the median and 50% below. The boxes above and below the median each contain 25% of the data points. The vertical lines show the range of all data points, excluding outliers.

Figure 8: Box-and-whisker graphs of the farmer household income including living income estimates for Kenya, India, Indonesia and Vietnam

Figure 8 shows the box-and-whisker graphs for all countries and the living household incomes for Kenya, India, Indonesia and Vietnam. From this figure, it can be concluded that according to the data gathered, 100% of Kenyan farmers, 25% of Indian farmers and about 35-50% of both Indonesian and Vietnamese farmers do not currently earn a living income. Furthermore, the graph shows that Vietnam has the highest median farmer household income but also the largest dispersion of data points. Even though the medians of the farmer household income are always positive, those of Tanzania, Uganda and Kenya are very low.

4.2.3 Distribution of farmer household income per country
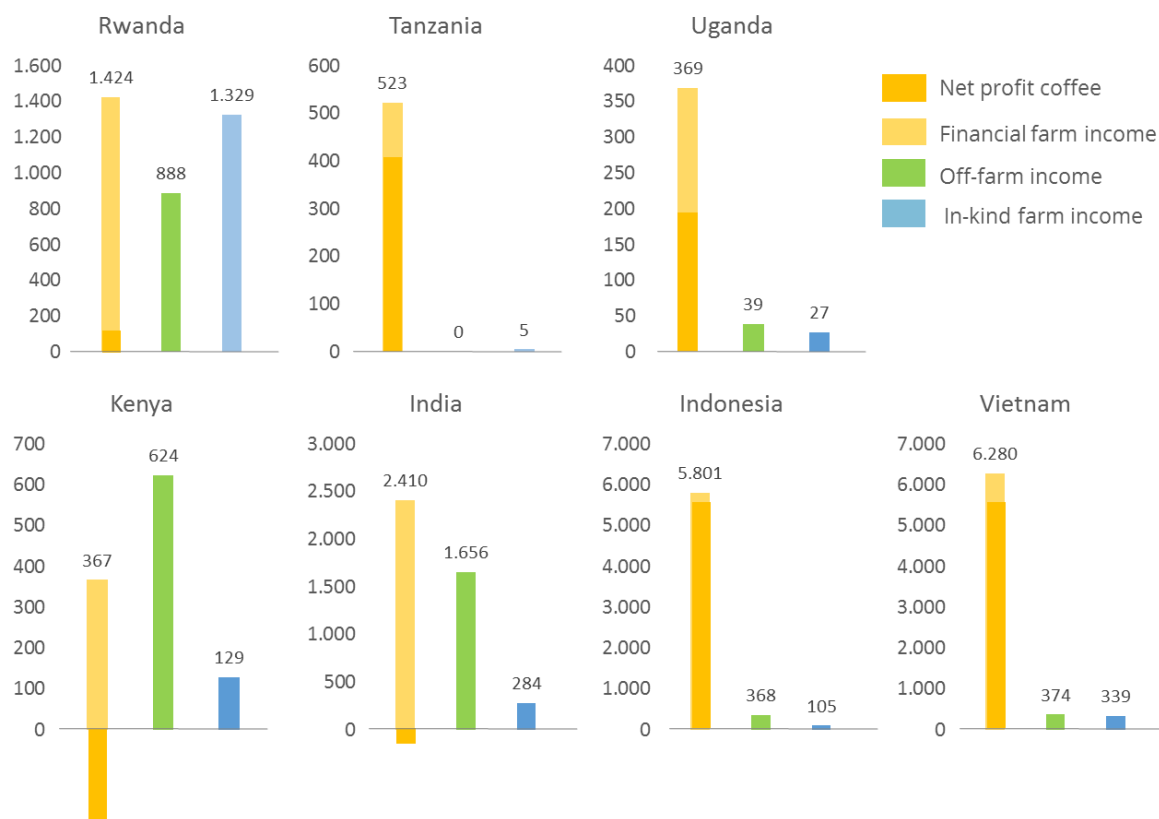
Figure 9: Distribution of farmer household income sources over financial farm income, off-farm income and in-kind farm income (USD/year)

Figure 9 provides a country specific distribution of the various sources of farmer household income. The graphs show that in Tanzania, Uganda, Indonesia and Vietnam farmer household income consists predominantly of financial farm income, which is mainly due to net income from coffee. The net income from coffee is dependent on yield and farm size, and in the case of Vietnam and Indonesia high yields contribute to the high net income. In Kenya, the farmer household income is mostly earned off-farm. Rwanda and Kenya are the only countries where the in-kind farm income contributes significantly (>10%) to the farmer household income. This in-kind farm income consists mostly of in-kind income from other farms and in-kind farm goods consumed by the household. In Tanzania, Vietnam and Indonesia income derived from coffee contributes more than half of the financial farm income. In Indonesia and Vietnam farmers receive almost all their income from coffee. Therefore, differences in coffee prices can result in large differences between farmer household incomes. Kenyan farmers make a significant loss on coffee production.

4.2.4 Coffee profitability per country[13]

Net profit coffee (USD/kg dried cherry)

1. Bars represent averages and lines represent 95% confidence intervals on the mean. Member-specific data collection and a large enough sample size are key to reducing the confidence interval
2. True Price research (2015); This living household income consists of a basic living basket (food, housing, clothing, health care & transportation) and education, taxes, social security, insurance and pension. See appendix for more details on living household incomes
3. In the semi washed process in Indonesia the coffee is processed from fresh cherry to dried parchment and then to green bean. The amount of dried cherry has not been reported in Indonesia and Vietnam and the figure shows profit per kg of parchment.
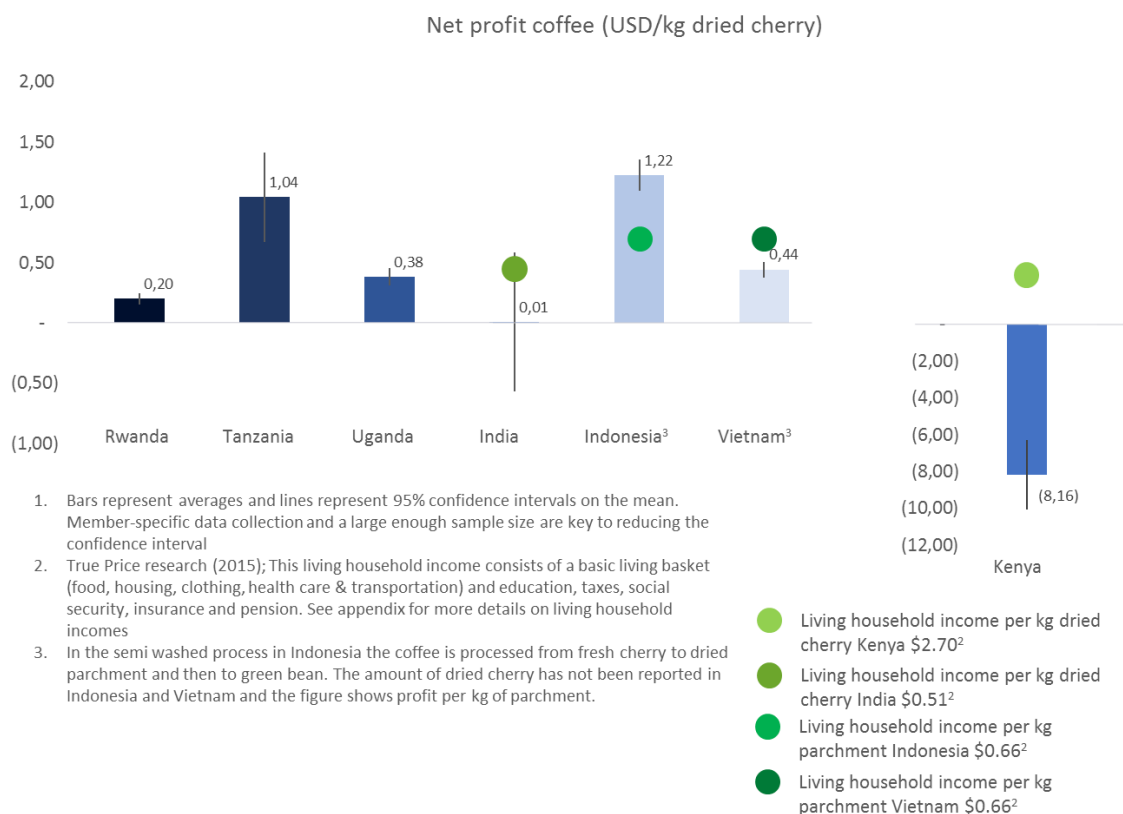
- Living household income per kg dried cherry Kenya $2.70[2]
- Living household income per kg dried cherry India $0.51[2]
- Living household income per kg parchment Indonesia $0.66[2]
- Living household income per kg parchment Vietnam $0.66[2]

Figure 10: Coffee profitability per country. Kenya is presented in a separate graph due to a negative coffee profitability
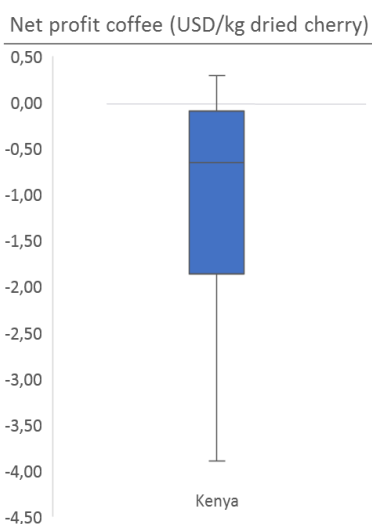
Net profit coffee (USD/kg dried cherry)

