



Farmfit

SDM Analysis ECOM SMS Ghana

How to scale market linkage
services enabling cocoa
farmers to earn a prosperous
income

*Public version
June 2021*

Table of content

Introduction

Recommendations

About the sector

Annex

Table of content

Introduction

Recommendations

About the sector

Annex

About Service Delivery Models

Importance of Service Delivery

Agriculture plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to climate change, which threatens the long-term viability of global food supply. To earn adequate livelihoods without contributing to environmental degradation, farmers need access to affordable high-quality goods, services and technologies.

Service Delivery Models (SDMs) are supply chain structures which provide farmers with services such as training, access to inputs, finance and information. SDMs can sustainably increase the performance of farms while providing a business opportunity for the service provider.

A solid understanding of the relation between impact on the farmer and impact on the service provider's business brings new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable.

About this study

To accelerate this process, IDH is leveraging its strength as a convener of key public-private partnerships to gain better insight into the effectiveness of SDMs. IDH developed a systematic, data-driven approach to understand and improve these models. The approach makes the business case for service delivery to investors, service providers, and farmers. By further prototyping efficiency improvements in service delivery, IDH aims to catalyze innovations in service delivery that positively impact people, planet, and profit.

Thanks

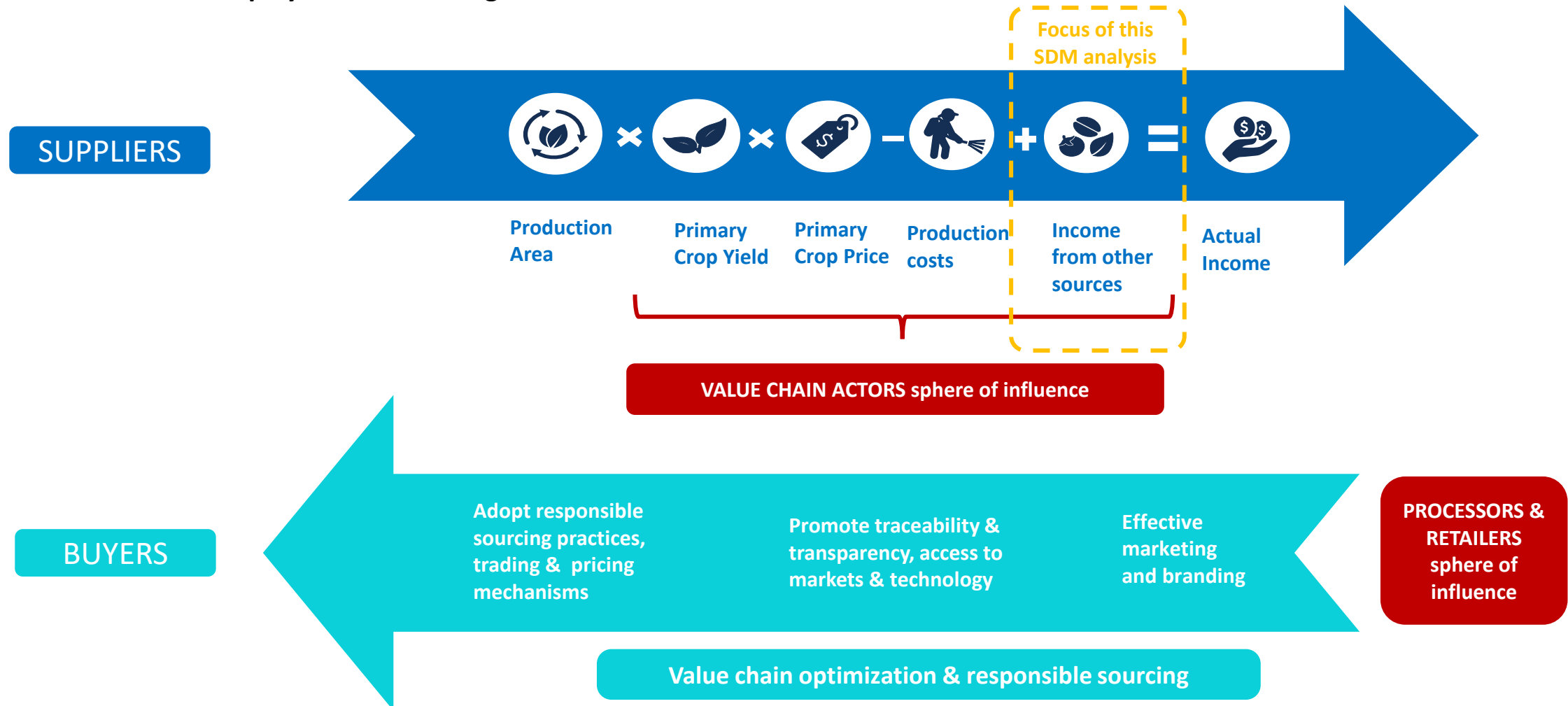
IDH would like to express its sincere thanks to ECOM Sustainability Management Services (SMS) for their openness and willingness to partner through this study. By providing insight into their model and critical feedback on our approach, ECOM SMS is helping to pave the way for service delivery that is beneficial and sustainable for farmers and providers.



Introduction

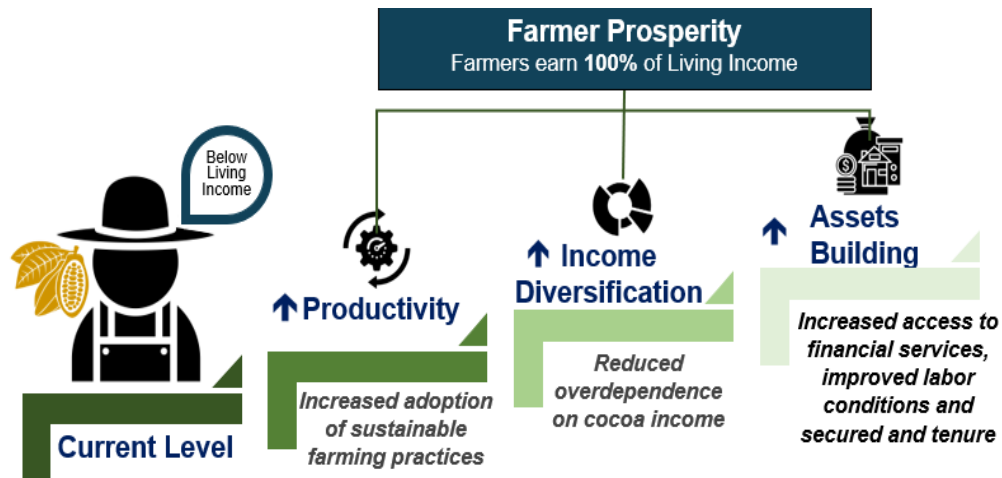
This SDM analysis informs a broader IDH – SMS collaboration that aims to close the farmer income gap, with a focus on increasing income from other sources (than cocoa)

Role of value chain players in increasing farmer incomes

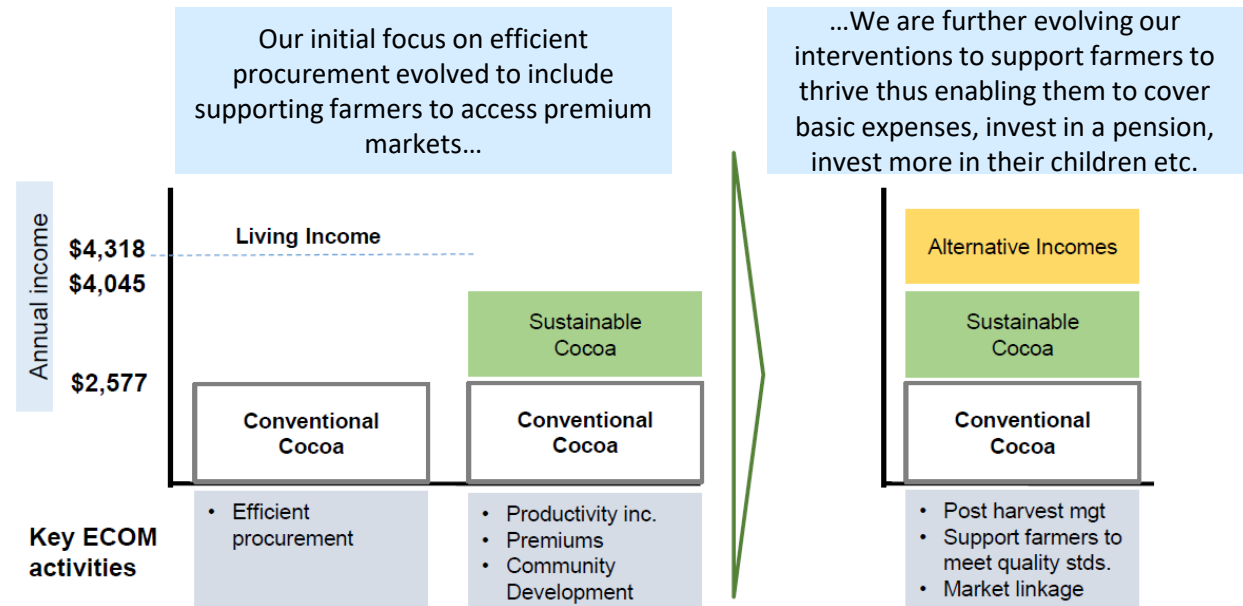


IDH and SMS vision on closing the income gap are closely aligned, providing an excellent opportunity to move the needle on living incomes in the West African cocoa sector

SMS pathway to prosperity

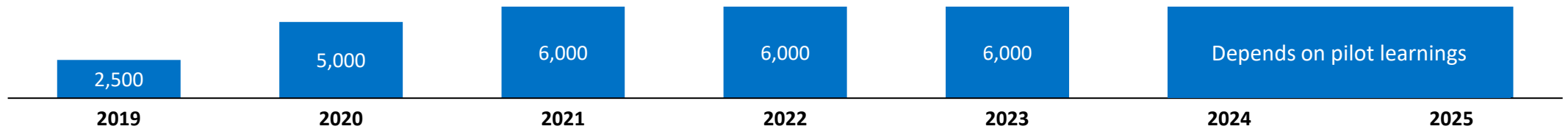


Approach to closing the living income gap



SMS seeks to pilot its non-cocoa service package at small scale, before expanding to more farmers and countries

Number of farmers over time

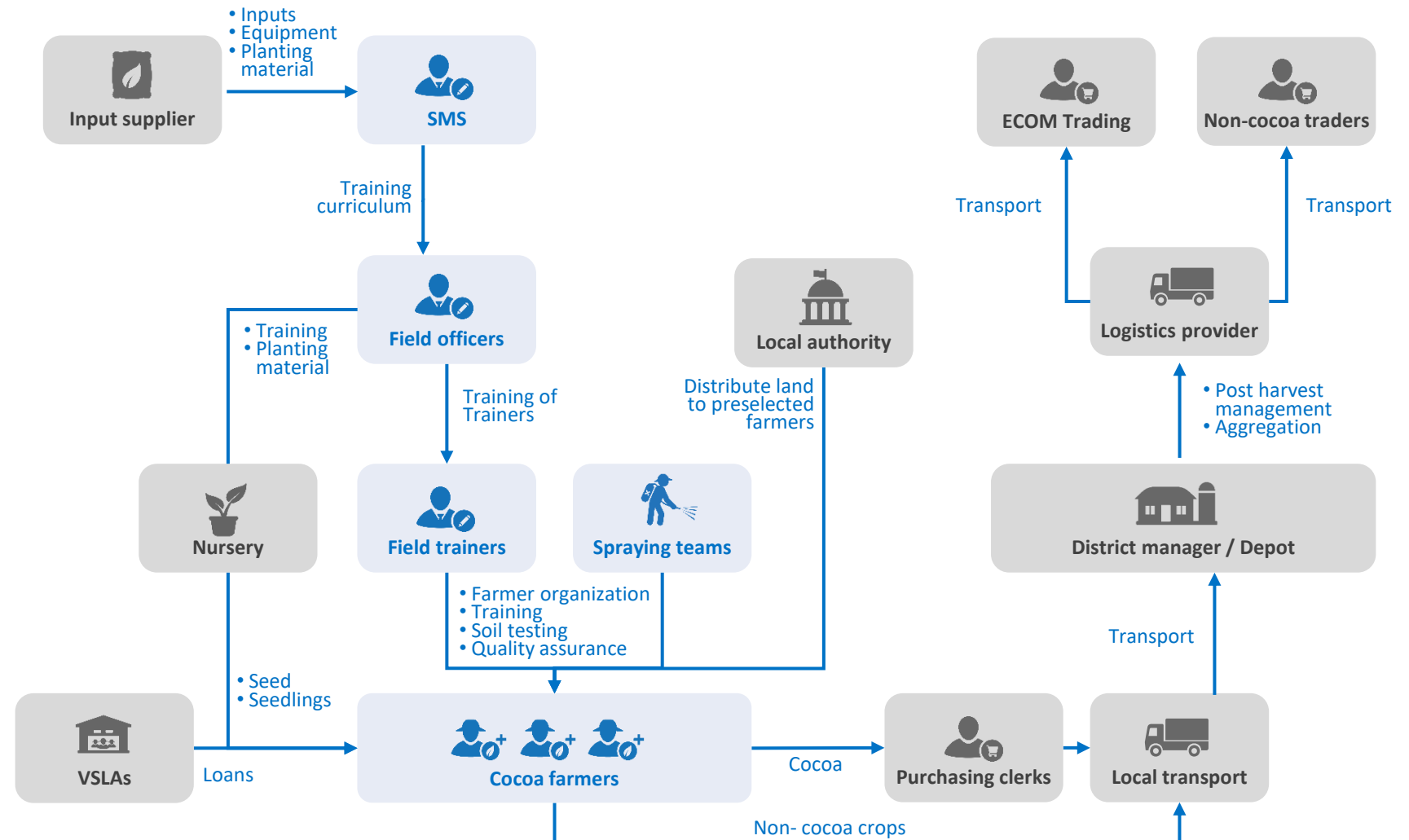


	Pilot		Enable				
Roadmap	Pilot to implement market-linkages at small-scale and test strategy, approach and impact at farm-level.	Strengthening the service offering and provision infrastructure. Improve farmer relationships and impact.					
		Scale-up market linkages services in Ghana, CDI and Nigeria to entire cocoa supply chain and possibly beyond					
		Develop supporting digital infrastructure to build farmer track records and enable scale-up.					
		Provide access to finance services via VSLAs, MFIs and own finance business unit					
		Implement digital service and sales platform connecting farmers to input providers, off-takers and consumers					
Objectives	<ul style="list-style-type: none">10%-15% increase in household net income by 202375% of volumes delivered are according to buyers quality and standards that will allow us to achieve farmer income targets		<ul style="list-style-type: none">Investments from end buyers coursed through SMSUnderstand farmer satisfaction and adoptionClear cost indication of service package to maximize efficiency		Target/product	Niche	Mass
					Income increase	20-30%	10-15%
					Rejection rate	15-20%	8%

For this pilot SMS can leverage their cocoa service and sourcing infrastructure to gradually roll-out alternative crop services

Service provision infrastructure

- This overview shows the main stakeholders and respective SDM service and payment flows between those
- SMS can build on their existing training, input provision and transportation services
- Some newly introduced non-cocoa crops require specific investments, ranging from a tailored training curriculum to post-harvest handling and storage equipment
- SMS will sell the non-cocoa crops either to ECOM trading or to local off-takers, charging a volume-based service fee
- The fee should cover the costs of all non-cocoa services provided but is not charged to farmers.



