



COCOA FARMERS IN POVERTY TRAP

Productivity and field size increases might
worsen the situation

FRIEDEL HÜTZ-ADAMS

The discussion around the potential of supporting West African cocoa farmers out of poverty has been ongoing for years. Companies have typically focused on the argument that farmers have to do more and do things better. They claim that farmers should apply good agricultural practices in order to improve productivity, diversify their farms, plant trees (“agroforestry”), increase their farm size, et cetera. If this is still not sufficient, farmers, especially women, should become members of saving unions and use the money to invest. Meanwhile, the situation on the ground has not changed much. Many farmers remain poor, their children are often forced to work, and many families struggle to afford three sufficient meals per day. Over the last two years, the situation has worsened due to the price increase of many goods, initially incited by the Covid crisis and becoming much worse after the Russian attack on Ukraine.

At a workshop in Kumasi (Ghana) that took place at the beginning of November 2022, four working groups of farmers and farmer representatives agreed, separately from one another, on the one most important aspect necessary to improve the situation: price for cocoa has to rise. However, this is not happening. In fact, over the last decades, inflation-adjusted prices have even decreased significantly.

Circling back to what most companies see as a solution for the poverty trap, it has to be stated that many of the assumptions of the sector are not based on publicly available data. Impact assessments of projects are also rare. The following figures were partly collected in the research for the Cocoa Barometer 2022. The calculations based on these figures use assumptions. Many data come from conversations with people working on

the ground for companies and NGOs. The aim of the paper is to provoke a reaction. The hope is to incite companies, research institutions and NGOs working with farmers to start publishing the data they collect on the daily life of farmers. If the following arguments within the paper are wrong, this should be proven with data and facts.

1 ASSUMPTION FOR YIELD, FARM SIZE AND LABOUR DAYS

YIELDS PER HECTARE

For more than a decade, companies have repeatedly stressed that farmers could easily double or even triple yields per hectare. They have implemented a large number of projects to foster this. Despite these projects, yields are still far away from the projected outcomes and in some regions are even declining.

According to the big cocoa grinders and traders, who have polygoned hundreds of thousands of farms in West Africa, the average yield per hectare in Côte d’Ivoire remains low at 521 kg per hectare and for Ghana the figure is 534 kg. Surprisingly, the three chocolate companies who delivered figures say that their farmers had significantly higher yields, 601 kg per hectare in Côte d’Ivoire and 614 kg in Ghana. Based on these figures, the average yield for both Côte d’Ivoire and Ghana is 550 kg per hectare.

TABLE 1: YIELD PER HECTARE IN KG

TRADER/ GRINDER	CDI	GHANA	CAMERO ON	NIGERIA	ECUA- DOR	SAO TOMÉ	INDONE- SIA
1	604	788		467			
2	341	420					
3	571	564	594				
4	525	665					750
5	550	450		500			
6	510	434					
7	567	420		407			
8	500				400	300	
Average	521	534					
Chocolate producer							
1	617	739					500
2	635	464			657		
3	550	640					
Average	601	614					
Average all	543	558	594	458	529	300	625

Source: Fountain/Hütz-Adams 2022

HOW BIG ARE THE FARMS?

As already reported in the Cocoa Barometer 2020 (Fountain/Hütz-Adams 2020), most figures on average farm size in older studies might be inaccurate. These studies relied on

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figures collected from farmers who most certainly often overestimated the size of the fields.

During the last years, hundreds of thousands of farms were located by GPS and then the size of the cultivated areas were polygoned. Most companies shared the available data in their answers on the questionnaire for the Cocoa Barometer 2022. The results are striking for two reasons. First of all, average farm size might not only be significantly smaller than reported in older studies. Secondly, there exists a large discrepancy between farm sizes reported by traders/grinders and figures coming from chocolate companies.

According to data from nine traders and grinders, the average farm size in Côte d'Ivoire is 3.02 ha. Additionally, three chocolate producers report an average farm size of 3.7 ha. The discrepancies are even bigger for Ghana. According to data coming from eight traders and grinders, the average farm size is 2 ha, while three chocolate companies report an average of 3.1 ha.

In the following calculations, the figures reported by traders and grinders are used as companies have very big samples which include many farms in remote areas and potentially not part of farmer support projects of chocolate companies. For the other major cocoa producing countries, only very few data exist which makes it impossible to calculate a reliable average. These averages might be misleading for two reasons. First of all, a significant spread in the data on farm sizes was reported. The lowest figure from one company, which mapped a huge number of farms in Ghana, was 1,3 ha per family. The highest number for the same country of another company was 3,5 ha. Nonetheless, one striking fact is that most of the big cocoa trading companies report average farm sizes for Ghana which are (partly far) below 2 ha. For Côte d'Ivoire, the differences between the figures revealed by the different companies are not that significant (Table 2). Only very few companies also reported figures of the median size of the farm. All these four figures (two for Ghana, two for Côte d'Ivoire) are roughly 0.5 ha lower than the data for mean farm size.