Figure 11: Box-and-whisker graph for the coffee profitability in Kenya

Figures 10 and 11 show the net profit of coffee in USD per kilogram of dried cherry. Kenya is shown in a separate graph because the average coffee profitability is negative. Tanzania, Indonesia and Vietnam have the largest coffee profitability. These are robust results due to the sample size. Figure 10 also shows that (on average) only coffee farmers in Indonesia currently earn a living household income from coffee production alone. Note that the profitability does not necessarily need to equal the living income, since most households also have other income sources. All countries have a positive average profitability, except Kenya. India's profitability however is very small and it has a large confidence interval due to the relatively small sample size. This small profitability is not necessarily problematic, as Indian farmers have low household labour intensities on coffee and earn most of their household income from other revenue streams. The coffee

[13] The results in this section are based on profit per kg. of dried cherry. In Rwanda and Kenya most farmers reported their crop in green coffee, which results in a profit/kg of green coffee of $0.40 and -$16.32 respectively. In the semi washed process in Indonesia the coffee is processed from fresh cherry to dried parchment and then to green bean. The amount of dried cherry has not been reported in Indonesia and Vietnam and the figure shows costs per kg of parchment, which results in a profit/kg of parchment of $1.22 and $0.44 respectively.

profitability per unit (per kilo of dried cherry) does not necessarily correlate with an overall net coffee profit of the farm – for example, even if a farmer has high coffee profitability per unit, if the production is low and fixed costs are high, the farmer might not have a high net profit from coffee. The total net profit can be seen in figure 9 or in the appendix (section 6.7) and more details on the breakdown of the costs of coffee production per country are provided in the appendix (section 6.6).

The Kenyan average profitability is largely negative. Nevertheless, almost a quarter of the Kenyan coffee farmers *do* have a positive profitability.

 It is important to note that the small percentage of coffee sold as Fairtrade in Kenya (7%) is not necessarily correlated with this negative profitability, as the prices of Fairtrade and non-Fairtrade coffee were found to be similar in Kenya, due to the market price being above the FMP. The large amount of variable costs of coffee production in Kenya might be a cause for the farmers' negative profit (see section 6.6 in the appendix: *Distribution of the costs of goods sold (coffee) per country*). Figure 11 shows that the median coffee profitability (-0,60 USD/kg dried cherry) in Kenya is significantly less negative than the average (-8,16 USD/kg dried cherry). This implies that 50% of the Kenyan coffee farmers earn more than -0,60 $/kg.

4.2.5 Value added on coffee per country
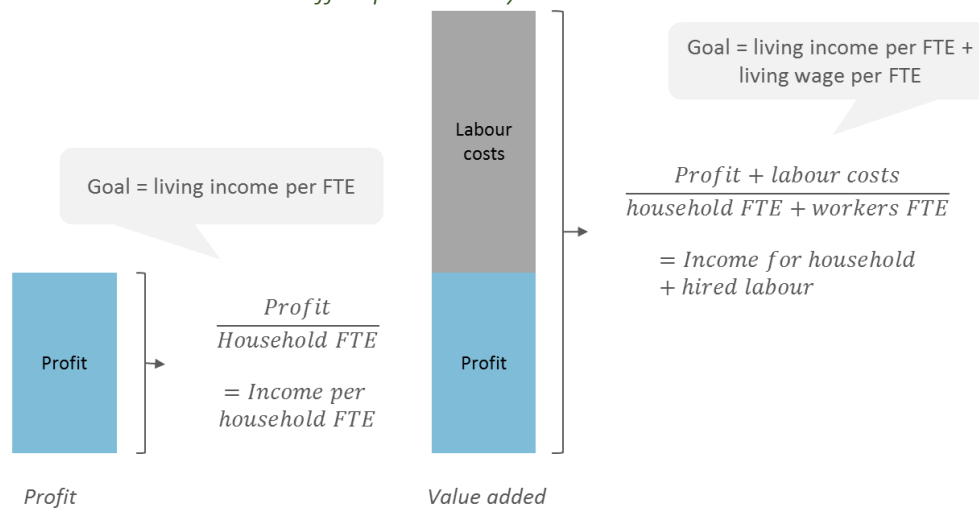
Figure 12: Explanation of the value added per FTE[14]

In order to evaluate whether the household and the hired labour are able to earn a living income and a living wage respectively, results can be expressed as the value added per FTE. In theory, value added equals an enterprise's profit + labour costs + taxes, which is the total value that the enterprise adds to society. In this study, the value added is defined as profit + labour costs, which is the amount that the farmer has available to pay his household and his workers. When dividing the value added by the amount of FTE working on the farm, the value added per FTE is obtained which represents the available income/wage per full time employee. If the value added per FTE is lower than the living income/wage per FTE, it can be concluded that the farmer does not earn enough from its coffee production to provide the farm household with a living income and the hired workers with a living wage. Comparing the value added per FTE with the living income per FTE can therefore inform FMP

---

[14] Living income refers to income for household labour and living wage refers to wage for hired labour

setting. By only focusing on profit per kilogram of coffee, the financial situation of hired labour might be overlooked. The value added method is a well-known economic concept that is also reported on by the World Bank.[15] The most material value drivers for the value added per FTE in this study are the amount of coffee sold, the price per kilogram, the variable input costs, the labour costs and the labour productivity. Via its programmes, standards and policies, Fairtrade can influence each of those value drivers.

Value added[1] coffee (USD/FTE)[2]

Average amount of FTE /farm[4]	1.28	1.45	1.87	0.49	0.56	1.51	3.02
	Rwanda	Tanzania	Uganda	Kenya	India	Indonesia	Vietnam

1. The value added (after tax) is the sum of profit and labour costs. Profit is already excluding labour costs of household workers.
2. One FTE or Full Time Employee consists of 48 weeks/year, 5 days/week, 8 hours/day
3. True Price research (2015); This living household income consists of a basic living basket (food, housing, clothing, health care & transportation) and education, taxes, social security, insurance and pension
4. This includes all on farm FTE, thus household + permanent + seasonal workers

- Living household income/FTE Kenya $1748[3]
- Living household income/FTE India $1039[3]
- Living household income/FTE Indonesia $1950[3]
- Living household income/FTE Vietnam $2930[3]

Figure 13: The value added on coffee in USD per FTE and the living household income per FTE for Kenya, India, Indonesia and Vietnam