Legend

→ Flow of goods and services



This SDM analysis aims to answer: “how can SMS effectively scale up its service delivery to enable alternative incomes for farmers?”



About SMS Ghana

- **SMS implements sustainability programs** and provides products and services for rural populations. SMS has made commitments to its economic impact on farmer livelihoods and sees farmers earning a Living Income as an important milestone.
- To achieve this **SMS aims to be the leading provider for socially responsible farmer-focused solutions**, services and products. In Ghana, SMS services cocoa farmers with a range of services including farmer organization, training, access to planting materials, crop protection and fertilizers, and certification and verification.
- **SMS works with AGL** (Ecom tradings vehicle in Ghana), Kiteko (logistics service provider) and Cropdoctors (inputs service provider). AGL's income is dependent on trading cocoa beans and is interested in using the existing infrastructure of SMS, Kiteko and the Cropdoctors to leverage synergies from sourcing more crops from the same farmer base.



Main cocoa challenges

- For **Ghanaian cocoa farmers**, yield appears to be the driver that has the highest potential to increase farmer income. Many interventions have been implemented and piloted surrounding yield, quality, and price improvements for farmers to raise farmer income.
- These **interventions range from** (i) farm level interventions such as training and input provision, (ii) market interventions to increase prices such as voluntary standards and minimum prices to (iii) enabling environment interventions focused such as access to finance and infrastructural improvements.
- However, today, **the cocoa sector can still be characterized by severe poverty, food insecurity, child labor and deforestation** which highlights the urgency for new interventions.



Alternative income as potential solution

- For **SMS and for ECOM** more broadly supplying services that enable farmers to generate alternative incomes has become attractive. For SMS this broader focus on household incomes potentially increases its farmer base as it would allow the organization to serve non-cocoa farmers and cocoa farmers with additional services.
- For **AGL as a trader**, diversification of the crops it sources in Ghana, CDI and Nigeria could reduce its dependence on cocoa and grow their other product sales.
- For **smallholder farmers**, creating and streamlining alternative markets could lead to increased farm revenues and income resilience and a reduction of household cost.
- To this end, this SDM analysis seeks to answer: **“how can SMS scale up its non-cocoa services in an effective and integrated way, enabling farmers to earn a living income and beyond?”**

Table of content

Introduction

Recommendations

About the sector

Annex

This section assesses how SMS could scale up its non-cocoa services in an effective and integrated way, enabling farmers to earn a living income and beyond

Core recommendations

1



By offering an **attractive value proposition** that farmers are able and willing to invest in

2



By offering **crops combinations** that close the income gap while minimizing farm investment needs

3



By **leveraging existing cocoa and digital infrastructure** to profitably offer alternative crop services at scale

Supporting analyses

- A. **Five high potential alternative value chains** have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger
 - B. **Farmer selection criteria** are proposed to determine how to best support and prioritize different types of farmers in growing non-cocoa crops
 - C. **Profitability and feasibility** of five crop combinations have been assessed
-
- A. **A clear income baseline and target should be established** to understand the relative importance of alternative incomes in closing the gap
 - B. **The business case for farmers** is assessed across crops combinations
 - C. **Limiting factors** in key farm assets (land, labor and cash) required to reach the income target have been identified
-
- A. **A holistic alternative service package** is required to reach farmer income targets and overcome key constraints
 - B. **Existing** cocoa service delivery and digital **infrastructure** can be leveraged
 - C. **The commercial viability** of SMS alternative crop services is assessed

What actions can be taken and how can other actors contribute to design and scale SMS non-cocoa services?

Recommendation	Actions required to execute this recommendation	Type of actor best positioned for driving the service	Relevant stakeholders to collaborate with on implementation	External support required to implement this recommendation
1A. Five high potential alternative value chains have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger	<ol style="list-style-type: none"> 1. Develop new and expand existing off-taker relationships 2. Develop and test product positioning and pricing strategy 3. Iterate based on first 1-3 seasons results 	<ul style="list-style-type: none"> • ECOM/SMS business development 	<ul style="list-style-type: none"> • ECOM trading • Local off-takers • Local markets 	<ul style="list-style-type: none"> • Third-party verification of sustainable, high-quality, exportable produce
1B. Farmer selection criteria are proposed to determine how to best support and prioritize different types of farmers in growing non-cocoa crops	<ol style="list-style-type: none"> 1. Review selection logic and criteria 2. Design data collection approach to track farmer performance and behavior to improve current service offering and develop future financial services 	<ul style="list-style-type: none"> • SMS management • SMS digital / M&E team 	<ul style="list-style-type: none"> • Knowledge partner on segmentation (e.g., IDH, IITA) 	<ul style="list-style-type: none"> • Advisory services to co-develop and share learnings on effective farmer segmentation
3A. A holistic alternative service package is required to reach farmer income targets and overcome key constraints	<ol style="list-style-type: none"> 1. Develop MVP* for land, labor and equipment services (chili drying, soil testing, weighing) 2. Roll-out and test effectiveness, affordability and profitability of services 3. Invest in VSLA for early access to finance 4. Design with inclusiveness and environmental sustainability in mind 	<ul style="list-style-type: none"> • SMS management & field staff 	<ul style="list-style-type: none"> • Soil test service provider • Knowledge partner and/or implementer on inclusion and sustainability • Donors 	<ul style="list-style-type: none"> • Access to land co-develop (block)farms • Advisory services and grant funding to strengthen farmer organizations and build case for access to finance • Advisory services and grant funding to design for inclusive and sustainable service offering
3B. The commercial viability of SMS alternative crop services is assessed	<ol style="list-style-type: none"> 1. Verify assumptions of business model 2. Define roadmap, including stage gate criteria and KPIs (e.g., farmer income and scale targets) 3. Prepare for scale and external investment 4. Make digital integral to the business for continuous improvement 	<ul style="list-style-type: none"> • ECOM / SMS management 	<ul style="list-style-type: none"> • (impact) Investors 	<ul style="list-style-type: none"> • Third-party verification of reaching farmer income targets • Finance to expand proven service offering to wider farmer population

* Minimum Viable Product

IDH could strengthen parts of SMS non-cocoa services business by providing Technical Assistance (TA) and financial support



How can SMS scale up its non-cocoa services in an effective and integrated way, enabling farmers to earn a living income and beyond?

Core recommendations

Supporting analyses

1



By offering an **attractive value proposition** that farmers are able and willing to invest in

- A. **Five high potential alternative value chains** have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger
- B. **Farmer selection criteria** are proposed to determine how to best support and prioritize different types of farmers in growing non-cocoa crops
- C. **Profitability and feasibility** of five crop combinations have been assessed

2



By offering **crops combinations** that close the income gap while minimizing farm investment needs

- A. **A clear income baseline and target should be established** to understand the relative importance of alternative incomes in closing the gap
- B. **The business case for farmers** is assessed across crops combinations
- C. **Limiting factors** in key farm assets (land, labor and cash) required to reach the income target have been identified

3



By **leveraging existing cocoa and digital infrastructure** to profitably offer alternative crop services at scale

- A. **A holistic alternative service package** is required to reach farmer income targets and overcome key constraints
- B. **Existing** cocoa service delivery and digital **infrastructure** can be leveraged
- C. **The commercial viability** of SMS alternative crop services is assessed

Five high potential alternative value chains have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger

	Chili	Tomato	Cassava	Maize	Ginger
Market potential	<ul style="list-style-type: none"> • High import growth Middle East (8%) & Europe (6%) • High Ghanaian export growth (300-500%) • High Ghanaian import growth (32%) 	<ul style="list-style-type: none"> • High import growth Middle East (9%) • Import substitution (\$49M import value) 	<ul style="list-style-type: none"> • Potential for import substitution from a high Ghanaian import growth (166%) 	<ul style="list-style-type: none"> • High import growth North America (14%) & Europe (6%) 	<ul style="list-style-type: none"> • High import growth North America 10%), Middle East (10%) & Europe (14%) • Advanced conversations with off-takers
Competitive advantage	<ul style="list-style-type: none"> • High production volumes and yield • Government priority crop • Little known among cocoa farmers (2%) 	<ul style="list-style-type: none"> • High production volumes and farmgate price • Government priority crop • Averagely known among cocoa farmers (18%) 	<ul style="list-style-type: none"> • High production volumes, production growth and yield • Very well known among cocoa farmers (76%) 	<ul style="list-style-type: none"> • High production volumes, production growth, and farmgate price • Government priority crop • Well known among cocoa farmers (46%) 	<ul style="list-style-type: none"> • Production virtually non-existing. Potential first-mover advantage • Low familiarity among cocoa farmers
Mentions in other shortlists	<ul style="list-style-type: none"> • Export crop* 	<ul style="list-style-type: none"> • Import substitution* 	<ul style="list-style-type: none"> • High priority crop** 	<ul style="list-style-type: none"> • High priority crop** 	<ul style="list-style-type: none"> • Export crop* • High priority crop**

Sources: Longlist of crops established from *ECOM SMS's Industry Strategy Paper on crop diversification ad **Dalberg study on Value Chain Selection. Shortlist criteria are presented in the [Annex](#). Criteria have been assessed based on FAO data and verified with the SMS team.

Chili and tomato are most profitable yet risky for farmers to grow. Cassava and maize provide small and steady income, while ginger is loss-making

	Chili	Tomato	Cassava	Maize	Ginger
Net income (USD/ha)	6,339	14,637	1,468	251	-553
Revenues (USD/ha)	7,437	15,951	2,180	1,183	1,567
Yield, kg/ha	11,450	8,377	16,653	5,091	8,907
Marketable surplus, kg/ha	9,708	7,095	14,005	4,277	7,551
Farm-gate price, USD/MT	0.77	2.25	0.16	0.28	0.21
Expenses (USD/ha)	-1,099	-1,314	-712	-933	-2,120
Labor	-173	-346	-301	-171	-936
Inputs	-273	-343	-356	-124	-1,128
Equipment	-84	-59	-55	-71	-55
Finance	0	0	0	0	0
Transport	0	0	0	0	0
Irrigation	-567	-567	0	-567	0

Sources: based on data collected from on-going crop pilots, as captured in ECOM SMS agro-economic models, completed with assumptions. Verified with SMS agronomists and operational staff. Detailed assumptions can be found in [the Annex](#)

Crop profitability

- While most profitable, **chili and tomato** are also the riskiest crops to grow due to high sensitivity to climate, perishability and price volatility.
- Cassava and maize** providing more stable income, are insufficient to close the prosperous income target alone.
- Ginger** is not recommended for farmers to grow unless farmers are able to reduce planting material (2471 units/ha at 1.2 GHS/unit) and harvesting labor costs (225 labor days/ha of which 80% hired).
- Farmers are recommended to grow a combination of high- and low-risk crops to mitigate against failed harvest and price volatility, while having the potential to earn a prosperous income.

Pilot objectives

- To establish proof of concept, key metrics on crop performance and profitability should be monitored during the first seasons.

Crop scenarios are created to better reflect reality, and benefit from agronomics synergies and cost-efficiencies of mixed farming

Baseline assumptions

- An average 0.4 ha plot of non-cocoa crops is assumed alongside the 3.3 ha of cocoa.
- Plantain income is assumed to be negligible and not modelled as part of farmer calculations.

Farm area of average farmer analyzed

3.3 ha cocoa plot
intercropped
with plantain

0.4 ha non-cocoa
plot

Reasons for growing multiple crops

- **Realism:** crop combinations are defined to be a more realistic reflection of the situation, where farmers do not grow a single crop.
- **Risk mitigation:** growing different type of crops (e.g., chili versus maize) can mitigate climate, demand and price risks.
- **Efficiencies:** regardless of the specific combination, non-cocoa crops can be grown alongside cocoa with limited additional investments as farmers can leverage existing equipment (pruners, saws, knapsacks, harvesting bowls, PPE). Furthermore, introducing smart crop mixes might reduce the needs for inputs as they require different nutrients.