TABLE 2: FARM SIZE IN HECTARE

FARM SIZE							
TRADER/GRINDER	CDI	GHANA	CAMEROON	NIGERIA	ECUADOR	SAO TOMÉ	INDONESIA
1	3,75	1,92					
2	2,92	1,71	3,2	2,3			
3	3,3	1,3	3,3				
4	3	2,5					1,4
5	3	2,5		1,5			
6	3,10	1,95					
7	3,1	2,1					
8	2,7	1,8		3,1			
	2,35				5	2	
Average	3,02	1,97					
Chocolate producer							
1	3,3	3,5					1,5
2	4,2	3,3					
3	3,7	2,5			6,5		
Average	3,7	3,1					

Source: Fountain/Hütz-Adams 2022

LABOUR

There are still no reliable data on labour input per hectare available. Compared to 2019, even less companies reported figures. The spread of the numbers for cocoa grown in a system with low productivity is between 25 days per hectare/per year and 85 days per hectare/per year. The figures for plantations where good agricultural practices are applied vary from 65 to 130 days. One company reported that for highly intensive cocoa production with best agricultural practices, 287 days per hectare/per year need to be invested (additionally see for example ICI 2016: 40; Kolavalli/Vigneri 2017: 20; Agrilogic 2017: 18).¹

DEFINITIONS OF LANGUAGE NECESSARY

The Cocoa Barometer and many other observers of the sector have repeated the same message for a decade now: the industry has not overcome the problems concerning data. Despite knowledge of this problem for at least 15 years, there still exists no defined agreement on how to collect data. Nevertheless, companies should adhere to certain rules during data collection:

- ▶ farm sizes should be polygon mapped and include all cocoa plots of the farmer
- ▶ figures should cover only productive cocoa farms, not diseased or freshly planted areas which are not productive
- ▶ statistics on field sizes should work with means
- ▶ the database should allow to identify regional differences
- ▶ yields should be measured more correctly
- ▶ field tests should identify the workload for different agricultural practices

IT IS NOT ONLY PRICE, BUT...

Prices are not the only factors influencing the well-being and the net income of the cocoa farming family. Other factors include “soft” issues such as education level, health status, access to health services, knowledge about healthy nutrition, potential for off-farm income, but also gender relations, and cultural norms and traditions. On the other hand, “hard” issues include availability of land, land rights, legislation, tax systems, infrastructure, inputs, credit and saving systems, extension services, et cetera. Most of the projects in the cocoa sector focus on interventions to achieve improvements in one or only a few of these factors. Ruerd Ruben summarised the existing problems (see box).² But he also concludes: “A tiny 1 % reduction of the retail share could be translated into a 10 % increase in farmer’s income”.

„The fundamental weakness of most of the current studies that focus on improving the small-holder position in tropical supply chain is that usually much attention is given to socio-economic dimensions (farm size, prices, income) and technical innovations (better inputs, digitalization), thus trying to answer the question: ‘what can be done to improve the cocoa sector?’. There is, however, another far more relevant question that has to be addressed, namely: ‘how to change the dynamics of the cocoa sector?’. The latter question focuses more on the change of behaviour and the improvement of the interactions amongst stakeholders in the cocoa chain.”

–Ruerd Ruben

¹ According to unpublished research commissioned by a company, the number of labour days on cocoa plantations in Côte d’Ivoire depend on agricultural practices:

- very low productivity afford an input of 126 labour days per hectare per year,
- low productivity: 148 days,
- good productivity: 177 days,
- low productivity and 50% of the trees in re-plantation status: 213 days
- low productivity and 100% of the trees in re-plantation status: 233 days.

² <https://www.linkedin.com/pulse/strong-need-improve-cocoa-governance-ruerd-ruben/>

PRODUCTIVITY INCREASE: MASSIVE PRESSURE ON WORLD MARKET PRICE

Calculations show the price risk of farmers. For example, if just 300,000 farmers with an average farm size of 3 hectares increased their productivity from 550 to 800 kg per hectare, 225,000 additional tons of cocoa would enter the market. This would have disastrous consequences on the world market price.

2 THE LABOUR-PRODUCTIVITY-FARM SIZE NEXUS

Unreliable figures on farm size, productivity and labour days per hectare lead to an unsatisfying situation. The whole discussion around income increases through higher productivity, bigger farms, and diversification has no serious scientific base as long as these figures are not available. From the farmer's perspective who is confronted with price volatility and yield risk due to weather, pests, and diseases, investing in good agricultural practices and investing in more labour on its own or hired labour is a very risky approach. Nonetheless, increasing productivity is still at the centre of many projects.

