The importance of cocoa in a diversified farm

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Abstract
This paper presents initial results based on a large-scale research project led by the Royal Tropical Institute (Bymolt et al. forthcoming) [1].The aim of the research is to question many of the myths and assumptions about the cocoa sector in Côte d'Ivoire and Ghana. Three research areas and their interlinkages were investigated: 1) dominant and subsidiary crop and livelihoods options; 2) differentiation of farming households in cocoa regions; and 3) intra-household dynamics, gender and nutrition. The following mixed methods were used for data collection: a systematic desk-study of 100 research papers; a household survey conducted with 1,560 households in cocoa growing areas in Ghana and 1,485 households in Côte d'Ivoire (34% female respondents); 76 focus group discussions; and an ethnographic study in three cocoa growing communities. This paper aims to share initial findings of this ongoing research trajectory, which shows that cocoa is not the only source of revenue for farmers in cocoa growing areas, although it remains at the core of the vast majority of cocoa farmers' concerns and priorities. The final research report, including the data set, will be published in early 2018.

1. Introduction

The debate on the future of the cocoa sector has become increasingly intertwined with discussions on how to achieve a living income[2] for cocoa farmers in West Africa. Examples are debates organized by GIZ and the ISEAL Alliance - which represents the global movement on sustainability standards - on living income, decent wages and human rights in the cocoa sector (see also the Cocoa Barometer 2015[3]). However, there are many myths and assumptions about how the sector will (or should) develop in the future. A striking example is the recent warnings about a serious shortage of cocoa in 2020 by both large chocolate manufacturers, such as Barry Callebaut and Mars[4]. According to the Cocoa Barometer (2015), the shortages were mainly because younger generations no longer want to be in cocoa, and current, older generations are reaching their life expectancy. The report also highlighted that cocoa farmers are not earning a 'living income', and that they lack decision-making power in terms of price setting and are price-takers.

Currently, instead of the projected shortage, there is an over-supply of cocoa, which has resulted in a serious drop in cocoa prices. This new reality has serious consequences for cocoa farmers who often are already live in poverty[5]. It also reinforces the belief that, for achieving a living income, cocoa farmers should diversify their income and depend less on cocoa production for their livelihoods.

However, farmers' different livelihoods options and choices in cocoa growing regions, as well as benefits of cocoa compared to other crops, are under-researched. We believe that informing more tailored programming and policy-making requires an integrated approach where the relations between profitability of different crops, resilience, living income, nutrition, as well as intra-household dynamics and the choice for different income generating activities, are better understood. Additionally, the debate would benefit from a relevant typology of cocoa growing households and the distinguishing characteristics that make households more profitable and/or resilient.

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1 Bymolt, R., Laven, A., Steijn, C. and Tyszler, M. (forthcoming) Demystifying the cocoa sector in Ghana and Côte d'Ivoire. KIT, in collaboration with Hütz-Adams, F., Südwind Institute, and Ruf, F., CIRAD. Supported by the Jacobs Foundation, International Trade Initiative (IDH), UTZ, the Lindt Cocoa Foundation and the German Initiative for Sustainable Cocoa (GISCO).
2 Living income is about households affording a decent standard of living.
3Downloadable at
http://www.cocoabarometer.org/Download_files/Cocoa%20Barometer%202015%20Print%20Friendly%20Version.pdf
4 Source Food Manufacturer. Link https://www.foodmanufacture.co.uk/Article/2012/06/13/Mars-Chocolate-warns-action-on-cocoa-needed-to-beat-shortage?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright
5Laurent Pipitone quoted in article by Simran Sethi in Forbes, 10-10-2017
https://www.forbes.com/sites/simransethi/2017/10/10/why-an-oversupply-of-cocoa-is-bad-for-chocolate-lovers/#50c83e8d78f2

2. Demystifying the cocoa sector

To close part of the research gap, robust quantitative and qualitative data on current income diversification strategies was collected from 3,045 farming households in cocoa growing areas in Côte d'Ivoire and Ghana . This extensive data set was collected in November 2016 – January 2017(Ghana) and February-March 2017 (Côte d'Ivoire) by KIT, in collaboration with local research partners Agriculture and Lifecycle (ALC), Ghana and Agricole Local Partner (ALP), Côte d'Ivoire. The data set will be published in early 2018.