Main limitations

- The maximum number of crops grown on the same plot is set to 2 as more crops will invite more pest and diseases.
- Cassava and maize are not found together as they cannot easily be grown together.

Farm area planted per crop, in hectare

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Chili	0.28	0.28	0.32		
Tomato			0.08	0.08	
Cassava				0.32	
Maize	0.12				0.20
Ginger		0.12			0.20

Rationale for relative importance

- Relatively larger land size allocated to chili due to promising results in existing SMS pilots.
- Tomato has smaller relative lands size. While very profitable it is also the most risky due to volatile prices.
- Cassava, maize and ginger are average. Goes well with more risky crop.

Various criteria are assessed to determine how to best service and prioritize different types of farmers

Criteria	All smallholder farmer households in cocoa growing regions			
Value chain	Cocoa			Non-cocoa
Farmer performance	Farmers should show good training attendance and meet cocoa sustainability performance criteria			No data available as farmers are not in SMS value chain
Farm size	< 3.3 ha cocoa plot	> 3.3 ha cocoa plot		6 ha on average
Cocoa age	Mixed	Young cocoa	Mature cocoa	
Approach	Land expansion: identify ways to increase plots size before providing non-cocoa services	Intercropping: food crops grown in between cocoa, gradually phasing out as canopy thickens	Mixed farming: food crops planted on separate 0.4 ha plot next to the 3.3 ha cocoa	Mixed farming: food crops planted on separate plot next to cocoa
Distance to markets	Farmers closer to markets will be prioritized to keep logistical costs low at first			
Soil suitability	Soil tests will determine which crops to be recommended			
Priority	Medium When effective land aggregation services have been developed SMS can support farmers to expand farms to over 3.3 hectare	High SMS prioritizes best performing farmers in own value chain to test feasibility of reaching a prosperous income target. These farmers are most likely to adequately adopt new services and successfully reach the prosperous income target.		Medium No core business. As non-cocoa services provision is maturing SMS can start expanding to non-cocoa farmers on the longer-term

Farmer selection

- Given the pilot phase of the project, it is recommended SMS tests their offering with eligible farmers first before scaling up.
- While service provision could potentially be rolled out to all farmer household in the cocoa-growing regions, high performing cocoa farmer in SMS's own value chain with at least 3.3 ha of cocoa and 0.4 ha additional lands are prioritized.
- On the longer-term, cocoa farmers with smaller plots and non-cocoa farmers could be serviced. SMS would need to formulate an approach to support farmers in land expansion and define selection criteria for farmers that have no track record with SMS.

How can SMS scale up its market linkage services in an effective and integrated way, enabling farmers to earn a living income and beyond?

Core recommendations

Supporting analyses

1



By offering an **attractive value proposition** that farmers are able and willing to invest in

- A. **Five high potential alternative value chains** have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger
- B. **Farmer selection criteria** are proposed to determine how to best support and prioritize different types of farmers in growing non-cocoa crops
- C. **Profitability and feasibility** of five crop combinations have been assessed

2



By offering **crops combinations** that close the income gap while minimizing farm investment needs

- A. **A clear income baseline and target should be established** to understand the relative importance of alternative incomes in closing the gap
- B. **The business case for farmers** is assessed across crops combinations
- C. **Limiting factors** in key farm assets (land, labor and cash) required to reach the income target have been identified

3



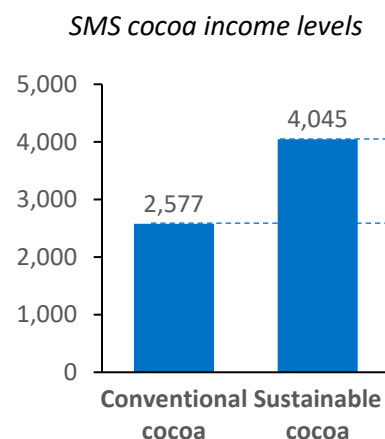
By **leveraging existing cocoa and digital infrastructure** to profitably offer alternative crop services at scale

- A. **A holistic alternative service package** is required to reach farmer income targets and overcome key constraints
- B. **Existing** cocoa service delivery and digital **infrastructure** can be leveraged
- C. **The commercial viability** of SMS alternative crop services is assessed

A clear income baseline and target should be set to understand the relative importance of alternative incomes in closing the gap

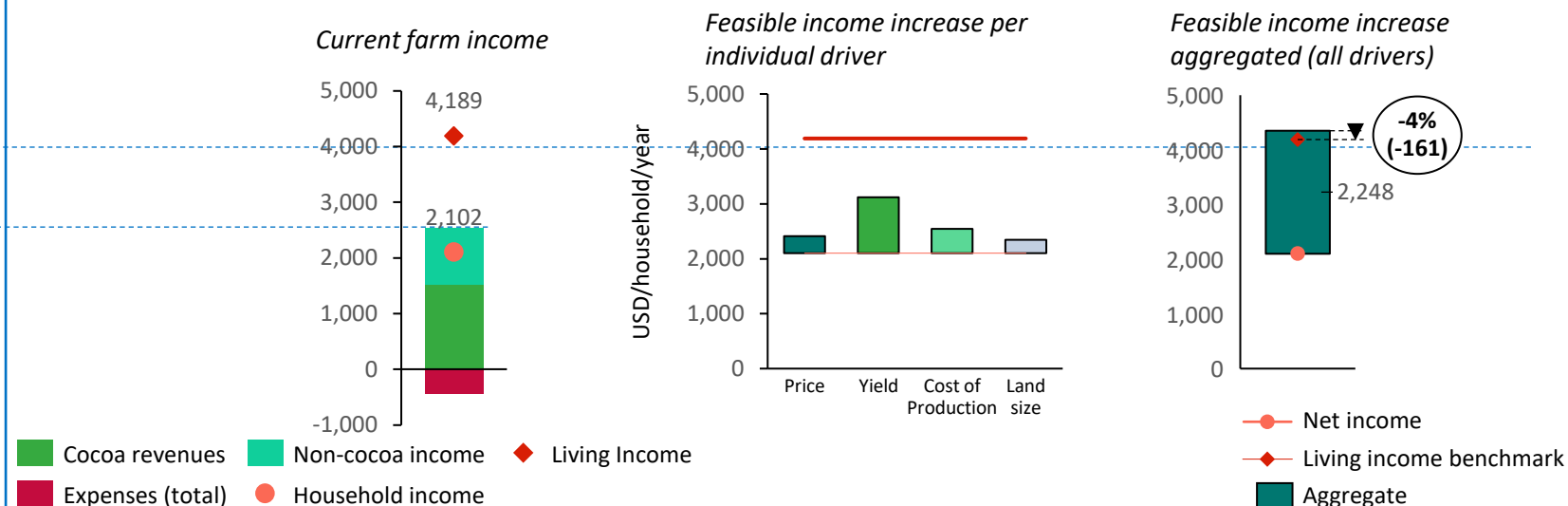
Cocoa income baseline

- SMS Conventional and Sustainable cocoa farmers earn 2,577 and 4,045 USD/year, assuming a 3.3-hectare farm
- Underlying assumptions on price, yield and cost of production could not be provided, limiting comparability



Ghanaian current & feasible cocoa income

- Below graphs show 1) the average current **Ghanaian cocoa farmer income**; 2) the **feasible income increase** from improvements in price, yield, cost of production and land size; and 3) the resulting total feasible income increase and **resulting annual income**.
- It shows that current farm income is lower than the average SMS conventional cocoa farmer (2,102 versus 2,577 USD/year) and the feasible income corresponds closely with the average SMS sustainable cocoa farmer (4,189 versus 4,045 USD/year)



We assume price, yield, cost of production and land size levers have been maxed out and can only get farmers to \$4,045/year. Alternative incomes from high potential markets thus are key in getting farmers beyond the living income benchmark

Recommendation 2B. Closing the income gap > farmer business case

On average non-cocoa crops should get farmers earn between approximately \$4,000 – \$7,200 per household per year. Few obstacles exist in terms of farmer assets

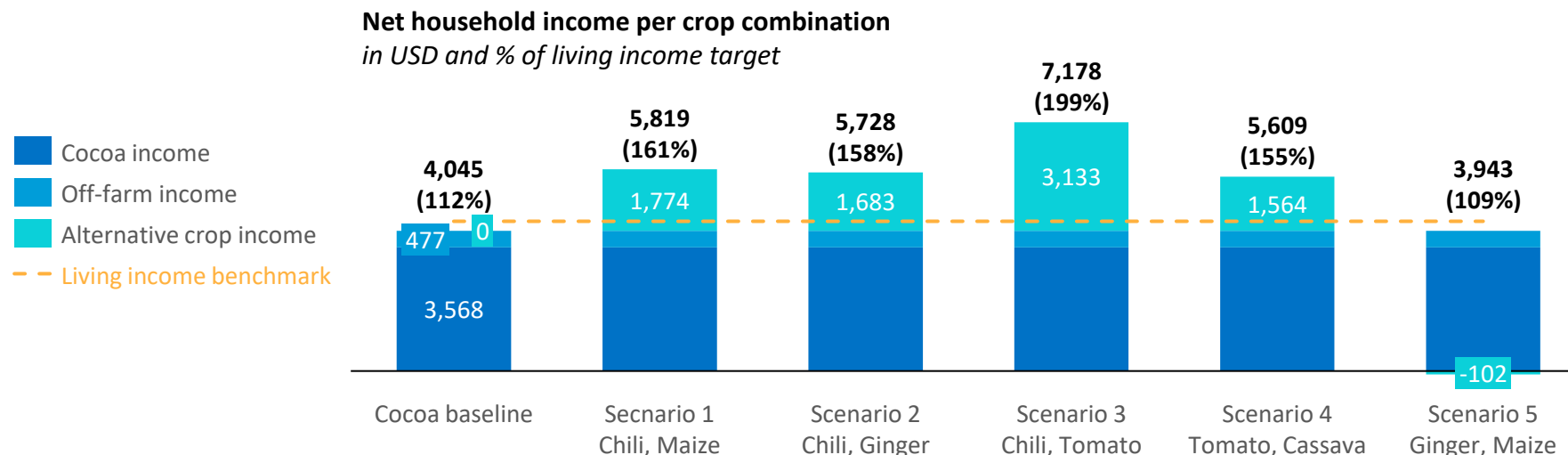
Assets	Indicator	Unit	Baseline Cocoa	Scenario 1 Chili, maize	Scenario 2 Chili, ginger	Scenario 3 Chili, Tomato	Scenario 4 Tomato, cassava	Scenario 5 Maize, ginger
Income	Net income	USD/household	4,045	5,819	5,728	7,178	5,609	3,943
	% living income target	%	111%	159%	157%	197%	154%	108%
	% prosperous income target	%	58%	83%	82%	103%	80%	56%
Land	Farm size – cocoa	ha/household	3.3	3.3	3.3	3.3	3.3	3.3
	Farm size - non-cocoa	ha/household	0.0	0.4	0.4	0.4	0.4	0.4
Labor	Total labor needs	Days/household	1,132	1,194	1,221	1,208	1,201	1,210
	Family labor needs	Days/household	1,000	1,041	1,049	1,052	1,030	1,022
	Family labor needs	Days/household FTE	170	177	179	179	175	174
	Hired labor needs	Days/household	132	152	172	156	172	188
	Hired labor needs	%	12%	13%	14%	13%	14%	16%
Cash	Annual depreciation	USD/household	-187	-453	-385	-453	-246	-340
	Length of cash shortage	# of months	0	0	0	0	0	0
	Lowest monthly cum. cash	USD/hh/month	5,322	7,445	12,345	10,304	11,568	3,964
	Month	%	May	May	May	May	Oct	May

Farmer business case

- While in all scenario's farmers earn a living income, large variances exists; scenario 4 earning a prosperous income; scenario 5 being worse off than when growing cocoa only.
- There is no significant pressure on family labor (highest 8 additional days per household member); hired labor could increase significantly in scenario 5 (56 additional days).
- Due to nature of the various food crop cycles all but scenario 5 experience a higher average monthly cash flow. May generally shows the lowest cumulative cash as from June onward food crop revenues start to come in. For the baseline cocoa revenues come in only after November.
- Investment in irrigation and drying facilities are the main bottleneck

Assumptions: living and prosperous income targets at 4,318 and 7,000 \$/year (see next slide)

