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Conclusions

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‘Demystifying the Cocoa Sector in Ghana and Côte d’Ivoire’ aims to contribute to the cocoa sector’s body of knowledge and provide a solid evidence base to test common assumptions and beliefs. We hope to have set an example for other actors, who commission or implement research in the cocoa sector, by providing everyone with free access to the database and research results.

In Chapter 2 (Methodology), we presented a number of research questions, which we answered in different chapters (Table 15.1).

Table 15.1 Research questions

Research questions	Corresponding chapters
<i>What are the defining demographic and socio-economic characteristics of cocoa and non-cocoa producing households?</i>	Chapter 3. Demographics
<i>What are the dominant crop/livelihood options in the research areas, and why?</i>	Chapter 5. Crop choices and diversification Chapter 7. The importance of cocoa
<i>Are cocoa households leaving cocoa or increasing the share of land under cocoa, and how is the process happening?</i>	Chapter 6. Land
<i>To what extent are cocoa household incomes diversified, and in what ways?</i>	Chapter 5. Crop choices and certification Chapter 12. Household income, poverty and wealth
<i>What is the poverty and wealth status of cocoa households compared with non-cocoa households?</i>	Chapter 12. Household income, poverty and wealth Chapter 13. Farmer profiles and cluster analysis
<i>What is the nutrition and food security status of cocoa households compared with non-cocoa households? What is the availability, affordability of different food groups?</i>	Chapter 4. Food and nutrition security
<i>To what extent do households invest in inputs and apply good agricultural practices for cocoa and other crops?³³</i>	Chapter 8. Cocoa Production Practices
<i>What are the costs, revenues and profitability of cocoa compared with other crops?³⁴</i>	Chapter 10. Cocoa productivity and yield Chapter 12. Household income, poverty and wealth
<i>How do cocoa households sell the cocoa, and how are cocoa prices formed?</i>	Chapter 11. Cocoa marketing and prices
<i>What roles do men and women typically play on the farm and in the household, and why? Who typically makes decisions about investments in cocoa and expenditures on other household items?</i>	Chapter 14. Gender and cocoa
<i>How are cocoa institutions perceived and what can be done to better support sustainable production?</i>	Chapter 8. Cocoa Production Practices Chapter 9. Cocoa producer groups, certification, training and credit Chapter 11. Cocoa marketing and prices

In our study, we made a distinction between ‘cocoa households’ and ‘non-cocoa households’. We defined a ‘cocoa household’ as one where the household reported cocoa to be either their most important or second most important crop. The idea was that making a distinction between cocoa and non-cocoa households would allow us to analyse whether certain phenomena are specific to cocoa households, or whether they are associated more generally with rural smallholders. In addition, we used a cluster analysis to allow for differentiation of cocoa households. We chose a data-driven approach, allowing profiles to naturally emerge from the data. Our analysis suggests there are three main groups: 1) female-headed household; 2) male-headed

³³ We did not collect sufficient data to answer this question for ‘other crops’

³⁴ We did not collect robust data on the net income from other crops

households, with typical productive land size (< 4ha); 3) male-headed household with large productive land size (> 4ha).

In our study, we tested a long list of hypotheses. In this concluding chapter, we return to a number of them, highlighting how our evidence has brought in new perspectives on the status of cocoa households and current trends.

1 The world is not ‘running out of cocoa farmers’

The age of cocoa farmers has, at times, been a contentious discussion in the cocoa sector. There is some concern that cocoa farmers are getting older and could become unproductive or less productive. Furthermore, some authors have suggested that youth are not interested in cocoa farming and may be more drawn to other crop options or non-agricultural livelihood options. The feared implication is that, as one generation passes away, the next generation may not be willing to take over, which would contribute to long-term global supply pressures.

