COCOA FARMER INCOME

The household income of cocoa farmers in Côte d'Ivoire and strategies for improvement

Final report

June 2021

ABOUT

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ABOUT

About Impact Institute

Impact Institute – spin-off of True Price - is recognised as a global leader in impact measurement and valuation. It has contributed to international frameworks such as the NCP and the TEEB framework. It developed the first methods worldwide for true pricing, the integrated profit loss, and impact statement.

impactinstitute.com

About Fairtrade International

Fairtrade International is the non-governmental organization that has commissioned this study on the cocoa farmer income. Fairtrade changes the way trade works through better prices, decent working conditions and a fairer deal for farmers and workers in developing countries. A non-profit organization representing more than 1.7 million farmers and workers, Fairtrade International owns the Fairtrade label, the most recognized ethical label and backed by rigorous social, economic and environmental standards and certification. Fairtrade International and its member organizations empower producers, partner with businesses, engage consumers and advocate for a fair and sustainable future.

fairtrade.net

About EMC

EMC is an Ivorian organisation that is specialised in market research, opinion polls and socio-economics studies. EMC has a special focus on Francophone countries of West Africa, especialy the 8 countries of the Economic Union of West African States. Data collection in Côte d'Ivoire was performed by EMC.

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INTRODUCTION

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CONTEXT

Côte d'Ivoire is highly dependent on its cocoa sector, which faces many challenges that threaten long-term sustainability

Côte d'Ivoire, located in Western Africa, is home to approximately 28 million people and over the past 5 years has seen one of the world's highest growth rates in terms of GDP. Côte d'Ivoire is the world's largest producer and exporter of cocoa beans. The Ivorian economy is largely dependent on the agricultural sector and about two-thirds of the population is engaged in this area. However, this dependency causes the Ivorian economy to be highly sensitive to changes in the international prices of these products. To counter this dependency, policy measures have prioritised a shift to higher value-adding activities such as the processing of cocoa, cashews and other commodities[1].

One of Fairtrade's most prominent products is cocoa. Fairtrade is pushing the sector to address the many challenges that endanger the long-term sustainability of cocoa and the people behind it. Fairtrade certifies 272 producer organisations in Côte d'Ivoire, with 293,237 farmer members including 28,031 female producers. A central element of Fairtrade International's strategic vision 2021-2025 is the ambition to see small-scale farmers earning a living income. This study touches upon different initiatives and investigates the progress that Fairtrade farmers have booked over the last years.

The first goal of this study is to assess the situation of these cocoa farmers in 2020, in terms of individual farmer household incomes and the income distribution of cocoa farmers in 2020 as compared to 2018[2].

The second goal is to evaluate the effectiveness of the Fairtrade Minimum Price (FMP) mechanism, a safety net for producers, which came into effect in the 2019/2020 harvest period.

The research conducted for Fairtrade uses four different research questions related to the two different goals:

- **1.1.** What is the current household income of the Fairtrade farmers in Côte d'Ivoire?
- **1.2.** How do these results compare to the previous study?
- **2.1.** What is the current household income of the Fairtrade farmers in Côte d'Ivoire?
- **2.2.** What is the effect of FT price mechanisms on farmer income, in particular for the FMP differential payments performed between October 2019-March 2020?

[1] CIA World Factbook (2021). Cote d'Ivoire.

[2] True Price (2018) Cocoa farmer income - the household income of cocoa farmers in Côte d'Ivoire and strategies for improvement Retrieved from: https://trueprice.org/consumer/cocoa fairtrade/

METHODOLOGY

02

METHODOLOGY | HOUSEHOLD INCOME MODEL

The farmer household income model is based on farmer wealth

The model on the right presents a breakdown of how the household income of cocoa farmers is calculated. The perspective of the model is farmer wealth (current and future income), not economic profit; therefore, opportunity costs are excluded. Net farm income, based on the sales of cocoa beans, was extended with in-kind farm and off-farm income.

The majority of the data points is derived from primary data collected from the conducted field study. Relevant data that could not be collected during the field study, including interest costs, subsidies and in-kind contributions from cooperatives, is based on secondary literature and previous studies.

Fixed costs include items like ropes, axes, tarpaulins, and other production equipment. The costs are used on an expense basis and not depreciation basis.

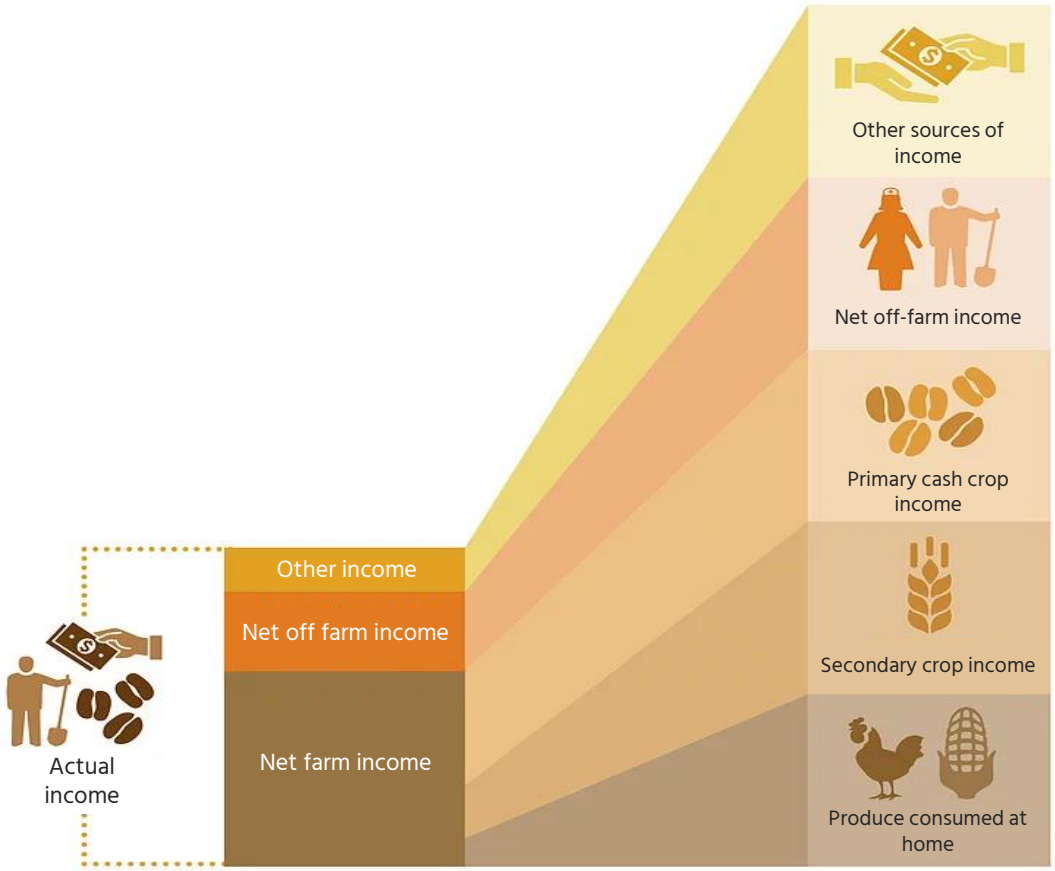


Figure 1: Overview of farmer household income model. Source adapted from LICOP (2020)

Revenues

- Revenue from sale of produce – crops and/or livestock

Costs

- **Input costs:** Planting and taking care of crops (e.g. seeds, tools, fertilisers, and pesticides)
- **Land costs:** Rental/purchasing of farm land
- **Labour costs:** Payment of wages of additional labour (outside household labour)
- **Unexpected costs:** Unforeseen costs, for example to cover crop damage from drought or bad weather
- **Other**

METHODOLOGY | SAMPLING & DATA COLLECTION

The two research questions use different samples to address the different purposes of each research question

Sampling approach

The sampling approaches enable random, but balanced samples where all cooperatives are represented. The selection of cooperatives to be included in the sample was made in consultation with Fairtrade. This means purposive sampling was used. Different samples were used for each research question. However, stratified random sampling ensured that a sufficient number of farmers contributing to the sales of the cooperatives were included in the samples. This leads to a 95% confidence level and 5% error margin approximately.

Research question 1.
Comparison study

The cooperatives included in the sample are cooperatives that participated in the study conducted in 2018 and that were still certified. Some differences in sampling with the previous study could hinder comparability. A total of 7 cooperatives were no longer certified at the time of this study.

384 farmers, sampled from

16 cooperatives

Research question 2.
Fairtrade price mechanisms

The cooperatives included in the sample have minimum sales on Fairtrade terms of 20%. The average sales on Fairtrade terms per cooperative is 45%. The cooperatives were selected using purposive sampling: only cooperatives with sales above 20% on Fairtrade terms were considered.

482 farmers, sampled from

20 cooperatives

Data collection

The fieldwork for this study was conducted between October 1st, 2020 and January 7th, 2021. Data collection was performed by EMC, in Côte d'Ivoire. Data collection was twofold: farmer data was collected through farmer interviews and additional information was collected through a survey amongst the management staff of the farmer cooperatives.

Due to the COVID-19 situation and the risk that on-location interviews carried, the interviews were conducted with the help of computer assisted telephone interviewing (CATI) technology.

The interview process was followed by a quality control by the statistics department of EMC and at a later stage upon receival by Impact Institute. All data processing steps and assumptions made can be found in Appendix A4.

METHODOLOGY | PRICE MECHANISMS

Three different scenarios shed light on how the Fairtrade Minimum Price (FMP) can influence the farmer household income

Data collection

Farmers were asked whether they had received the FMP differential payment from their cooperative. All cooperatives reported to have distributed the FMP, yet only 57% of farmers reported to have received the payment. No pattern in the results could be identified. Some cooperatives performed better than others in the distribution of the FMP differential (ranging from 100% of farmers who reported to have received the FMP differential payment for the highest performing cooperative, to 12% for the lowest performing cooperative).

On notification of the issue FLOCERT, auditor of Fairtrade, carried out a rapid assessment at all cooperatives in the study with low awareness rates of the FMP differential payment amongst the interviewed farmers and found no evidence of fraud at the cooperatives. FLOCERT did find some evidence of delayed payments. Additionally, farmers get a variety of different payments from their cooperatives, and it might be difficult for them to disentangle which payment is coming from which organisation.

Fairtrade will take action to ensure that future payments are made in a timely manner and farmers are more clearly informed by their cooperative on the reason for payment.

Analysis

Because of the uncertainty in the collected data, three scenarios are created, and farmer household income and household income distribution are calculated under these 3 scenarios. The three scenarios are as follows:

- Conservative. Farmer household income is calculated assuming no FMP was received for any of the farmers in the sample.
- As collected. Farmer household income is calculated with the data as reported by the farmers.
- Ideal scenario. Farmer household income is calculated with an 'ideal FMP distribution' which is defined as follows: all farmers receive the FMP differential payment equal to the value of 141.5 CFA per kg of cocoa sold to the cooperative.

Finally, the FMP differential payment is examined in light of the Fairtrade Living Income Reference Price[1]. Based on studies by the Living Income Community of Practice, a formula for the LI Reference Price was set up. This is dependent on certain parameters, such as yield and cocoa area. The payment of the LI Reference Price is analysed under different conditions: calculating farmer household income using yield as collected in the sample and yield as implied by the LI Reference Price formula.

[1] Veldhuyzen, C. (2019). Fairtrade Living Income Reference Prices for Cocoa. Retrieved from https://www.fairtrade.net/issue/living-income

METHODOLOGY | LIVING INCOME

The living income is 7,468 USD per year for the median household

This slide presents the living income results based on the median household size of the full sample.

The living income value has been calculated using CIRES[1] data. It is then scaled up to match the median household size of the sample, which is 5 adults and 3 children (compared to 2 adults and 4 children in the CIRES study).

Values are also adjusted to the inflation rate of the period of the analysis.

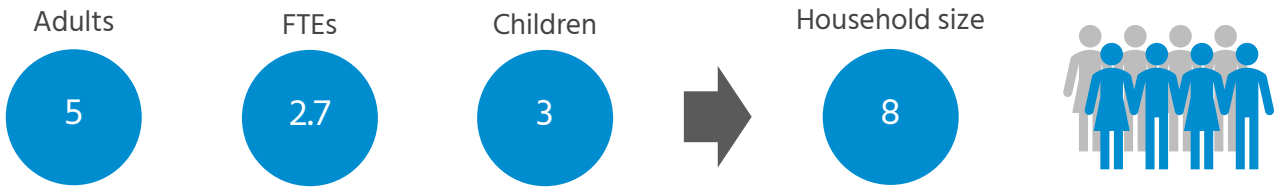
The living income figure does not include social security and taxes, in order to align with the Fairtrade and the Living Income Community of Practice setting standard.

However, social security are expenses that farmers should be able to make and therefore could be included in the living income figure.

For this reason, two separate household living income are estimated: one without social security and one including social security.

[1] CIRES is the Ivorian Centre for Economic and Social Research. CIRES has calculated a living income benchmark for Ivorian cocoa farmers in 2018.