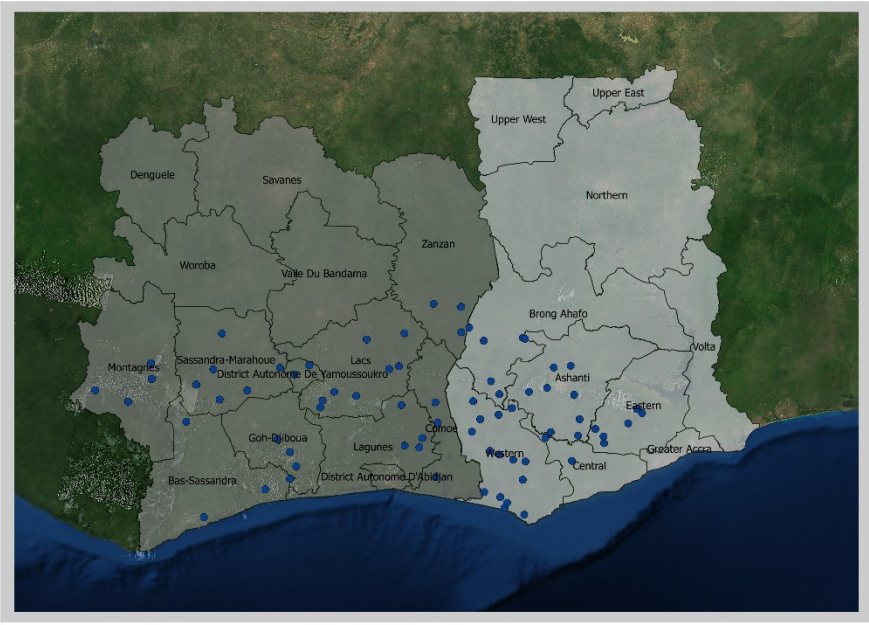
The survey covered social-economic characteristics and income sources of the farming households, nutrition and food security questions and detailed questions on the production and sales of two major crops (out of nine possible crops) per household. The survey contained questions covering the Dietary Diversity Index (DDI) and the Poverty Probability Index (PPI) and included DHS Wealth Index survey questions.

The focus group discussions (FGD) consisted of a variety of different exercises aimed at supporting the survey questions and understanding the 'why, how, and for whom?'. The participatory exercises included scoring and ranking, and provided the opportunity to probe farmers' perceptions to understand risks and their behaviour[6]. The FGD participants included all survey respondents.

Sampling of villages
Fieldwork took place in 37 villages in Ghana and 37 villages in Côte d'Ivoire. The number of villages allocated per geographical area was proportional to recent cocoa production figures. The local research partners provided a list of all potential villages in the selected locations, which were then randomly selected.

The selected villages were notified in advance. Map 1 indicates the location of the selected villages in Ghana and Côte d'Ivoire.

Map 1: Location of sampled villages



Sampling of respondents
Respondents from each village were selected by means of a transect: the village was divided into four areas (North, East, South, West) and 10 houses were randomly sampled. The household member that was encountered was invited for the interview. For all 10 members invited the researchers made sure at least three were women. In the final sample, in both countries, 34% of respondents were women.

[6] The KIT team developed a set of adapted participatory development (PADev) exercises www.padev.nl.

3. Research findings

In this paper, a selection of the initial research findings is presented. Firstly, background information is provided on the survey respondents and their households. Secondly, data on current income generating activities of households and current crop combinations is presented. Thirdly, it is shown how on the one hand households in cocoa growing areas are more diversified in terms of crop choice and income than is often assumed, and on the other hand cocoa is still the most important crop for the majority of households in cocoa growing areas for different reasons.

In our analysis, we make a distinction between 'cocoa households' and 'non-cocoa households'. We define cocoa households as households for which the respondent said that cocoa is either their households most important or second most important crop. For Ghana, this was 84% of the total sample (N= 1318); for Côte d'Ivoire, this was 61% (N =910) (Table 1).