Figure 13 shows that the value added on coffee per FTE varies widely per country. For Ugandan farms, the value added is very small and in Kenya the value added is negative (due to a negative profit on coffee). In India and Indonesia, the value added on coffee is larger than the living income, which means that farmers are able to earn a living income and pay a living wage to their workers. In Kenya and Vietnam, however, there is a substantial gap betw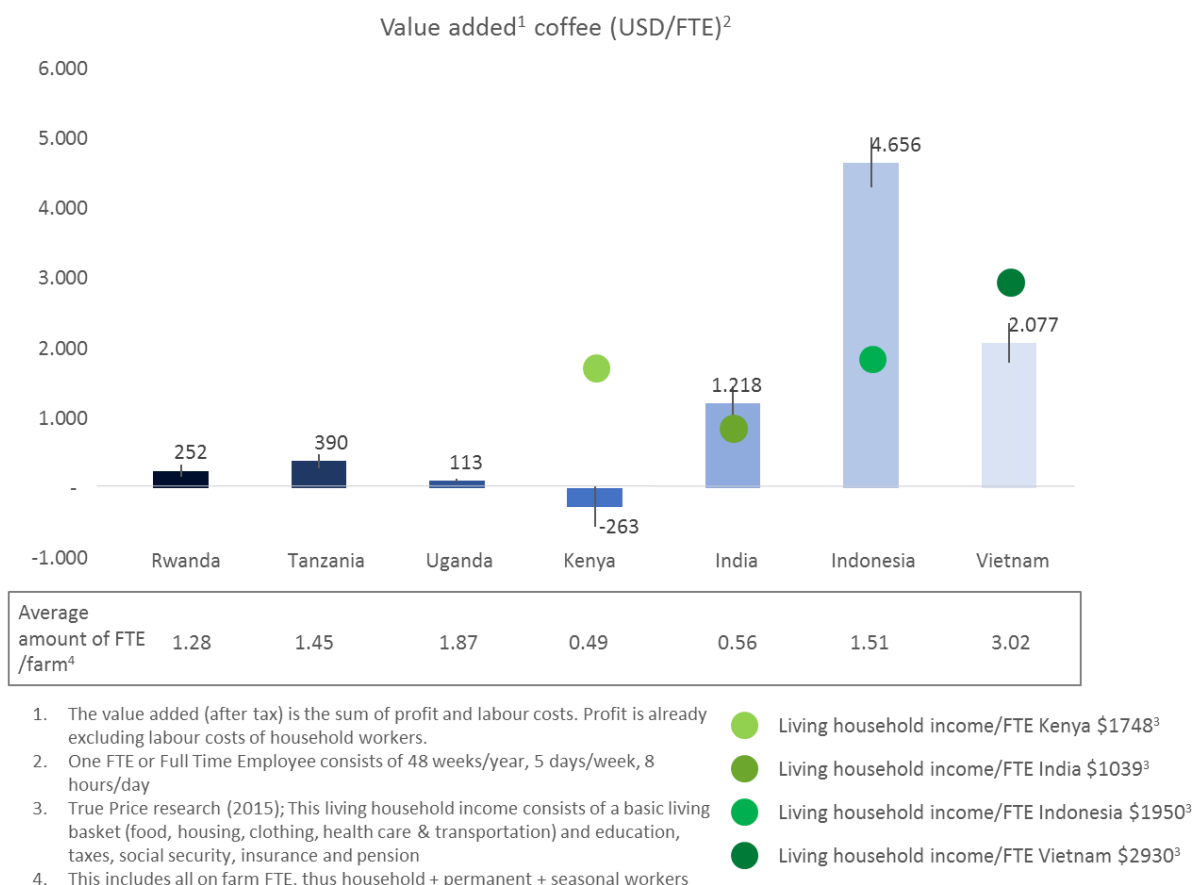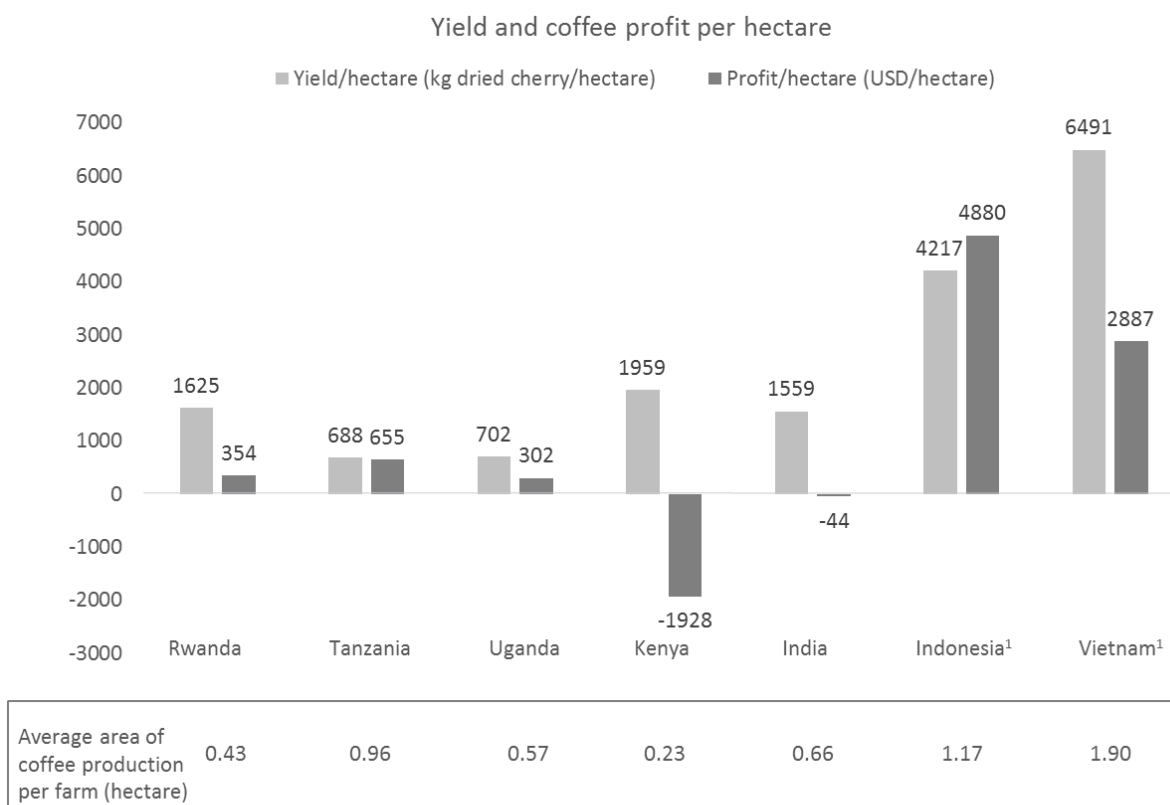een the value added and the living income implying that the household and hired labour are not able to earn a living income or living wage respectively. The most striking difference between the farmer household income approach and the value added approach can be seen in the results for Vietnam. Whereas it can be concluded from the farmer household income (figure 5) that farmers on average earn a living household income, the

---

[15] http://data.worldbank.org/indicator/EA.PRD.AGRI.KD

value added approach shows that on average farmers and hired workers in Vietnam are not able to earn a living income from coffee. This difference shows that hired labour on Vietnamese coffee farms do not earn a living wage. Another interesting case is India, where the average coffee profitability is very low (figure 10), yet the value added analysis shows that farmers should be able to earn a living income and pay their workers a living wage from coffee production (figure 13). As Indian coffee farmers pay their workers above the living wage, it decreases their profitability and leaves less income for the farmers to provide for the living needs of their own households. It should, however, be noted that Indian farmers only use on average 0.29 household FTE per farm and have other income sources to provide for the household income.

4.2.6 Yield and coffee profit per hectare per country

Yield and coffee profit per hectare

■ Yield/hectare (kg dried cherry/hectare)   ■ Profit/hectare (USD/hectare)

Average area of coffee production per farm (hectare)	0.43	0.96	0.57	0.23	0.66	1.17	1.90

1. In the semi washed process in Indonesia the coffee is processed from fresh cherry to dried parchment and then to green bean. The amount of dried cherry has not been reported in Indonesia and Vietnam and the figure shows profit per kg of parchment.

Figure 14: Yields in kilogram dried cherry per hectare and net coffee profit per hectare

Figure 14 shows that coffee yields and net coffee profits per hectare are naturally correlated. This correlation has been further tested by carrying out a regression analysis of *net coffee profit per kilogram* on *yield.* This analysis showed a significant positive correlation (p-value of 0.009 and correlation factor of 0.001), which means that if the yield increases with 1 kg dried cherry per hectare, then the profitability increases with $0.001/kilogram of dried cherry. However, while Kenyan farmers have higher yields per hectare than farmers from Tanzania and Uganda, they have a negative profit per hectare. This is because in Kenya the costs of coffee production are much higher than the revenues, implying that either coffee prices are too low or production costs are too high. Kenyan farms do have a relatively high amount of FTE per hectare (3.23) which indicates a relatively low labour productivity. Furthermore, a large part of the Kenyan farmers only cultivate coffee on an

area below 0.1 hectare. In order to provide solid conclusions on the drivers of these low and even negative profits, more insights on a. o. input use, soil fertility and climatic conditions are desirable. Rwandese farmers have the largest yield per hectare of the African countries, but still a small profit on coffee per hectare, because revenues are not much higher than costs. An overview of the revenues and the costs per hectare converted with the PPP-rate is given in the appendix (section 6.5).

4.2.7 Fairtrade Premium projects

Apart from providing higher coffee prices to certified farmers, Fairtrade Standards also require that buyers pay the Fairtrade Premium, an extra sum of money paid on top of the selling price that farmers invest in business or community projects of their choice. . These projects are democratically decided upon, by the cooperative, in their General Assembly. They can include projects which provide training, agricultural inputs (fertilizers etc.), health care or farm security, or projects to benefit the community or the SPO, e.g. by building roads, electricity lines, water facilities or sanitary facilities. A financial analysis of the Fairtrade Premium projects was out of scope, meaning the financial benefits were not quantified or factored into the living income calculation. However, a qualitative analysis was carried out to assess which categories of benefits the farmers receive from Fairtrade Premium projects. The table below shows the percentages of farmers that receive benefits from the Fairtrade Premium projects in five categories (all projects were placed in one of these five categories). Most of the farmers experience benefits from Fairtrade Premium projects in the form of training, community or SPO facilities and farm facilities, and those benefits are likely impacting positively farmers' income.

Table 4: Percentages of farmers that receive these categories of Fairtrade Premium projects

Training	Facilities for the community or SPO	Facilities for the farm	Farm security	Social security
51%	48%	40%	14%	11%

According to data gathered by the monitoring and evaluation unit at Fairtrade, the SPOs included in the sample received 2.4 million USD in Fairtrade Premium money for the 12 month period between 2014 and 2015[16]. Of this, 57.5% was used for expenditures in producer organizations, meaning facilities and infrastructure, training and capacity building of staff and board members; 9.5% was used in providing services for communities, such as school buildings and infrastructure, investment in clinics and hospitals, medical supplies, and reforestation projects. Further, 24.8% was used to provide services to farmers, for instance trainings in good agricultural practices, farm management, waste management, soil protection programs and also in provision of farm inputs and additional price given to farmers. Finally, 8.2% was allocated to miscellaneous projects mainly related to financial services, and donations of building materials.

---

[16] Aggregated data of the organizations covered by this study, collected by Fairtrade's Monitoring & Evaluation Unit, using 2014-2015 FLOCERT audit reports and CODIMPACT questionnaires.

5. Applications and advice

5.1 Possible applications

This research can be used for the following key applications.

5.1.1 Methodology development

Firstly, a methodology has been designed, applied and tested in the field and through expert feedback. This tested method, including the tested tools such as the questionnaires, the sample size calculators and the databases, can be used in future projects for efficiently assessing farmer household income and measuring progress over time. The review on the data collection from the field staff can be used to improve the questionnaires and data collection methods, to increase the efficiency of data collection and the robustness of results in the future. This can further be done by concentrating on key data points and refining the methodology and questionnaires based on this report. Moreover, a simplification of this methodology and questionnaires could be used as input to construct simple 'Profit & Loss tools' that could be used by farmers themselves to create more insight into their own costs and revenues.