Median household composition



Variable	Unit	Value	Variable	Unit	Value
Costs per adult			**Costs per child**		
Food	$	553	Food	$	369
Housing	$	104	Housing	$	104
Clothing	$	67	Clothing	$	67
Healthcare	$	35	Healthcare	$	35
ICT	$	68	Education	$	188
Transport	$	91	Transport	$	91
Savings/unforeseen expenses	$	329			
Total per adult	$	1,245	Total per child	$	852
Total household living income	**$**	**7,468**			
Total household living income (incl. social security)	**$**	**8,094**			

Table 1: Living income results, based on median household size of full sample

COMPARISON STUDY

Results for the following research questions:

1.1. What is the current household income of the Fairtrade farmers in Côte d'Ivoire?

1.2. How do these results compare to the previous study conducted in 2018?

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COMPARISON STUDY | DESCRIPTIVE STATISTICS

In comparison to the 2018 study, the most notable change is an increase in the yield of cocoa farmers

The table on the right contains average descriptive statistics for both the current sample and the sample from the study conducted in 2018. Findings should be interpreted with caution given the differences in sampling.

The most notable change is the increase in yield. It can be explained as follows:

> Both the absolute number of trees and the number of trees per hectare have increased. A change in the distribution of trees per tree age can also be observed. The percentage of trees below 5 years and between 5 and 25 years old has increased, while the percentage of trees over 25 years has decreased. This partly explains the significant increase in production, and therefore the increase in yield since younger trees are more productive than older ones.

The profit per kilogram of cocoa has remained relatively similar. This can be explained by the decrease in farm-gate cocoa prices between the previous and current study. Yield has increased, potentially driven by higher fertilizer and pesticide costs, which are also decreasing profit.

Indicator	Unit	Average (2020)	Average (2018)
Total farm area	ha	7.3	6.7
Area of cocoa production	ha	4.63	4.9
Amount of cocoa trees	#	7,732	6,352
Trees per hectare	#/ha	1,881	1,348
Kilos of cocoa produced	kg	2,743	1,999
Farm-gate price	USD/kg	1.48	1.53
Profit per kilo cocoa	USD/kg	1.01	0.9
Yield	kg/ha	625	437
Hired FTE	#FTE	1.04	0.8
Household FTE	#FTE	3.55	3
Wages (of hired labour)	USD/FTE	508.1	530.2
Quality of life	scale of 1-5	3.8	4.1
Household size	# people	9	9
Model household	# adults & children	5.8 adults & 3.6 children	4.9 adults, 4.1 children
Percentage of trees below 5 years	%	18%	13%
Percentage of trees between 5 and 25 years	%	53%	51%
Percentage of trees over 25 years	%	28%	35%
Number of farmers	#	364	3202

Table 4: Development of average descriptive statistics

COMPARISON STUDY | FARMER HOUSEHOLD INCOME

The average yearly household income is 4,937 USD per household, compared to 2,670 USD per household in the 2018 study

The household income is not sufficient to make the living income. The average farmer earns 66% of a living income. Cocoa is the main source of income: almost 58% of farmer income stems from the profit on cocoa. The average household makes 13% of their income from selling other goods, whereas in-kind income and off-farm income account respectively for 10% and 20% of total household income.

Average household income has increased largely compared to 2018.

Revenue from cocoa has increased significantly, while the costs of cocoa production have increased at a slightly lower rate. As a consequence, the average profit from cocoa has increased at a significant rate.

The increase in revenue from cocoa can be explained by the large increase in yield, which is due to higher tree productivity and therefore higher production of cocoa. In addition, some farmers received a Fairtrade Minimum Price (FMP) differential on top of their regular revenue. The FMP serves as a safety net: when the market price drops below the FMP level, farmers receive the FMP.
The increase cannot be explained by an increase in price, since the farm-gate price that farmers have received has decreased from an average of 850 CFA/kg to 825 CFA/kg. This is excluding the FMP differential payment.

A key difference is that the average farmer is more diversified in the current study than in the previous results. Where in the previous study, the average farmer earned 74% of his/her household income from cocoa, the average farmer currently earns 58% of his/her household income from cocoa.

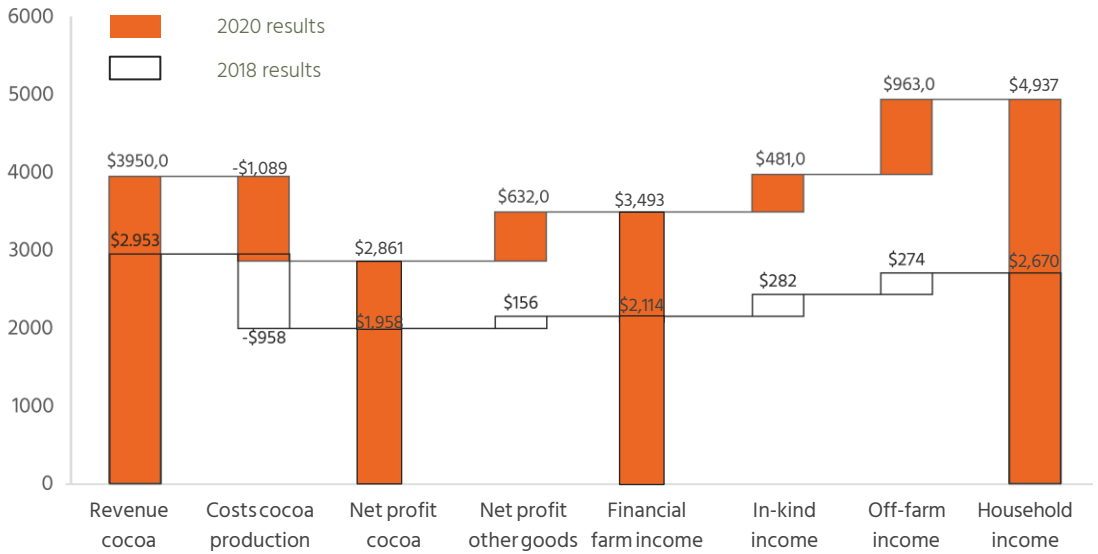


Figure 9: Average farmer household income 2018 vs. 2020 (USD/year)

COMPARISON STUDY | FARMER HOUSEHOLD INCOME

Higher farmer household income is driven by diversification through in-kind income and off-farm income

Diversification

Farmers are diversifying their production. About 70% of the farmers have diversified their production to some degree and produce other goods next to cocoa, compared to 55% of farmers in the previous study. Other goods serve both as a form of in-kind income (30% produce other goods only for in-kind purposes), as a form of financial revenue (19% produce other goods only for sales purposes) or both (51%). Rubber, cassava, palm, and chicken are among the most popular and profitable crops/herds next to cocoa. The average farmer earns most from rubber.

Farmer household income is partially driven by both in-kind income and off-farm income. In-kind income comes from the consumption of agricultural goods., such as cows, sheep and yam. Off-farm income stems from wage income primarily.

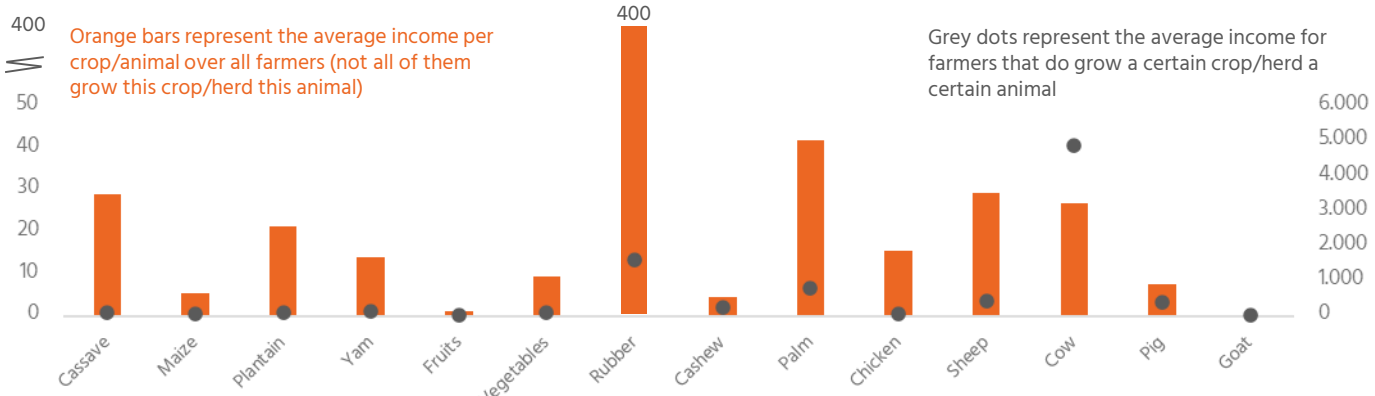


Figure 10: Average income per crop/animal for all farmers vs. for farmers that grow the crop/herd the animal

Costs of production

The profit margin of cocoa production is high. In comparison to the previous study, both the revenue and profit have increased. In 2018, the revenue per ha was $648 compared to $896 in the current study and the profit per cocoa area was $443 compared to $695 currently. The biggest driver of costs is labour costs, accounting for 60% of the total cost of cocoa production.

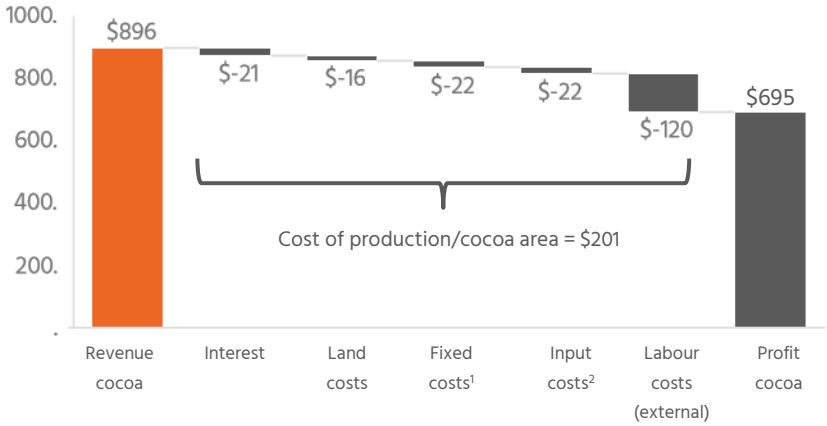
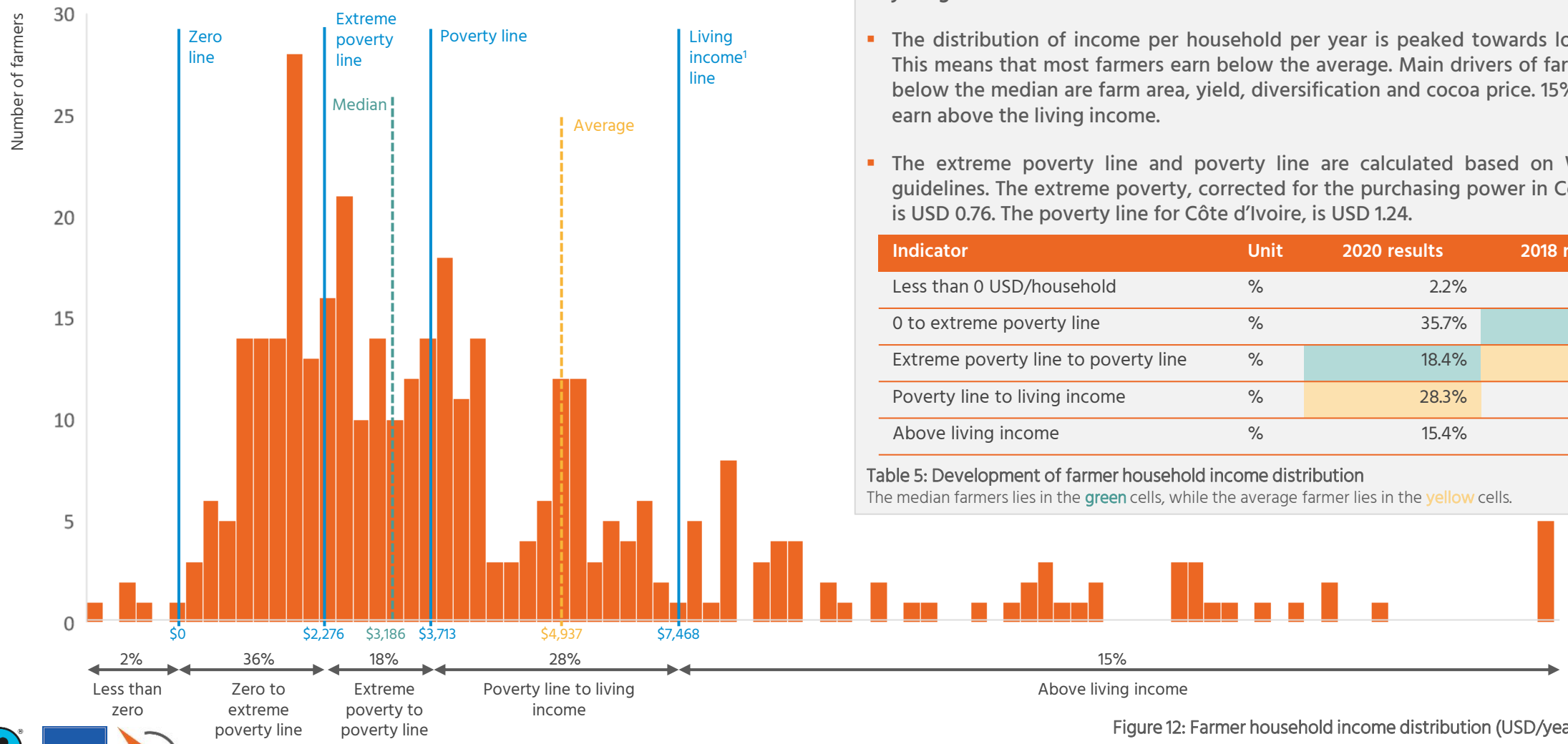


Figure 11: Breakdown of cost of production per cocoa area

[1] Fixed costs include machete, machete file, tarpaulins, pick, basket, rope, axe, mechanic pruner, bag, boots, bucket, fuel and other fixed costs
[2] Input costs include fertilizer, pesticides, transport and seedlings costs

RESULTS | HOUSEHOLD INCOME DISTRIBUTION: COMPARISON

85% of farmers earn below the living income



Key insights:

- The distribution of income per household per year is peaked towards low incomes. This means that most farmers earn below the average. Main drivers of farmer income below the median are farm area, yield, diversification and cocoa price. 15% of farmers earn above the living income.
- The extreme poverty line and poverty line are calculated based on World Bank guidelines. The extreme poverty, corrected for the purchasing power in Côte d'Ivoire, is USD 0.76. The poverty line for Côte d'Ivoire, is USD 1.24.