Our findings suggest the average age of cocoa farmers is not increasing over time. This argument is supported by the fact that the mean age of cocoa farmers reported in various studies has remained relatively constant in recent decades. However, we do observe that, in both Ghana and Côte d’Ivoire, the average age of respondents of cocoa households is slightly higher than of non-cocoa households. The average age of survey respondents from cocoa households in Ghana was 51 years and in Côte d’Ivoire, this was 46 years. The analysis of the distribution of respondent ages suggests that the *slightly* higher average age is a result of both a higher proportion of older respondents and a lower proportion of young respondents in cocoa households. However, the data suggests to us that younger farmers continue to step into cocoa at a rate that at least replaces older farmers stepping out. Otherwise, the age distribution of cocoa farmers would have not remained more-or-less unchanged with a mean of around 45-50 years, and Ghana and Côte d’Ivoire would not have been able to maintain their position as the leading global suppliers.³⁵

2 Cocoa is currently the ‘best option’ for most households in cocoa growing regions

Cocoa has remained attractive and important despite long periods of low and declining prices, particularly from the early 1980s to the early 2000s. This is explained by many factors including: a ‘guaranteed’ market, land rights and a sense of ‘social

³⁵ We concluded this in an intermediate paper by A. Laven, R. Bymolt, M. Tyszler, C. Steijn, F. Hütz-Adams, F. Ruf (2017) The importance of cocoa in a diversified farm. 2017 International Symposium on Cocoa Research (ISCR), Lima, Peru, 13-17 November 2017

security', established knowledge and culture, and a comparative advantage over other suitable crop options. Generally, households like how cocoa income is received 'in bulk' at the end of the main season, which enables them to pay school fees and other fixed expenses, and invest in house construction and renovations. The cocoa season is also the time when debts are settled, inputs and equipment is bought, and money is spent on Christmas gifts and meals.

'Cash crops' such as rubber, cashew, palm and coffee are frequently mooted as alternatives to cocoa, but these are all produced by a much smaller number of farmers in both countries (with some regional exceptions). In Chapter 5, we concluded that competing crops are not (yet) perceived to be better than cocoa. On the contrary, the importance of cocoa was said to have increased in the past 5 years in Ghana and Côte d'Ivoire. Presently, there are no signs that households will move out of cocoa in the short to medium term.

In the cocoa growing areas studied in Ghana, cocoa is produced by a high proportion of both male- (91%) and female-headed (86%) households. Likewise, both male-headed and female-headed households identified cocoa as their first or second most important crop. However, in the cocoa growing regions studied in Côte d'Ivoire, a greater proportion of male-headed households (73%) produce cocoa than female-headed households (36%). Twice as many male-headed households as female-headed households identified cocoa as one of their most important crops. Instead, twice as many female-headed households as male-headed households identified cassava as one of their most important crops.

3 Poverty is not a 'cocoa farmer' phenomenon, but rather a 'rural smallholder' phenomenon

A major concern is the livelihood status of cocoa farmers. The Cocoa Barometer 2015 stated that "most cocoa farmers live in destitute poverty".³⁶ National statistics do indeed show that smallholders in developing countries are less well-off than the national averages. However, the extent to which poverty is a cocoa specific issue, rather than a broader smallholder farmer phenomena, has not received a lot of attention until recently.

The different approaches used to calculate income, poverty and wealth point in the same direction: cocoa households are, like other rural households, fairly poor. Using the DHS wealth index, we find that 25% of Ghanaian households are in the 1st (poorest) quintile nationally, 52% fall into the 2nd quintile, and 21% fall into the third (middle) quintile. In Ghana, our DHS analysis suggests that cocoa households

³⁶ Fountain, A.C. and Hütz-Adams, F. (2015). Cocoa Barometer 2015-USA Edition. Available at http://www.cocoa-barometer.org/International_files/Cocoa%20Barometer%202015%20USA.pdf

are not poorer than non-cocoa households. In Côte d'Ivoire, we also find that 43% of households are in the 2nd quintile, implying that many are reasonably poor at a national level. However, in contrast to Ghana, a higher proportion of cocoa households are in the third and fourth quintiles than in the bottom quintile, which reflects their relative wealth position within the wider country. In Côte d'Ivoire, we found no statistically significant differences between cocoa and non-cocoa households.

The DHS Wealth Index is constructed as a relative index within each country. Thus, specific scores cannot be directly compared across countries or over time. In this research, this means that we cannot compare Ghana and Côte d'Ivoire. Using the Poverty Probability Index (PPI), we do observe significant differences between the two countries. We find that an estimated 7.5% of Ghanaian cocoa households are under the \$1.90 PPP (2011) poverty line, while in Côte d'Ivoire, we estimate 26% of households are under the equivalent poverty line.