5.1.2 Inform Fairtrade strategies and programmes

Secondly, the increased insights that resulted from this study can inform Fairtrade's strategies and programmes. These include insights into the profitability of coffee versus other farm products, into farm productivities and into the other revenue sources of coffee farmers in the different countries. For example, this study shows that Fairtrade coffee farmers in India and Indonesia are doing reasonably well. The underlying reasons, however, are different for both countries. Farmers in Indonesia have high incomes from coffee production whereas farmers from India gain most of their income off-farm and have very low coffee profits. This study also shows that coffee farmer household incomes in Kenya are low and coffee profits are negative. Further research can investigate how the situation of Kenyan coffee farmers can optimally be improved, whether by increasing minimum prices or encouraging more Fairtrade Premium projects that focus on productivity or good agricultural practices training or by other means. Another interesting insight from this study is that in Kenya, Rwanda, Uganda and India most of the coffee farmer household income does not come from coffee production, but from the production of other goods, other farms and off-farm income. This, as well, can inform strategies and programmes.

5.1.3 Inform Fairtrade target and FMP setting

Thirdly, the results on the farmer household income and added value per FTE in combination with the living income data provided in this report can be used to inform Fairtrade's target and FMP setting. Fairtrade could for instance set targets on how many of their coffee farmers should earn at least the living income. The results show, for instance, that around 55% of the farmers in Vietnam earn a living income (see *income per household*)*. A target could be to enable at least 75% of the farmers to earn a living income. By using the value added per FTE, Fairtrade can make sure that not only the farmer household earns a living income from coffee production, but also that the hired workers can earn a living wage. FMP setting and reorientation of premium projects could be possible ways to achieve this, depending on the country. If Fairtrade considers using the farmer household living income approach for the FMP setting, it should evaluate the different sources of income to include. For instance, the inclusion of remittances as a part of the farmer household income might be controversial. In table 5 an overview is given of two possible options for FMP setting that result from this study.

Table 5: Options for FMP setting

Options for FMP setting	*Added value approach*	*Farmer household living income approach*
What?	FMP setting according to the value added on coffee	FMP setting according to the entire household income
How?	Making the coffee profit + labour costs per FTE correspond to the living wage per FTE	Making the total household farmer living income correspond to the living income per household
Limitation	Amount of working hours needs to be measured correctly (including those of the household)	Evaluation and justification of the different household income components is vital
Benefits	The price can be set such that both the farmer and his workers can earn a living income or wage respectively	Other income that farmers earn can be taken into account

5.1.4 Future research

Finally, this study has exposed several interesting topics and areas for future research. One interesting area for future research is to explore correlations and causal relationships of a series of variables with coffee farmer household income and/or coffee profitability. Some correlations have already been tested with the current dataset, such as profit per hectare versus hectare and type of sales (Fairtrade/organic/conventional), but they could not produce a significant result. The data that has resulted from this study can be analysed for more correlations and the sample size can be increased such that correlations that have already been tested might become significant. Examples of interesting variables are Fairtrade sales, coffee quality, coffee prices, farm management practices and other productivity variables (e.g. age and density of trees, land size, amount of fertilizer used). This would require (possibly historic) data collection on specific data points for larger sample sizes and for specific types of farmers. These types of studies might be able to shed light on how to optimally increase farmer household income and coffee profitability (e.g. via certain productivity interventions) and which 'threshold' conditions (e.g. yield, farm size, coffee price) need to be met in order to earn a decent living from coffee production or to have coffee as a primary income source. More interesting insights would be obtained when including a broader supply chain perspective. This perspective could for instance take into account the differences in how farmers sell their coffee (to private buyers, to middle men, or directly to the SPO) and might be able to shed light on how these differences affect farmer household income. Another interesting area for future research is the mapping of productivity constraints (soil fertility, land tenure change opportunities, climate) for certain countries and regions. Being aware of these constraints can help to set and design realistic targets and programs and, for example, make sure that the expectations of labour productivity will not exceed the possibilities.

Moreover, in extension to the current study, future research could also focus on a financial analysis of the Fairtrade Premium projects (and its incorporation into the income calculation), in addition to the research Fairtrade already conducts on Premium use each year. This could help prove the impact of Fairtrade certification and inform Fairtrade Premium projects. Another interesting area of research could focus on calculating living income benchmarks in coffee producing countries, as this can help inform FMP setting.

The current study − and its findings − can also be further improved by making the method and data collection more efficient, effective and robust and scaling up to other countries and commodities. Section 5.2 already provides some recommendations for improvements based on the insights, testing and expert feedback gathered during the study.

5.2 Future data collection on farmer household income

There are several applications of this study related to future data collection on farmer household income. Below, the three main applications are provided. Firstly, improving the research design of future COSP and farmer household income studies by a better informed sample selection. Secondly, improving the efficiency and effectiveness of the data collection by focusing on the key drivers of farmer household income and their related data points. And thirdly, the optimisation of the tools and data collection methods for the COSP and the farmer income questionnaires.

5.2.1 Research design

A relevant methodological question which concerns every study where primary data is collected, is the selection of the sample size. This should be based on an estimation of σ and c (see *sample design and data collection*), which are difficult to estimate beforehand as they should be based on member-specific data on the right indicators. The member-specific database that was created in this study allows estimating minimal sample sizes for future studies in each of the countries in scope. In the table below, estimated sample sizes are given for a confidence level of 90% and error margins[17] of 10% and 20%. Next to the estimated sample sizes, the actual sample sizes that were collected in this study are shown. For these actual sample sizes the amount of individual data points were chosen. Therefore, focus group discussions were counted as one data point.

Table 6: Estimated and actual sample sizes for the countries in the sample

Country	Estimated sample size		Actual sample size
	Error margin 10%	Error margin 20%	
Rwanda	136	34	5
Tanzania	271	68	50
Uganda	200	50	60
Kenya	2163	541	151
India	85	22	26
Indonesia	48	12	60
Vietnam	68	17	15

When designing a sample selection and data collection strategy, there are trade-offs between collecting disaggregated and aggregated data points, via personal interviews and focus group

---

[17] The margin of error is the margin in which the mean result will lie with a chance of the confidence level. In the case of a margin of error of 10% and confidence level of 90%, it can be said with 90% certainty that the population mean (the 'real average farmer household income') will lie within a range of 10% above or 10% below the sample mean

discussions respectively. If there is a limited availability of time and resources, a larger sample size – and therefore a more accurate point estimate – can be obtained by using focus group discussions. However, this does not allow for the same level of statistical analysis and will incur a lower accuracy. This trade-off should not only be made by considering available resources, but also by considering the study purpose. If results are used for strategic decision making, it is important to work with large sample sizes and therefore focus group discussions might be preferred, especially when resources are limited. It is important to keep in mind, however, that focus groups will induce larger confidence intervals and are therefore less suited when the main purpose is external communication of the findings.

5.2.2 Data points

This research provides insight in which data points (questions) are crucial to consistently collect on a granular level, which can be easily collected on an average level and less frequently and which need not be collected (not material) for future studies on farmer household income.

Key data points

From the COSP questionnaire, data on labour costs are crucial for informing target setting and pricing policies and strategies. In order to make a good estimation on whether the coffee production provides a living income, a correct estimation of household and other labour hours spent on coffee is crucial. From the Farmer Income questionnaire, the data points that were most influential for the farmer household income included the quantity and value of coffee sold (question 1), the value and quantity of other farm goods sold (question 2), the total cost of farm goods production (question 3) and the wage income from off-farm work (question 11). As such, these data points are important to collect as robust as possible, i.e. for large sample sizes and in a detailed manner. Moreover, expanding the question on income from other farms would help to interpret the outcome, such as: (i) how many other farms are there, and (ii) how many of these farms are coffee farms and what are the revenues (and costs) from coffee. It is important to note that the relevance of certain data points for the estimation of farmer household income is country dependent.

Other data points

Indicators that also significantly contribute to the farmer household income are: income from other farms (question 10), remittances (question 14) and in-kind consumption by the household (question 6). As mentioned before, the relevance of certain data points for the estimation of farmer household income is country dependent. Family inheritance was not included in the questionnaire. At this point it is unclear if this could be a material data point, but it might be good to include it in future data collection. Indicators that were less significant in the calculation of the farmer household income were social security benefits (questions 12 and 13), subsidies (question 5) and goods given and received to and by the SPO (questions 7, 8 and 9). The in-kind benefits provided to workers (question 4) have no impact in the farmer household income, since these benefits are both costs and income from the farmer's perspective. The assumption in this case is that, if the farmer had not given the workers the goods, he could have sold them, but instead of the goods he would have had to pay his workers more.

5.2.3 Process and tools

In this section some improvements are proposed on the data collection process and tools (COSP and Farmer Income questionnaires), based on the results and on input from the local field staff.

1. Data collection process

a. Some field staff advised using focus group discussions for the COSP questionnaire. Difficult questions can then be answered after deliberation with the group. It was suggested to have farmers from the same region and with similar land sizes in one focus group in order to have comparable results. As mentioned before, there is a trade-off to be made, as focus group discussions give less statistical insight into the robustness of the results. The Farmer Income questionnaire might be better filled out individually because the answers will have a large dispersion and might be sensitive.