Indicator	Unit	2020 results	2018 results
Less than 0 USD/household	%	2.2%	5.5%
0 to extreme poverty line	%	35.7%	52.3%
Extreme poverty line to poverty line	%	18.4%	19.4%
Poverty line to living income	%	28.3%	16.2%
Above living income	%	15.4%	6.6%

Table 5: Development of farmer household income distribution
The median farmers lies in the green cells, while the average farmer lies in the yellow cells.

Figure 12: Farmer household income distribution (USD/year)

[1] Estimated using median household size, excluding social security

RESULTS | POTENTIAL HOUSEHOLD INCOME DRIVERS

Yield, cocoa area and product diversification positively correlate with household income

Significant positive correlations are found between the variable household income and the variables cocoa area, product diversification and yield.

The correlation between household income and cocoa area is the strongest and almost identical to the result of the previous study.
As for profit per hectare, there is a strong correlation with the yield. The positive correlation seems to indicate that the higher a farmer's yield is, the higher his profits are. Remarkably enough, a weak, negative correlation is found between profit per hectare and cocoa area.

As for the drivers of the yield, there is a positive correlation between yield and fertilizer plus pest management costs and tree productivity and the yield.

Literature states that younger and older trees are generally less productive and that trees between 5-25 years are most productive. This also shows in the positive correlation that was found between trees with the age between 5-25 years and yield.

About the Fairtrade premium:

The Fairtrade Premium, which is paid on top of the Fairtrade Minimum Price, is a sum of money that farmers and workers invest in projects they choose. Based on external Fairtrade data, 75% of the premium is used for services for workers and their families, 16% for services for communities, 6% for training and empowerment of workers and 3% for other purposes (Fairtrade, n.d.)

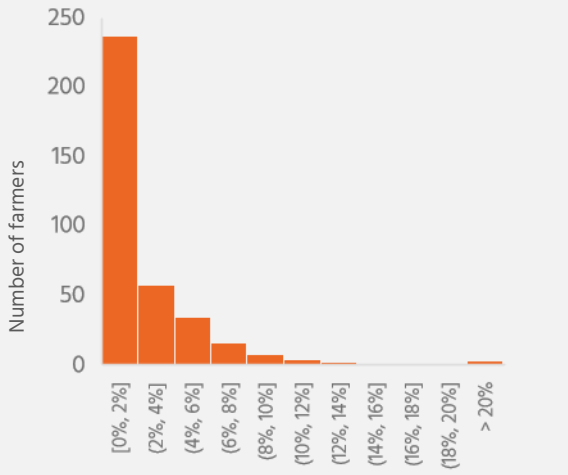


Figure 13: Distribution of Fairtrade premiums

Key insights from this study:

The results show that for the majority of the farmers (64.3%) the FT premium makes up less than 2% of their income. In comparison to the previous study, it seems that farmers have become less reliant on the premium, given that the average household income has increased.

It can also be the case that farmers have received more support from the Fairtrade premium in the form of services and trainings instead of monetary payments.

FAIRTRADE PRICE MECHANISMS

Results for the following research questions:

2.1. What is the current household income of the Fairtrade farmers in Côte d'Ivoire?

2.2. What is the effect of the FT price mechanisms on farmer income, in particular for the FMP differential payments performed between October 2019-March 2020?

04

FAIRTRADE PRICE MECHANISMS | DESCRIPTIVES & HOUSEHOLD INCOME

The average household income is 4,080 USD per household, or 55% of a living income

Descriptive statistics

Variable	Unit	Average	Median
Total farm area	ha	6.52	5.00
Area for cocoa production	ha	4.11	3.14
Amount of cocoa trees	#	4,128	3,300
Profit per kg cocoa	USD/kg	0.91	1.10
Yield	kg/ha	597	500
Hired FTE	# FTE	1.07	0.17
Household FTE	# FTE	0.94	0.96
Household size	# people	9	8
Number of farmers	# farmers	482	482

Table 2: Key descriptive statistics

Household income

- The average household income is 4,080 USD per household. This is around 55% of a living income, and therefore the household income is not sufficient to make the living income.

- Cocoa is the main source of income for the average household (54%), supplemented by selling other goods (13%), in-kind income (11%), and off-farm income (22%).

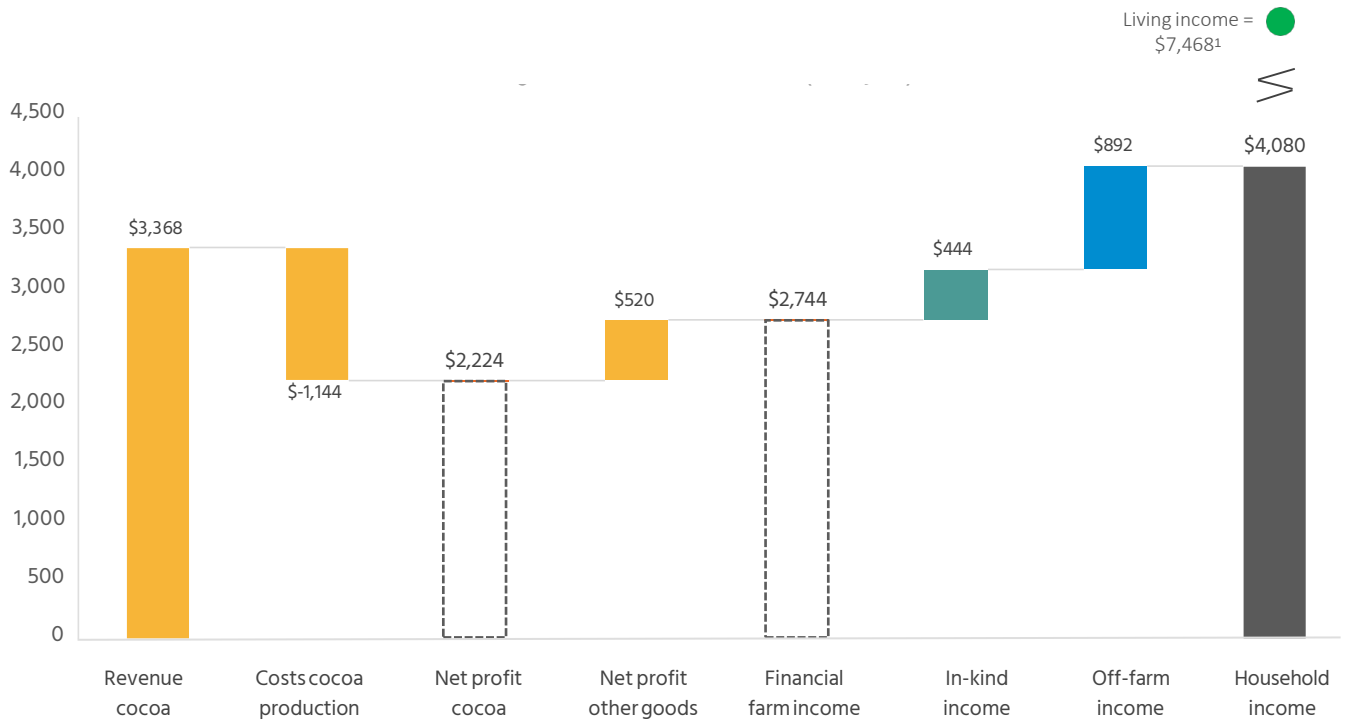


Figure 2: Average farmer household income (USD/year)

[1] Estimated using median household size, excluding social security

FAIRTRADE PRICE MECHANISMS | FARMER HOUSEHOLD INCOME

Farmer household income is driven by diversification of income and costs of production

Diversification

Farmers are diversifying their production. About 70% of the farmers have diversified their production to some degree and produce other goods next to cocoa. Other goods serve both as a form of in-kind income (23% produce other goods only for in-kind purposes), as a form of financial revenue (18% produce other goods only for sales purposes) or both (59%). Rubber, cassava, palm, and chicken are among the most popular and profitable crops/herds next to cocoa. The average farmer earns most from rubber.

Farmer household income is partially driven by both in-kind income and off-farm income. In-kind income comes from the consumption of agricultural goods., such as cows, sheep and yam. Off-farm income stems from wage income primarily.

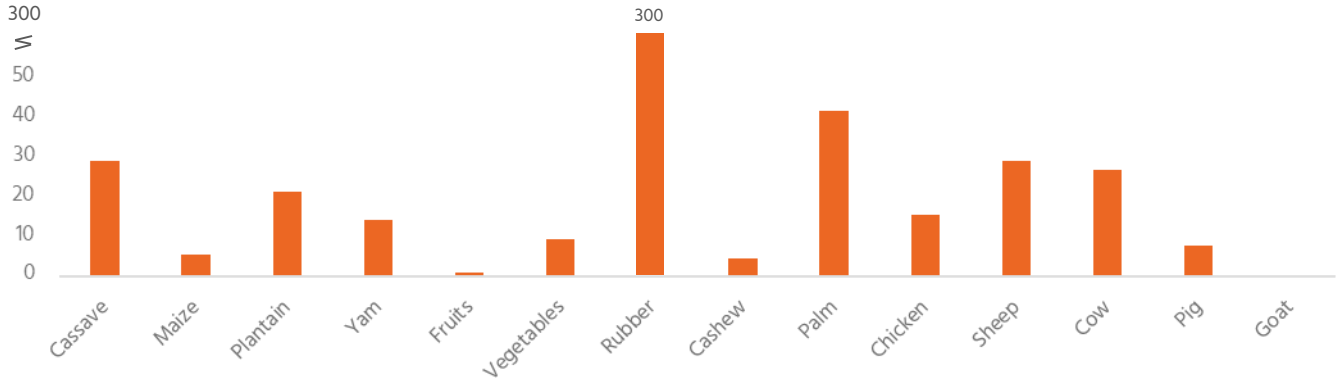


Figure 3: Average income per crop farmed / animal herd

Costs of production

The profit margin of cocoa production is quite high since the cost of production per cocoa area is only 234 USD/ha, making up 27% of the revenue. The revenue per cocoa area is $873 and the profit per cocoa area is $640. The biggest driver of costs is labour costs, which is responsible for 66% of the total cost of cocoa production.