ASSUMPTIONS ON LABOUR, YIELDS, WORKLOAD

The following chapters are based on a calculation which comes, as with all models, with certain preconditions.

ASSUMPTIONS ON AVAILABLE FAMILY LABOUR

Data on family size are available both for Ghana and Côte d'Ivoire. The typical family in Ghana consists of five members while in Côte d'Ivoire the number is slightly bigger. However, our calculations account only for two adults per family. This leads to the following assumptions:

- ▶ Available labour days: 365 days - 104 weekend days - 20 sick days - 11 days off = 230 working days per person
- ▶ 1.6 full-time workers in the family (0.4 for care work)
- ▶ Number of working days available: $1.6 \times 230 = 368$ working days
- ▶ Share of cocoa in family income: Ghana 67%, Côte d'Ivoire 74% (Source: Bymolt/Laven/Tyszler 2018)
- ▶ Based on these figures: Working days available for cocoa: 246 in Ghana and 272 in Côte d'Ivoire

ASSUMPTIONS ON YIELDS AND WORKLOAD PER HECTARE

The figures on available labour days can be combined in a model with the reported farm size, present yields, and potential yields; additionally, they incorporate different assumptions on potential workload per hectare, hired labour and the costs for planting material, fertiliser, pesticides, and other inputs per hectare:

- ▶ present farm size: 3 ha for Côte d'Ivoire, 2 ha for Ghana
- ▶ additional model: 4 hectare per farm

Yields:

- ▶ 350 kg/hectare which are according to some studies the mean yield of the farmer
- ▶ 550 kg/hectare as presently reported as average by all companies
- ▶ 800 kg/hectare which is a target in some calculation models
- ▶ 1000 kg/hectare which are proclaimed by some companies as a potential yield

For the workload, different figures were used in the model based on average yield per hectare, see the tables below and the excel-based calculation.³

Input costs per hectare are set higher than in all the studies due to the exploding prices for fertiliser and pesticides, as these are needed for higher productivity:

- ▶ US\$100 for 350 kg/ha
- ▶ US\$250 for 550 kg/ha
- ▶ US\$500 for 800 kg/ha
- ▶ US\$750 for 1000 kg/ha

It might be argued that the production costs merely for inputs per hectare are high, but to harvest stable yields year by year in the longer run, significant investments into re-planting plus the regular use of fertiliser and pesticides are essential.

ASSUMPTIONS ON LABOUR COSTS: LIVING INCOME AND WAGE

Based on the Anker-Methodology, full-scale living income calculations were made for Côte d'Ivoire and Ghana in 2018 (CIRES 2018; Smith/Sarpong 2018; Tyszler/Bymolt/Laven 2018a and 2018b).

These were updated in 2020 and 2022. Based on these calculations, living income for a cocoa farming family in Côte d'Ivoire is US\$5712 per year and in Ghana US\$3744.⁴ These figures are used in the calculation.

For the calculation of costs for hired labour, the model uses the available data on living wage:

- ▶ US\$11 per day as a living wage for Côte d'Ivoire
- ▶ US\$13,5 per day as a living wage for Ghana

Some critics state that instead of a living wage, these calculations should be done based on current real costs of hired labour. However, that would then normalise massively underpaying wage workers. Therefore, the calculation is based on the latest scientific calculations (Anker Methodology) on living wage. The latest calculation of a living wage in Côte d'Ivoire came up to **XOF 137,545** (USD 211/conversion rate September 2022) per month.⁵

For a farmer, it was calculated: 365 days - 104 weekend days - 20 sick days - 11 days off = 230 working days per person. These are 19 labour days per month. US\$211 divided through 19 labour days add up to a daily wage rate of US\$11. For Ghana the latest calculation of a living wage was done in spring 2022. A living wage in a semi urban banana producing area was **GHC 1,841** (USD 257) per month.⁶ Again, based on 19 labour days per month US\$257 divided through 19 labour days results in a daily wage rate of US\$13,5. Since spring 2022, Ghana has seen a high inflation rate, particularly in regard to food and fuel/transport. In a parallel development, the GHC has lost massively against the US Dollar and the Euro. Some economists think that the devaluation might reverse soon given that the Ghanaian government is in an ongoing consultation with the IMF. Based on uncertain figures on real inflation rates and the unpredictable development of the GHC, the calculation uses for Ghana the figures from spring 2022. Nonetheless, the figures should be recalculated latest in spring 2023.

HOW TO VALUE "FREE" DAYS?

Another open question is what to do with available labour days on farms, which are not needed for cocoa production and for the diversified crops:

³ All calculations can be downloaded here: <https://www.suedwind-institut.de/files/Suedwind/Publikationen/2022/2022-21%20Annex.xlsx>

⁴ The figures for Côte d'Ivoire are based on calculation for June 2022 (https://www.living-income.com/_files/ugd/0c5ab3_9aef39b2ef654ab6a8f7bc4dd2bdb026.pdf).