2. Tools (questionnaires)
   a. General
      i. Some field staff found it problematic that the questionnaires were in English, whereas most farmers only spoke the local language.
      ii. The guiding Q&A form was found to be imperative, but this could be more standardized.
      iii. The length of the questionnaires was found to be acceptable by some field staff, but too long by others. Most farmers understood, however, that this length was necessary. A 'tea break' in the middle was suggested by one Fairtrade field officer, as to maintain productivity.
   b. Farmer Income questionnaire
      i. The revenues of other goods produced, but even more so the costs, were difficult data points to collect. The initial questionnaire was extended with a question on total costs of *other* goods production, but this also turned out to be a difficult data point. The data collection on this would need to be improved in the future, for example by making this part of the questionnaire more granular. This is important because the net profit of other goods is a large determinant of the farmer household income.
      ii. Filling out the amount of remittances (question 14) the household received also needs some extra guidance, as it was not always clear that this concerned money received by non-household members that was then transferred to the household.
      iii. The farm goods consumed by the household (question 6) was difficult to answer because the answer required a daily estimate, whereas most farmers only knew the yearly value. This could be easily adapted in the questionnaire.
      iv. The wage income (question 11) was asked in hours per week and hourly wage. However, most farmers do not know their hourly wage, but only their daily wage. Reformulating the question to include days per year and wage per day could therefore be a better approach.
      v. The in-kind goods given to workers could be split up into goods produced by the farm and other goods. This way a more accurate calculation of the in-kind expenses of the farmer can be made.
   c. COSP questionnaire
      i. Question 1.3 might be difficult because farmers do not split up the labour costs between labour spent on coffee and labour spent on other goods. It could be considered to include an estimated percentage of labour spent on other goods.

ii. Question 2 was difficult for some farmers because the establishment was concluded a long time ago (e.g. twenty years) and therefore the costs were difficult to estimate.

Furthermore, in order to make results from the questionnaires comparable, it is important that all units across questionnaires are known. The units do not have to be the same, but do have to be properly documented, such that they can be converted if that is needed.

6. Appendix

6.1 References

Anker, R., Anker, M. (2014). Living Wage for Kenya with Focus on Fresh Flower Farm area near Lake Naivasha.

Anker, Richard. Anker, R. (2011). Estimating a living wage: A methodological review. ILO.

Berkeley, H., Bradley, B., (2015). Comparison of Farmers' Incomes in the EU Member States. EU.

Brealey and Myers (2013). Principles of corporate finance.

Carsan S. (2012). Managing Transitions in Smallholder Coffee Agroforestry Systems of Mount Kenya.

Committee on Sustainability Assessment. (2013). The cocoa measuring sustainability report; coffee and cocoa in 12 countries.

Damadoran (2012). Investment Valuation: Tools and Techniques for Determining the value of any asset.

FLOCERT (2014). Transactions data (FLOTIS).

Glossary of statistical terms. OECD. Page visited 18-10-2016.
https://stats.oecd.org/glossary/detail.asp?ID=1255

INCAE (2009). Nespresso's Sustainable Sourcing Model and Real Farmer Income.

Koller, Goedhart, and Wessels (2015). Valuation: Measuring and Managing the Value of Companies McKinsey & Company Inc.

Levine D. M. et al. (2013). Statistics for Managers Using Microsoft Excel (7th Edition), Pearson Publishing.

Poudel K. L. et al. (2012). Comparing technical efficiency of organic and conventional coffee farms in Nepal using data envelopment analysis (DEA) approach.

Ruben R. and Zuniga G. (2010) Comparative Impact Assessment of Coffee Standards in Northern Nicaragua.

Living income references:

India: The true price of cotton from India- Joint report by IDH and True Price, 2016

Indonesia: Improving Business Decision Making: Valuing the Hidden Costs of Production in the Palm Oil Sector. A study for The Economics of Ecosystems and Biodiversity for Agriculture and Food (TEEBAgriFood) Program. – Joint report by True Price and TruCost, 2016 - Forthcoming

Kenya: The true price of roses from Kenya – Report by True Price, 2014

Vietnam: The true price of coffee from Vietnam - Joint report by IDH and True Price, 2016

6.2 List of consulted experts

6.2.1 Experts
What follows is a list of experts that were consulted for validating the methodology and results during this project:

Fairtrade International:

- Rene Capote, Global Product Manager, Coffee
- Carla Veldhuyzen, SPO development Senior Advisor
- Lee Byers, Senior Advisor Coffee and Tea

Fairtrade Africa:

- Frank Olok, Fairtrade Africa, Head of Region for East Africa

Network of Asia and Pacific Producers (NAPP):

- Raju Ganapathy, Principal India
- Rohini Chandrasekharan, Associate India
- Erwin Novianto, Principal for South East Asia
- Wardah Hasyim, Associate Indonesia
- Hung Trang, Associate Vietnam

Coffee Research Institute:

- Lucy Muchangi, Kenya

Provided input on the COSP methodology:

Coordinadora Latinoamericana y del Caribe de Comercio Justo (CLAC)

- Joao Mattos, Production and market Coordinator for Coffee
- Red Café members: Luis Martínez, Merling Preza, Lina Trujillo, Carlos Reynoso
- Silvia Jurado and Carlos García, consultants for CLAC/Red Café on the work on COSP.

6.2.2 Local data collection partners
What follows is a list of local data collection partners that tested the tools. Their input on the tools was incorporated in the advice section of this report. The data collection partners also gave their input on the results of the study.

- Rohini Chandrasekharan, Associate India
- Erwin Novianto, Principal for South East Asia
- Wardah Hasyim, Associate Indonesia
- Hung Trang, Associate Vietnam
- Colbert Sangnie, Business Development Advisor Uganda/Cameroun
- Justine Zziwa Namayanja, Development Advisor Uganda
- John Mabagala, Development Advisor Tanzania
- Pascasie Nyirandege, Development Advisor Rwanda
- Sylvain Harerimana, Assistant to BDA Rwanda
- Team at CRI, led by Lucy Muchangi

6.3 Calculations from the questionnaires

Most calculations for the results or directly from the questionnaires are straightforward. However, some questions on the calculations came up from the expert input. Therefore, an overview of these variables and their calculations is given.

Result	Calculation
Net coffee profit per kilogram	The profit per kilogram was calculated as the net profit from coffee divided by the yield in kilogram dried cherry as provided in the COSP questionnaire. If the yield in the COSP questionnaire was in parchment or green coffee, the conversion factors of 0.625 and 0.5 respectively, were used.
Value added per FTE	The value added per FTE was calculated as the sum of the net profit from coffee and the labour costs, divided by the total amount of FTE that works on the farm (thus household, permanent and temporary labour).
Profit per hectare	The profit per hectare was calculated as the net profit of coffee divided by the size of cultivated land with coffee provided in the farmer income questionnaire. If the size of the land was provided in acre the conversion the hectare of 2,47 hectare/acre was used.
Data point	**Calculation**
Labour costs	In the COSP questionnaire there are two different places in which labour costs are filled out. In question 1.3 the total days worked per year and cost per day are filled out for household workers, permanent workers and temporary workers expect temporary harvest workers. The labour costs are also filled out per activity, thus for instance for pruning the total labour spent is filled out in days per year and price per day. In order to calculate the total hired labour costs, the costs for permanent and temporary workers from question 1.3 was added to the labour cost for harvest.
COGS coffee	The COGS of coffee consists of input costs (crop management, processing, packing, transport, energy, water, fertilizers, agrochemicals and other), land costs, maintenance costs, labour costs and other costs.
Net investment outlays	The net investment outlays were calculated from questions 1.1 and 1.2 (except for the part on land costs), by dividing the cost of the facilities by its useful life years.
Total costs of farm goods	Question 3 in the Farmer Income questionnaire concerns the farms total costs of all its farm goods. This question was used to calculate the cost of production of the other goods (other than coffee) by subtracting the total costs from the COSP questionnaire from this value. Because this was a difficult question to answer, question 3.1 was added in which the total costs of the production of the *other* goods was asked.
In-kind benefits	From all in-kind benefits both the quantity received or given and the market value of the product was asked in the questionnaires. Therefore, the in-kind costs and revenues were calculated by multiplying the quantity by its market value.
In-kind farm goods consumed by the household	The in-kind farm goods consumed by the household were reported per day in de the farmer income questionnaire. However, some values were so high that it was more probable to assume they were filled out in years. Therefore, two filters were applied. If the amount of farm goods consumed per day exceeded 3 kilograms, the variable was considered to be per year. Moreover, if the total amount of in-kind farm goods consumed by the household exceeded more than

	half of the daily food expenditure in the country specific living incomes (converted with PPP-rates), they were also considered to be per year.
Off-farm wage income	The off-farm income was calculated by multiplying the average wage per hour with hours per week and weeks per year spent on off-farm work.
Social security	The income from social security was filled out in the questionnaire as received by the entire household per type of social security: unemployment insurance, old age pension and health insurance. These were then added to obtain the total income from social security benefits.