Table 1: Most important or second most important crop (combined) by country

	Ghana	Côte d'Ivoire	p-value	sig
Cocoa	84%	61%	0.00	***
Plantain	26%	5%	0.00	***
Cassava	23%	25%	0.29	
Maize	10%	6%	0.00	***
Palm	8%	4%	0.00	***
Rice	5%	12%	0.00	***
Peppers	5%	0%	0.00	***
Rubber	3%	9%	0.00	***
Tomatoes	3%	2%	0.33	
Cashews	2%	15%	0.00	***
Cocoyam	2%	0%	0.00	***
Coconut	2%	0%	0.00	***
Okra	2%	3%	0.04	**
Yam	1%	8%	0.00	***
Eggplant	1%	4%	0.00	***
Chili	0%	8%	0.00	***
Groundnuts	0%	5%	0.00	***
Coffee	0%	7%	0.00	***

Note: The table presents the percent of respondents in each country for which a crop was reported to be either the most important or second most important crop. This categorization of 'most important or second most important' was used to ask survey respondents detailed questions about each crop later in the survey. The table includes only crops reported by at least 2% of respondents in either country, sorted by Ghana.

3.1 Demographics

Household heads

Most respondents in both countries self-identified as the head of the household (Ghana 78%, Côte d'Ivoire 69%). As expected, there were highly significant gender differences in Ghana and Côte d'Ivoire as to who identifies as the head of the household. In Ghana, 45% of female respondents identified as the head of the household. In 95% of cases, male respondents self-identified as the household head, and those who were not the head were often the son of the head. In Côte d'Ivoire, only 26% of females self-identified as the household head. Among male respondents, 90% said they were the household head (Table 2).

Table 2: Female and male-headed households of respondents in Ghana and Côte d'Ivoire

	Ghana Female respondent	Ghana Male respondent	Côte d'Ivoire Female respondent	Côte d'Ivoire Male respondent
Head	45%	95%	26%	90%
Non-head	55%	5%	74%	10%
N	538	1,022	498	987

Note: P-value is 0.00 for Ghana (highly significant) and P-value is 0.00 for Cote d'Ivoire (highly significant). Table has been modified for ease of reading.

Marital status

Female household heads were found to be a mix of single, divorced and widowed women in both Ghana and Côte d'Ivoire. Around a quarter of female heads also reported being married or in *concubinage (*co-habiting*)*, and we are unsure whether these women consider themselves to be the sole head or co-head of the household (

Table 3). Certainly, female-headed households should not be thought of only as 'older, widowed women', as is sometimes implied.

Table 3: Respondent marital status, by sex of household head

	Ghana Female head	Ghana Male head	p-value	sig	Côte d'Ivoire Female head	Côte d'Ivoire Male head	p-value	sig
Single	12%	4%	0.00	***	30%	10%	0.00	***
Married/concubinage	24%	91%			27%	86%		
Divorced	23%	3%			10%	1%		
Widowed	40%	2%			34%	3%		
Don't know	0%	0%			0%	0%		
N	287	1270			157	1,319		

Education

Household heads in Ghana were found to have a generally higher level of educational attainment than household heads in Côte d'Ivoire. For example, in Ghana, 24% of household heads reported having attained no formal education with a further 12% only attaining primary school education. The most common category of educational attainment in Ghana was Junior High School (JHS), which was attained by 46% of household heads. By comparison, a higher proportion of household heads in Côte d'Ivoire had attained no formal education (32%) or only primary school education (34%). A much lower proportion of Côte d'Ivoire heads had completed JHS (21%). These statistical differences are highly significant (p-value<0.01) (Table 4).

Table 4: Educational attainment of the household head by country

	Ghana head	Côte d'Ivoire head	p-value	significance
No formal education completed	24%	32%	0.00	***
Primary school	12%	34%		
Junior high school (JHS)/middle school	46%	21%		
Senior high school (SHS) A/O level	11%	8%		
University	4%	1%		
Technical college/vocational	2%	1%		
Other, École Franco-arable / Coranique	1%	2%		
Don't know	0%	0%		
N	1,548	1,458		

In both Ghana and Côte d'Ivoire, substantial differences in educational attainment were observed between male and female-headed households. In particular, 46% of female heads reported having attained no formal education, compared with 21% of male heads. Likewise, in Côte d'Ivoire, 50% of female heads reported having attained no formal education, compared with 30% of male heads. Male heads in both countries attained JHS education at approximately twice the rate of female heads (p-value <0.01) (Table 5). These findings do not reflect the current state of the education system in either country, but rather illustrate educational disparities in years past.