In Ghana and Côte d'Ivoire, we find no statistically significant differences between male- and female-headed households in the PPI poverty likelihood nor in the DHS wealth index. This suggests that male- and female-headed households tend to have a fairly similar poverty and wealth profile.

4 Poverty levels among cocoa households are less severe than projected by other researchers

The lack of quality data and data availability has made it difficult for researchers to reliably estimate income, wealth and poverty levels in cocoa growing regions. What adds to the challenge is that there are different approaches to measuring poverty, and each approach has its drawbacks. Despite these difficulties, there have been a number of attempts to estimate cocoa farmer incomes.

Our household income model estimates that, on average, Ghanaian cocoa households earn US\$2,487 per annum from all income sources, which is equivalent to US\$6,784 PPP (2016). Applying the current OECD equivalence scale, we calculate an income of US\$2.89 per person per day (in 2016 US\$), equivalent to \$7.89 PPP (2016). This does not include in-kind income. Our household income model estimates that, on average, Ivorian households earn an average of US\$2,900 per annum, which is equivalent to \$7,429 PPP (2016). This equates to US\$3.11 per person per day (in 2016 US\$), or equivalent to \$7.97 PPP (2016) when applying the current OECD equivalence scale. This does not include in-kind income.

In Ghana, we estimate that male-headed, typical households earn US\$2,128 per year from all income sources, compared with US\$1,630 per year for female-headed households. We should recall that female-headed households have fewer household

members and hence have lower household expenditures meaning they are not worse off on a per person basis. Male-headed, large households earn US\$4,749 per year, on average.

We believe our income model can be considered a good estimate of average income in 2015-2016. The differences with the other studies can be explained, at least partly, by different estimates of household size and the share of cocoa contributing to total household income.

We suggest that total annual household income is a more appropriate unit of aggregation than any other. A per person per day income calculation prohibits reasonable estimates and can lead to erroneous conclusions due to choices in equivalence scales (to recalculate, say, consumption differences between adult males and small children), exchange rates (to calculate purchasing power parity) and estimates of household size. Therefore, we are strongly in favour of calculating incomes per household instead of ‘per person per day’.

5 Cocoa households already diversify their crops and with that their income

One of the recent shifts in the discourse is to encourage households to diversify into other crops (and even other non-agriculture incomes) to help reduce household dependence on cocoa and make them more resilient. Our findings confirm some well-known practices such as the systematic intercropping of plantain and tubers in young cocoa farms. Our findings highlight that cocoa is not the sole source of revenues; farmers clearly diversify, especially in Côte d’Ivoire. Nevertheless, cocoa remains at the core of the vast majority of cocoa farmers’ concerns and priorities. Among cocoa producing households in Ghana, the average share of income from cocoa is 61%; in Cote d’Ivoire, this share is 66%. Other income comes mainly from selling other crops and, to a lesser extent, from small business/trade.

On average, Ivorian households produce a greater diversity of different crops (6 crops) than Ghanaian households (5 crops). Both of these findings are linked to land size. Cocoa households have, on average, slightly larger areas of cultivated land than non-cocoa households, and Ivorian households have larger plots of land than Ghanaian households.

6 Cocoa production does not have a negative effect on food consumption, however there are periods of relative food insecurity

Our survey challenges the ‘myth’ of cocoa production compromising household food security. Our findings suggest that cocoa households are slightly better off in

terms of food security and nutrition levels, compared with non-cocoa households. Ghanaian cocoa households appear to be more 'food secure' than Ivorian households. In addition, focus group data suggests that there is greater availability of most food groups in Ghana compared with Côte d'Ivoire. In Ghanaian cocoa households, 62% of women of reproductive age achieved minimum dietary diversity. In Ivorian cocoa households, only 41% achieved the same. It should be noted that, in Ghana, the data was collected during the main cocoa season when households had more disposable income available, whereas data was collected a month or two later in Côte d'Ivoire, which means the two countries are not directly comparable.

Food insecurity is greatest just before the cocoa main season. This is the period when there is little money left in the household, farmers run out of stocks, and it is still too early to harvest food crops. In this period, food prices are relatively high. Food affordability of certain food groups is more of a challenge than availability. There are other periods of the year when food crops are produced in abundance, with low local prices as a result.