6.4 Living income: methods and sources

For the living household incomes benchmarks of Kenya, India, Indonesia and Vietnam four previously published or upcoming True Price studies were used. The estimates in these studies concern rural living incomes estimates. In general the living income and living wage differentiate on taxes and social security income, which has been largely aligned by assuming farmers pay themselves and their household workers a wage from the farm profit. The living household incomes were inflated to 2015 where needed. Included in the estimations of a living income are (i) a basic living wage basket: food, housing, clothing, health care, transportation and (ii) the following additional costs of living: education, taxes, social security, insurance and pension. This living household income builds upon the method by Anker (2011). The True Price method is more granular with respect to taxes and savings. Where Anker uses an error margin, the True Price method uses the actual amounts for taxes, social security, insurances and pension. As a comparison, the living income estimate in Kenya from Anker is $2699[18], whereas the estimate used in this study is $2927. The living income for Kenya was based on the Lake Naivasha region, for Vietnam on the Central Highlands and for India and Indonesia on rural areas in general. All sources for the living income estimates are provided in the references (section 6.1).

6.5 PPP adjusted farmer household income, coffee revenues and costs per country

Figure 15 shows the farmer household income per country converted with the Purchasing Power Parity conversion factors. The following exchange rates and PPP-rates were used:

Table 7: Exchange rates and PPP-rates for the countries in the sample

Exchange rates (Worldbank 2015)	LCU/USD	LCU/PPP
Rwanda	720,9751089	285,8709
Tanzania, United Republic of	1991,390964	645,6999
Uganda	3240,64542	1046,584
Kenya	98,17845333	43,84875
India	64,15194446	16,99611
Indonesia	13,38941294	4,060455
Vietnam	21698,80333	7591,675

---

[18] Amount calculated from Anker study, using inflation to 2015 and correction for household size. http://www.fairtrade.net/fileadmin/user_upload/content/2009/resources/LivingWageReport_Kenya.pdf
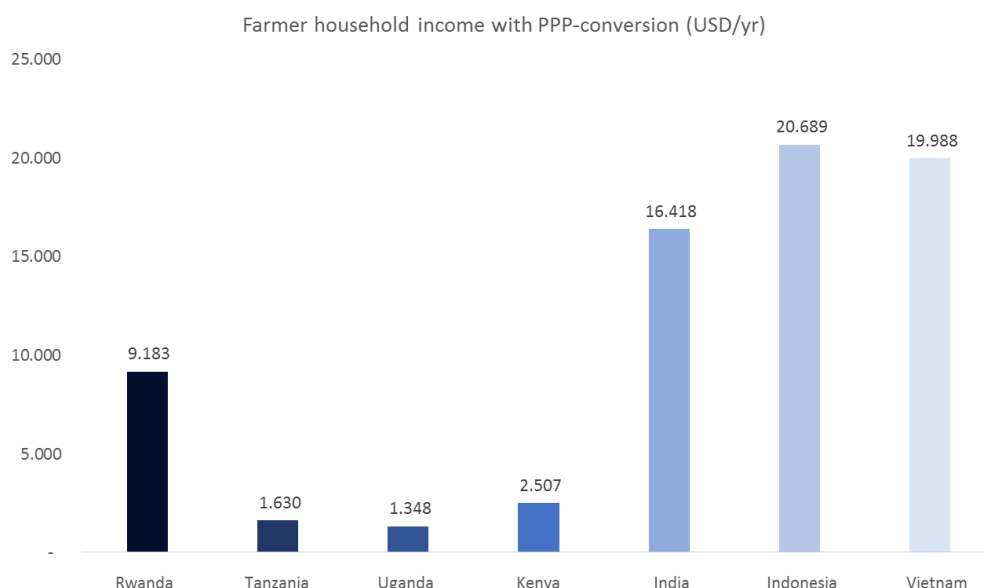
Figure 15: Farmer household income converted with PPP-rates

In table 8, an overview is given of the revenues and costs of coffee production per hectare (total costs including overhead and non-operating costs and net investment outlays) converted with the PPP-rates, as well as the amount of FTE per hectare (household and hired labour).

Table 8: Revenue and costs of coffee production per hectare converted with PPP-rates and total amount of FTE per hectare (household and hired)

	Rwanda	Tanzania	Uganda	Kenya	India	Indonesia	Vietnam
Coffee revenues ($/ha)	1.062	1.889	908	957	2.238	20.913	17.936
Coffee costs ($/ha)	663	567	346	1.703	2.688	5.340	9.722
FTE per hectare	4,47	2,36	4,20	3,23	0,81	1,42	1,50

6.6 Distribution of the costs of goods sold (coffee) per country

In this study, the costs of coffee production are divided into five categories: land costs, input costs (herbicides, fertilizers, pesticides, fuel and other inputs for coffee crop management, processing, packing, storage and transport), maintenance costs (annual costs of maintenance and reparation of tools, machinery, materials and equipment) and labour costs. In table 9 an overview is given of the cost values in these five categories.

Table 9: Costs of Goods Sold (coffee) per farm per country and per category

	Land costs	Input costs	Maintenance costs	Labour costs
Kenya	$ 0,00	$ 193,66	$ 9,99	$ 255,74
India	$ 4,67	$ 82,63	$ 0,00	$ 738,03
Vietnam	$ 313,77	$ 4.144,94	$ 2,88	$ 433,81
Uganda	$ 0,00	$ 46,72	$ 0,00	$ 28,69
Rwanda	$ 0,00	$ 3,99	$ 0,00	$ 185,52
Indonesia	$ 5,17	$ 66,72	$ 97,20	$ 1.375,81
Tanzania	$ 0,00	$ 49,18	$ 0,00	$ 73,63

In table 10, an overview is given of the costs of goods production per kilogram of dried cherry. This table shows that on average Kenyan farmers have the largest variable costs of coffee per kilogram, which could explain their losses on coffee production.

Table 10: Costs of Goods Sold (coffee) per kilogram of dried cherry per country and per category[19]

	Land costs	Input costs	Maintenance costs	Labour costs
Kenya	$ 0,00	$ 0,74	$ 0,04	$ 0,98
India	$ <0,01	$ 0,07	$ 0,00	$ 0,64
Vietnam	$ 0,03	$ 0,34	$ <0,01	$ 0,04
Uganda	$ 0,00	$ 0,12	$ 0,00	$ 0,07
Rwanda	$ 0,00	$ 0,01	$ 0,00	$ 0,28
Indonesia	$ <0,01	$ 0,01	$ 0,02	$ 0,29
Tanzania	$ 0,00	$ 0,11	$ 0,00	$ 0,16

---

[19] In the semi washed process in Indonesia the coffee is processed from fresh cherry to dried parchment and then to green bean. The amount of dried cherry has not been reported in Indonesia and Vietnam and the figure shows costs per kg of parchment.
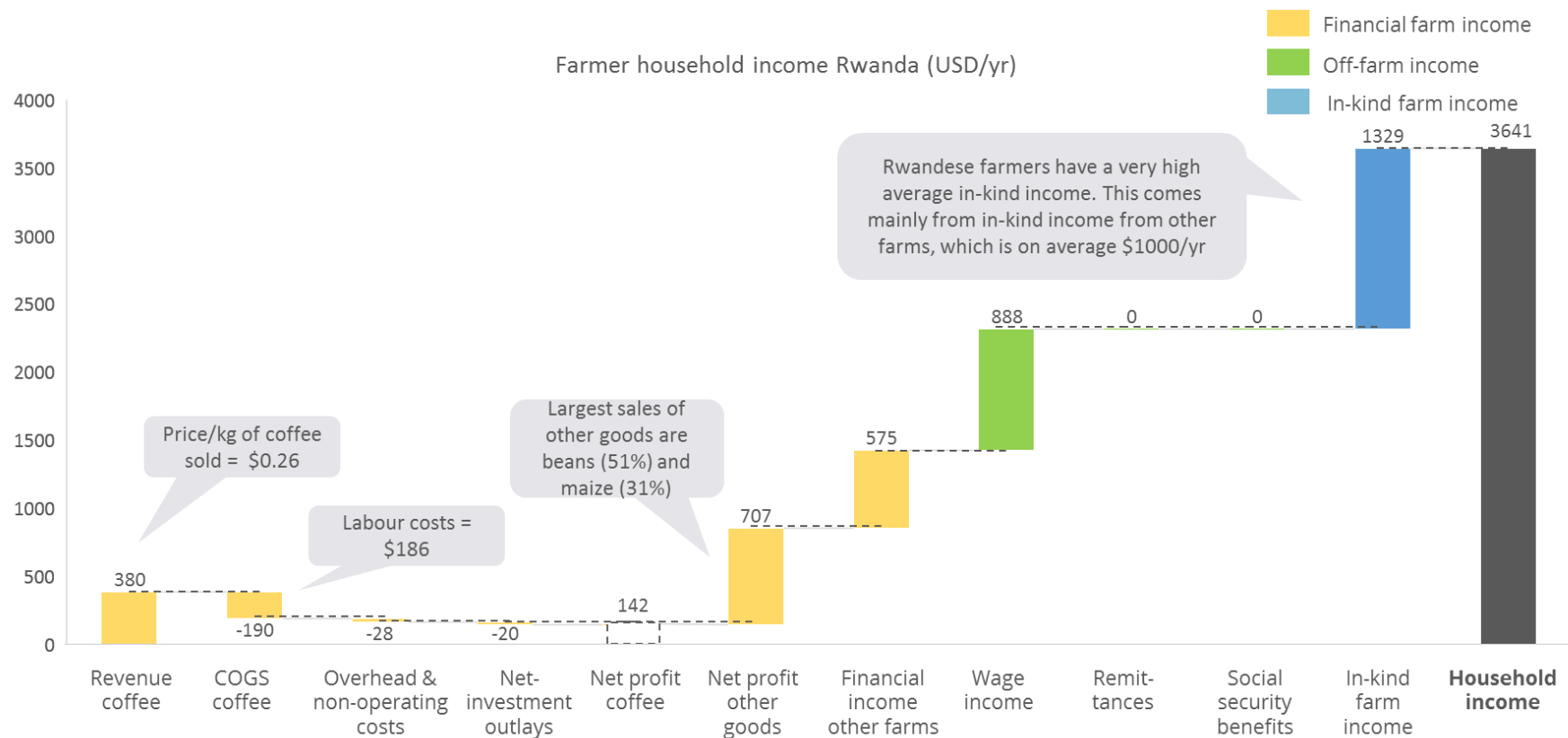
6.7 Distribution of farmer household income per country