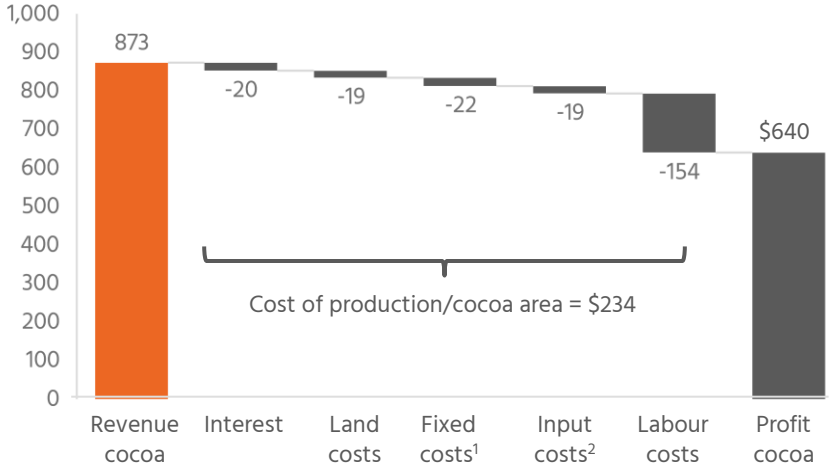
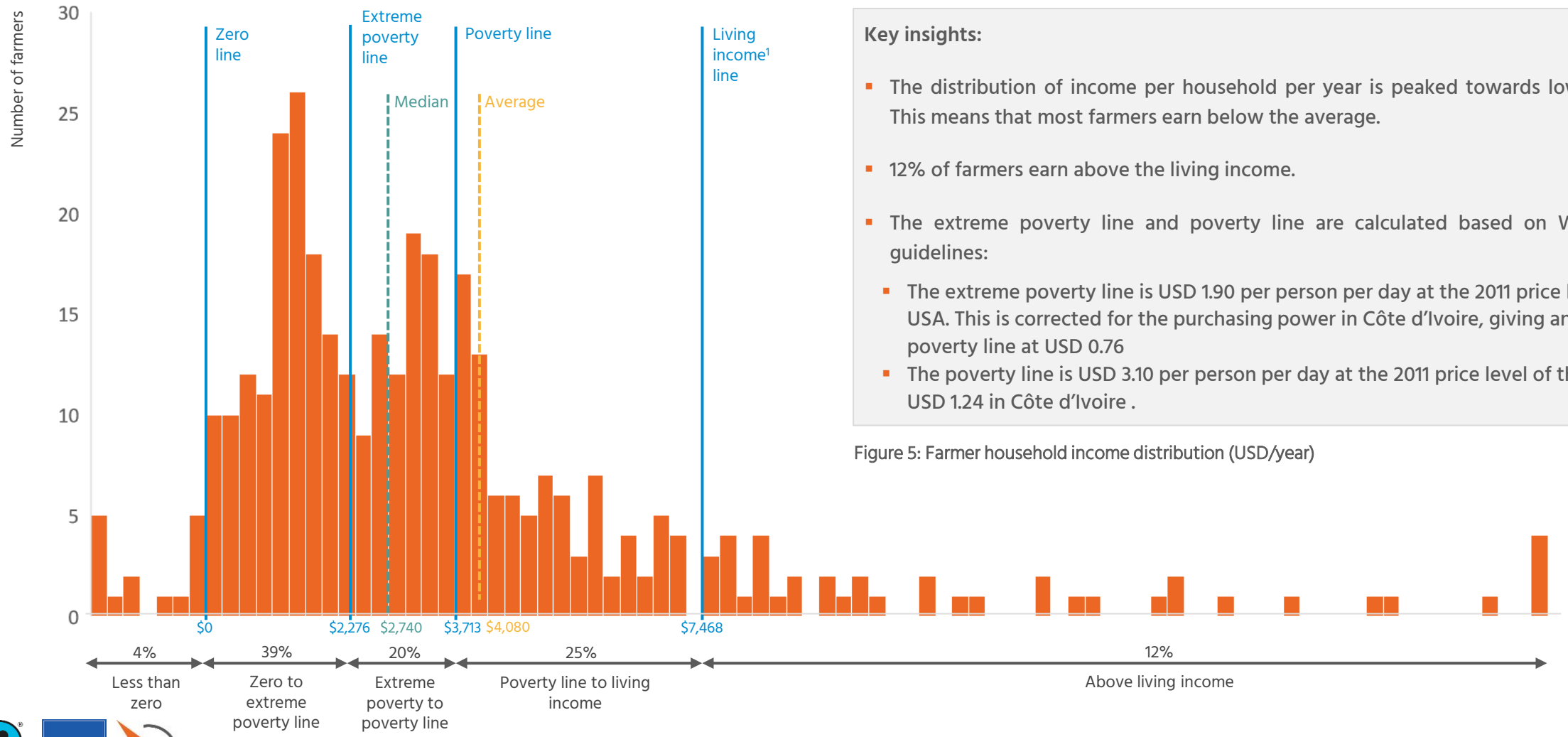


Figure 4: Breakdown of cost of production per cocoa area

[1] Fixed costs include machete, machete file, tarpaulins, pick, basket, rope, axe, mechanic pruner, bag, boots, bucket, fuel and other fixed costs
[2] Input costs include fertilizer, pesticides, transport and seedlings costs

FAIRTRADE PRICE MECHANISMS | HOUSEHOLD INCOME DISTRIBUTION

88% of farmers earn below the living income



Key insights:

- The distribution of income per household per year is peaked towards low incomes. This means that most farmers earn below the average.
- 12% of farmers earn above the living income.
- The extreme poverty line and poverty line are calculated based on World Bank guidelines:
  - The extreme poverty line is USD 1.90 per person per day at the 2011 price level of the USA. This is corrected for the purchasing power in Côte d'Ivoire, giving an extreme poverty line at USD 0.76
  - The poverty line is USD 3.10 per person per day at the 2011 price level of the USA, or USD 1.24 in Côte d'Ivoire .

Figure 5: Farmer household income distribution (USD/year)

[1] Estimated using median household size, excluding social security

FAIRTRADE PRICE MECHANISMS | EFFECT FMP DIFFERENTIAL ON INCOME

An improvement in average farmer household income is observed as the number of farmers who receive the FMP increases

Farmer household income

Scenario 1 is the scenario where farmers have received no FMP differential payment. Farmer household income is the lowest in this scenario, standing at 3,957 USD/household.

In scenario 2, farmers receive the FMP differential payment they claim to have received in the questionnaire. Revenue from cocoa increases to 3,368 USD/household from scenario 1, an increase of 4%. Farmer household income increases to 4,079 USD/household, representing a 3% increase from scenario 1.

In the ideal distribution scenario, all Fairtrade farmers receive the FMP differential payment for cocoa sold to their cooperative on a pro-rata basis, i.e. the same amount per kg sold. In scenario 3, average farmer household income stands at 4,332, an increase of 9% from scenario 1.

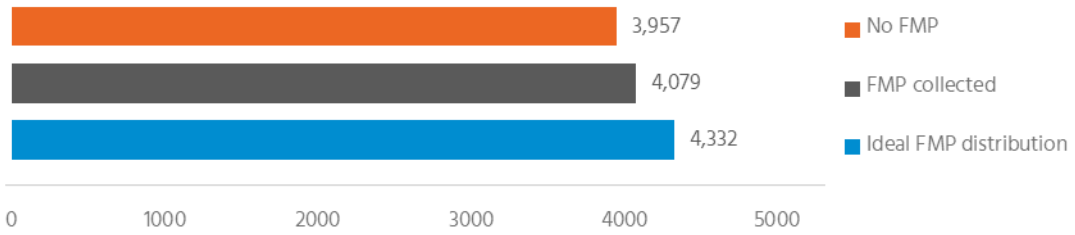


Figure 6: Average farmer household income under different scenarios

Household income distribution

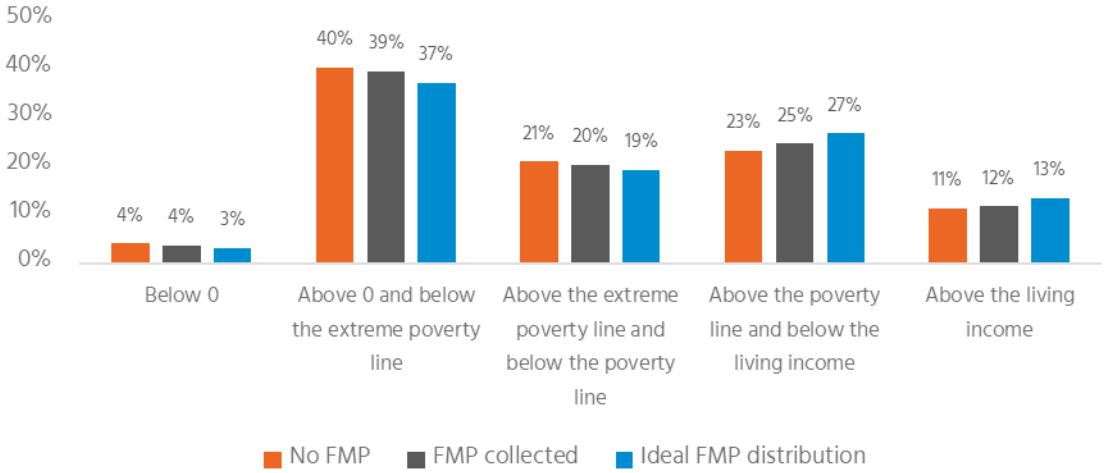


Figure 7: Farmer household income distribution under the different scenarios

When moving from scenario 1 to scenario 2, the bottom two categories (farmers earning below 0 and farmers living in extreme poverty) become less populated. Around 1.8% of farmers have moved from these bottom two categories to the top three categories: farmers living in poverty, farmers earning below the living income and farmers earning above the living income.

Similar observations can be drawn for moving from scenario 2 to scenario 3. The bottom three categories become less populated, 3.6% of farmers have shifted to the top two categories.

FAIRTRADE PRICE MECHANISMS | LIVING INCOME REFERENCE PRICE

22% of farmers in the sample meet the productivity benchmark used to calculate the Fairtrade Living Income Reference Price

Fairtrade Living Income Reference Price parameters against study results

Revised in 2019, the Fairtrade Living Income Reference Pirce[1] for cocoa at farm gate is estimated to be $2.20 (CFA 1289) per kg for Côte d'Ivoire. The median price received by farmers in the sample is $1.40 (CFA 825) per kg. The reference price is calculated based on some benchmark parameters, such as a productivity benchmark of 800kg/ha and a cocoa area benchmark of 4.4 ha amongst others. The median yield in the sample is 500 kg/ha. Only 22% of farmers in the sample meet the productivity benchmark of 800 kg/ha[2]. Similarly, the median cocoa area of farmers in the sample is 3.1 ha. 31% of farmers have cocoa area of 4.4 hectare or larger.

Variable	Unit	LI reference price	Current sample[1]	% farmers at LI reference price benchmark
Farm-gate price	CFA/kg	1,289	825	N/A
Farm-gate price (incl. FMP)	CFA/kg	1,289	965	
Yield	kg/ha	800	500	22%
Cocoa area	ha	4.4	3.11	31%

Table 3: LI Reference Price parameters against results in the current sample

Household income distribution

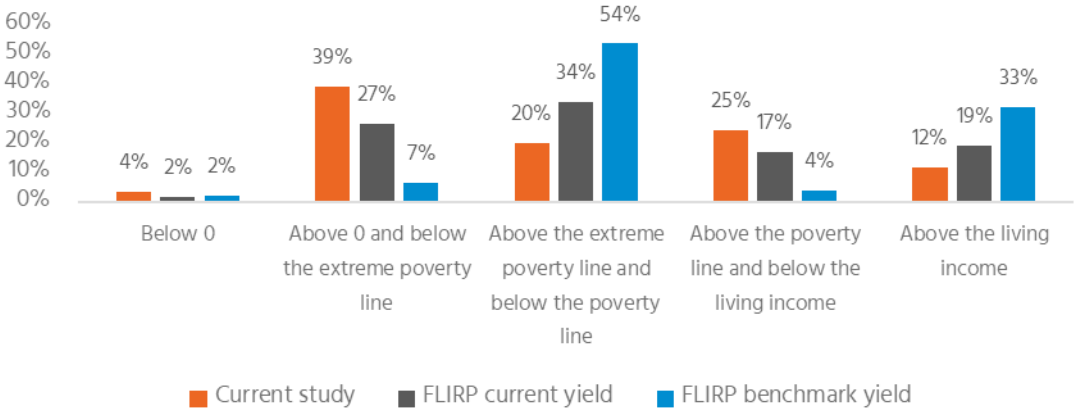


Figure 8: Share of farmers in each income bucket under the different scenarios

Assuming farmers received the Living Income Reference Price at their current yield improves the household income distribution. The median farmer shifts from earning income below the poverty line to earning income above the poverty line. Assuming farmers received the Living Income Reference Price at the benchmark yield improves the household income distribution even further. There are now less than 10% of farmers living in extreme poverty, while 33% of farmers earn above the living income.

[1] Fairtrade Living Income Reference Price indicates the price needed for an average farmer household with a viable farm size and an adequate productivity level to make a living income from the sales of their crop.

[2] The productivity benchmark is a long-term achievable goal to help reaching living incomes. This study is used to get insights about current farmers' situation and how (potential) improvements can be made to achieve the goal.

CONCLUSION & RECOMMENDATIONS

05

CONCLUSION

Farmer income remains low, however positive developments can be observed notably due to the FMP as well as compared to the 2018 study

Research question 1.
Comparison study
What is the current household income of Fairtrade farmers in Côte d'Ivoire ?
How do these results compare to the previous study?

Based on this study, the average annual household income of Ivorian cocoa farmers is $4,937. The median annual household income is $3,186 per household. The average (and median) annual household income of cocoa farmers in Côte d'Ivoire has increased when comparing results from this study with the results of the previous study.

This appears to be driven by an increase in the cocoa yield of the sampled farmers, and therefore an increase in cocoa production, an increase in the diversification of income sources through higher in-kind income and production of other goods. Off-farm income has also increased. Costs have remained relatively similar, with labour costs accounting for the majority of the production costs.

85% of farmers earn below the living income. In the previous study, only 7% of the sampled farmers were earning a living income. While positive developments can be noted, it is important not to draw too optimistic conclusions since sampling differences could be a key driver of the differences.

Research question 2.
Fairtrade price mechanisms
What is the current household income of Fairtrade farmers in Côte d'Ivoire ?
What is the effect of FT price mechanisms on farmer income, and in particular of the FMP differential payments performed in the 2019/2020 harvest?

Based on this study, the average annual household income of Ivorian cocoa farmers is $4,080. The median annual household income is $2,740 per household. This implies that the majority of farmers earn less than the average income. 88% of farmers earn below the living income.

The data collection regarding the FMP differential payment was complicated by the fact that some farmers did not report correctly whether they had received it. Nevertheless, farmer household income was assessed under three different scenarios. An improvement in average farmer household income was noted as the number of farmers who receive the FMP increased.