The figures for Ghana are based on the calculations for 2020 (https://www.living-income.com/_files/ugd/0c5ab3_55017cee608047d494f56b496925ae4a.pdf). Due to the high inflation, the updates for Ghana for the situation in June 2022 show that measured in GHS living income has to be much higher than in 2020. But as the GHS lost massively value against the US-Dollar, living income measured in US-Dollar even decreased slightly. This trend continued in the last months. Therefore, these calculations should be updated as soon as possible.

⁵ See <https://www.globallivingwage.org/living-wage-reference-value-rural-cote-divoire/>

⁶ See https://www.globallivingwage.org/wp-content/uploads/2018/04/Updatereport_Ghana_2022_29032022final.pdf.

- ▶ In one model, remaining days are calculated as potential wage earning days and the income from cocoa and diversified crops are supplemented with the income from selling all surplus labour days at a living wage (this in reality will never take place due to the economic situation in cocoa growing areas)
- ▶ In another model, no extra income from cocoa and diversified crops based on the wage labour for the remaining days is calculated.

THE LABOUR AND AGROCHEMICALS COST TRAP

Studies show that higher productivity has the potential to lead to higher net income for farmers (Bymolt/Laven/Tyszler 2018; Waarts/Kiewich 2021; Krain, et al. 2021). Research which considers how much additional hired labour or sharecroppers landowning farmer need to achieve a productivity increase is not publicly available. It is also unknown if these labourers or sharecroppers earn a living wage/income. For sharecroppers this seems highly implausible. Since farmers with a high productivity will often need much more labour than is available within the family, this raises a question on whether these farmers can achieve a higher, or even a living income if they have to pay a living wage to labourers and sharecroppers.

Wages in Côte d’Ivoire have increased significantly, and many farmers now need hired labour (IDH 2022: 48). In Ghana, farmers also complain about increasing labour costs and an overall high inflation rate. This limits the potential to increase productivity.

A study commissioned by IDH about the impact of the credit systems which aim to support farmers to invest in better agricultural practices in Côte d’Ivoire shows the risk of the farmer. Based on data from the farmer’s field books, the authors conclude that the use of the wrong fertiliser particularly had negative effects: yields declined, costs increased, and farmers had lower margins. Household labour costs were not included in this calculation. Investments in the use of more pesticides also resulted in lower margins (IDH 2022: 10, 14, 83).

The results of the calculation below show that indeed the productivity focused strategy of most companies might lead not only to a disaster concerning oversupply and world market price decrease but is also not achieving further net income for farmers. This is true even if the seasonality of labour is not taken into account. The model shows⁷ that achieving higher yields might lead to a lower net income due to increased costs in inputs and labour.

The exception here is that for farms that are currently producing at the 350 kg per hectare level; getting up to around 550 kg per hectare does have benefits. This calculation of a potential increase is based on the assumption that surplus labour within the family is available to invest more time into the plantation and that this investment will lead to higher productivity. The situation for single woman households, farms run by old farmers, or sick persons might be different as these groups need to hire labour to achieve productivity increases.

Only if labour days per hectare are relatively low and surplus labour is able to be sold on the market at a living wage rate can a farming family earn near to or up to a living income. The higher the number of labour days needed per hectare of cocoa, the lower the income. This indirectly indicates that the present prices of cocoa production lead to an income which is significantly lower than a living wage (Table 3).

Investing in higher productivity could lead to a lower income if the number of surplus labour days is decreasing due to the additional workload necessary to achieve a higher productivity. Again, it must be stressed that everything depends on labour days. If a farmer has to invest 150 labour days per hectare to harvest 800 kg of cocoa, the income is equal (CDI) or lower (Ghana) than for farmers who invest 100 labour days and harvest 550 kg per hectare. Even the step of increasing productivity from 550 kg per hectare to 1000 kg per hectare leads to a higher net income if workload for 550 kg is higher than 75 labour days and workload for 1000 kg is merely 100 labour days per hectare - however, this not a realistic option.