In this section the country specific distribution of the household income is shown. In order to create the necessary context, every graph is extended with more information on labour costs, the average price of coffee per kg of dried cherry and the two goods (and their percentages) that contribute most to the sales of other farm goods.
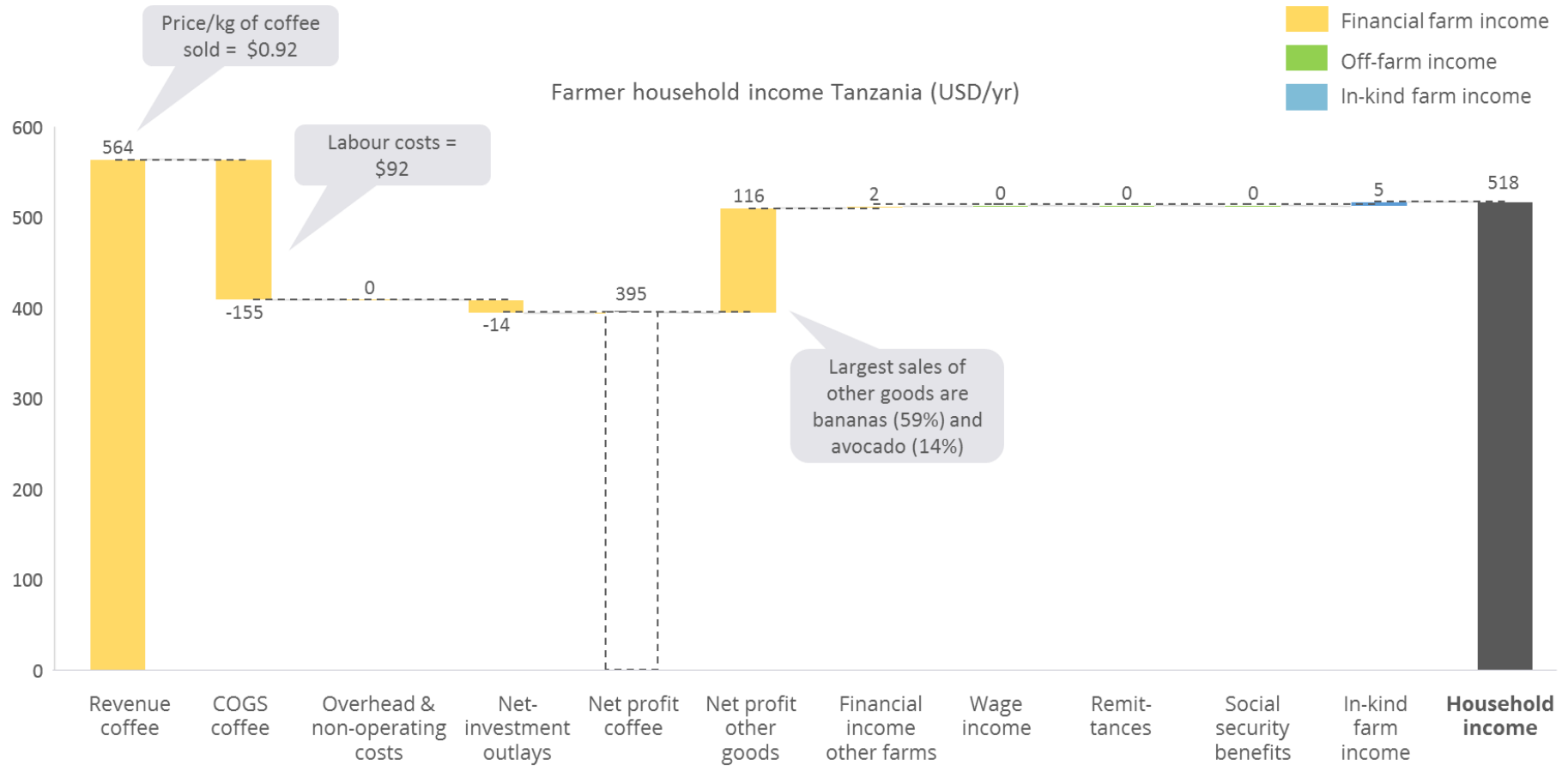
6.7.1 Rwanda

Figure 16: Farmer household income distribution of Rwanda
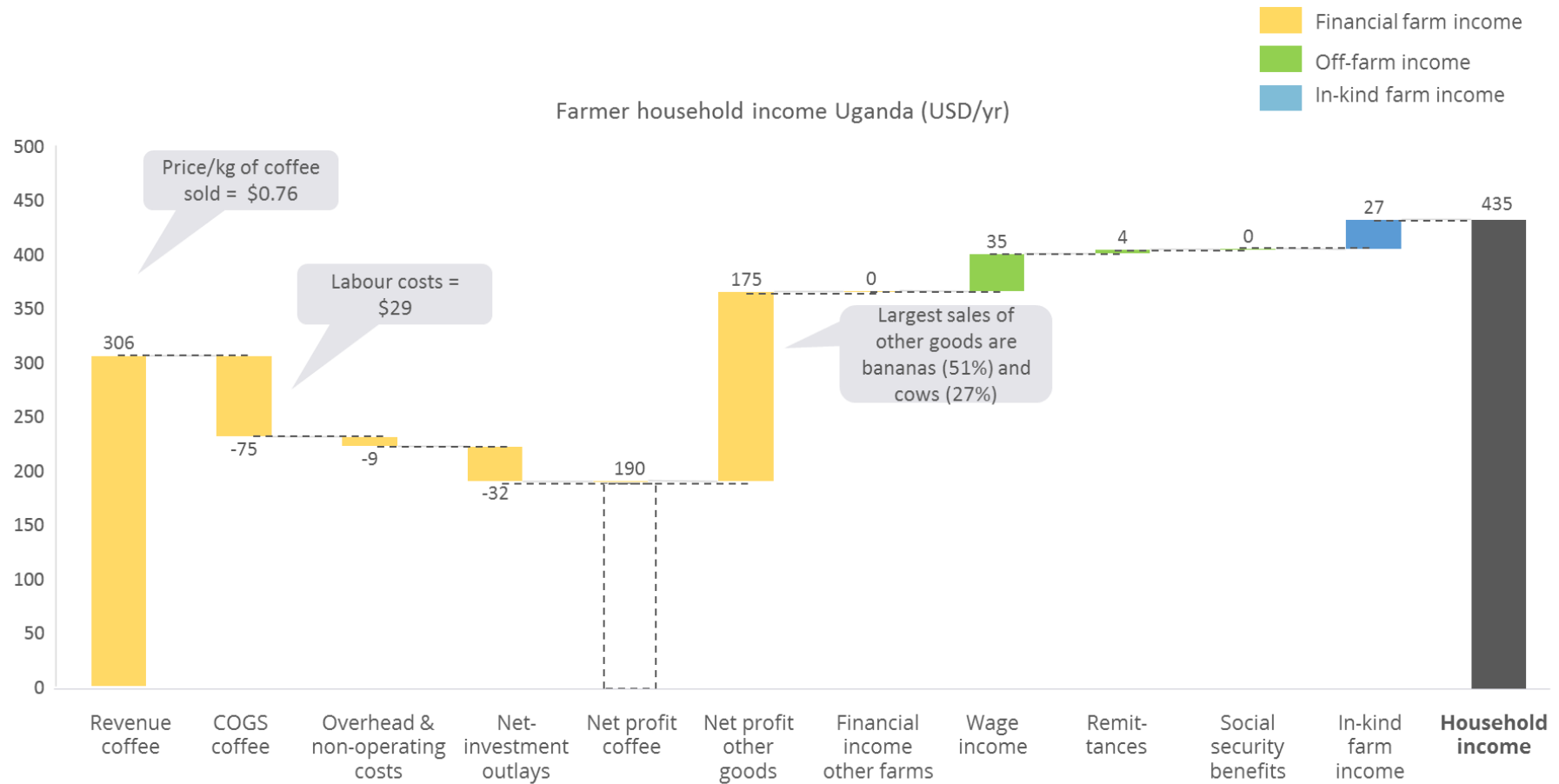
6.7.2 Tanzania