7 The choice to grow cocoa contributes to pressure on land availability, soil erosion and deforestation

In Ghana, around half of the households reported clearing land and planting cocoa in the last year; in Côte d'Ivoire, around a quarter did land clearing and a third planted cocoa. This appears to confirm that land under cocoa is increasing and that planting or (re)planting is a fairly common practice. Once planted, cocoa typically remains on the land for 30 years or more, as it offers long-term land tenure security and income. Participants explained that land owners are rarely interested in selling land if there is cocoa planted on it because income from cocoa is believed to be more profitable than selling the land. Participants also explained that a lack of land has inevitably led to some households intensifying production on the same piece of land. Previously, they would rotate (non-cocoa) crops and leave land fallow at times so as not to exhaust the soil of nutrients, however, now land is frequently under continuous cultivation. Farmers expect yields to decline in the future unless fertiliser use is increased, which emphasizes to us the importance of programmes that educate on erosion control and soil fertility management.

A fairly high proportion of respondents in Ghana (46%) and in Côte d'Ivoire (35%) reported that their household had increased the amount of land under cocoa in the past five years. Most respondents in Ghana (84%) and Côte d'Ivoire (66%) did so by clearing bush or a natural area, which could be considered rational economic behaviour. Forestland typically has good soil fertility, and the household does not lose income (or the value of food crops) from conversion. Planting cocoa may also allow the household to strengthen their tenure claims over the land in a context

of increasing land scarcity. Earlier studies also point out other reasons for clearing natural area for cocoa, such weak laws and enforcement, weak legal systems, and government policies promoting cocoa production.

8 Land-size positively correlates with income, but negatively with yield

In Ghana (US\$2,873) and Côte d'Ivoire (US\$3,796), male-headed, large households have much higher net cocoa income than other groups. In Côte d'Ivoire, male-headed, typical households earn US\$2,215 per year, while male-headed, large households earn US\$5,687 per year from all income sources.

In Ghana, this difference is primarily driven by their larger productive land size, resulting in higher total production. Their higher net income is not typically due to higher cocoa yields. In Ghana, a significant negative correlation was found between the amount of productive land under cocoa and yield. The model shows that, for every additional hectare under cocoa, yields fall by approximately 71 kg.

In Ghana and Côte d'Ivoire, we found the majority of the households produce between 100 and 500 kg/ha, which is well below potential yields commonly cited between 1,000 and 1,900 kg/ha. In Ghana, a regression analysis shows that several other variables are significantly correlated with yield. We found that farmer group members produce 85 kg/ha more than non-members, and Central and Western regions yield more than other regions. Input use was also significantly correlated, with fertiliser use increasing yields by 95 kg/ha, and pesticide use boosting yields by 65 kg/ha. In Ghana, we found that male-headed households produce, on average, approximately 63 kg/ha more cocoa than female-headed households.

In Côte d'Ivoire, a regression analysis shows fewer variables significantly correlate with yield compared with Ghana. The strongest predictor of higher productivity was the use of pesticides, which increases yields by around 105 kg/ha. In Côte d'Ivoire, we find no statistically significant differences in yield between male-headed and female-headed households, possibly due to the very low number of observations.

9 Female-headed households have access to land, but their average land size is smaller than male-headed households

Female-headed households do typically own land, contrary to some narratives. In Ghana, an even higher proportion of female-headed households (91%) reported owning land than male-headed households (85%). In Côte d'Ivoire, virtually all male- and female-headed households said they own some land. These findings may suggest

that female-headed households' access to land is changing, possibly due to legislative changes (e.g. regarding inheritance) and enforcement of women's rights. These findings should not be interpreted more broadly in terms of 'female land ownership'. We are unsure about the extent to which any changes also apply to married women in male-headed households.

However, female-headed households still own less land than male-headed households, on average. In Ghana, female-headed households own a little less land, on average (3.49 ha), compared with male-headed households (4.19 ha). The disparity in Côte d'Ivoire is greater, with 4.54 ha for female-headed households compared with male-headed households owning 8.16 ha.