⁷ All calculations can be downloaded here: <https://www.suedwind-institut.de/files/Suedwind/Publikationen/2022/2022-21%20Annex.xlsx>

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TABLE 3: INCOME AS PERCENTAGE OF A LIVING INCOME
SURPLUS LABOUR DAYS VALUED WITH LIVING WAGE (CÔTE D'IVOIRE 11\$ / GHANA 13,5 \$ PER DAY)

	% OF LIVING INCOME	
	CÔTE D'IVOIRE	GHANA
350 kg/ha, 50 labour days	50	144
350 kg/ha, 75 labour days	39	75
350 kg/ha, 100 labour days	33	50
350 kg/ha, 150 labour days	24	31
550 kg/ha, 50 labour days	68	160
550 kg/ha, 75 labour days	56	97
550 kg/ha, 100 labour days	47	69
550 kg/ha, 150 labour days	36	44
800 kg/ha, 50 labour days	82	157
800 kg/ha, 75 labour days	69	109
800 kg/ha, 100 labour days	60	83
800 kg/ha, 150 labour days	47	57
800 kg/ha, 200 labour days	39	43
1000 kg/ha, 50 labour days	88	148
1000 kg/ha, 75 labour days	76	111
1000 kg/ha, 100 labour days	66	89
1000 kg/ha, 150 labour days	53	63
1000 kg/ha, 200 labour days	45	49

Farm size: Côte d'Ivoire 3 ha, Ghana 2 ha / price per Kilo: \$1,5

Highlighted in red: according to the assumptions of the author this estimate is the most realistic figure.

In practice, if the farmers are unable to use the labour days not necessary for farming to find a job and earn a living wage, productivity increases have a slightly better impact. Again, farmers are far away from a living income and they are running into higher risks as they have to pay significant amounts of money upfront (see below) for hired labour if they want to achieve the target of 800 or even 1000 kg per hectare. The only exception is a low workload of 800 kg for less than 75 days per hectare. Realistically, farmers will not be able to achieve significantly higher yields per hectare without investing in inputs and labour, a hurdle which most of them are not be able to cross (see Table 4).

It is unclear how many cocoa farming families were able to increase their productivity during the last decades. From 2018 to 2020, the average yield per hectare of farmers in the already mentioned IDH project decreased (IDH 2022: 63-65). A company employee shared data on a six-digit number of farmers in Ghana and Côte d'Ivoire which came to a similar conclusion. Despite efforts to increase productivity, yields per hectare significantly decreased over the last five years.⁸ The reasons are unclear. Spreading diseases, climate change, and aging trees might be one aspect. The use of fertilisers and pesticides which are not adapted to the needs of specific cocoa growing regions might be another reason. It is also possible that farmers decreased expenses for inputs and for labour after the price collapse at the end of 2016.

⁸ Interview with company employee who wants to remain unnamed. The reaction of this person on the argument that some projects and companies report average yields of large groups of farmers of more than 600 kg per hectare was: "I don't believe that."

TABLE 4: INCOME AS PERCENTAGE OF A LIVING INCOME - SURPLUS LABOUR DAYS NOT VALUED

	% OF LIVING INCOME	
	CÔTE D'IVOIRE	GHANA
350 kg/ha, 50 labour days	35	39
350 kg/ha, 75 labour days	35	39
350 kg/ha, 100 labour days	33	39
350 kg/ha, 150 labour days	24	31
550 kg/ha, 50 labour days	50	55
550 kg/ha, 75 labour days	50	55
550 kg/ha, 100 labour days	47	55
550 kg/ha, 150 labour days	36	44
800 kg/ha, 50 labour days	63	68
800 kg/ha, 75 labour days	63	68
800 kg/ha, 100 labour days	60	68
800 kg/ha, 150 labour days	47	57
800 kg/ha, 200 labour days	36	39
1000 kg/ha, 50 labour days	69	75
1000 kg/ha, 75 labour days	69	75
1000 kg/ha, 100 labour days	66	75
1000 kg/ha, 150 labour days	53	63
1000 kg/ha, 200 labour days	45	49

Farm size: Côte d'Ivoire 3 ha, Ghana 2 ha / price per Kilo: \$1,5

Highlighted in red: according to the assumptions of the author this estimate is the most realistic figure.

THE FARM SIZE TRAP

Many company employees and some scientists stress the need for bigger farm sizes in order to achieve a living income. Indeed, bigger farms usually achieve a higher net income, but the effects of increased farm size on net income and the situation of hired labour/sharecroppers remain unclear:

- ▶ In Côte d'Ivoire, bigger farmers usually have significantly lower yields (IDH 2022: 69; Bymolt/Laven/Tyszler 2018).
- ▶ Similar observations were made in Ghana (Bymolt/Laven/Tyszler 2018).

One potential reason for this is that the application of better agricultural practices on bigger farms comes with relatively high costs for hired labour. Therefore, increasing labour input to achieve a higher productivity might have a negative impact on the net income of farmers from a certain point on. A recent study on the situation in Côte d'Ivoire proves that many farmers with bigger farm sizes achieve a living income. The same study also says that of these "arrived elite" farmers, 62 % make use of sharecroppers (Habracken/Laven/Steijn 2022: 139). The open question is if the sharecroppers also have a living income. Or is the system leading to a living income of the farm owners based on the exploitation of sharecroppers and/or hired labourers?