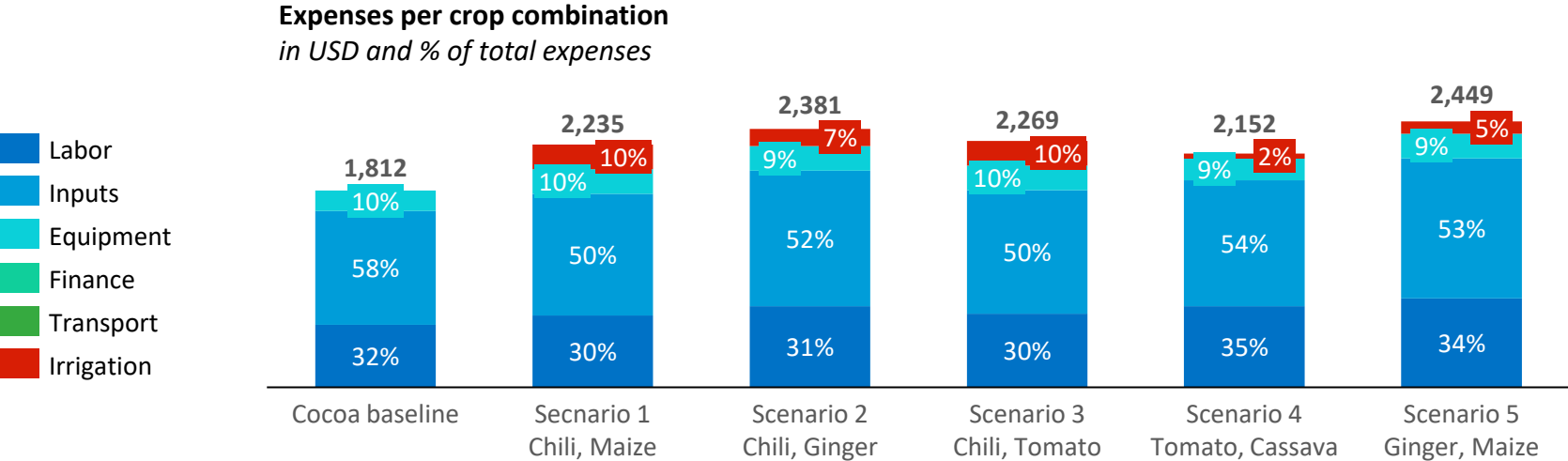
Chili and tomato earn farmers a prosperous income. Cassava and ginger pushes income below “cocoa only” income levels



Revenues by crop
in USD/year

Revenues (USD)	6,005	8,204	8,258	9,597	7,911	6,541
Cocoa	6,005	6,005	6,005	6,005	6,005	6,005
Chili	0	2,069	2,069	2,367	0	0
Tomato	0	0	0	1,224	1,224	0
Ginger	0	0	184	0	0	310
Cassava	0	0	0	0	682	0
Maize	0	130	0	0	0	226

The main additional expenses are additional inputs and irrigation



Expenses by cost category
in USD/year

Expenses	-1,812	-2,212	-2,318	-2,246	-2,126	-2,359
Labor	-576	-663	-747	-679	-748	-821
Inputs	-1,049	-1,119	-1,249	-1,137	-1,159	-1,289
Equipment	-187	-226	-226	-226	-200	-226
Finance	0	0	0	0	0	0
Transport	0	0	0	0	0	0
Irrigation	0	-227	-159	-227	-45	-113

Labor shortage risks are highest during main cocoa harvesting season. While non-cocoa labor is spread more even across the year, solutions are needed to overcome shortages

Annual labor needs

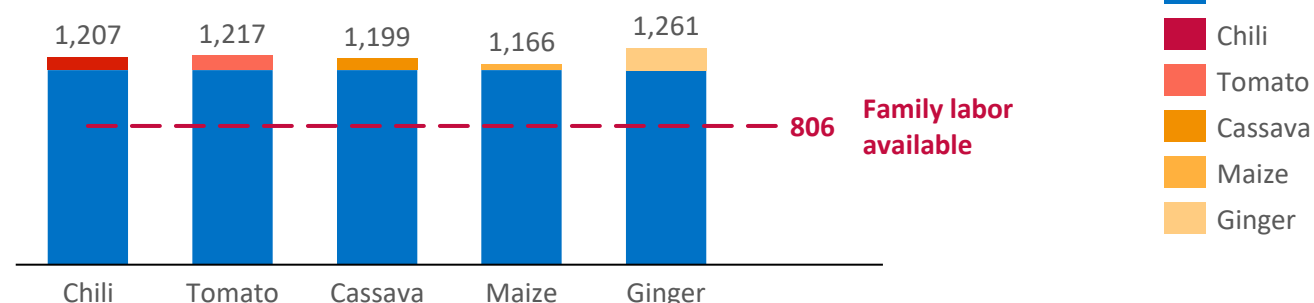
- Additional labor for non-cocoa crops adds around 7-11% on top of existing total labor needs
- Only cocoa labor, with 1,132 days per year significantly exceeds the average 806 days per year of family labor available.
- At first glance, this potentially increases risk of labor shortages and/or drives up labor expenses as the household needs to hire more laborers.

Monthly labor needs

- However, on a monthly basis labor needs, are more evenly spread throughout the year. Primarily because harvesting of alternative crops is done outside the cocoa peak harvesting season
- Risk of labor shortages are highest from November to January when harvesting ginger simultaneously with cocoa.

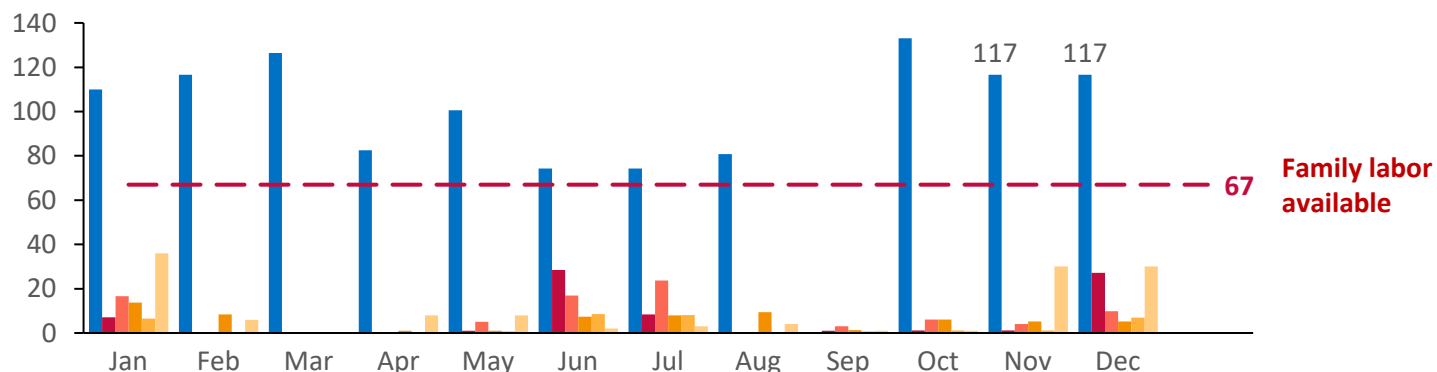
Annual family labor needs per crop

in days per year for a 3.3 ha cocoa and .4 ha non-cocoa plot



Monthly total labor needs compared to family labor availability

in days per year for a 3.3 ha cocoa and .4 ha non-cocoa plot



Few additional investments in farm equipment are necessary to start mixed farming. A chili and maize drying station is the largest investment.

Investment requirements for non-cocoa crops

Showing purchase cost, useful life, and annual rent per type of equipment

Items	Cocoa	Chili	Tomato	Cassava	Maize	Ginger	Additional investment needed?	Lifespan	Purchase cost	Annual rent	Annual expenses
Machete	1	1	1	1	1	1	No	1	25		25
Knapsack	1	1	1	0	1	0	No	5	90		18
Harvesting baskets	10	10	10	10	10	10	No	3	30		10
Long sickle	7	0	0	0	0	0	No	5	15		3
Hoe	0	2	2	2	0	2	Yes	5	200		40
PPE (overall, boots, goggles)	2	2	2	2	2	2	No	3	143		48
Mist blower	1	0	0	0	0	0	No	1		40	40
Cocoa drying statin	2	0	0	0	0	0	No	10	3,800		380
Chili & maize drying station	0	1	0	0	1	0	Yes	1	150		150
Soil test	1	1	1	1	1	1	No	1		20	20

How can SMS scale up its market linkage services in an effective and integrated way, enabling farmers to earn a living income and beyond?

Core recommendations

1



By offering an **attractive value proposition** that farmers are able and willing to invest in

2



By offering **crops combinations** that close the income gap while minimizing farm investment needs

3



By **leveraging existing cocoa and digital infrastructure** to profitably offer alternative crop services at scale

Supporting analyses

- A. **Five high potential alternative value chains** have been shortlisted for SMS to focus their service provision on: chili, tomato, cassava, maize and ginger
 - B. **Farmer selection criteria** are proposed to determine how to best support and prioritize different types of farmers in growing non-cocoa crops
 - C. **Profitability and feasibility** of five crop combinations have been assessed
-
- A. **A clear income baseline and target should be established** to understand the relative importance of alternative incomes in closing the gap
 - B. **The business case for farmers** is assessed across crops combinations
 - C. **Limiting factors** in key farm assets (land, labor and cash) required to reach the income target have been identified
-
- A. **A holistic alternative service package** is required to reach farmer income targets and overcome key constraints
 - B. **Existing** cocoa service delivery and digital **infrastructure** can be leveraged
 - C. **The commercial viability** of SMS alternative crop services is assessed









IDH and SMS are exploring various potential solutions for diversifying farmers to overcome limitations in land, labor and cash

Farm assets	Limitations	Potential solutions	Status
Land	<ul style="list-style-type: none"> At least 3.3 hectares of farmland is needed to be able to earn a living income Only about 15% of farmers are expected to have 3.3 hectare or more 	<ul style="list-style-type: none"> Land aggregation: SMS could propose and support farmers to combine and codevelop neighboring plots Land rent: SMS could purchase or rent governmental land and run a block-farming model 	<ul style="list-style-type: none"> SMS is piloting several land expansion solutions. No definitive approach has been decided on yet. Internal discussions are on-going In the meantime, SMS selects farmers based on farm size, only offering alternative incomes services to those with 3.3 hectares or more
Labor	<ul style="list-style-type: none"> Labor needs often exceed available family labor Scarcity of hired labor can drive up prices during peak season 	<ul style="list-style-type: none"> Labor pooling: farmers can pool and rotate labor within their community Professional teams: SMS could equip teams to manage certain farm aspects, charging a fee. Especially ginger and chili harvesting require attention Cash advance: SMS could provide cash-advances for farmers to pay hired labor, recouped at time of sales 	<ul style="list-style-type: none"> The latest status on labor services for alternative crops is still unclear. SMS already works with spraying teams for cocoa. Cash advances are feasible only if financial track records are available
Cash	<ul style="list-style-type: none"> Insufficient cash available to purchase inputs in advance or invest in equipment No cash reserves to absorb failed harvests No access to affordable loans 	<ul style="list-style-type: none"> Inputs on credit: SMS provides inputs on credit as with cocoa Insurance: SMS provide crop insurance as with cocoa VSLA: farmers can join VSLAs to pool resources and lend to those willing to make larger investments on a rotation basis Access to finance: on the longer-term SMS and partners need to design and offer tailored loan products to bankable farmers 	<ul style="list-style-type: none"> SMS is already providing inputs on credit and crop insurance and is investing in VSLA capacity building On the longer-term SMS intends to provide access to finance. How exactly is still unclear. First SMS would need to understand the farmer finance needs and build a digital infrastructure to collect financial track records of those farmers

SMS is rolling out other alternative crop services beyond land, labor and cash services

Services	Objectives	Mode of delivery	Revenue model
Farmer organization capacity building	<ul style="list-style-type: none"> Improve operational efficiency and increase bargaining power, SMS provides cocoa farmers with support to organize into (in)formal societies or cooperatives. 	<ul style="list-style-type: none"> SMS Field officers and field trainers go in person to host events and trainings. 	Included in service fee charged to off-takers
Training and coaching	<ul style="list-style-type: none"> Increase productivity and quality of crops in order to increase farmer income and develop a stable and verified high quality supply. 	<ul style="list-style-type: none"> Field officers train field trainers to help build their training capacity. Field trainers train farmers in groups on good agricultural practices. 	Included in service fee charged to off-takers
Input provision	<ul style="list-style-type: none"> Provide adequate inputs for healthy crops and optimal productivity Recommend optimal inputs based on crop and soil requirements 	<ul style="list-style-type: none"> Field officers conduct soil tests to measures input needs. Field officers and input providers provide inputs on credit. 	Margin on inputs (by input supplier)
Quality assurance	<ul style="list-style-type: none"> To ensure EU and organizational standards are met. This requires internal monitoring, inspection and market inspection visits. 	<ul style="list-style-type: none"> These visits are mostly performed by field trainer, sometimes by an external auditor. 	Included in margin on trade
Post-harvest services	<ul style="list-style-type: none"> Ensure quality produce can be sold to traders. These services include the cleaning, drying, cooling, applying extending shelf-life coatings and storage 	<ul style="list-style-type: none"> Field officers will perform most of the post-harvest management activities. 	Included in service fee charged to off-takers
Aggregation and transport	<ul style="list-style-type: none"> Farmer produce is bagged and weighed. 	<ul style="list-style-type: none"> Crop aggregation, bagging and weighing is done by SMS staff The crops are then transported by logistics providers from farm to depot 	Transport fee (Logistics provider) Margin on trade

For most services SMS can leverage the existing cocoa infrastructure

Services	Leveraged cocoa service provision infrastructure	New investments needs	Type of new investment needs
Data & insights	Farmer organization services can be used to further professionalize farmer societies. However, farmer groups are very immature with limited-service provision capability		Capacity building and IT are necessary to further professionalize farmer societies
Farmer organization	SMS and Integrity are the current platforms being used by SMS. Most data are currently fragmented in different files and on different platforms. To centralize this, SMS is transferring its current data and plans to use Empower		Digitization of data, improved data quality and centralization of data will allow for improved insights
Training and coaching	The current cocoa infrastructure of field officers and field trainers can be leveraged when providing training for alternative crop production		New curricula for non-cocoa crops and a new training of trainers' program would improve GAP for alternative crops
Input provision	The current cocoa infrastructure of sourcing and service provision through field officers can therefore be leveraged in alternative crop services		Further development of digital infrastructure would improve farmer insights and reduce transaction cost
Quality assurance	SMS is providing certification and verification services in its current cocoa service delivery model. This infrastructure can be leveraged. However, the standards for alternative crops will be different and require new expertise and inspections		Additional expertise to provide QA for several different crops and standards enhances exporting opportunities
Post-harvest services	SMS can leverage its logistical centers (depots) and equipment that are being used for the aggregation and post harvest management of cocoa beans		Improved equipment/ infrastructure for cooling, cleaning coating and drying to enable market access of perishable crops
Aggregation and transport	SMS can leverage its network of (local) transport companies and bagging and weighing equipment		New equipment for bagging of crops can be necessary to transport crops with certain requirements
			