The Fairtrade price mechanisms in place are compared to the Fairtrade Living Income Reference Price. While some farmers do not meet the productivity benchmarks used to calculate the Living Income Reference Price, implementing this as farm-gate price will alleviate farmers out of poverty. When adjusting the revenue and costs from cocoa using the benchmark yield for the Living Income Reference Price, significant improvement can be seen.

RECOMMENDATIONS

Diversification strategies, premiums and trainings can drive further improvements in farmer household income

- **Diversification**. Farmer income diversification strategies seem to contribute to farmer household income. Farmer household income has increased significantly partly due to increased sales and consumption of other goods. Continue, and improve where possible, the initiatives that stimulate product diversification.

- **Rehabilitation**. It appears farmers have benefited from rehabilitating their farms and rejuvenating their cocoa trees. This should be encouraged as younger trees enable higher yields.

- **Cocoa prices**. The Fairtrade Minimum Price has acted as a safety net during the cocoa season at hand in this study. Moving towards a living income reference price can further improve the cocoa revenue of farmers. Additionally, supporting financial literacy can improve farmers' understanding of the various payments they receive and how they can use these payments in productive ways. Clarity on what the payments are and why they are being paid would improve farmers' understanding of the benefits of Fairtrade.

- **Fairtrade premiums**. The results of this study hint that Ivorian cocoa farmers are not directly reliant on the payment of Fairtrade premiums for their financial farm income. It would be interesting to understand how the premium does impact farmers and what form is perceived to be most effective.

- **Training**. Obtain more knowledge on trainings and how effective they are at conveying information to farmers. This study's results show weak but positive correlation between the various trainings provided by Fairtrade and the cocoa yield of farmers.

- **Distribution policies.** Depending on the goal of the FMP differential payments, Fairtrade can steer its cooperatives towards distribution policies that are more or less incentivizing, or more or less poverty alleviating.

- **Create a roadmap.** Towards a successful living income strategy, it can be useful to create a roadmap of the steps required to achieve the goal, whether it is about lifting farmers out of poverty or setting the price to a living income reference price.

APPENDIX

06

APPENDIX | CONTENTS

ADDITIONAL ANALYSES RQ1

Additional analyses were performed for research question 1. These include the calculation of median household income and the distribution of farmer household income per person per day.

A1

RESULTS | FARMER HOUSEHOLD INCOME

The median household income is 3,186 USD per household

- The household income is not sufficient to make the living income. The median farmer earns 43% of a living income.
- Cocoa is the main source of income: 63% of farmer income stems from the profit on cocoa
- The median household makes 1% of their income from selling other goods, whereas in-kind income and off-farm income account respectively for 3% and 0% of total household income

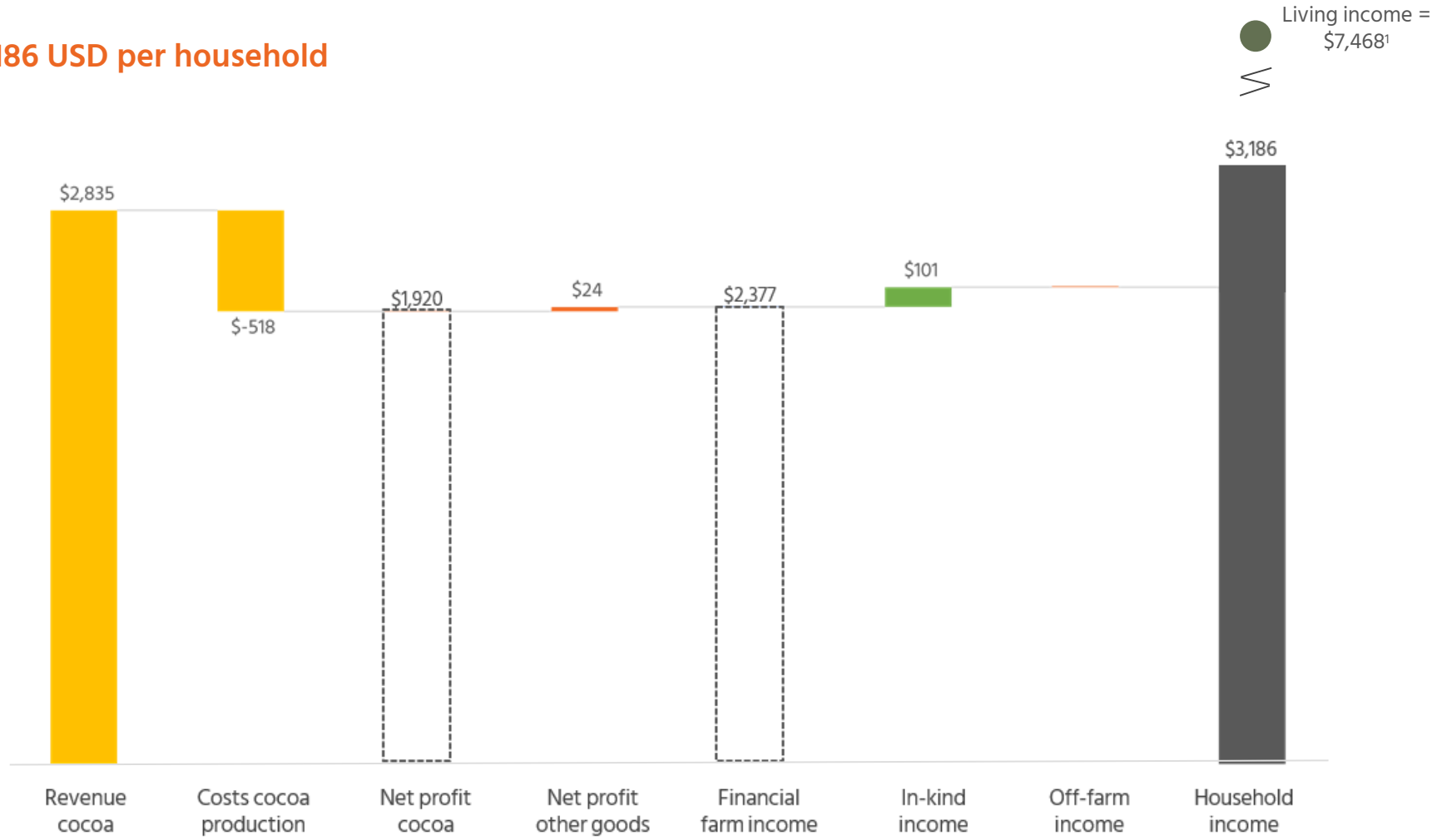
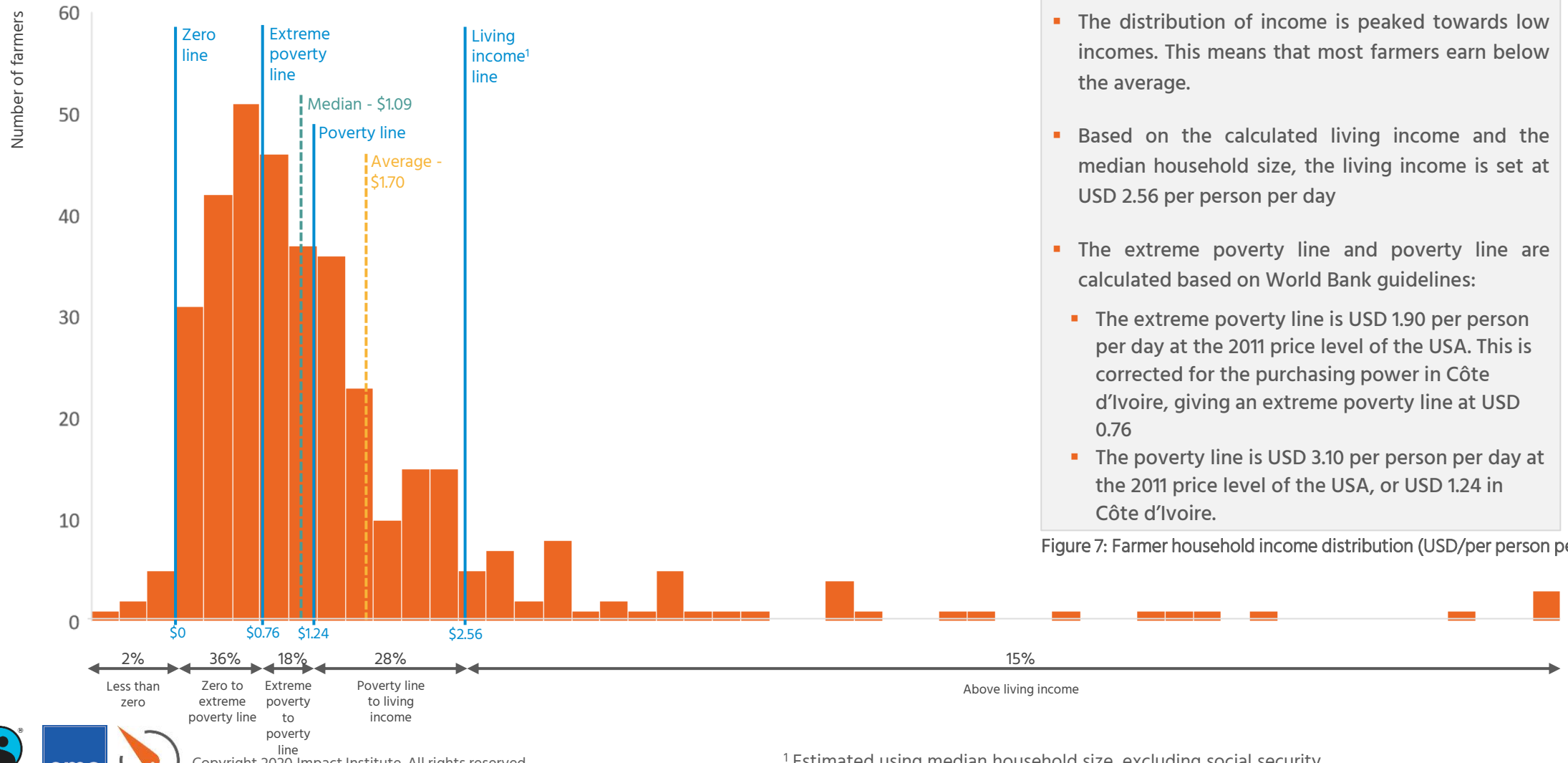


Figure 3: Median farmer household income (USD/year)

[1] Estimated using median household size, excluding social security

RESULTS | INCOME DISTRIBUTION PER PERSON

87% of farmers earns less than the daily amount needed for a living income



Key insights:

- The distribution of income is peaked towards low incomes. This means that most farmers earn below the average.
- Based on the calculated living income and the median household size, the living income is set at USD 2.56 per person per day
- The extreme poverty line and poverty line are calculated based on World Bank guidelines:
  - The extreme poverty line is USD 1.90 per person per day at the 2011 price level of the USA. This is corrected for the purchasing power in Côte d'Ivoire, giving an extreme poverty line at USD 0.76
  - The poverty line is USD 3.10 per person per day at the 2011 price level of the USA, or USD 1.24 in Côte d'Ivoire.

Figure 7: Farmer household income distribution (USD/per person per day)

[1] Estimated using median household size, excluding social security

ADDITIONAL ANALYSES RQ2

Additional analyses were performed for research question 2. These include the calculation of median household income and the distribution of farmer household income per person per day.

Further, regression analysis was performed to assess the effect of FMP differential payments. The distribution polices of cooperatives are also assessed under different scenarios.

A2

RESULTS | FARMER HOUSEHOLD INCOME

The median household income is 2,740 USD per household

- The household income is not sufficient to make the living income. The median farmer earns 37% of a living income.
- Cocoa is the main source of income: 60% of farmer income stems from the profit on cocoa
- The median household makes 1.5% of their income from selling other goods, whereas in-kind income and off-farm income account respectively for 3.5% and 0% of total household income