Low cocoa prices reduce the potential of farmers with bigger farm sizes to increase productivity. The easiest way for farmers to reduce costs is to reduce labour input (IDH 2022: 76). For the calculation, a farm size of 4 ha per family is used - which is not a

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realistic option in Ghana and even more difficult in Côte d'Ivoire. This can lead to a significant net income increase if the number of labour days per hectare is low. The moment, farmers have to hire labour they are running again into significant risks and net income declines (Table 5).

TABLE 5: INCOME AS PERCENTAGE OF A LIVING INCOME

	% OF LIVING INCOME	
	CÔTE D'IVOIRE	GHANA
350 kg/ha, 50 labour days	45	72
350 kg/ha, 75 labour days	43	58
350 kg/ha, 100 labour days	35	42
350 kg/ha, 150 labour days	26	27
550 kg/ha, 50 labour days	63	94
550 kg/ha, 75 labour days	60	78
550 kg/ha, 100 labour days	50	59
550 kg/ha, 150 labour days	37	40
800 kg/ha, 50 labour days	77	106
800 kg/ha, 75 labour days	73	92
800 kg/ha, 100 labour days	63	73
800 kg/ha, 150 labour days	49	53
800 kg/ha, 200 labour days	40	40
1000 kg/ha, 50 labour days	83	109
1000 kg/ha, 75 labour days	80	96
1000 kg/ha, 100 labour days	70	79
1000 kg/ha, 150 labour days	55	58
1000 kg/ha, 200 labour days	46	46

Farm size 4 hectare / surplus labour days not valued / price per Kilo: \$1,5

Highlighted in red: according to the assumptions of the author this estimate is the most realistic figure.

The problem is again not only the fact that they need additional labour, but also that they need significant upfront financial investments long before the harvest is paid for. Even in the model with only 100 labour days to produce 1000 kg per hectare, farmers need massive upfront investments of roughly US\$4400-US\$5100 long before they can sell the harvest. At the present farmgate price of \$1.50 per kilo, it is still not possible for farmers to generate a living income (Table 6).

TABLE 6: INCOME AS PERCENTAGE OF A LIVING INCOME

	CÔTE D'IVOIRE	GHANA
Total farm yield	4.000 kg	4.000 kg
Farm size	4,00 ha	4,00 ha
Yield per ha	1000 kg	1000 kg
Labour input per ha	100,00	100,00
Needed labour	400,00	400,00
Available adult family labour	272	246

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Hired labour days per farm	127,68	153,44
Labour costs (CDI 11/Ghana 13,5 US-Dollar per day)	\$1.404	\$2.071
Inputs: Production costs per hectare	\$750	\$ 750
Inputs: Production costs per farm	\$3.000	\$3.000
Total production costs	\$ 4.404	\$ 5.071
Living Income Level per household	\$ 5.712	\$ 3.744
% of household income from cocoa	74%	67%
Cash income from cocoa necessary to achieve Living Income	\$8.631	\$ 7.580
Necessary farm gate price per kilo	\$ 2,158	\$ 1,895
Present farm gate price	\$1,50	\$ 1,50
Percentage of a living income	70%	79%

Farm size 4 hectare; 1000 kg/ha / 100 labour days per ha / surplus labour days not valued / price per Kilo: \$1,5

THE QUALITY TRAP

It has often been claimed that producing better cocoa quality leads to higher prices. Indeed, the buyers of cocoa do not only focus on the price of the stock exchange, but pay additional country differentials. Ghana for example was for a long time known for its better cocoa quality and the farmers were rewarded by a quality premium which could add up in some years to 300 US dollars per tonne. Since the reforms in Côte d'Ivoire, the quality of cocoa coming from Côte d'Ivoire has increased significantly and is now similar to Ghana's.

However, the market is not always rewarding quality. Since quality improved in Côte d'Ivoire, German importers for example reduced the overall percentage of cocoa originating from Côte d'Ivoire and increased volumes bought in Nigeria. Nigerian cocoa has a lower quality and is cheaper, but it seems to be sufficient at least for some qualities of chocolate produced in Germany.

Producing Fine or Flavour Cocoa also does not guarantee that farmers receive higher farmgate prices. More and more farmers in Ecuador have realised that producing FFC leads to more labour input and significant lower yields per hectare compared to using the hybrid varieties CCN 51. A study covering the years 2013 to 2019 shows that the farmgate price for FFC is nearly the same as that for CCN 51 and that both prices are very similar to the price at the stock exchange (Villacis/Alwand/Barrera 2019: 11).

Generally, only a very small percentage of the global cocoa harvest achieves significantly higher prices for its FFC quality. According to market sources, most customers won't taste the difference between FFC and good fermented standard cocoa. The market for high quality chocolate which needs specific high-quality varieties of cocoa beans is still very small (for details see Fountain/Hütz-Adams/Campos 2022).