Table 5: Educational attainment of the household head, by sex of head

	Ghana Female head	Ghana Male head	p-value	sig	Côte d'Ivoire Female head	Côte d'Ivoire Male head	p-value	sig
No formal education completed	46%	21%	0.00	***	50%	30%	0.00	***
Primary school	20%	14%			37%	38%		
Junior high school (JHS) / middle school	27%	49%			10%	20%		
Senior high school (SHS) A/O level	3%	10%			1%	7%		
University	1%	3%			1%	1%		
Technical college / vocational	2%	2%			1%	1%		
Other	0%	0%			0%	0%		
École Franco-Arabe / Coranique	0%	0%			0%	2%		
Don't know	0%	0%			0%	0%		
N	288	1270			157	1323		

In Ghana, there was found to be no statistical difference in educational attainment between cocoa and non-cocoa household heads. However, in Côte d'Ivoire, the data shows a highly significant difference between cocoa and non-cocoa heads (Table 6). This can be largely explained by lower educational attainment of female heads who less frequently reported producing cocoa as one of their most important crops. However, this finding should not be interpreted as cocoa production affecting the educational attainment of household heads in Côte d'Ivoire.

Table 6: Educational attainment of the household head by cocoa versus non-cocoa household

	Ghana Cocoa head	Ghana Non-Cocoa head	p-value	sig	Côte d'Ivoire Cocoa head	Côte d'Ivoire Non-Cocoa head	p-value	sig
No formal education completed	24%	26%	0.30		28%	39%	0.00	***
Primary school	13%	10%			36%	32%		
Junior high school (JHS)/middle school	47%	42%			23%	17%		
Senior high school (SHS)A/O level	10%	14%			8%	8%		
University	3%	5%			2%	1%		
Technical college/vocational	2%	3%			1%	1%		
Other	1%	0%			0%	0%		
École Franco-arable / Coranique	0%	0%			2%	3%		
Don't know	0%	0%			0%	0%		
N	1311	237			897	561		

Age

As discussed in the introduction, cocoa farmers' age is an important and sometimes contentious discussion in the cocoa sector. Some actors are concerned that cocoa farmers are getting older and could become unproductive, and that youth are not interested in cocoa and may seek other crop 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.

In our survey, we find that that the average age of respondents is 49.73 in Ghana and 44.69 in Côte d'Ivoire (*p-value* <0.01) (Table 7). We also find that Ghanaian household heads are around two years older than Ivorian heads in the sample (Ghana 51.55; Côte d'Ivoire 48.29; *p-value* <0.01) (Table 7). Female heads of the household are, on average, 3.5 years older than male heads of the households (Table 8).

Table 7: Age of respondent and household head (mean years) by country

	Ghana	Côte d'Ivoire	pvalue	sig
Age of respondent (mean)	49.73	44.69	0.00	***
Age of household head (mean)	51.55	49.45	0.02	**
N	1,558	1,442		

Table 8: Age of household heads (mean years) by household head

	Ghana Female head	Ghana Male head	pvalue	sig	Côte d'Ivoire Female head	Côte d'Ivoire Male head	pvalue	sig
mean	54.41	50.90	0.00	***	51.73	49.18	0.39	
std.error	0.86	0.39			1.08	1.02		
N	287	1269			141	1197		

We believe that it is important to show whether any age-related issues are cocoa specific, or whether they are common smallholder farmer phenomena.

Further analysis of the age distribution suggests that there is a difference between cocoa household heads and non-cocoa household heads. In Ghana, the data suggests a lower proportion of young respondents that have cocoa as their first or second most important crop and a higher proportion of older respondents that have cocoa as their first or second most important crop (*p-value <0.01*) (Figure 1). For Côte d'Ivoire, there is no significant difference (Figure 2).

Figure 1: Age distribution of household heads for cocoa and non-cocoa households in Ghana