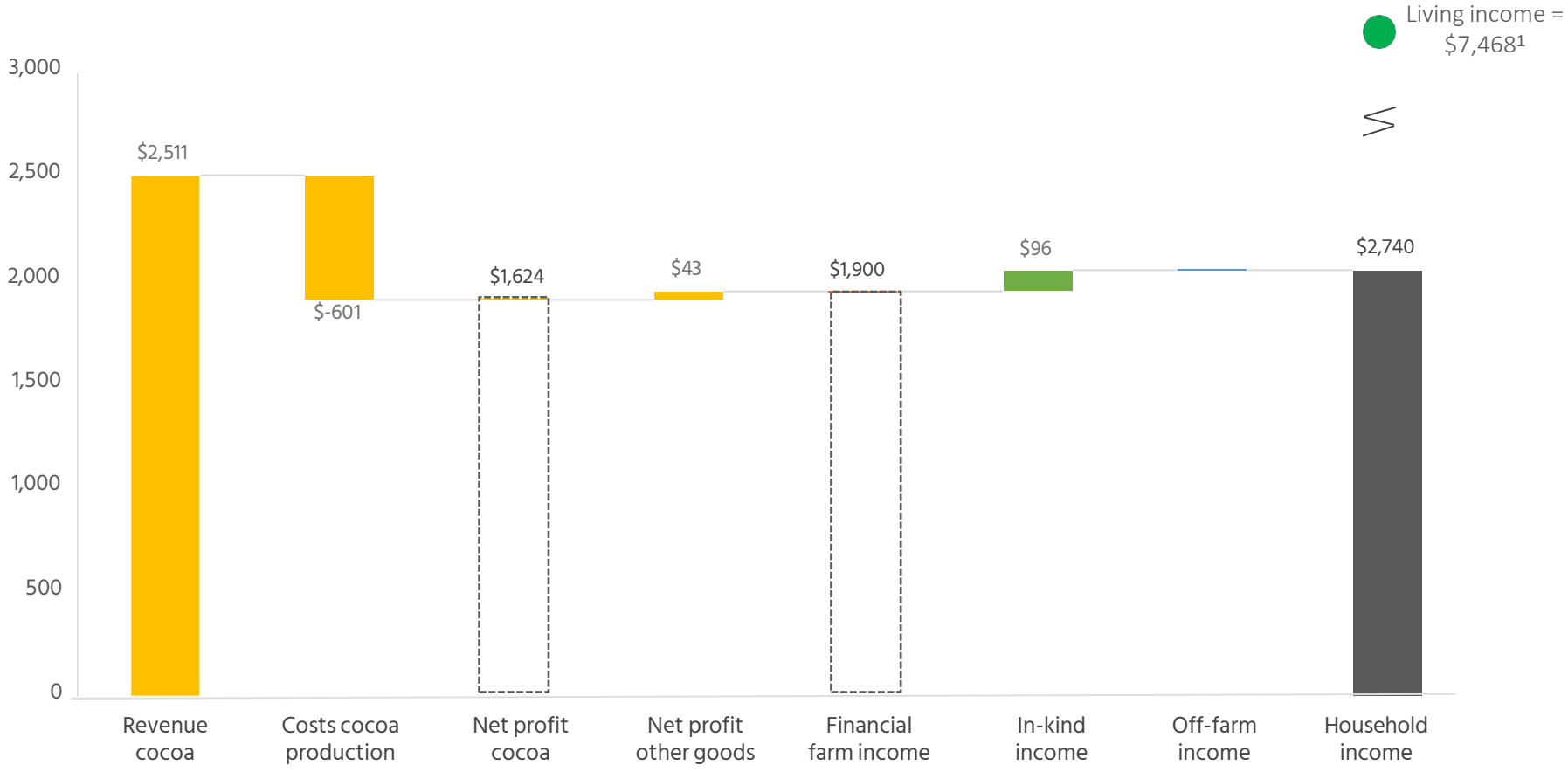
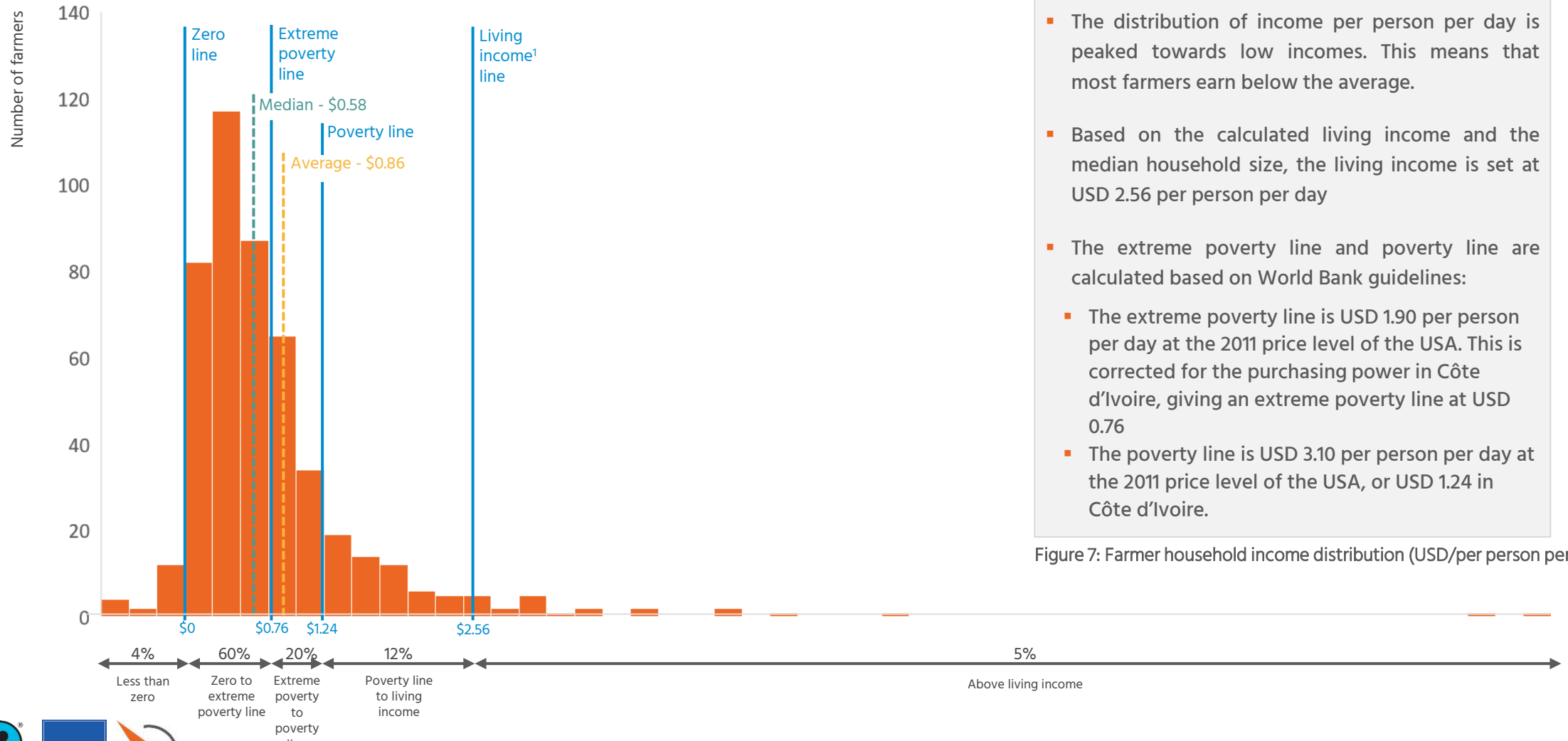


Figure 3: Median farmer household income (USD/year)

[1] Estimated using median household size, excluding social security

RESULTS | INCOME DISTRIBUTION PER PERSON

95% of farmers earns less than the daily amount needed for a living income



Key insights:

- The distribution of income per person per day is peaked towards low incomes. This means that most farmers earn below the average.
- Based on the calculated living income and the median household size, the living income is set at USD 2.56 per person per day
- The extreme poverty line and poverty line are calculated based on World Bank guidelines:
  - The extreme poverty line is USD 1.90 per person per day at the 2011 price level of the USA. This is corrected for the purchasing power in Côte d'Ivoire, giving an extreme poverty line at USD 0.76
  - The poverty line is USD 3.10 per person per day at the 2011 price level of the USA, or USD 1.24 in Côte d'Ivoire.

Figure 7: Farmer household income distribution (USD/per person per day)

[1] Estimated using median household size, excluding social security

RESULTS | FAIRTRADE PRICE MECHANISMS

FMP received potentially contributes to closing the living income gap

- The table on the right presents the results of a regression to get better insight into what variables have an effect, either positive or negative, on the living income gap. The variable living income gap is therefore the dependent variable.
- The results show that only the relationship between production in kgs and the living income gap is found to be significant. The regression coefficient of -1.380 indicates that the more a farmer produces, the smaller the living income gap becomes.
- The relationship between the receipt of the FMP and the living income gap was also found to be negative, yet just insignificant (at p <0.10)[1]. This means that the living income gap of farmers who have received the FMP is smaller than the ones who did not receive this. Even though it cannot be said with certainty, the payment of the FMP seems to have a direct positive effect on farmer income, moving it closer to a living income.
- For the rest of the variables, there is insufficient evidence to conclude that there is effect at the population level since all p-values are insignificant.

Variable	Coefficient (Standard error)	P-value
(Constant)	5763.530 (1969.251)	0.004
Farmer age	19.342 (34..159)	0.572
Yield (kg/ha)	0.975 (1.017)	0.338
Production in kg's (main + mid season)	-1.380 (0.167)	0.000
Costs per kg	1.504 (0.962)	0.119
FT Sales volume	100.37 (1616.834)	0.951
FMP Received (1 = Yes, 0 = No)	-1198.64 (733.591)	0.103
FMP Distribution dummy[1] (1 = Yes, 0 = No)	628.955 (785.075)	0.423
FMP Distribution dummy[2] (1 = Yes, 0 = No)	-240.302 (1661.817)	0.885
R-squared[3]	0,202	

Table 6: Regression results with living income gap as dependent variable

[1] Represents the distribution policy in which all Fairtrade farmers receive an equal FMP

[2] Represents the distribution policy in which all farmers receive an equal FMP

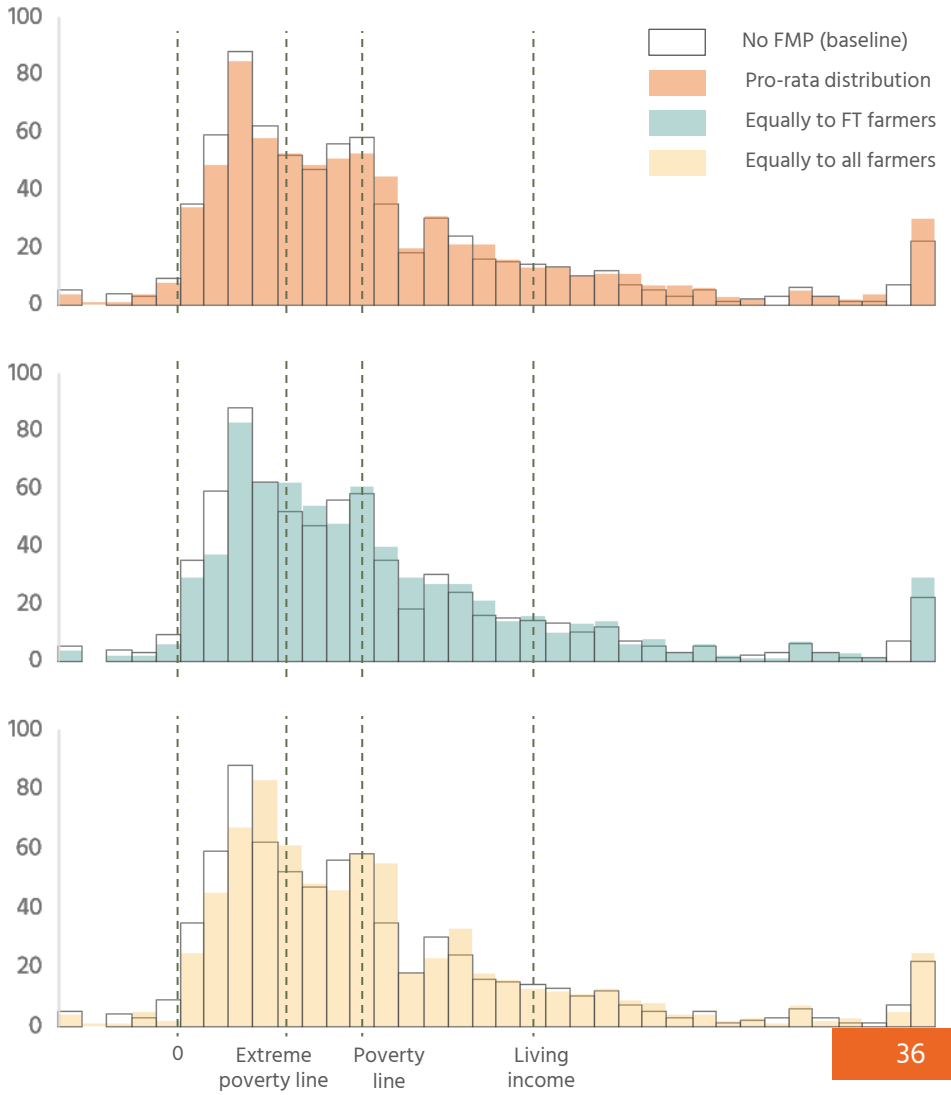
[3] R-squared is a statistical measure of how well the data fits the model

[1] It should be noted that cocoa, on average, only makes up 58% of the income. There are many intervening variables of other income sources and their potential shifts during the past years for which this model does not control

RESULTS | FAIRTRADE PRICE MECHANISMS

A pro-rata distribution policy is incentivizing, while an equal distribution policy helps to alleviate more farmers from poverty