THE DIVERSIFICATION TRAP

Many companies and scientists stress that farming families should diversify their cocoa production to generate alternative income sources. They use this as an argument to avoid price discussions. Indeed, diversified income structures could support farmers income. Nonetheless, there are different factors which impede the diversification of farmers, including:

- ▶ Most farms are already strongly diversified, not only Latin America, but also in West Africa and Asia. In Côte d'Ivoire and Ghana, cocoa farming families for example already produce a number of crops (Bymolt/Laven/Tyszler 2018), but the income of

most cocoa farming households is still far below a living income and often the World Bank places them below poverty lines.

- ▶ Many farmers in West Africa focus strongly on cocoa – despite all existing problems – as this generates the highest potential income (Bymolt/Laven/Tyszler 2018).
- ▶ Due to limited land access, diversification might lead to lower cocoa production and reduce income.
- ▶ To diversify on a large-scale, farmers need sufficient knowledge of other crops and access to necessary inputs. Both are often not available in remote areas in West Africa.
- ▶ To diversify production, farmers need to invest. Many farmers do not have the necessary savings nor access to financial services including credit.
- ▶ For many potential additional products, no developed markets exist. Investments are therefore risky.
- ▶ It is unclear whether farmers have surplus family labour to increase the production of diversified products. Figures on necessary labour days per hectare for the production of the main cocoa crop collected by companies and scientists differ massively and it is not clear whether farmers have the potential to achieve increased net income after diversifying into products other than cocoa (see chapter 1).

Summarised, it is not clear if stronger diversification in production increases net income for farmers, but it will definitely reduce the risk of price shocks on the cocoa market. Farmers in West Africa are aware of this, but in meetings they raised the question: “Why should it not be possible to live from selling cocoa?” The idea behind diversification is to pay a low price for cocoa as farmers gain additional income from other sources that subsidise cocoa production. Rather, the focus should be on paying full-time cocoa farmers a price which allows them to earn a living income from cocoa.

AND WHAT ABOUT PRICE?

Price interventions have an immediate influence on the income of farmers. Nonetheless, many companies stress that this is a no-go as it will not help the poorest farmers and might even lead to more deforestation due to higher cocoa production, and according to some of these companies, more child labour due to higher labour demand. Indeed, very small farms and farms with very low productivity cannot reach a living income even with significantly higher prices (Waarts/Kiewich 2021).

Regardless, the situation of many families will improve significantly after a price increase: “Cocoa prices can certainly help, but as an illustration consider the yields among the poorest 20 %. At less than 200 kg/ha, a doubling of price would move these farmers from the first quintile (0 %-20 %) to the third quintile (40 %-60 %), where the gap to the Living income is certainly smaller but still far short of what it takes to meet or exceed the benchmark.” (IDH 2022: 88).

Higher prices can be accounted for in different ways. One is a minimum price set by standard organisations or internally by companies. In these systems, the impact of higher prices is coupled with the overall production of the farm. Therefore, the better-off farmers profit more. A law which prohibits cocoa farmers to step out of poverty and into the middle class does not exist. The income increase will have its impact on the communities and might even allow the farmer to spend more money on higher wages for hired labourers which would create new jobs.

The second option is a premium which is paid in addition to world market prices. This premium would be flexible and reactive to the developments of the world market. Again, higher absolute production leads to a higher impact.

Companies could set up long-term contracts with cooperatives and in these contracts implement minimum prices or premiums guaranteeing a certain direct or indirect price level to support the daily life of families and to reduce the risk of farmers who want to invest in good agricultural practices (GAP) or diversification. Companies which are doing this have had positive experiences (e.g. Tonys Chocolonely).

Companies can reward specific measures by paying cash transfers (e.g. Nestlé cash transfer program in Ghana and Côte d’Ivoire (ICI 2022)). This is decoupled from the production of the farms and thereby has a relatively stronger impact on poor farming families. No proof based on studies show that higher prices lead to more child labour, deforestation, and oversupply. Inversely, there exists a direct connection of lower prices with

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the pressure on farmers to reduce costs. The fastest way to reduce production cost is to reduce labour costs by using the children of the family as workers. The second way to react to lower prices is to reduce inputs. Buying less fertiliser means that the soil depletes even faster which might lead to the erection of new plantations on fresh soil, which is usually accompanied by deforestation.

Using the parameters mentioned above, the massive influence of price increases are obvious. At a farmgate price of three dollars per kilo, average farm households could either earn a living wage or come significantly closer to benchmarks, even with current production structures. It is striking again that labour days per hectare have a significant influence on the situation of farmers. The situation in which they harvest 550 kg per hectare with lower labour intensity might not bring in as high an income as increasing productivity, but comes with much lower risks. In addition, if farmers have to invest 200 labour days to harvest 1000 kg at a price of three dollars per kilo, it might be a better option to stay with 550 kg per hectare (Table 7).