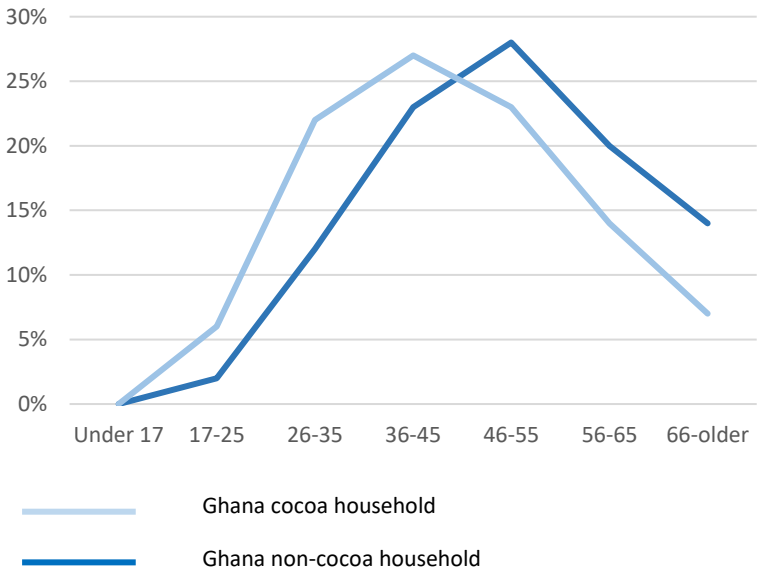
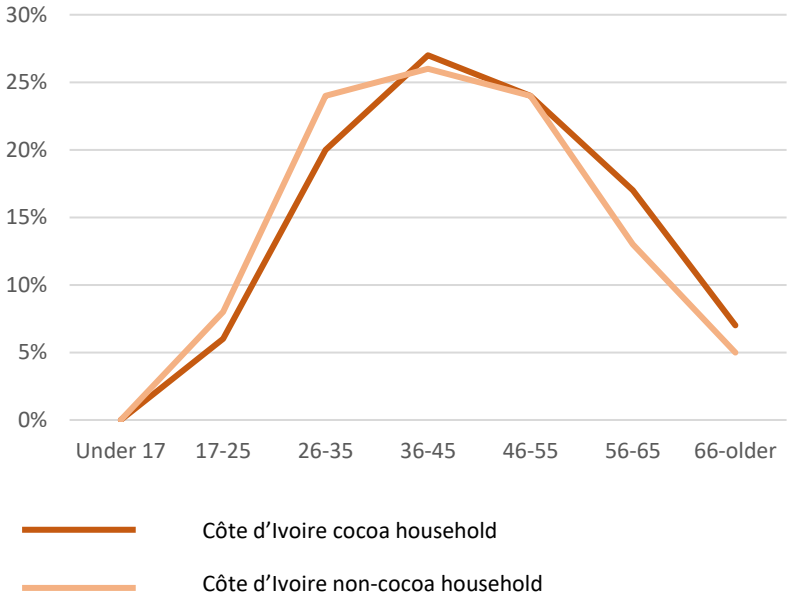


Figure 2: Age distribution of household heads of cocoa and non-cocoa households in Côte d'Ivoire



The average age of respondents corresponds with earlier studies (e.g. Boahene *et al*, 1999; Laven, 2010; Hainmueller *et al.* 2011; Barrientos & Akyere, 2012; Ingram *et al.* 2014). This suggests that younger farmers keep entering the cocoa sector, especially in Côte d'Ivoire. Otherwise, the age distribution of cocoa famers would have not remained well balanced with a mean around 45-50 years.

3.2 Income diversification

There is increasing attention for the importance of diversification for cocoa growing households, for different reasons. These include the impact of deforestation and difficulties of cocoa replanting (Ruf & Schröth, 2015) and the projected decrease in climate suitability of cocoa production for areas where cocoa is currently being produced (e.g. Schroth *et al.* 2016) and from the growing concerns about (periods of) foods insecurity and malnutrition that seem to coincide with dependence on cocoa as well as macro-economic studies which point out that the majority of farmers lives below the poverty line (different authors in Oomes *et al.* 2016).

In our research, we collected data in cocoa growing areas in Ghana and Côte d'Ivoire to understand what are the current income diversification patterns, and the reasons behind this. We believe that this type of data could offer a benchmark and give guidance for future interventions.

Although cocoa was found to be the most important crop, or second most important crop for the majority of farmers (Table 1) and cocoa is the most frequently produced crop in both Ghana (90%) and Côte d'Ivoire (69%), there were also other frequently produced crops. In Côte d'Ivoire, about twice as many male-headed households (73%) reported they produce cocoa as female-headed households (36%) (*p-value <0.01*) (Table 9).