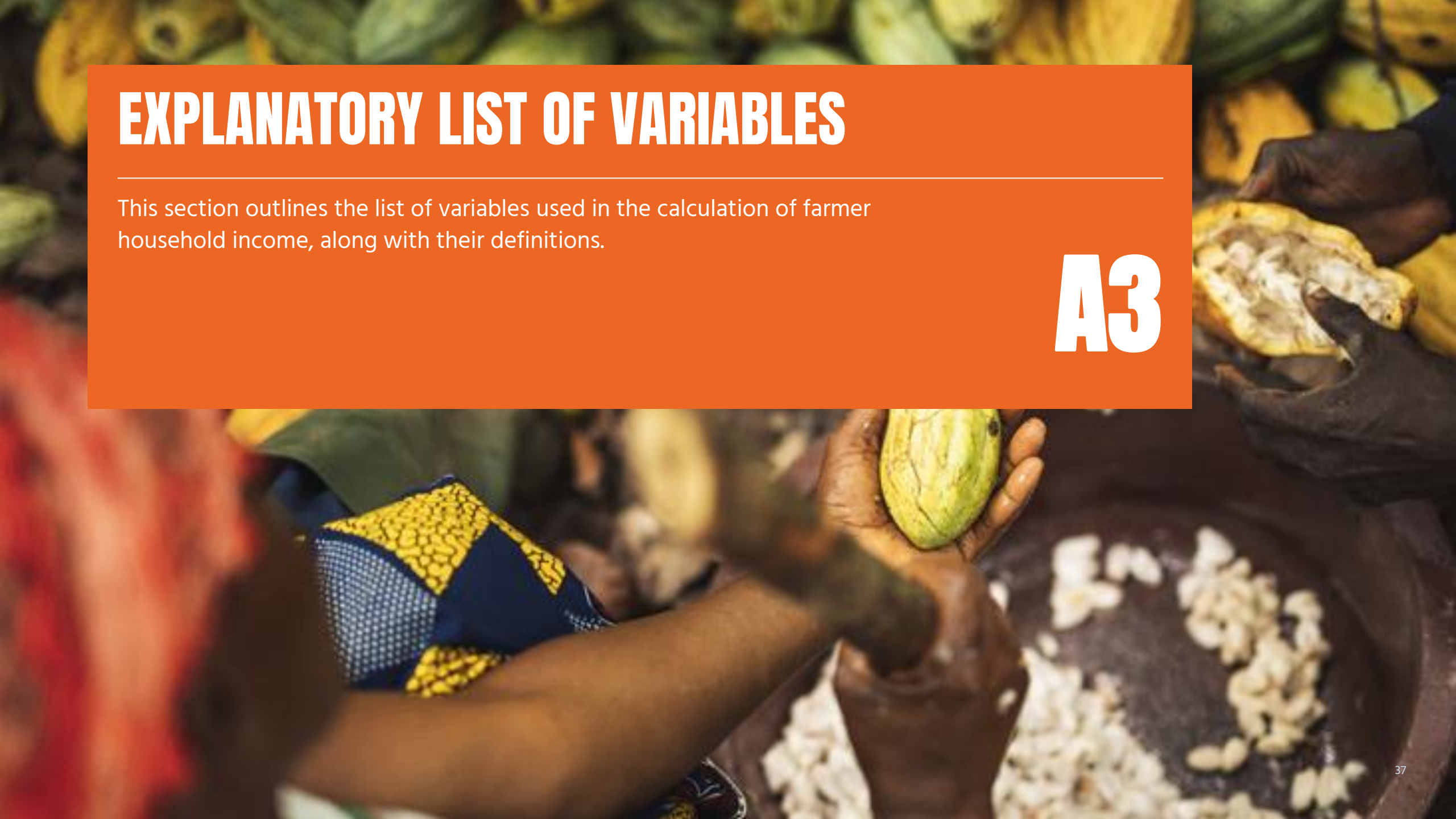
- In the scenario definitions, the pro-rata distribution policy is used as the ideal distribution policy for feasibility purposes. However, there is a possibility that the ideal distribution policy is different depending on the goal of the FMP.
- In the graphs on the right, the different household income distributions under each FMP distribution policy are presented.
  - The baseline graph uses the farmer income distribution assuming there had been no FMP differential payment. The other graphs are overlayed on top of the baseline graph to show the impact of each distribution policy when compared to the baseline.
- Pro-rata distribution of the FMP has the lowest effect on the farmers earning negative income and the biggest improvement can be observed for farmers earning above the living income.
  - A pro-rata distribution policy is expected to be incentivizing for low earners and will pull the higher income earners who already produce a lot of cocoa up.
  - The share of farmers earning the living income below decreases slightly, while the share of farmers earning above the living income increases significantly.
- Distributing the FMP equally to all farmers and to all Fairtrade farmers have similar effects on poverty alleviation. The share of farmers in extreme poverty decreases while the share of farmers earning above the poverty line increases.
  - Equal distribution to all farmers will alleviate farmers with lower sales and farmers who cannot afford to be certified from poverty.
  - The share of farmers earning above the living income increases slightly, but the biggest differences can be observed for relatively poorer farmers. The decrease in the share of farmers earning below 0 is more important. A similar observation can be drawn for farmers earning below the extreme poverty line.



EXPLANATORY LIST OF VARIABLES

This section outlines the list of variables used in the calculation of farmer household income, along with their definitions.

A3



3. EXPLANATORY LIST OF VARIABLES AND CONCEPTS

Variable	Definition
Financial farm income	Financial income from the household's farm(s)
Net profit other goods	Revenues of goods besides cocoa that are sold for cash minus the extra costs of these other products (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 cocoa 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
Interest	Interest costs on outstanding loans
Taxes	Government taxes
Subsidies	Subsidies in cash received from the SPO or other parties
Revenue cocoa	Financial revenues of cocoa sold for cash
COGS (costs of goods sold) cocoa	Operational costs of cocoa including input costs and hired labour costs; all costs from cocoa crop management, cocoa processing, cocoa packing, and storage and cocoa transport
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
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
Rental income	Income from rental of land, house, vehicle or other property owned by the household
Other income and remittances	Money or checks received from non-household members, either family or not family (usually internationally), or any other not farm related income source that was not earned from a job or rent

3. EXPLANATORY LIST OF VARIABLES AND CONCEPTS

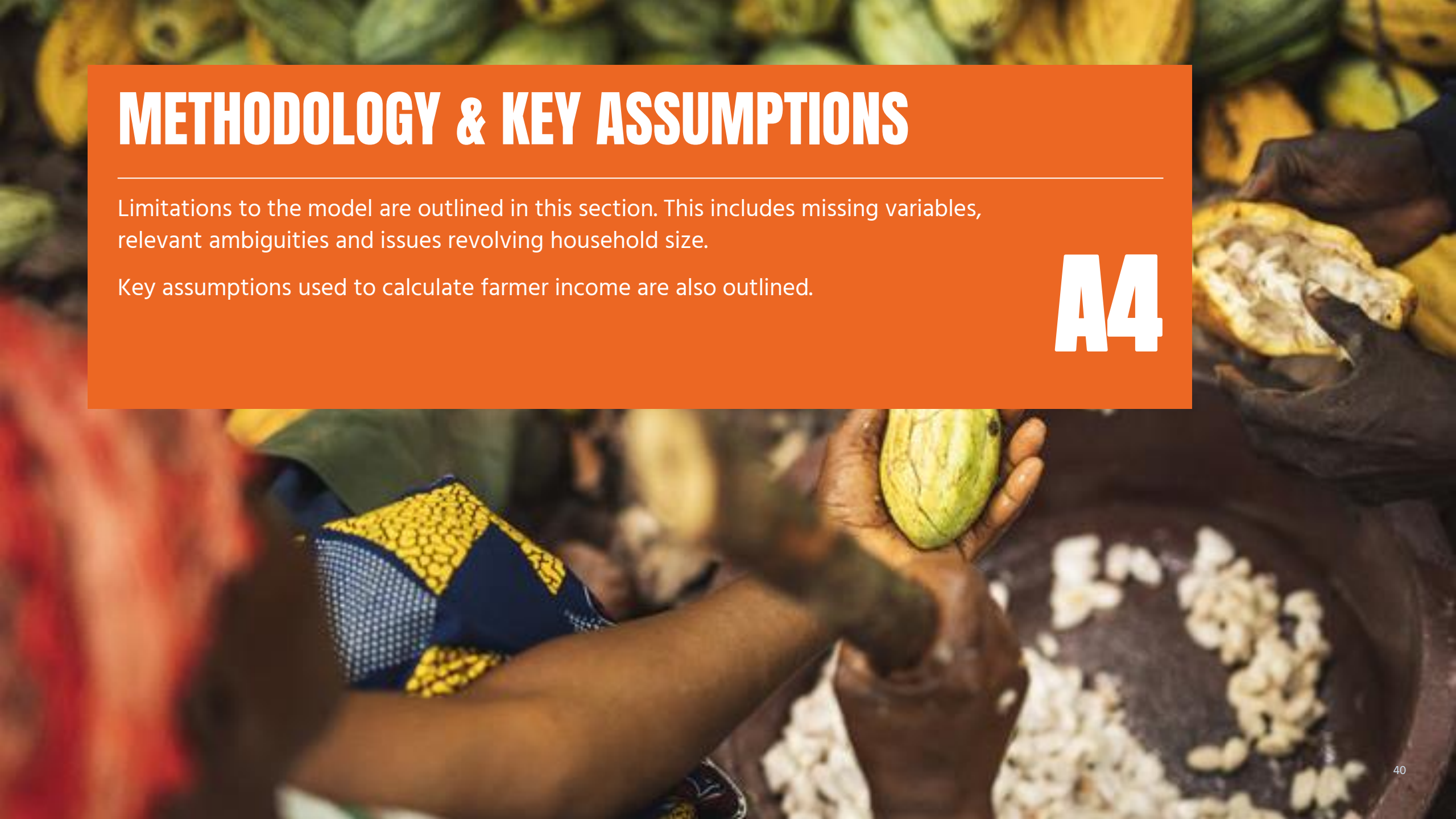
Concept	Definition
LI Reference Price	Fairtrade Living Income Reference Price
	The LI Reference Price indicates the price needed for an average farmer household with a viable farm size and an adequate productivity level to make a living income from the sales of their crop.
FMP	Fairtrade Minimum Price
	The FMP is the minimum price that must be paid by buyers to producers for a product to become certified against the Fairtrade Standards. The FMP is a floor price which covers producers' average costs of production and allows them access to their product markets. The FMP represents a formal safety net that protects producers from being forced to sell their products at a too low price when the market price is below the FMP. It is therefore the lowest possible price that the Fairtrade payer may pay to the producer.
FMP Differential payment	Fairtrade Minimum Price Differential Payment
	The Fairtrade Standard for Cocoa requires traders to pay a price differential for Fairtrade cocoa beans if the reference price in Ivory Coast falls below the Fairtrade Minimum Price.
Fairtrade Premium	Fairtrade Premium
	The Fairtrade Premium is an extra sum of money paid on top of the selling price that farmers or workers invest in projects of their choice. They decide together and democratically how to spend the Fairtrade Premium to reach their goals, such as improving their farming, businesses, or health and education in their community.

METHODOLOGY & KEY ASSUMPTIONS

Limitations to the model are outlined in this section. This includes missing variables, relevant ambiguities and issues revolving household size.

Key assumptions used to calculate farmer income are also outlined.

A4



3. METHODOLOGY & KEY ASSUMPTIONS | MISSING VARIABLES

The elaborate questionnaire enabled detailed calculation, but some variables are missing and there are some ambiguities

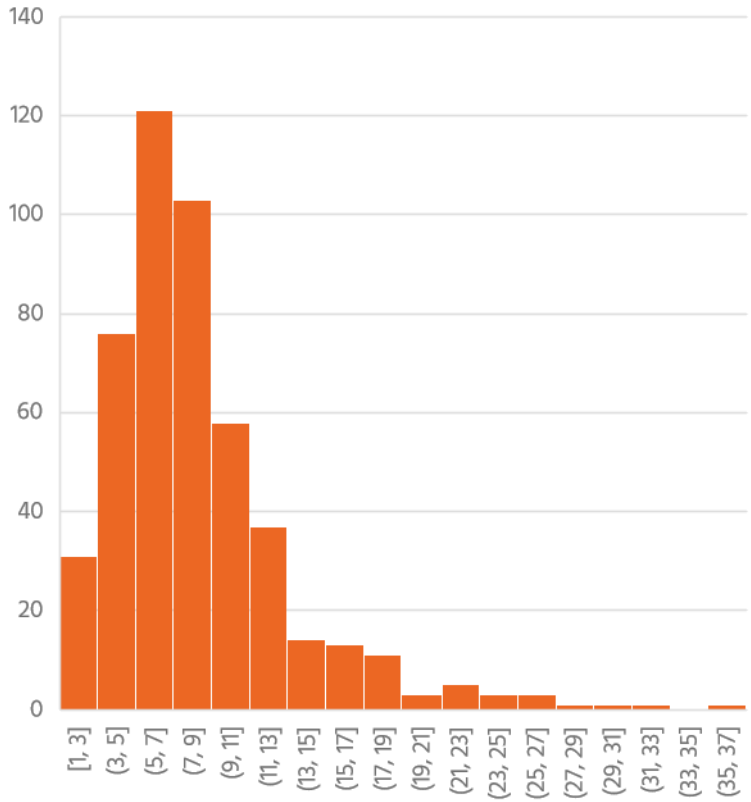
Potentially relevant missing variables
1. Water costs
2. Taxes
3. (In-kind) contribution SPOs
4. In-kind payment of hired labour
5. Duration of the harvest season (this is asked per SPO, but individual farmers might a different harvest season duration).

Relevant ambiguities
1. Land costs are not specified to refer to purchase or rent. For some farmers these can be very high. Do they represent one-off costs?
2. Farmers indicate how many months a year they worked (for the other activities next to farming). However, when a 'weekly' or 'daily' pay rate is selected, the questionnaire is unclear on how many days or weeks were actually worked.
3. Field interviews were not possible. It was not possible to check the number of cocoa trees or the size of the farm as reported by the farmers.
4. Regarding off-farm labour for other family members, it is unclear how the farmers have answered the questions on how many days they have worked off-farm and how much money they have received for that work.