TABLE 7: INCOME AS PERCENTAGE OF A LIVING INCOME

	PRICE PER KILO: \$1,5		PRICE PER KILO: \$2,25		PRICE PER KILO: \$3,0	
	% OF LIVING INCOME		% OF LIVING INCOME		% OF LIVING INCOME	
	CÔTE D'IVOIRE	GHANA	CÔTE D'IVOIRE	GHANA	CÔTE D'IVOIRE	GHANA
350 kg/ha, 50 labour days	35	39	52	58	70	78
350 kg/ha, 75 labour days	35	39	52	58	70	78
350 kg/ha, 100 labour days	33	39	49	58	65	78
350 kg/ha, 150 labour days	24	31	36	46	49	61
550 kg/ha, 50 labour days	50	55	75	82	99	110
550 kg/ha, 75 labour days	50	55	75	82	99	110
550 kg/ha, 100 labour days	47	55	70	82	94	110
550 kg/ha, 150 labour days	36	44	54	66	71	88
800 kg/ha, 50 labour days	63	68	94	103	126	137
800 kg/ha, 75 labour days	63	68	94	103	126	137
800 kg/ha, 100 labour days	60	68	90	103	119	137
800 kg/ha, 150 labour days	47	57	70	85	94	113
800 kg/ha, 200 labour days	36	39	54	59	71	79
1000 kg/ha, 50 labour days	69	75	104	112	139	150
1000 kg/ha, 75 labour days	69	75	104	112	139	150
1000 kg/ha, 100 labour days	66	75	100	112	133	150
1000 kg/ha, 150 labour days	53	63	80	95	107	127
1000 kg/ha, 200 labour days	45	49	67	74	89	99

Farm size: Côte d'Ivoire 3 ha, Ghana 2 ha / surplus labour days not valued

Highlighted in red: according to the assumptions of the author this estimate is the most realistic figure.

The same is true for bigger farm sizes. Lower productivity comes with much less risk for farmers, and depending on labour days assumptions, increasing productivity on large farms might even have a negative impact on net income.

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TABLE 8: INCOME AS PERCENTAGE OF A LIVING INCOME

	PRICE PER KILO: \$1,5		PRICE PER KILO: \$2,25		PRICE PER KILO: \$3,0	
	% OF LIVING INCOME		% OF LIVING INCOME		% OF LIVING INCOME	
	CÔTE D'IVOIRE	GHANA	CÔTE D'IVOIRE	GHANA	CÔTE D'IVOIRE	GHANA
350 kg/ha, 50 labour days	45	72	68	108	91	144
350 kg/ha, 75 labour days	43	58	64	87	85	116
350 kg/ha, 100 labour days	35	42	52	64	70	84
350 kg/ha, 150 labour days	26	27	38	41	51	55
550 kg/ha, 50 labour days	63	94	95	141	126	188
550 kg/ha, 75 labour days	60	78	89	117	119	156
550 kg/ha, 100 labour days	50	59	75	89	100	118
550 kg/ha, 150 labour days	37	40	56	60	75	80
800 kg/ha, 50 labour days	77	106	116	160	154	213
800 kg/ha, 75 labour days	73	92	110	138	147	184
800 kg/ha, 100 labour days	63	73	94	109	126	146
800 kg/ha, 150 labour days	49	53	73	78	98	103
800 kg/ha, 200 labour days	40	40	60	60	80	80
1000 kg/ha, 50 labour days	83	109	125	163	166	218
1000 kg/ha, 75 labour days	80	96	120	144	159	193
1000 kg/ha, 100 labour days	70	79	104	119	139	158
1000 kg/ha, 150 labour days	55	58	83	88	111	117
1000 kg/ha, 200 labour days	46	46	69	69	92	92

Farm size: 4 ha / surplus labour days not valued

Highlighted in red: according to the assumptions of the author this estimate is the most realistic figure.

SUMMARISED: THE INDUSTRY WANTS CHEAP COCOA WHILE LEAVING ALL THE RISKS TO THE FARMER

As long as cocoa prices are as low as present, investing in higher productivity is a big risk for farmers. The living wage in Côte d'Ivoire is US\$11, and the rate is even higher for Ghana with US\$13,5. This means that 10 additional hired labour days per hectare have to lead to nearly 100 extra kilos of cocoa only to pay the additional labour and input bill. The farmer has to invest at a time in input and labour when there is no indication of the price for cocoa in the upcoming season. Additionally, there is a risk of extreme weather patterns, pests, et cetera. This raises serious questions about the strategy of many projects to improve productivity and the call for larger farm sizes. All in all, investing in these projects means increasing cocoa supply and leaving all the risks to the farmers. Having in mind that the UN Guiding Principles on Businesses and Human Rights demand a due diligence of companies to avoid violations of human rights, it is obvious that the cocoa sector has to talk about pricing.

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