Table 9: Crops produced by sex of household head

	Ghana Female head	Ghana Male head	p-value	sig	Côte d'Ivoire Female head	Côte d'Ivoire Male head	p-value	sig
Cocoa	86%	91%	0.02	**	36%	73%	0.00	***

Cassava	84%	84%	0.92		76%	65%	0.01	***
Plantain	82%	80%	0.36		35%	47%	0.01	***
Maize	44%	47%	0.43		20%	36%	0.00	***
Cocoyam	44%	45%	0.84		18%	19%	0.84	
Peppers	31%	26%	0.09	*	1%	0%	0.35	
Yam	20%	25%	0.09	*	50%	48%	0.70	
Tomatoes	24%	20%	0.09	*	34%	27%	0.05	*
Palm	9%	15%	0.01	***	4%	7%	0.14	
Okra	14%	14%	0.75		52%	46%	0.18	
Eggplant	8%	10%	0.16		52%	44%	0.04	**
Rice	2%	8%	0.00	***	16%	29%	0.00	***
Bananas	5%	6%	0.27		1%	2%	0.82	
Rubber	3%	6%	0.04	**	10%	20%	0.00	***
Coconut	3%	4%	0.55		0%	1%	0.17	
Other	3%	4%	0.76		8%	6%	0.29	
Oranges	2%	4%	0.19		1%	0%	0.00	***
Cashews	2%	3%	0.41		18%	21%	0.46	
Chili	1%	2%	0.18		62%	52%	0.02	**
Beans	2%	1%	0.14		3%	6%	0.18	
Groundnuts	0%	1%	0.27		21%	25%	0.26	
Coffee	0%	0%	0.63		7%	15%	0.01	***
N	288	1270			157	1323		

Note: Table sorted on Ghana male head and only includes crops for which at least 2% of respondents reported producing in either country

Household cropping systems are currently characterised by a diversity of crops. Table 10 illustrates the diversity of choices within the cocoa producing regions in Ghana and Côte d'Ivoire. In Ghana, cocoa households produced 5.08 different crops in 2016 compared with 4.60 for non-cocoa households (*p-value <0.01*). This pattern is repeated in Côte d'Ivoire, where cocoa households grew 6.09 crops in 2016, compared with 5.46 crops for non-cocoa households (*p-value <0.01*).

Table 10: Crop diversity with number of crops produced by cocoa vs non-cocoa households

	Ghana Cocoa HH	Ghana Non-HH	p-value	sig	Côte d'Ivoire Cocoa HH	Côte d'Ivoire Non-Cocoa HH	p-value	sig
Mean	5.08	4.60	0.01	***	6.09	5.46	0.00	***
std.error	0.07	0.17			0.11	0.12		
N	1318	242			910	575		

Two findings stand out. First, Ivorian respondents have greater crop diversity than Ghanaian respondents, which is linked to the larger land sizes that Ivorian farmers have access to (Bymolt et al. forthcoming). Second, in both Ghanaian and Ivorian cases, cocoa households feature greater crop diversification than non-cocoa households (*p-value <0.01*). Again, this is correlated with the higher average land sizes among cocoa farmers (Bymolt et al. forthcoming).

Crop combinations

Table 11 and Table 12 show the current crop combinations for respondents in Ghana and Côte d'Ivoire, respectively. In Ghana it stands out that cassava and plantain are the most frequently produced crops by households that also produce cocoa, followed by cocoyam and maize. In Côte d'Ivoire, fewer crops stand out as being pairs.

Table 11: Crop combinations with percent of respondents reporting that the household produces each crop pair in Ghana

	Bananas	Cashews	Cassava	Chili	Cocoa	Coconut	Cocoyam	Eggplant	Maize	Okra	Oranges	Palm	Pepper	Pineapple	Plantain	Rice	Rubber	Tomatoes	Yam
Bananas		0	6	0	6	1	4	2	4	2	1	2	3	1	6	1	1	3	4
Cashews	0		3	0	3	0	2	1	2	1	1	1	1	0	3	0	0	1	2
Cassava	6	3		2	76	3	43	9	43	13	3	13	25	2	76	5	4	19	23
Chili	0	0	2		2	0	2	1	2	1	0	1	0	0	2	0	0	1	2
Cocoa	6	3	76	2		3	43	9	42	13	3	13	24	2	74	6	2	18	23
Coconut	1	0	3	0	3		2	1	2	1	0	2	2	0	3	0	1	1	1
Cocoyam	4	2	43	2	43	2		7	27	9	2	7	16	1	43	3	1	13	18
Eggplant	2	1	9	1	9	1	7		7	6	1	2	7	1	9	1	1	7	5
Maize	4	2	43	2	42	2	27	7		11	2	8	18	1	42	4	2	14	17
Okra	2	1	13	1	13	1	9	6	11		1	3	11	1	13	1	1	9	7
Oranges	1	1	3	0	3	0	2	1	2	1		1	1	0	3	0	0	1	1
Palm	2	1	13	1	13	2	7	2	8	3	1		4	1	12	1	1	4	5
Pepper	3	1	25	0	24	2	16	7	18	11	1	4		1	24	1	2	15	11
Pineapple	1	0	2	0	2	0	1	1	1	1	0	1	1		3	0	0	1	1
Plantain	6	3	76	2	74	3	43	9	42	13	3	12	24	3		4	3	19	22
Rice	1	0	5	0	6	0	3	1	4	1	0	1	1	0	4		0	1	1
Rubber	1	0	4	0	2	1	1	1	2	1	0	1	2	0	3	0		2	1
Tomatoes	3	1	19	1	18	1	13	7	14	9	1	4	15	1	19	1	2		9
Yam	4	2	23	2	23	1	18	5	17	7	1	5	11	1	22	1	1	9	