3. METHODOLOGY & KEY ASSUMPTIONS | HOUSEHOLD SIZE

Some farmers report household sizes up to 36 people

- The questionnaire includes a question on household size ("Total number of household members, not including farmer"). Some farmers have filled in very large numbers – values up to 36 have been recorded (see figure). This might correspond to genuinely large households, but alternatively, this number might include relatives not living in the household.
- The effect of the very large families is 'countered' by using the median instead of the average family size in comparisons. The median family size with 8 people ~11% lower than the average. These very large household sizes are likely not realistic. However, it is preferable not to use a 'hard' cut-off, as all choices (16?, 20?, 25?) are arbitrary.
- The main effect of the very large households, is that they drive up the average family size. The average family in the sample consists of 9 people.
- Note that the family size does not directly affect the farmer household income. However, the household income needs to be compared to the (extreme) poverty line and living income based on larger families.



3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Key assumptions were made in order to calculate farmer income

Building block	Calculation
Revenue cocoa	Calculated as the sum of sales to different buyers plus FMP differential plus bonus. Cocoa sales are calculated for each buyer (cooperative, other cooperative, exporter/trader, private company or individual, other) by multiplying the volume sold.
Constituent of building block	**Assumption**
Volume of cocoa sold (for each buyer)	We test on the sum of all volumes sold versus the total volume produced: for most farmers, these are (almost equal). Farmers for which the sum of all sales is much smaller than the cocoa produced (less than 50%), we use the following assumptions: 1) the amount sold is assumed to be the full amount produced. 2) all cocoa is assumed to be sold to the cooperative. Note also that we have omitted a number of farmers that have given strongly incoherent answers. See data processing protocol for more on omitted entries.
Fairtrade minimum price differential received	Some farmers have replied they have not received a FMP differential. As discussed with Fairtrade, farmers should have received the differential but have not reported it for a variety of possible reasons. Because of the different distribution policies of cooperatives, it is difficult to make an accurate estimate of how much each farmer should have received. The data is therefore treated as reported by the farmers.

3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Key assumptions were made in order to calculate farmer income

Building block	Calculation
Cost of goods sold (COGS) cocoa	Calculated as the sum over hired labour, land costs, input costs, fixed costs and other costs. It is calculated by multiplying the number of people hired in each category (permanent vs. temporary), with the days worked by them, with their daily pay rate and then summing over all categories. Input costs are calculated as the sum over 'fertilizer costs', 'pest management costs', 'transport costs' and the product of 'seedlings purchased' with 'seedling costs'. Fixed costs consist of 'machete', 'machete file', 'tarpaulin', 'pick', 'basket', 'rope', 'axe', 'pruner', 'bag', 'boots', 'bucket', 'fuel' and 'other'. It is calculated by taking the sum over the amount of these items times their respective costs. Expenses on these items are treated as a cost in the year that they occur, not depreciated over the lifetime. Other costs consists only of training costs.
Constituent of building block	**Assumption**
Hired labour – people hired, days worked and pay rate	The normal rules for overwriting empty cells and cells containing "Non-applicable", can be overruled. This happens when one or two out of the three factors (people hired, days worked and daily pay rate) have a positive value, while the other(s) are not filled in (or are 0 or "Not Applicable"). In that case, the missing elements are replaced by their respective medians. For example: a farmer does not fill in the number of people hired but gives values for days worked and the daily pay rate. The number of people hired is replaced by the median, instead of by 0 (as would happen under the regular replacement rules). We have checked that this procedure does not have a large influence on the results.
Hired labour – days worked (seasonal)	Responses above 7 days per week were replaced with the median of the responses below or equal to 7 days per week.
Input costs	If seedling costs are bigger than thousand, it is likely to refer to the total costs of all seedlings, not the average costs per seedling. Seedling costs smaller than 10 XOF per seedling are unrealistic and are replaced by the median. Water costs are not included in the questionnaire and are assumed to have a negligible effect on the input costs. This hypothesis needs further research.

3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Building block	Calculation
Interest	Calculated as a percentage of revenue.
Constituent of building block	**Assumption**
Interest	Assumed to be 2.4% of the cocoa revenue (based on two other studies, previously done by True Price).

Building block	Calculation
Taxes	Calculated as a percentage of revenue.
Constituent of building block	**Assumption**
Taxes	Our understanding is that the farmers are theoretically obliged to pay this but are not doing so in practice. Tax burden is not included in the questionnaire and is assumed to be zero.

Building block	Calculation
Subsidies	Calculated as a percentage of revenue.
Constituent of building block	**Assumption**
Subsidies	Assumed to be 1% of the cocoa revenue (based on the coffee project, previously done together by Fairtrade & True Price).

Building block	Calculation
Net investment outlays	Out-of-scope

3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Building block	Calculation
Net profit other goods	Calculated as the sum over profits from each crop and each form of cattle. The crops consist of cassave, maize, plantain, yam, fruits, vegetables, rubber, cashew and palm. The cattle consists of chicken, sheep, cow, pig and goat. The profit of each category is calculated by taking the value (revenue) in that category and substracting some of the costs made to grow that crop or breed that type of cattle. The questionnaire reports the total costs per type. Some of these can be attributed to the commercial activities, the remainder to the own consumption (see below). We calculate the share of costs relevant to commercial activities by multiplying total costs by portion that is sold (instead of consumed in the household). When that portion could not be properly calculated from the given data, the full costs of production are assigned to the commercial activities. As a formula: profit = value - (total cost of production)*(volume sold/volume produced)
Constituent of building block	**Assumption**
Crops – total volume sold	It is assumed that all volume not sold is consumed by the household.
Crops – total volume produced	No additional assumptions.
Crops – cost of production	No additional assumptions.
Crops – value	No additional assumptions.
Cattle – number sold	It is assumed that all volume not sold is consumed by the household.
Cattle – number raised	One farmer had reported to raise 30,000 chickens, far above the median of the sample. The value is replaced with the median.
Cattle – cost of production	No additional assumptions.
Cattle – value	No additional assumptions.

3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Building block	Calculation
In-kind contributions cooperatives	Calculated as a percentage of revenue.
Constituents of building block	**Assumption**
In-kind contributions cooperatives	Assumed to be 1.1% of the cocoa revenue (based on the coffee project, done together by Fairtrade and True Price).

Building block	Calculation
Other income & remittances	Consists of remittances from friends or relatives, gift money to pay for health or education, or any other money not earned from a job or rent.
Constituents of building block	**Assumption**
Other sources of income	No additional assumptions.

Building block	Calculation
Exchanged goods received	Consists of produce exchanged for land.
Constituents of building block	**Assumption**
Produce exchanged for land	No additional assumptions.

Building block	Calculation
Rental income	Summation over house, vehicle and other sources of rental income.
Constituents of building block	**Assumption**
Land, house, vehicle and other rental income	No additional assumptions.

3. METHODOLOGY & KEY ASSUMPTIONS | FARMER INCOME

Building block	Calculation
Wage income	Calculated as the summation over the incomes of the different types of work. For each type of work, the income is calculated as the income per unit time, multiplied, when relevant, by the number of months worked. The other sources of work consist of other agricultural work, construction work, domestic labour, public service, wood charcoal, palm wine and other work.
Constituents of building block	**Assumption**
Other sources of work – months worked	No additional assumptions.
Other sources of work – income	No additional assumptions.
Other sources of work – rate basis	If the rate basis is "Annually", then the 'income' is directly used. If the rate basis is "Monthly", then the income per month is multiplied by the number of months worked. If the rate basis is "Daily" or "Weekly", the income is still multiplied by the number of months worked. This is because the weeks or days worked per month are not known. In addition, this approach gives roughly equal contributions for the different rate bases. Multiplying with the number of days or weeks in a month, gives results that are out of line with the other entries. When the rate basis is "Does not know", "Refuse to answer" or "Not Applicable", but the income has a positive value, the rate base is either changed to "Annually", or to "Monthly". When the income is larger than ten times the average of all the incomes that have a pay rate category of "Monthly", the rate basis is changed to "Annually", otherwise "Monthly" is used.

3. METHODOLOGY & KEY ASSUMPTIONS | OTHER

Key assumptions were made in order to calculate farmer income

Element	Assumption
Poverty line & extreme poverty line	Extreme poverty line and poverty line are taken from the World Bank to be $1.90 and $3.10 respectively. This needs to be corrected for purchasing power parity (PPP), which has a value of approximately 2.4 for Côte d'Ivoire. After this correction the extreme poverty line and the poverty line become $0.78 and $1.27 respectively.
FTE calculation	Data about days entitled to paid leave, official public holidays, working days per week and hours per working week of Côte d'Ivoire were found at the database of the International Labour Organization (ILO). For full-time employment expressed in days, the year was corrected for the holidays, the weekends and the paid leaves. For full-time employement expressed in hours, this number was multiplied by the number of working hours per day. From the data, the amount of hours or days worked by the farmers, the household and the hired labour could be calculated, from which their respective amount of FTE's followed. For this calculation, the duration of the harvest season of the relevant cooperative per farmer was taken from the questionnaire of the cooperatives.
Household size	The sum of adults, children and babies is taken as the household size, rather than the answer provided by the farmer to the question: what is your household size?
Cocoa trees	A large number of farmers have not reported their number of cocoa trees. The 'do not know' values are replaced by the median of trees per hectare multiplied by the cocoa area of that farmer.

LIST OF REFERENCES

List of sources used in the report and modelling of farmer household income.

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4. LIST OF REFERENCES

Author (Year)	Title
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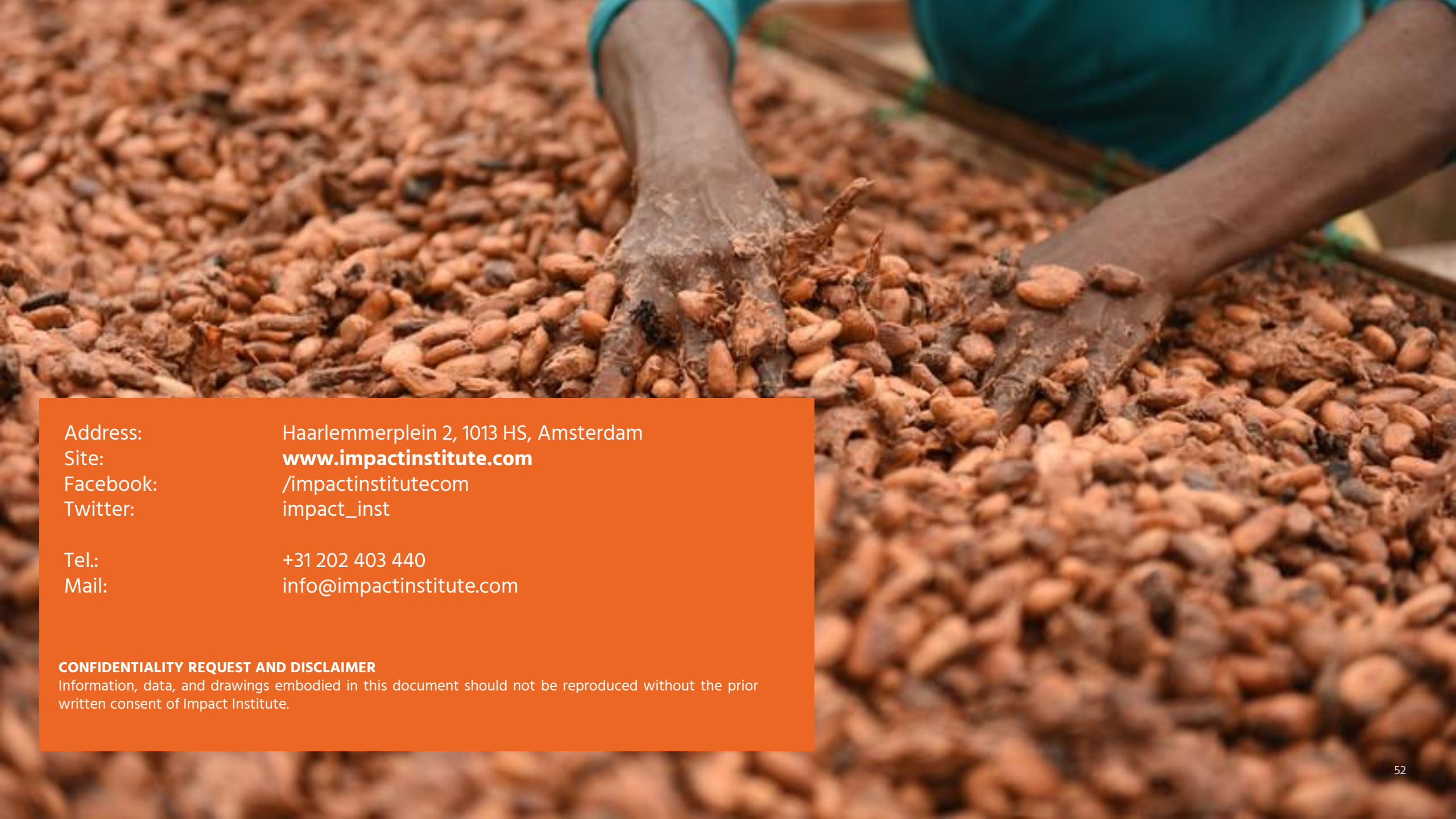

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