10 Despite the high importance given to cocoa, there are no optimal-functioning institutions in place

The governments of both Ghana and Côte d'Ivoire closely regulate their country's cocoa sector. While both have enacted certain reforms in recent decades, the state-owned marketing board COCOBOD in Ghana and Conseil du Café-Cacao (CCC) in Côte d'Ivoire regulate the prices and coordinate the marketing. Through their monopoly positions on external marketing, COCOBOD and CCC are able to effectively tax producers at rates that contribute to farmers receiving consistently lower prices than those in liberalised markets. For the period 2000/2001 to 2014/2015, Ghanaian producers received an average of 57% of the ICCO daily price, while Ivorian farmers received an average of 51% of the ICCO daily price. Therefore, regulated price mechanisms do not lead automatically to higher incomes for cocoa farmers than liberalised price mechanisms in other countries.

Part of the cocoa revenues received by the marketing boards in Ghana and Côte d'Ivoire are reinvested in the sector and in general public goods. However, there is a perceived lack of transparency in decision-making, and the efficiency of the allocated public reinvestments (e.g. input distribution) has been questioned. There is a lack of evidence that the effective tax on producers applied by the marketing boards of Ghana and Côte d'Ivoire has led to significantly higher productivity as a result of government programmes. Any productivity improvements are not sufficient to offset the lower prices farmers receive, even with companies providing further support to some farmers.

Farmers in Ghana receive considerably more institutional support than farmers in Côte d'Ivoire. CODAPEC, a subsidiary of Ghana COCOBOD distributes free or subsidised hybrid cocoa seedlings and pods and provides 'free' mass spraying. This explains why 'hybrid' cocoa varieties are much more frequently planted in Ghana than in Côte d'Ivoire. In Ghana, a much higher proportion of cocoa households use fertiliser and fungicide than in Côte d'Ivoire. Both countries have relatively high rates

of pesticide use. Ghanaian households also apply pesticides and fungicides a greater number of times per year than Ivorian households, though still below recommended frequencies. The difference in input use with Ghana can largely be attributed to the fact that most Ivorian households do not receive inputs for free through government programmes or other sources.

11 Despite the potential benefits of being organized in a cocoa producer group, most farmers are not organized

In Ghana, only 11% said that someone in their household was a producer group member compared with 21% in Côte d'Ivoire. In Ghana, participants typically confirmed that cocoa producer group members get access to training about farming techniques, such as spraying and pruning, and access to seedlings. In Ghana, we found that farmer group members produce 85 kg/ha more than non-members. This being the case, we do not know for sure why there are relatively few formal farmer organisations or why farmers have not self-organised. Other studies have suggested that the benefits of collective action may be mitigated in a regulated cocoa sector, where being organised does not provide any tangible benefits in terms of price negotiation or economies of scale. Moreover, without being formally organized, farmers can access training and certification.

In Côte d'Ivoire, when discussing formal cooperatives, participants often expressed negative sentiments. The main reasons were financial mismanagement or embezzlement of funds by cooperative leaders, which, understandably, causes mistrust among community members and hampers the establishment of new cooperatives. Participants also said that it was not particularly easy to set up a cooperative without support from local actors (i.e. governments and NGOs). Despite the higher degree of organization in Côte d'Ivoire, only 17% received training on cocoa farming in the past five years, compared with 49% in Ghana. However, training density (number of training sessions) was significantly higher in Côte d'Ivoire.

12 Most cocoa households do not keep a record of the inputs and labour they invested in cocoa production, and this is a barrier to professionalization

In Ghana and Côte d'Ivoire, records are only kept by one third of cocoa households. Of those keeping records, most only keep records on volume produced and sold, the price, and amount of money received. A smaller proportion of respondents in Ghana kept records on money spent on inputs and hired labour whereas, in Côte d'Ivoire, records were not kept on these items.

In Ghana, household labour is the predominant source of labour for most cocoa activities, as there is no perceived cost (although there is an opportunity cost). Ghanaian households more frequently use hired labour for heavy and laborious tasks (land clearing and weeding), and for the spray application of fertiliser, pesticides and fungicides. Most often, households use either household labour or hired labour, rather than a combination of both. In Côte d'Ivoire, households rarely reported hiring labour for cocoa production. When they do, it is usually for the spray application of fertiliser, pesticides and fungicides; less frequently, labourers may be hired for weeding and transport.