Four use cases for digitalization have been selected and discussed with SMS

Use case	Use case description	Desired benefits	Practical example	SMS response
Bundled solution providers	Providers bundle multiple digital agricultural services (e.g. market linkages, digital finance and digital advisory services) and deliver a fully integrated digital value proposition to smallholder farmers and other agricultural value chain intermediaries. The idea is that the services that are bundled together have some type of complementarity which will increase the added value to the people and organizations using them, also allowing for less complexity in dealing with different service providers.	<ul style="list-style-type: none"> • Cost reduction (Cost efficiency) • Improved financial stability • Increased transparency • Increasing scale or replication • Quality improvement of provided services 	1. Esoko	Can be interesting if details are clear and if it can be integrated into other solutions.
Access to e-market/e-commerce services	Access to e-market/e-commerce services enables the clients to access online virtual trading marketplaces, where buyers and sellers are present, with little to no human intermediation helping them to reach customers more easily or access produce from different suppliers in a single e-marketplace.	<ul style="list-style-type: none"> • Cost reduction • Quality improvement of provided services • Improved financial stability • Increasing scale or replication 	1. Cropchain 2. DigitalGreen	SMS wants farmers to sell their new crops to the market and facilitate/enable that as Ecom (so farmers diversify their income). Done some test in the past but finding a market was difficult.
Interactive advisory services	Interactive advisory services provide (white label) solutions that allow organizations to set up communication channels to share information and engagement with agri-actors through mobile phones.	<ul style="list-style-type: none"> • Cost reduction (Cost efficiency) • Cost reduction (FTE reduction) • Quality improvement of provided services 	1. Africa's Talking (Kenya)	Could be interesting to take a closer look at to know more about this digital solution.
Peer-to-peer education platforms	Participatory (peer-to-peer) education platforms provide a platform with the possibility to interlink farmers directly, so that farmers' questions can be answered by other farmers facilitating the learning and helping to create a community amongst farmers.	<ul style="list-style-type: none"> • Cost reduction (Cost efficiency) • Cost reduction (FTE reduction) • Quality improvement of provided services 	1. WeFarm 2. DigitalGreen	Could be interesting as an additional use-case to be explored.

The peer-to-peer education platform was prioritized as the most promising use-case and two technology providers are highlighted

Prioritized use-case

1. **Peer-to-Peer education platforms** scores lowest in rank of the 4 use-cases. Nevertheless, **this use-case was highlighted as most promising by Esi**, if possible via **radio communication channels**. However, since there is no prior experience in the effectiveness of integrating such a service (and database examples did focus on SMS service), this ranks lower in our desirability/feasibility analysis
2. It was mentioned by Esi that SMS services was not favorable in the region of operation due to:
 - a) Local language requires more elaboration and words which in SMS texts could be time-consuming and misinterpretation is easily made
 - b) Limited number of words to be used in SMS texts in combination with point 1 might result in increased telecom costs for users
 - c) Possible connectivity issues while using such a technology
3. Our further search and analysis shows potential for radio communication channels, with some **example P2P radio technology providers** shown below, for Ecom SMS further to investigate. Both Amplio and Farm Radio International seem to be a potential partner for Ecom SMS and its farmer-base

Technology providers



- Amplio's audio platform enables organizations to bridge the digital divide, share knowledge to empower the world's most vulnerable communities, and collect usage data and user feedback to update and improve their programs.
- With their talking book, low-literate users can select and listen to messages in their local language, overcoming communication and written language barriers
- This ranges from technical lessons on sustainable agriculture or more general development information on health, education and more
- As the technology also captures usage statistics/data, partners can monitor the community engagements
- AMPLIO: <https://www.amplio.org/>
- A videolink: <https://www.youtube.com/watch?v=q7GN3q7katA>



- Farm Radio International makes radio the very best it can be for rural communities across Africa.
- Their service enables targeted development projects that results in improving the lives of tens of millions of people through the power of radio already today, in rural communities in Africa (including Ghana, Kenya and Nigeria for example)
- As farm radio sees it, small-scale farmers produce most of the food in Africa and yet are often those most vulnerable to poverty and food insecurity. They need relevant, reliable information to make the best of their land and improve their livelihoods. And radio is still the best way to reach and serve them. Farm radio has been active since 2008 to implement targeted radio projects that help small-scale African farmers succeed.
- Farm Radio: <https://farmradio.org/>

Table of content

Introduction

Recommendations

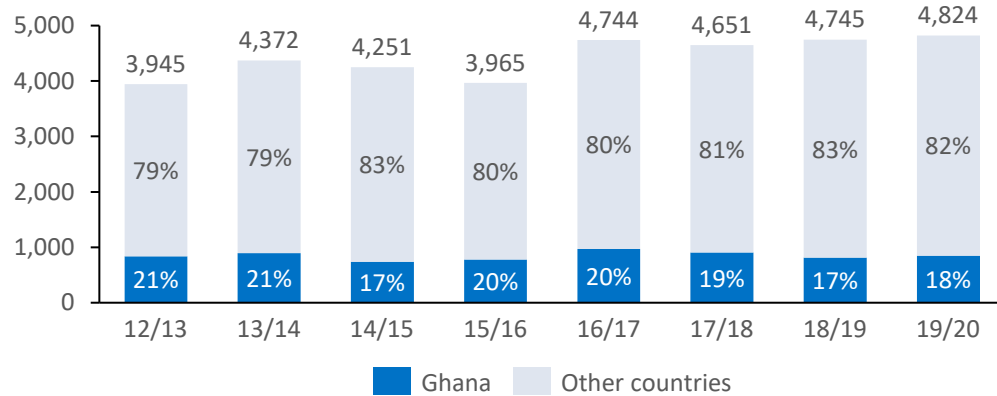
About the sector

Annex

Ghana is the world's second largest cocoa producer, with a stable market share of 20% globally

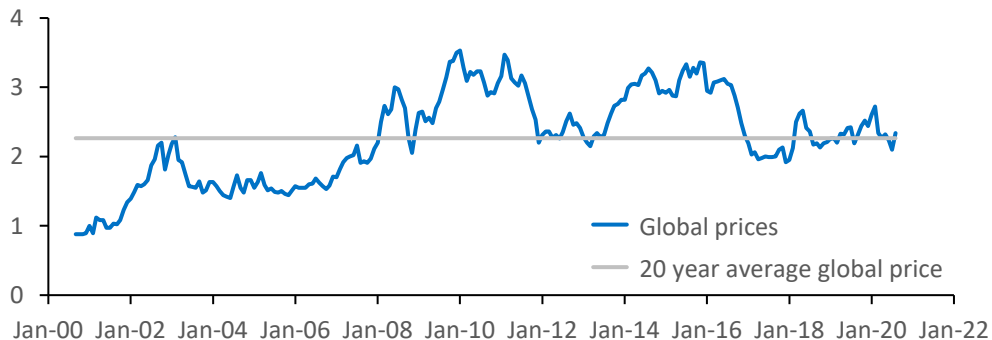
Annual global cocoa production¹

Production per million MT



Cocoa bean pricing²

Price in USD/Kg



State of the sector

- 60% of the world's cocoa production comes from Ghana and Côte d'Ivoire.
- In Ghana, the cocoa sector forms the economic backbone of the country. The sector contributes c.3% of the national gross domestic product (GDP), makes up c.25% of total export receipts, provides about two-thirds of cocoa farmers' incomes and supports the livelihoods of c.4 million farming households³.
- Given the importance of the sector to the country's economy, the sector is highly regulated with the Government heavily involved through its various institutions⁴. Cocobod has monopoly on cocoa marketing and export through its subsidiary, the Cocoa Marketing Company (CMC)⁸. Licensed Buying Companies (LBCs) (such as AGL) are however allowed to compete with the state-owned Produce Buying Company (PBC) in sourcing locally. All produce is then delivered to the CMC for marketing⁷.
- The partially liberalized structure of the cocoa sector in Ghana has earned the country a reputation for supplying large quantities of high-quality cocoa beans in the international market for which it receives a premium price⁵.
- Approximately 80% of exported cocoa is sold in its raw form to be processed in importing countries which mostly are Malaysia, Netherlands and U.S. The balance is processed in-country, either for local consumption or semi-processed for export.
- Producer prices are fixed at the beginning of each harvest season by the Cocobod. The farm-gate price is set as a percentage of the pre-sale price (c.70%)^{7,8}. However, farm-gate prices in Ghana are considerably lower on average than in countries where pricing is unregulated. It is estimated that the farm gate prices in Ghana are c.20% - 25% lower than in other cocoa producing countries⁷.

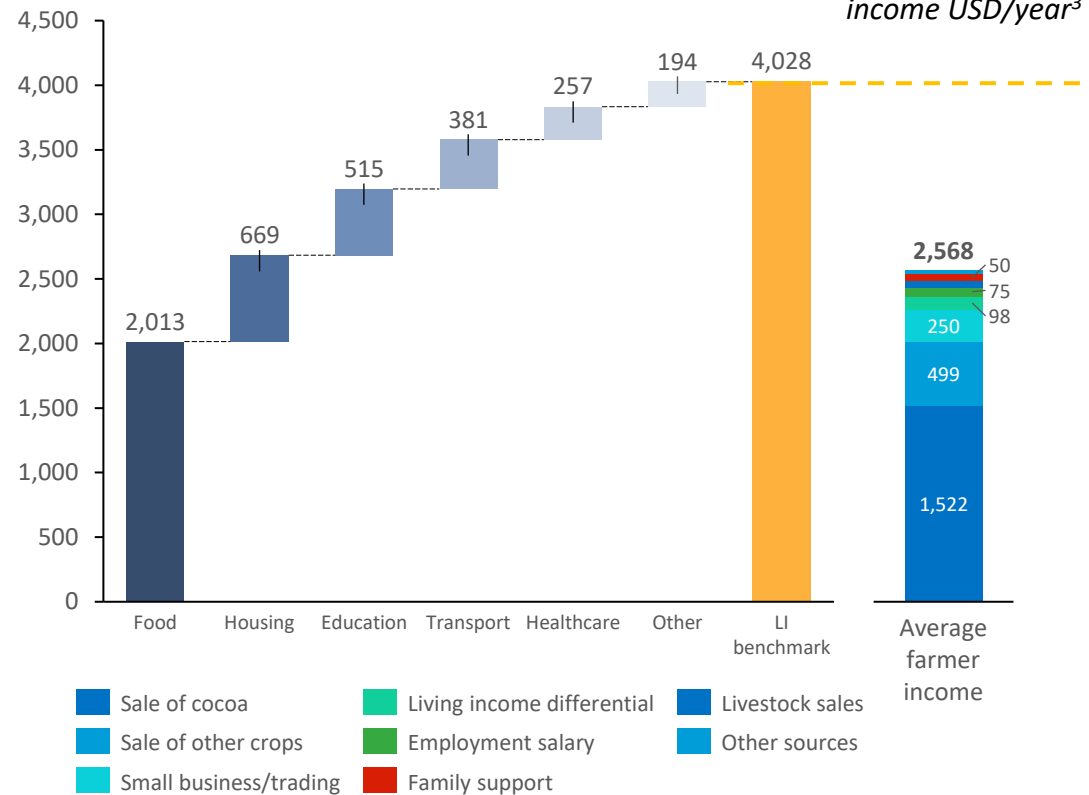
Sources: ¹Statista, ²IndexMundi, ³ILO - Assessing the employment effects of processing cocoa in Ghana, ⁴Asoko Insight - Ghana cocoa value chain, ⁵Trading Economics, ⁶Financial Times (2014), ⁷KIT - Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ⁸Royal Tropical Institute - Incentives for sustainable cocoa production in Ghana

Despite the importance of cocoa to Ghana's economy, the majority of cocoa farming families are unable to earn a living income

Ghanaian cocoa HHs earn averagely 39% below the living income benchmark

Cocoa farmers are unable to cover basic living costs from their income

Living income benchmark USD/year⁴



Sources: ¹ILO - Assessing the employment effects of processing cocoa in Ghana, ²International Cocoa Initiative – Cocoa farmers in Ghana experience poverty and economic vulnerability, ³KIT – Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ⁴Wage Indicator, ⁵Cocoa & The Living Income Differential: DMs With Laura Ann Sweitzer, Pt 2

- Cocoa is produced by c.800,000 farmers most of whom are smallholders with average farm sizes of not more than 4 hectares and an estimated yield of 400 Kgs/ha. These farmers account for c.90% of the country's output¹.
- Currently an average cocoa farmer in Ghana earns 2,568 USD/year which is well below the Living Income (LI) benchmark. To protect farmer incomes, Cocobod announced that farmers would receive an additional USD 400/MT cocoa as a Living Income Differential (LID)⁵. This LID is however still insufficient to close the living income gap for Ghanaian cocoa farmers.
- The seasonality of cocoa farming means that incomes are not consistent year-round and cocoa farming families experience heightened economic vulnerability and deepened poverty during off-seasons².
- In Ghana, farmer yields are well below potential yields which are estimated at between 1,000Kg/ha – 1,900Kg/ha³. Low farmer yields are attributed to poor agronomic practices, and low, incorrect or untimely use of inputs³.
- Farmer income from cocoa is not only affected by yield, but also by price, land size and cost of production. For Ghanaian cocoa farmers, yield appears to be the key driver to increasing farmer income. It is estimated that professionalized smallholder farmers yield c.800kg/ha which, if attained by an average smallholder, would account for an increase of c.1000 USD/year. Price and land size have a positive potential income effect, but to a lesser extent.
- Although increasing farmer yields has potential to increase farmer incomes, the realization of this yield improvement has proven to be very challenging to achieve. Even though the sector is aware of the challenges and interventions necessary to improve farmer income from cocoa, historical results show little promise.
- It's important to note that the benefits of yield improvements could be short-lived as improving productivity would contribute to an oversupply in the future, resulting in lower prices. Consequently, farmers would still be unable to earn a living income³.