Note: Figures presented in the above table are percentages of households reporting producing each pair. The percentage sign has been removed for legibility. Crops that do not have at least one crop pair produced by 3% of respondents have not been included.

Table 12: Crop combinations with percent of respondents reporting that the household produces each crop pair in Côte d'Ivoire

	Beans other	Cashews	Cassava	Chili	Cocoa	Cocoyam	Coffee	Eggplant	Groundnuts	Maize	Okra	Palm	Plantain	Rice	Rubber	Tomatoes	Yam
Beans other		1	4	4	5	2	2	4	3	4	4	1	3	4	1	2	2
Cashews	1		13	14	9	6	2	9	8	9	12	0	10	2	1	7	16
Cassava	4	13		42	45	17	10	36	18	25	37	4	38	17	12	23	38
Chili	4	14	42		35	17	8	39	19	24	41	2	33	14	9	24	35
Cocoa	5	9	45	35		15	14	30	15	24	31	5	37	24	16	20	28
Cocoyam	2	6	17	17	15		4	14	7	11	16	0	17	3	5	13	15
Coffee	2	2	10	8	14	4		7	5	6	7	1	8	6	3	5	6
Eggplant	4	9	36	39	30	14	7		17	20	35	2	28	13	9	23	28
Groundnuts	3	8	18	19	15	7	5	17		14	18	1	14	7	4	12	17
Maize	4	9	25	24	24	11	6	20	14		22	2	20	13	6	16	20
Okra	4	12	37	41	31	16	7	35	18	22		2	28	13	8	23	31
Palm	1	0	4	2	5	0	1	2	1	2	2		2	3	3	1	2
Plantain	3	10	38	33	37	17	8	28	14	20	28	2		12	10	20	28

Rice	4	2	17	14	24	3	6	13	7	13	13	3	12		5	5	7
Rubber	1	1	12	9	16	5	3	9	4	6	8	3	10	5		6	7
Tomatoes	2	7	23	24	20	13	5	23	12	16	23	1	20	5	6		21
Yam	2	16	38	35	28	15	6	28	17	20	31	2	28	7	7	21	

Note: Figures presented in the above table are percentages of households reporting producing each pair. The percentage sign has been removed for legibility. Crops that do not have at least one crop pair produced by 3% of respondents have not been included.

These crop combinations do not come as a surprise. It is well known that cassava and plantain are often intercropped with cocoa on young cocoa farms (e.g. Aneani *et al.,* 2011 and Ameyaw *et al.,* 2011).

Our qualitative data collection revealed four reasons for the high frequency of pairing of these three crops: i) cassava and plantain provide excellent possibilities for intercropping with young cocoa; ii) pairing these crops provides additional income more regularly and in cocoa off-season; iii) cassava and plantain are nutritious products for households; and iv) the production of these crops fit current gender roles. When the cocoa is young, women manage the young cocoa farms and are responsible for the food crops that are intercropped with cocoa. When cassava and plantain are cultivated on separate plots, men help with land clearing and planting, while women do most of the maintenance and are the ones mainly involved in processing and sales of these crops.

3.3 Importance of cocoa in a diversified farm

We asked all respondents to estimate the percent of income from different sources for their household (Table 13), and the income percentage from sale of cocoa for cocoa households (Table 14).