The availability and affordability of labour is perceived to be getting worse. In Ghana, this was most frequently attributed to farm labourers moving to other sectors (gold mining, work in the towns). In both countries, participants said that young people are staying in school longer instead of working as labourers, and that more people are working to establish their own cocoa farms instead of selling their labour. However, focus group participants often noted that increases in hired labour costs were broadly in line with increases in other costs and in the price of cocoa, which suggests that inflation is also playing a role.

13 Good intentions to increase prices to farmers can potentially do harm if a supply/demand imbalance results

Since 2000, average global prices have trended upwards (in both nominal and real terms). On several occasions, average annual prices have pushed above US\$3,000/tonne in real terms, reflecting price levels not seen for two decades. It is in this context that we must consider the narrative that 2016/2017 prices are 'too low'. The 2016/17 season was remarkable as it saw the largest ever annual increase in production by tonne, and the fourth largest change as a percent of total production; oversupply led to a single year fall in prices, and much uncertainty in the market. However, there is no evidence that this signifies a new trend. Most of the production increase can only be attributed to particularly favourable weather conditions, as most other factors influencing production levels (e.g. production improvements, tree planting etc.) take place over several years and we would be able to observe trends, if this was the case.

From a policy perspective, it is important that arguments for and against market interventions (particularly price interventions) are based on a good analysis of market dynamics. Our analysis illustrates that the market is a system that generally follows economic principles of supply and demand, if imperfectly. It is not possible to intervene in one aspect without triggering effects in other aspects. For those entertaining the idea of a cocoa cartel, supply management (buffer stocks), or guaranteed (minimum) prices, there should be good evidence that the intervention will, as a minimum, do no harm to farmers over time.

14 Although more often seen as a ‘man’s job’, cocoa farming should be considered as a family business

In Ghana, men participate in all cocoa production activities at very high rates and ‘take the lead’, while women typically do so at lower rates alongside men. Women rarely participate in heavy, labour intensive activities, such as land clearing and weeding, and have much lower participation in the application of inputs. Women participate most frequently in ‘lighter’ work, such as planting, pod breaking, fermenting and drying.

In Côte d’Ivoire, women participate at much lower rates. The main cocoa activity where women contribute alongside men is ‘pod breaking’. But women also participate in complementary activities, such as food preparation for the labourers, fetching water for spraying, and managing the young cocoa farms and taking care of the intercropping of plantain and cassava. Male and female respondents agreed that in male-headed households, women generally engage in cocoa production activities at lower rates than men, and were often described as ‘supporters’. Women in female-headed households are more actively engaged in cocoa production activities; for heavy labour and spraying, these women would still hire male labourers.

The tendency to look at women mainly as ‘supporters’ is also reflected in the lower proportion of women than men reported receiving training in the past five years. In Ghana, male respondents reported higher rates of training (56%) compared with female respondents (34%). Likewise, in Côte d’Ivoire, 20% of male respondents reported having received training in the past 5 years, compared with only 5% of female respondents.

Our findings suggest that, particularly for Ghana, male-headed households apply good agricultural practices at a somewhat higher rate than female-headed households, which explains why male-headed households produce, on average, higher yields. In Ghana, we find female heads, on average, produce approximately 63 kg/ha less cocoa than male heads after controlling for all other variables (highly significant). In Côte d’Ivoire, we find no statistically significant differences in yield between male-headed and female-headed households, possibly due to the very low number of observations.

15 Men are typically the ones that sell the cocoa, which gives them more decision-making power over the largest share of the household income

In marriage, men and women usually recognise the man as the household head. Being the head of the household typically implies an important role in decision-making and is often related to ownership over assets such as land, and taking up a

management role on the farm. The head of the household (either man or women) is typically the one who sells the cocoa.

In male-headed households, men take the most decisions about cocoa and do the marketing, while women tend to have more control over the income they earn from selling food crops and other small businesses. This income tends to be far less than the income that is earned with selling cocoa. We observe some differences between Ghana and Côte d'Ivoire. In Ghana, men and women report a reasonably high degree of shared decision-making on cocoa-related issues. In Côte d'Ivoire, men in male-headed households virtually always make decisions related to cocoa, while only a small proportion of women in the household contribute to such decisions. Women in male-headed households are almost never involved in selling cocoa.