Only all income drivers optimized cocoa farmers can obtain a living income

Quick facts

- **Average yield:** 400 kg / ha
- **Sacks (60kg) exported annually:** 8.3 million bags, representing the world's 2nd largest exporter, after its neighbor Cote d'Ivoire
- **Cocoa species:** Forastero
- **Estimated number of individuals relying on cocoa for livelihood:** More than 8 million
- **Key cocoa regions:** Ashanti, Brong Ahafo, Western, Central, Eastern
- **Typical Harvest Times:** 2 harvests: October-March (*main harvest*) and April-September (*second harvest*)
- **Semi-liberated market:** Prices are kept stable through the unique interventions of Ghana's COCOBOD, which regulates all cocoa export volumes and prices, keeping price fluctuations to a minimum. It also provides services such as pest control, input provision, and nurseries and seedling provision.

Cocoa producing regions in Ghana

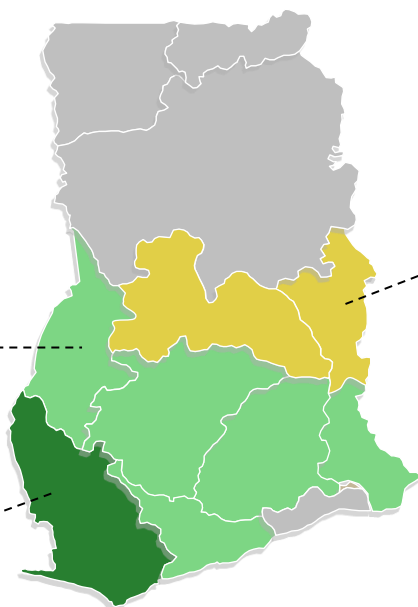
Cocoa is cultivated in Southern Ghana, and can be segmented into three climatic zones⁵:

Middle region

Ahafo, Ashanti, Central, Eastern, Volta

Wet region
Western

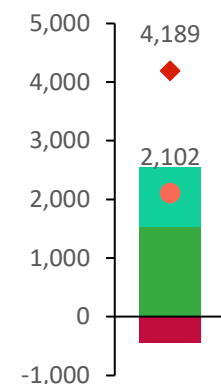
Dry region
Bono East, Oti



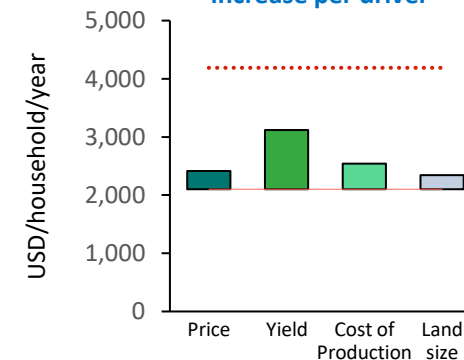
Current & Feasible level Ghana

- Cocoa yields are generally low in Ghana, with national averages at nearly half the level of several other countries around the world where 800 kg/ha is not uncommon.
- However, there is wide regional variation, with yields in Ghana's dry region as low as 250 kg/ha, while the middle and wet region have already realized 700 and 850 kg/ha, respectively.
- For the 2020/2021 season, COCOBOD announced the Living Income Differential (LID), a 20% increase in the cocoa price guaranteed to farmers.
- This LID is however still insufficient to close the living income gap for Ghanaian cocoa farmers.
- However, looking at the primary drivers of income, there is more room for improvement. If all drivers reach their feasible level simultaneously, farmers can earn a living income.

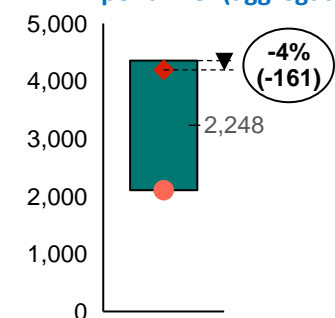
Current farm income



Feasible income increase per driver

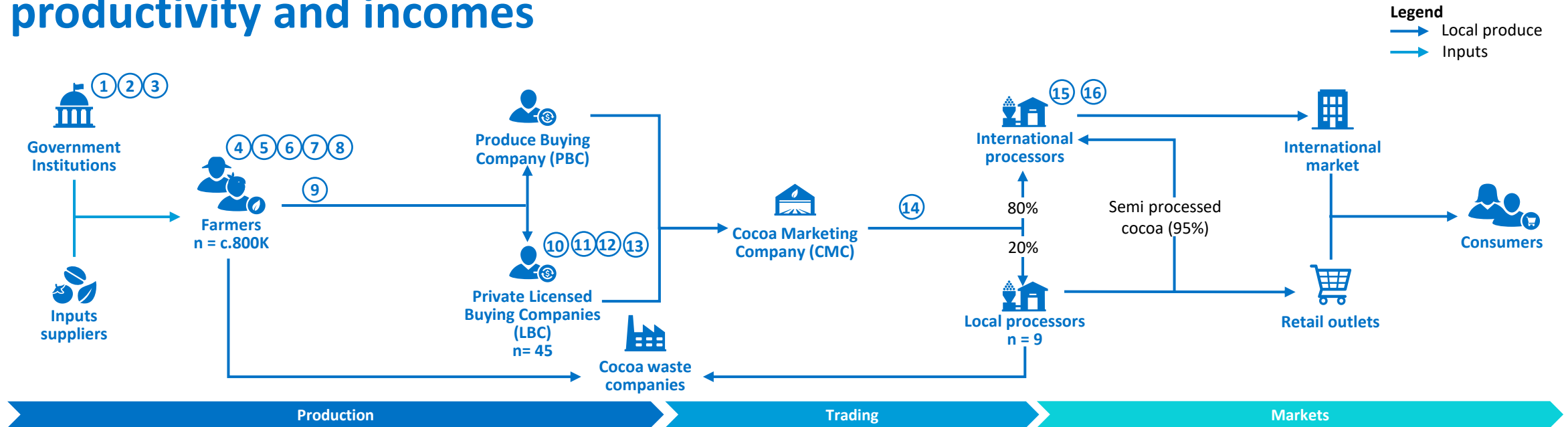


Feasible income increase per driver (aggregated)



- Revenues from main crop
- Expenses (total)
- Income from diversification
- Household income
- ◆ Living Income
- Net income
- ◆ Living income benchmark
- Aggregate

Limited access to inputs and services continue to affect farmer productivity and incomes



1. Slow farmer adoption of training and new farming techniques.
2. Poor service delivery by CODAPEC resulting in crop diseases and pests.
3. Poor road infrastructure making it difficult to reach farmers in the villages.
4. Limited access to finance.
5. High cost of inputs.
6. Limited access to quality farm inputs and services.
7. Land tenure insecurity thus discouraging investments.
8. Reduced yields due to pests, tree diseases and aged trees.
9. Child labour where children carry the cocoa beans from farms to markets.

10. High transport costs.
11. Low margins paid by the Cocobod to the LBC making it challenging to conduct business.
12. Delayed payments from the Cocobod coupled with the high cost of financing makes it difficult for LBC to conduct business.
13. Difficulty in establishing a loyal farmer base as cocoa bean prices are fixed.

14. Price volatility in international markets. However, from 1990, there has been notable reduction in price volatility resulting from reduced imbalances in annual demand and supply. Cocobod absorbs losses occasioned by price fluctuations within the season.
15. Fixed producer prices means cocoa farmers do not benefit from price increases within a season and neither are they able to negotiate different pricing based on quality.
16. Cocoa certification allows for farmers to earn a premium in addition to the producer price. However, very few farmers benefit from the certification as it is not well understood.

Sources: ¹Asoko Insight, ²ILO - Assessing the employment effects of processing cocoa in Ghana, ³KIT - Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ⁴Research Journal – Assessing the challenges facing cocoa production in Ghana

Poor infrastructure, lack of finance and environmental degradation are the main risk factors affecting SMS

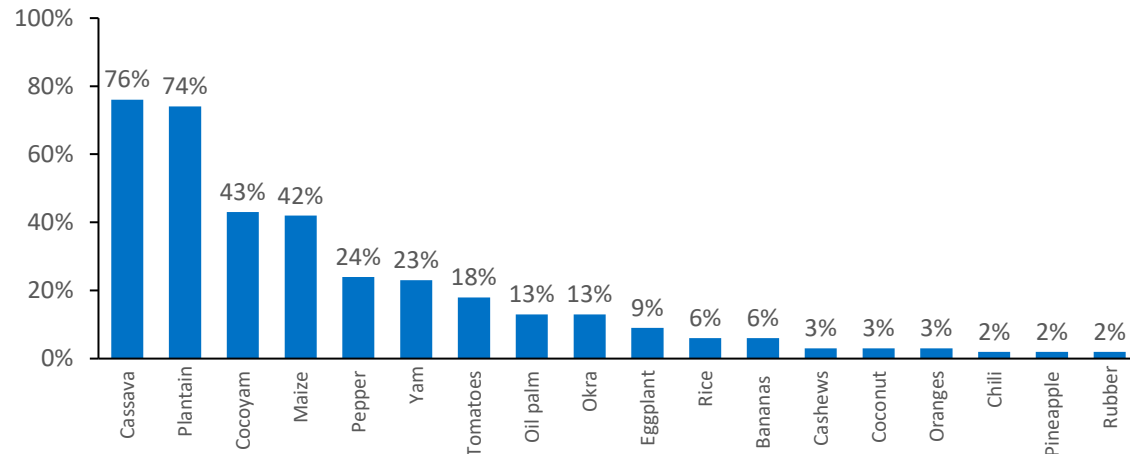
			Risk level		
			Low	Average	High
Definition	Situation	Impact on SDM			
Technology	At least 80% of adults own a mobile phone. c.40% of the mobile users have a mobile money account ¹ .	Opportunities for technological solutions, e.g. for payments and sending educational messages to farmers			
Environment	Farmers are continually clearing forests to make farmland. Between 2017 and 2018, there was a 60% increase in Ghana's primary rainforest loss (the highest in the world) ² .	Deforestation will affect climate and consequently farm productivity and cocoa supply in the long run.			
Infrastructure	Roads are rutted and poorly maintained, which complicates getting inputs to the farms and farm produce from remote areas to the market. This increases transport costs ³ .	This affects the ability to provide inputs and services to the farmers and source their produce.			
Labor	Limited availability of household labor and relatively high cost of labor resulting in poor adoption of GAP.	Low farm productivity thus affecting cocoa supply due to poor GAP adoption.			
Inputs & Financing	Quality inputs are usually not available or affordable. Financing is not easily accessible ³ .	Lack of quality inputs and limited access to finance affects farm productivity and investment. Opportunities for improving the access and affordability of farm inputs.			
Trading System	Although the sector is partially liberalized, Cocobod has monopoly on cocoa marketing and export through its subsidiary, the Cocoa Marketing Company ³ .	No room for price negotiation or for prices to be differentiated based on quality.			
Pricing & Competition	Farm-gate prices are regulated by the Government. Farm-gate prices in Ghana are considerably lower on average than in countries where pricing is unregulated ³ .	Regulated pricing could put pressure on SMS' margins thereby negatively impacting financial sustainability of SMS.			
Institutional Stability	Political stability is underpinned by Ghana's strong democratic credentials, despite slow progress on job creation and industrialisation ⁴ .				
Land Tenure	Land is owned by the communities and in custody of the chiefs. Although this discourages land investments, it promotes local farming and smallholder farming projects ³ .	Land tenure insecurity disincentivizes investment into the sector.			
Social Norms	Child labor is rife in Ghana. c.21% of children aged 5-17 years are involved in child labor ⁵ .				