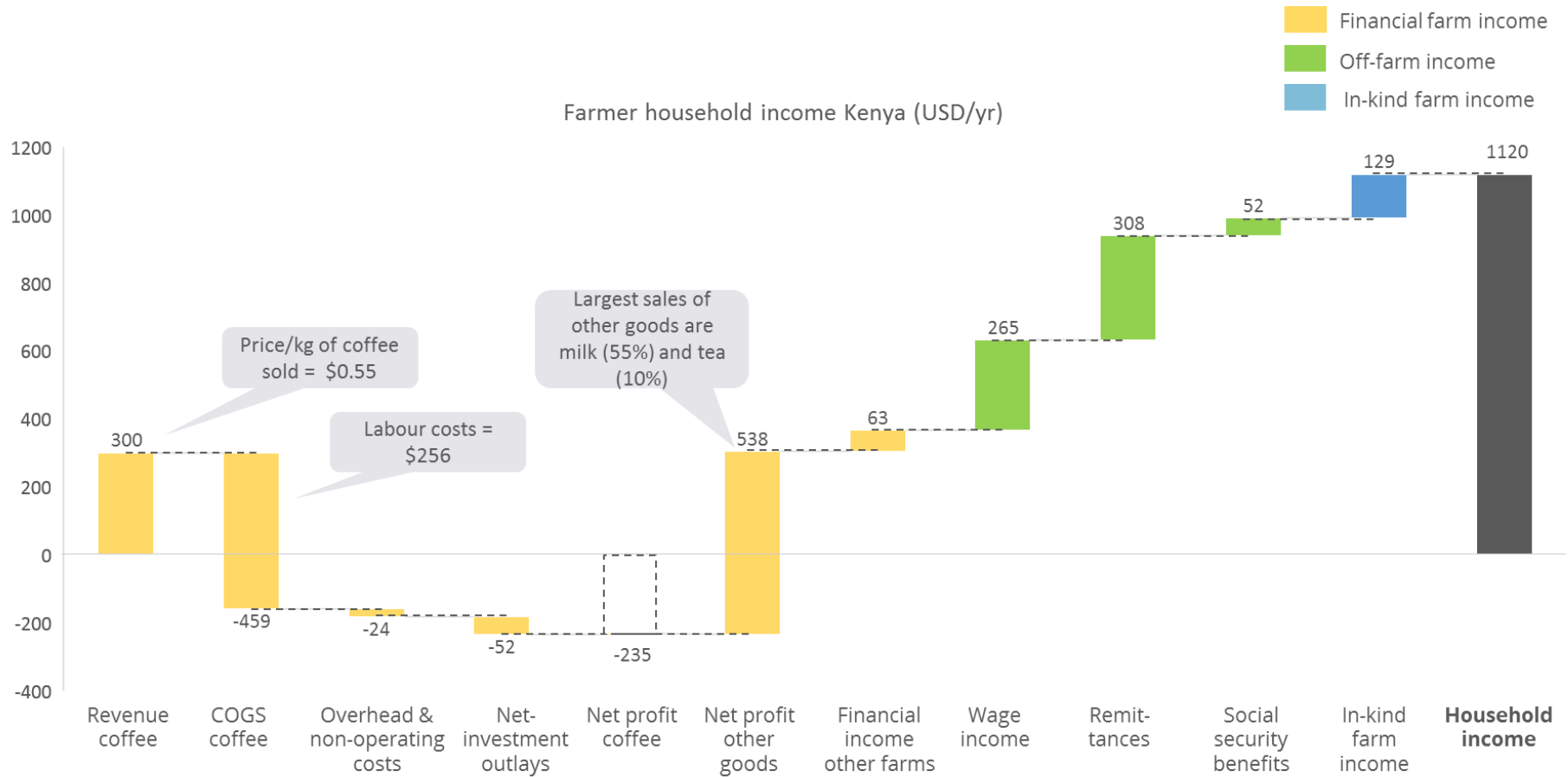*Figure 17: Farmer household income distribution of Tanzania*

6.7.3 Uganda

Figure 18: Farmer household income distribution of Uganda

6.7.4 Kenya

Figure 19: Farmer household income distribution of Kenya

Farmer household income Kenya (USD/yr)

Legend:
- Financial farm income
- Off-farm income
- In-kind farm income

Values:
- Revenue coffee: 300
- COGS coffee: -459
- Overhead & non-operating costs: -24
- Net-investment outlays: -52
- Net profit coffee: -235
- Net profit other goods: 538
- Financial income other farms: 63
- Wage income: 265
- Remittances: 308
- Social security benefits: 52
- In-kind farm income: 129
- Household income: 1120

Callouts:
- Price/kg of coffee sold = $0.55
- Labour costs = $256
- Largest sales of other goods are milk (55%) and tea (10%)

6.7.5 India

Figure 20: Farmer household income distribution of India

Farmer household income India (USD/yr)

Legend:
- Financial farm income (yellow)
- Off-farm income (green)
- In-kind farm income (blue)

Annotations:
- Price/kg of coffee sold = $0.97
- Labour costs = $738
- Largest sales of other goods are pepper (86%) and nuts (6%)

Values:
- Revenue coffee: 732
- COGS coffee: -825
- Overhead & non-operating costs: -7
- Net-investment outlays: -46
- Net profit coffee: -146
- Net profit other goods: 1108
- Financial income other farms: 1449
- Wage income: 1081
- Remittances: 0
- Social security benefits: 576
- In-kind farm income: 284
- Household income: 4350

6.7.6 Indonesia

Figure 7: Farmer household income distribution of Indonesia
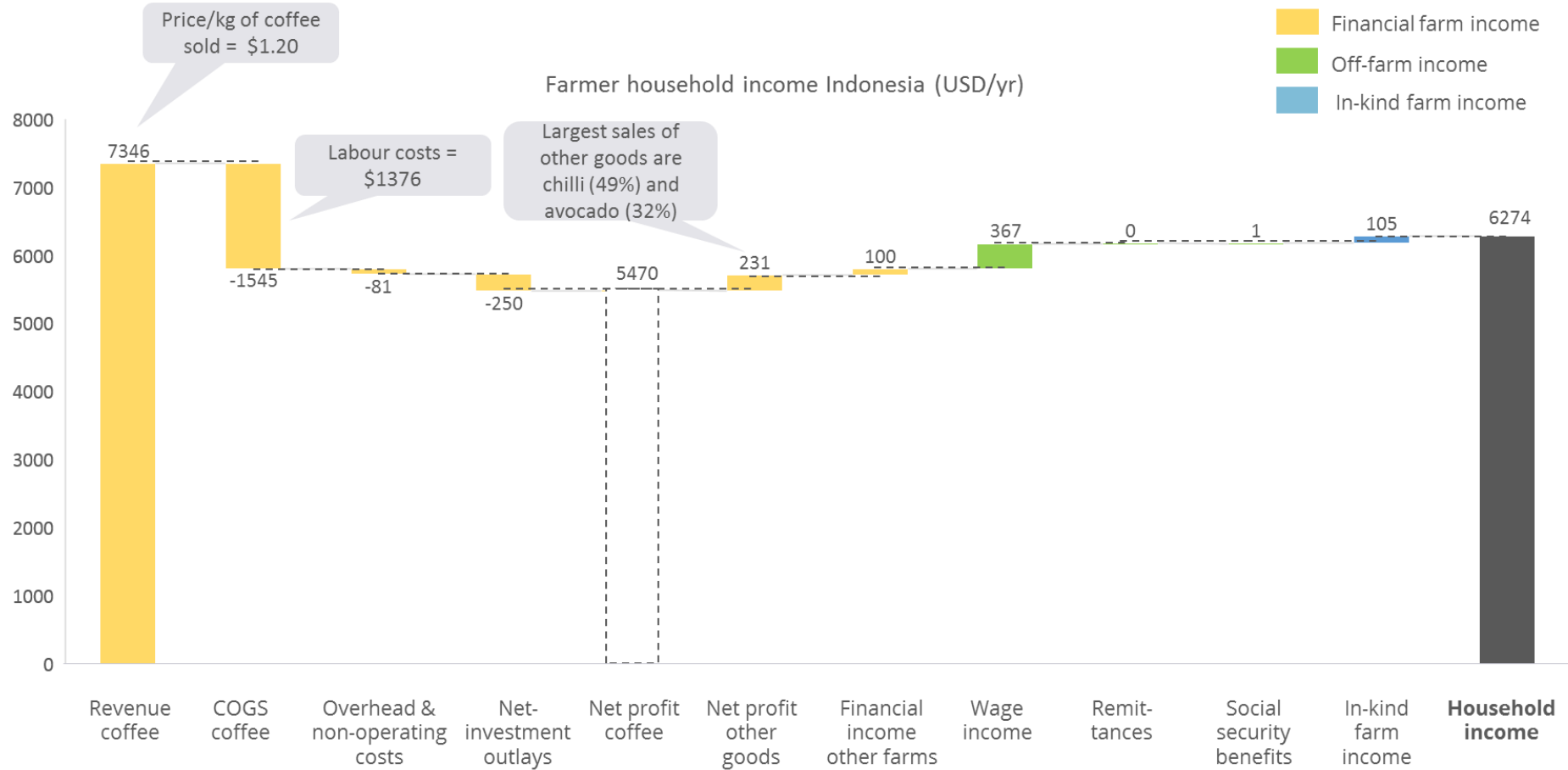
6.7.7 Vietnam

Figure 8: Farmer household income distribution of Vietnam