Table 13: Percent of income from difference sources, all respondents, by country

	Ghana	Côte d'Ivoire	p-value	sig
Sale of cocoa	53%	42%	0.00	***
Sale of other crops	26%	41%	0.00	***
Own small business or trading	11%	6%	0.00	***
Remittances from friends and family	3%	1%	0.00	***
Sale of livestock or livestock products	2%	0%	0.00	***
Salary employment in government job	2%	1%	0.00	***
Other	1%	6%	0.00	***
Salary employment with a company	1%	1%	0.28	
Labouring for other people on their farms	1%	0%	0.03	**
Sale of fish	0%	0%	0.99	
Labouring for other people non-agriculture	0%	1%	0.01	**
Sale of bush products	0%	0%	0.02	**
Sale or lease of land	0%	0%	0.02	**

Table 14: Income percentage from sale of cocoa in cocoa households

	Ghana Cocoa hh	Côte d'Ivoire Cocoa hh	p-value	significance
Mean	61%	66%	0,00	***
std.error	1%	1%		
N	1314	909		

Table 13 and 14 show that cocoa remains the major source of revenues but diversification is already well established. We observe that crop diversification is more advanced in Côte d'Ivoire while small

business or trading are twice as important in Ghana. The sale of livestock still appears marginal in both countries.

Our qualitative data collection provided good insight into why so many farmers in the cocoa growing areas regard cocoa as the most important crop. In Ghana, the main reasons given by participants were: i) a reliable source of income that consistently generates the highest source of income; ii) farmers feel that it is a crop of national importance; and iii) that it provides them with a high degree of land security. Other reasons mentioned included social security, credit access and because of tradition. It was the male participants, in particular, who felt that national importance of cocoa mattered. In terms of income, benefits from cocoa involve not only a relatively high income, but also a stable income (guaranteed market and price), a bulk income and long-term income.

In Côte d'Ivoire, it was mainly the male participants that prioritised cocoa as their most important income. Their most frequently mentioned reason was that cocoa provided a 'high income'. To a far lesser extent, male participants mentioned 'tradition and national importance' and 'securing land rights and social security'. In some groups, male respondents made reference to cocoa having a lower labour demand and a shorter harvest time compared to other crops.

The relatively little interest of the female focus group participants in cocoa can be better understood if we look at the gender relations and intra-household dynamics[7]. Particularly in Côte d'Ivoire, cocoa is perceived as 'a man's job' whilst women are seen as 'helpers'. Activities that stand out as 'a woman's task' are often not recognized as contributing directly to cocoa production. For example, taking care of the young cocoa farm, preparing food for the men and workers that do the harvesting/pod breaking, and fetching the water for spraying. *Spouses* are hardly involved in cocoa marketing, have little decision-making power and no control over the income that is generated from cocoa. This is particularly true in Côte d'Ivoire.

FGD participants generally argued that decision-making depends on ownership: if it is 'her production, she decides; if it is 'his production', he decides. Women have much more difficulty accessing cocoa land than men (Bymolt et al. forthcoming).

Conclusion

This large-scale survey in Côte d'Ivoire and Ghana confirms some well-known practices such as the systematic intercropping of plantain and tubers in young cocoa farms. These results are not new but the first achievement of this large-scale survey has been the capability to quantify these processes.

One of the preliminary study results is to highlight the role of cocoa in cocoa farms particularly that the crop is not the sole source of revenues; farmers clearly diversity, especially in Côte d'Ivoire. Nevertheless, cocoa remains at the core of the vast majority of cocoa farmers' concerns and priorities. Younger farmers are also entering the cocoa sector, especially in Côte d'Ivoire. Otherwise, the age distribution of cocoa famers would have not remained well balanced with a mean around 45-50 years and Côte d'Ivoire could not have kept its leadership among cocoa producing countries (Ruf, 2014).

The capacity of cocoa to remain as an attractive and important crop despite long periods of declining prices and revenues is explained by many factors which include a guaranteed market and established cocoa knowledge and habits. The possibility to intercrop cocoa with other crops, including some food crops, also plays a role. The debate and analysis about 'cocoa versus food crops' is not over but this survey will challenge the 'myth' of cocoa destroying food security.

Beyond the survey's rich potential to distinguish and explain differences between the cocoa sectors in Côte d'Ivoire and Ghana today, there will be also a large field of comparisons over time using the benchmark of previous surveys.

These combined results should help the chocolate industry to better understand and appreciate the rationale behind decisions and investments made by cocoa smallholders and thus help the industry to improve its support when they are willing to do so.

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[7] In discussing labour division and decision-making in a household, it is necessary to be aware that the marital status of participants differs.

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