Sources: ¹DataReportal, ²World Economic Forum – Ghana is losing its rainforest faster than any other country in the world, ³KIT – Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ⁵The Economist, ⁴UNICEF

Income from additional crops has been identified as a means to improve farmer livelihood

Crop combinations

% of cocoa farming households produces secondary crop together with cocoa

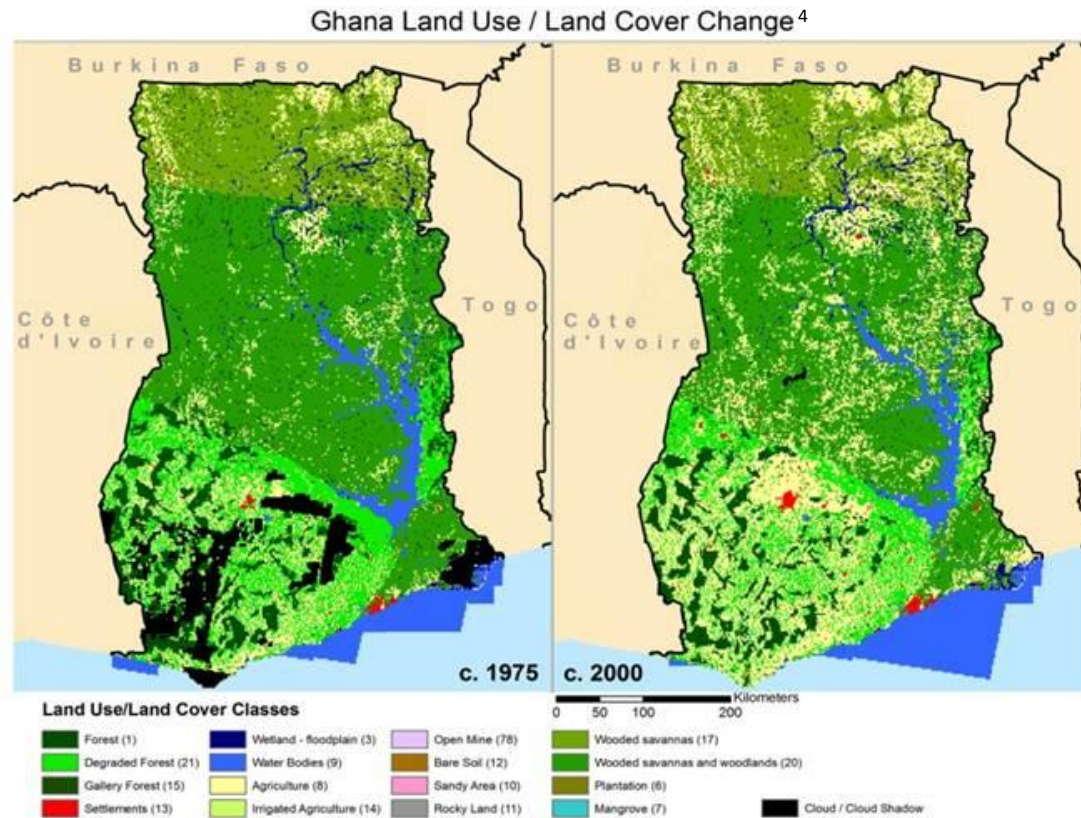


- **Cocoa farmers in Ghana have diversified cocoa cultivation.** In 2017, farmers reported to have grown five different crops. Of these, farmers reported to have marketed three crops thus earning additional income¹.
- **Cassava and plantain are the most preferred intercropped** for cocoa as farmers consider them as highly nutritious staple crops and due to their dual role as a food and cash crop. They therefore provide additional income when cocoa is off season as farmers are able to easily sell their excess produce in local markets.
- Diversification of cocoa with food crops is considered to be useful for **mitigating food insecurity** and malnutrition, particularly outside of the main cocoa season.

- **Cocoa farmers have been encouraged to diversify** into other crop and non-agricultural income with a view to reduce dependence on cocoa thus **making them more income resilient whilst allowing farmers to increase their total income**¹.
- Further, it is argued that crop diversification could **slow worrying trend of deforestation** for cocoa plantation¹.
- Although diversification can help farmers increase their income, this **success is only achievable where there are developed markets for the additional products**. Market development should therefore be supported alongside supporting farmers with their diversification efforts³.
- The Ghana vegetable market has shown rapid growth in the recent past. The Government, through partnerships, is working towards professionalizing the value chain for vegetable production and consumption⁴.
- As farmers do not receive advice on which crops to select for diversification, farmers practice what has been handed down from previous generations. **Adopting a market approach to crop diversification would enable the farmers maximize available resources**².
- Other challenges to crop diversification include farmers not being able to market the produce, lack of bargaining power to seek better prices for their produce as they are not organized into farmer associations or cooperatives, lack the necessary extension services and market information. Further, poor infrastructure connecting rural farms to the urban markets is an added constraint as most cash crops are perishable².
- Although diversification is increasingly promoted as a pathway to improve farmer incomes, there is a **lack of evidence proving diversification will lead to higher household incomes**.
- Encouraging households to diversify out of cocoa may worsen household incomes if the markets for the alternative options are not strong and established, and if alternative crops generate lower profits per unit of land allocated¹.

Sources: ¹KIT – Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ²Consultative Board on the World Cocoa Economy – Inventory of diversification on cocoa farms, ³Wageningen University – A living income for smallholder commodity farmers, ⁴Wageningen University – Ghana Veg Sector Reports

Deforestation poses significant threat the ecosystem health, local climate patterns and biodiversity



Sources: ¹Global Environment Facility – How food companies can protect forests and the oceans, ²USAID – Land and Natural Resource Governance and Tenure for Enabling Sustainable Cocoa Cultivation in Ghana, ³The Conversation – Ghana's cocoa production relies on the environment, which needs better protection, ⁴Science Publishing Group - Unsustainable Management of Forests in Ghana from 1900-2010

- Ghana has one of the **highest deforestation rates in Africa at 3.2% per annum**¹.
- **Cocoa production is the leading agricultural product driving deforestation.** c.27% of forest to agricultural land conversion is as a result of cocoa expansion making it the single most important commodity driver of deforestation in Ghana.
- Cocoa farming takes place in Ghana's agro-ecological zones where the soil structure and fertility are favorable. Further, the forest zones offer the ideal rainfall, temperature and shade required for cocoa production³.
- With the rising demand for cocoa, large areas of forest cover have been lost to its cultivation. Expansion and cultivation of new parcels of forest land, replacement of old cocoa trees and abandonment of old cocoa farms due to declined soil fertility have depleted the country's forest cover. Between 2010 and 2015, 117,240 Ha of forest were cleared³.
- Due to climate change, Ghana has been experiencing a rise in the sea level, which has caused damage to property along the coastal regions particularly the coast of southern Ghana in the Gulf of Guinea⁴.
- **Deforestation has also resulted in soil degradation** where removal of tree covers and continuous exposure of bare soils to excessive sunlight and rainfall have resulted in reduced soil fertility. The ultimate effect of this is the declining crop yield per unit of land which threatens the livelihoods of farming communities within the forest zones⁴.
- **Ghana has further experienced drying up of water bodies** which supply water to major cities in the country. Between 2010 and 2012, Kumasi, the country's second largest city, experienced acute potable water shortage due to continued drought along River Owabi which is a major source of water supply for the city⁴.
- There have been attempts by the government to undertake various afforestation programs in order to regenerate Ghana's degraded forests. The goal of this program is to first, halt the alarming deforestation rate in the country and secondly to initiate and pursue a national afforestation program to restore the lost forest cover⁴.

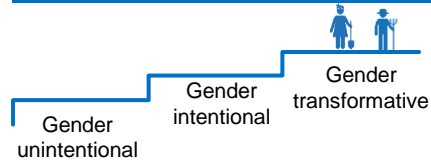
Often overlooked and unrecognized, women farmers and laborers make significant contributions to cocoa farming

Parameter	On the farm		Off the farm
Distribution of decision-making on various topics	<p>Decision making on cocoa issues¹</p> <p>Female headed HH: 50% Male, 91% Female</p> <p>Male headed HH: 97% Male, 68% Female</p> <p>Male Female</p> <p>Question: When decisions are being made about cocoa, who normally takes the decision? Men, women or both?</p>	<p>Decision making on who sells the cocoa¹</p> <p>Female headed HH: 63% Male, 73% Female</p> <p>Male headed HH: 97% Male, 30% Female</p> <p>Male Female</p> <p>Question: Who sells the cocoa - men, women or both?</p>	<p>Women's involvement in decisions²</p> <p>Own healthcare: 23% Male, 27% Female, 50% Joint</p> <p>Major HH purchases: 26% Male, 23% Female, 51% Joint</p> <p>Visit to family: 13% Male, 26% Female, 60% Joint</p> <p>Male Female Joint</p>
Typical activities undertaken by women	<ul style="list-style-type: none"> In young cocoa farms, women contribute mainly through tending to the farm, manual weeding and intercropping¹. Women are mainly involved in cocoa drying (79%), planting (75%), pod breaking (71%) and transporting of cocoa (60%)¹. In addition, women were said to prepare food for the men and workers, and sometimes fetch water for the spraying on the farm¹. 		<ul style="list-style-type: none"> Women are mainly involved in household activities including cleaning, cooking, sweeping, dishwashing, washing husbands' clothes, taking care of the children and sending them to school, and fetching water¹.
Description of risk	<ul style="list-style-type: none"> Although women work alongside the men on the farms, men are responsible for marketing of cocoa and take charge of the income when the crop enters into the high-valued export market. 		<ul style="list-style-type: none"> Disproportionate load of unpaid care work Women are less productive in managing farms compared with their men counterparts Limited time to engage in training on GAP (time poverty)
Expected Impact	<ul style="list-style-type: none"> Role of women invisible in agricultural value chains Unequal distribution of value along the agricultural value chain 		<ul style="list-style-type: none"> Women's exclusion of effective participation in agricultural value chains Lower farm yields Unsustainable agricultural value chains

Sources: ¹KIT – Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ²Ghana – Demographic and Health Survey (2014)

ECOM is potentially gender transformative: clear opportunities exist in working towards inclusive value chains

Where is ECOM on its gender journey?



ECOM is potentially gender transformative

It takes a data-driven approach to understand the different needs and constraints of women and men, tailoring services to ensure either that men and women have access to resources, control over the benefits of those resources or are working in an inclusive workplace.

It can strengthen the three priority areas:

1. Gender Strategy
2. Women's independence and control of resources
3. Inclusive tailoring

Gender Strategy

- Have in place a written overarching gender strategy with definition of strategic/transformative gender objectives that ECOM aims to achieve.
- In the overarching gender strategic plan, articulate how to support gender integration in the service delivery design.
- Allocate resources to ensure implementation of gender strategy (technical and financial)
- Foster a robust monitoring and evaluation framework that is flexible to adapt to change and capture learnings.

Independence and control over resources

- Explore use of landless collateral or non-collateralized loans in cases where land ownership prevents women from financial inclusion.
- Assign women individual contracts, instead of households.
- Increase women's access and control of financial resources through mobile money/personal accounts.
- Provide resources, and other support/mentoring (e.g., business development services) to women interested in assuming higher-value and/or leadership roles.

Inclusive Tailoring

- Establish diversification of income streams to strengthen women's resilience to shocks.
- Establish structures to support women during shocks, such as partnerships with saving institutions, community health units.
- Recruit and strengthen women's self-help groups
- Support women participating in the whole value chain to access insurance.

Cocoa farming households are mostly food insecure in the months of June and July, before the main cocoa harvesting period

Food security of cocoa households in Ghana ¹

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

- In Ghana, cocoa farmers experience food scarcity after most food crops have been harvested in March. During this period, cassava is difficult to harvest due to hardness of the soil¹.
- The main rainy season is in June and July and in these months, there can be periods of food scarcity as newly planted food crops are not yet ready to be harvested. Low food supply in leads to increased food prices. Further, durable food stuff purchased during the main cocoa season (September – December) usually start running low during this period¹.
- As coping strategies for food insecurity, farmers may reduce the amount of food they consume or as a last resort take out loans¹.

Main expenses for cocoa households in Ghana

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fees	Other	Other	Other	Fees	Food	Food	Other	Fees	Other	Food	Food

- Food and school fees are reported as the highest household expenditures¹. Food expenditure is highest in June and July due to food scarcity during this period and in December when farmers have more cocoa money to spend (following main season harvest), and households celebrate the holiday period¹.
- School fees is ranked a major expense due to the number of school going children in a HH (averagely three). Fees are paid over three terms each year and farmers find it most difficult to pay in September as this is the beginning of the cocoa season and prior to harvesting other crops. During this period, farmers either rely on savings, non-agricultural income sources, or take out a loan as a last resort ¹.
- Healthcare, insurance and social costs are incurred at any time throughout the year. Expenditure on these items is dependent on availability of cash. Ghanaian farmers benefit from a national health insurance program thus reducing their healthcare costs¹.

Ghana food security

- The prevalence of food insecurity in the total population in Ghana is estimated at 8.4%². Globally, 9% of the world's population is severely food insecure⁴.
- Food insecurity is linked to the inability of households to produce sufficient quantities of staples to meet their food needs, due to poor soil quality, unfavorable weather conditions, constrained access to inputs, and limited financial resources to expand production³.
- Significant regional disparities exist in the nutrition and food security situation in Ghana. The prevalence of stunting is 19% nationally but rises to 33% in the Northern region. Levels of acute malnutrition are also higher in the Northern region at 9%. Food insecurity is a major contributor to the poor nutritional status of the population in the Northern region³.
- The prevalence of stunting among children under five years if age is 17.5% nationally² (globally 22%⁴).
- Prevalence of undernourishment is reported at 6.5%² (globally 10.5%⁴).
- National average dietary energy supply adequacy is 132%².

Sources: ¹KIT – Demystifying the Cocoa Sector in Ghana and Côte d'Ivoire, ²FAOSTAT – Ghana country indicators, ³USAID – Ghana: Nutrition Profile, ⁴Our World in Data – Hunger and Undernourishment

Table of content

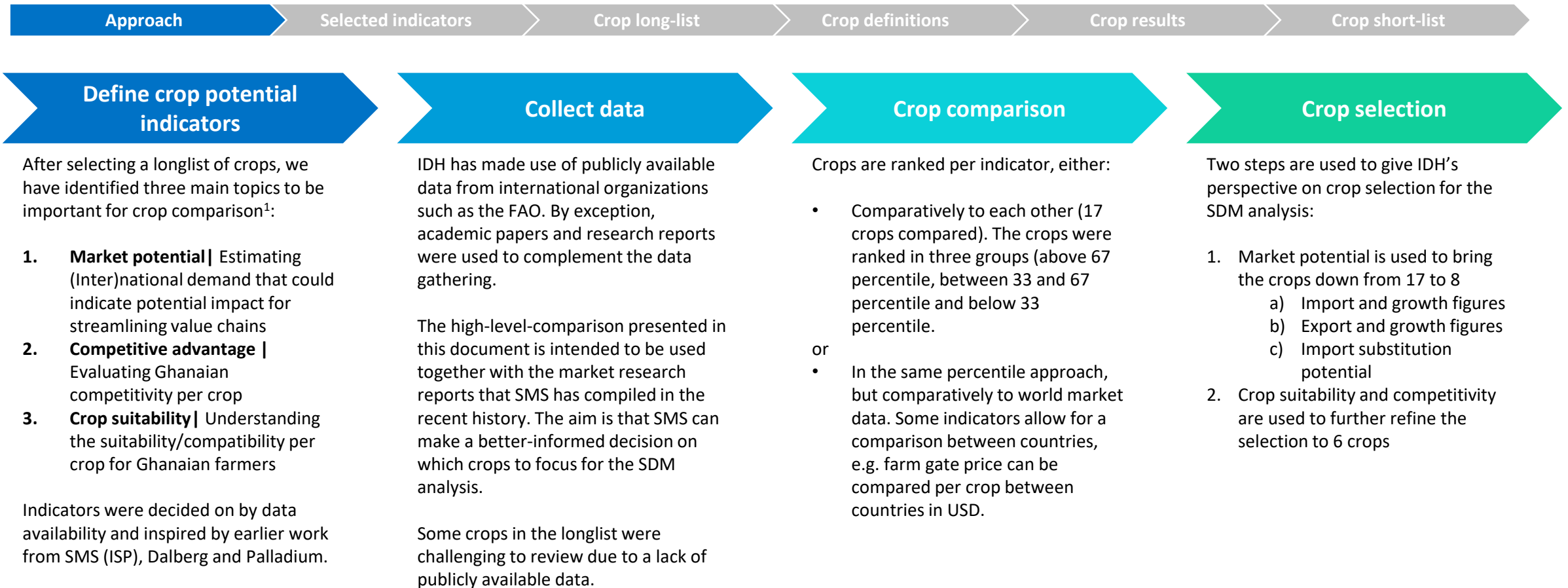
Introduction

Recommendations

About the sector

Annex

Approach to short-listing the high potential markets that SMS could serve



1. These topics were chosen to estimate the potential feasibility and impact of streamlining value chains through smallholder farmer market access services

Rationale for indicator list

Approach

Selected indicators

Crop long-list

Crop definitions

Crop results

Crop short-list

	Indicator	Indicator rational	Comparison
Market potential	Import value North America, Europe and Middle East	Static view of the import market size to understand the scale of potential export to North America, Europe and Middle East (selected as focus regions)	17 crops compared
	Import growth North America, Europe and Middle East	Annual growth rate as a proxy for the future potential demand from North America, Europe and Middle East	17 crops compared
	Ghana export value	Static view of the export market size to understand the maturity of Ghanaian crop export	17 crops compared
	Ghana export growth	Annual growth rate as a proxy for the future development of exports from Ghana	17 crops compared
	Ghana import value	Static view of the import market size to understand the potential for import substitution	17 crops compared
	Ghana import growth	Annual growth rate as a proxy for the future development of imports in Ghana	17 crops compared
Competitively advantage	Farm gate price compared to other countries	Global farm gate price comparison in USD between farmers producing the same crops. Indicator that could signal potential for net income, quality and competitiveness	Global comparison per crop
	Ghana average yield	Global yield comparison to evaluate farmer professionalism and international competitiveness.	Global comparison per crop
	Ghana production	Static view of the Ghanaian market size in comparison to other producing countries globally to estimate the bargaining power.	Global comparison per crop
	Gross production value	Static comparison of market size of 17 Ghanaian crops to estimate the national importance and farmer adoption	17 crops compared
	Gross production value growth	Annual growth rate as a proxy for the future development of production in Ghana	17 crops compared
	Government priority crop	Estimation of the enabling environment that Ghanaian national government can provide	17 crops compared
Crop suitability	Regional coverage	Proxy for long-term future production and proxy for farmer income resilience. Crops that can grow in certain regions only could be more vulnerable to climatic changes	17 crops compared
	Regional coverage compared to cocoa growing regions	Proxy for crop diversification. Number of regions where cocoa is grown that coincides with region where other crop is grown.	17 crops compared
	Nutritional value	Calorific content per 100 gram as a proxy for nutritional value to indicate potential for farmer food security	17 crops compared

Potential crops longlist

Approach

Selected indicators

Crop long-list

Crop definitions

Crop results

Crop short-list

A longlist of potential crops was selected for SMS to provide market access services. This longlist was based on three major research initiatives:

1. SMS own internal research into crops with potential for export;
2. Regional studies from Dalberg into the potential value addition crops for West Africa (and Ghana in particular); and lastly
3. An important state document outlining the priority crops for the Ghanaian government.

The table below explains the reasons why each crop made it to the longlist.

	Okra	Chili	Turmeric	Ginger	Tomato	Oil Palm	Rice	Sugar Cane	Maize	Yam	Cassava	Plantain	Millet	Sorghum	Soybean
SMS research	Export	Export	Export	Export	Import Sub	Import Sub	Import Sub	Import Sub	Common grown	Common grown	Common grown	Common grown			
Dalberg report							High priority ¹		High priority ¹	Low priority ³	High priority ¹	Low priority ³	High priority ¹	Medium priority ²	Medium priority ²
Ghana gov PFJ		Priority crop			Priority crop	Priority tree crop	Priority crop		Priority crop						Priority crop

1. High priority is based on consumption demand & potential for value added opportunities and medium to high social impact potential

2. Medium priority is given to crops that were not an obvious choice when prioritizing status as a staple crop, volumes demand, or biggest commercial opportunity

3. Low priority was determined when industry players generally did not show excitement about trading in this crop

Crop descriptions

Approach	Selected indicators	Crop long-list	Crop definitions	Crop results	Crop short-list
Crop	Description				
Cassava	Cassava is the staple food in many tropical countries. It is not traded internationally in its fresh state because tubers deteriorate very rapidly. Market potential values include dried cassava (peeled, sliced and sun-dried (cassava chips), as well as ground and compressed cassava (pellets)), cassava flour and cassava starch. Competitive advantage values include only fresh cassava.				
Chilli (fresh)	Red and cayenne pepper, paprika, chillies (<i>Capsicum frutescens</i> ; <i>C. annuum</i>); allspice, Jamaica pepper (<i>Pimenta officinalis</i>). Uncrushed or unground fresh pimentos are considered to be vegetables.				
Chili (dried)	Production data exclude crops cultivated explicitly as spices. In contrast, trade data include these crops, provided they are fresh, uncrushed and unground.				
Cocoyam	Aroids cultivated for their edible starchy corms or underground stems. Taro is grown throughout the tropics for food. Trade data cover both fresh and dried taro.				
Ginger	Rhizome of a perennial herb. It also is used for making beverages. Includes fresh, provisionally preserved or dried, whereas ginger preserved in sugar or syrup is excluded.				
Maize	A grain with a high germ content. At the national level, hybrid and ordinary maize should be reported separately owing to widely different yields and uses. Used largely for animal feed and commercial starch production.				
Turmeric	N/A				
Oil Palm	Obtained from the mesocarp of the fruit of the oil palm by pressure, and also by solvent from the residues of the pressure extraction. Production and yield values include value of oil palm fruit whereas market potential values include value of oil palm.				
Okra	Also known as gombo.				
Plantain & others	Generally known as a cooking banana. Data should be reported excluding the weight of the central stalk.				
Rice	Market potential values include white rice milled from locally grown paddy (including semi-milled, whole-milled and parboiled rice) and broken rice. Production and yield values include rice paddy only.				
Sorghum	A cereal that has both food and feed uses. Sorghum is a major food grain in most of Africa, where it is also used in traditional beer brewing. It is desirable to report hybrid and other varieties separately.				
Soybean	The most important oil crop. Also widely consumed as a bean and in the form of various derived products because of its high protein content, e.g. soya milk, meat, etc. Market potential values includes soybean cake, soybean oil and soybeans.				
Sugar cane	In some producing countries, marginal quantities of sugar cane are consumed, either directly as food or in the form of juice.				
Tomato	Market potential values include tomatoes and tomato paste				
Yam	The principal edible yams are widely grown throughout the tropics. A starchy staple foodstuff, normally eaten as a vegetable, boiled, baked or fried. In West Africa they are consumed mainly as "fufu", a stiff glutinous dough. Trade data cover both fresh and dried yams.				

Market research results

Approach			Selected indicators			Crop long-list			Crop definitions			Crop results			Crop short-list					
			<div><div></div> Low – Percentile 0-33%</div> <div><div></div> Medium – Percentile 33-67%</div> <div><div></div> High – Percentile 67- 100%</div> <div><div></div> No data available</div>																	
			Units	Cassava	Chili (fresh)	Chili (dried)	Cocoyam	Ginger	Maize	Millet	Turmeric	Oil Palm	Okra	Plantain	Rice	Sorghum	Soybeans	Sugar cane	Tomato	Yam
Market potential	Import value North America	USD (M)/year	183	1,856	350	N/A	152	887	7	N/A	1,238	N/A	251	1,230	2	1,473	N/A	2,887	N/A	
	Import growth North America	CAGR (2014 - 2018)	8.5%	4.4%	5.7%	N/A	10.4%	13.7%	8.3%	N/A	6.9%	N/A	5.8%	4.5%	-14.4%	-4.0%	N/A	4.3%	N/A	
	Import value Middle East	USD (M)/year	14	130	52	N/A	96	4,233	14	N/A	1,822	N/A	151	5,929	10	5,098	N/A	1,019	N/A	
	Import growth Middle East	CAGR (2014 - 2018)	13.2%	8.3%	3.5%	N/A	10.2%	6.6%	-4.5%	N/A	0.1%	N/A	-6.1%	1.2%	-9.1%	6.7%	N/A	8.5%	N/A	
	Import value EU	USD (M)/year	114	3,177	423	N/A	347	9,495	56	N/A	7,753	N/A	341	1,935	176	19,940	N/A	7,084	N/A	
	Import growth EU	CAGR (2014 - 2018)	5.8%	2.0%	6.0%	N/A	14.0%	6.0%	-1.0%	N/A	1.0%	N/A	7.2%	1.7%	25.6%	1.1%	N/A	-0.5%	N/A	
	Ghana export value	USD (M)/year	1.4	0.1	0.1	N/A	0.1	0.2	0.0	N/A	79.7	N/A	0.1	N/A	N/A	2.6	N/A	9.7	N/A	
	Ghana export growth	CAGR (2016 - 2018)	3.3%	307.8%	492.9%	N/A	754.4%	66.2%	274.2%	N/A	-16.5%	N/A	706.2%	-66.5%	0.0%	-41.2%	N/A	6.5%	N/A	
	Ghana import value	USD (M)/year	0.5	0.3	0.0	N/A	0.1	22.8	0.4	N/A	225.4	N/A	0.0	448.2	0.1	64.5	N/A	49.1	N/A	
	Ghana import growth	CAGR (2016 - 2018)	165.9%	31.7%	8.5%	N/A	-50.2%	6.5%	-51.7%	N/A	39.1%	N/A	N/A	8.6%	-93.8%	89.1%	N/A	-10.9%	N/A	
Competitive advantage	Price ¹	USD/Tonne	253	N/A	N/A	509	1,151	370	620	N/A	1,554	N/A	429	N/A	539	N/A	N/A	1,127	527	
	Ghana average yield ¹	Kg/ha	20,180	9,366	7,526	6,537	1,208	1,947	1,012	N/A	7,033	21,999	11,196	2,825	1,127	1,680	24,810	7,664	17,525	
	Ghana production ¹	MT ('000)/year	20,846.0	123.4	115.1	1,460.9	0.1	2,306.4	181.6	N/A	2,604.4	74.0	4,170.0	769.4	316.2	152.0	152.5	381.0	7,858	
	Gross production value	USD (M) 2018	5,264	26	54	743	0.1	854	112	N/A	1,487	15	679	144	170	N/A	1	429	4,137	
	Gross production value growth	CAGR (2014 - 2018)	4.0%	0.2%	1.7%	3.0%	2.2%	7.0%	4.0%	N/A	1.6%	2.8%	2.4%	6.2%	5.1%	N/A	0.6%	1.0%	2.5%	
	Government priority crop	Yes, No	No	Yes	Yes	No	No	Yes	No	No	Yes	No	No	Yes	Yes	Yes	No	Yes	No	
Crop suitability	Regional coverage ²	#/10 regions	8	N/A	N/A	6	N/A	10	3	N/A	N/A	N/A	6	10	5	4	N/A	N/A	8	
	Regional coverage compared to cocoa growing regions ²	#/6 regions	6	N/A	N/A	6	N/A	6	-	N/A	N/A	N/A	6	6	2	1	N/A	N/A	6	
	Nutritional value	Kcal/100g	160	40	40	112	80	365	378	312	884	33	122	360	329	446	74	18	118	

	Low – Percentile 0-33%
	Medium – Percentile 33-67%
	High – Percentile 67- 100%
	No data available

¹Indicators that are compared globally per crop which has an effect on the grouping of results per percentile. E.g. even though farm gate price is lower for maize (370.1) than for ginger (1150.7), compared to other countries, Ghanaian farmers are receiving a relatively high price for maize and medium price for ginger

Crop selection based on market potential



- Import and import growth best performers in trade blocks
- Export and export growth best performers in Ghana
- Import substitution potentials

		Units	Cassava	Chili (fresh)	Chili (dried)	Cocoyam	Ginger	Maize	Millet	Turmeric	Oil Palm	Okra	Plantain	Rice	Sorghum	Soybeans	Sugar cane	Tomato	Yam
Market potential	Import value North America	USD (M)/year	183	1,856	350	N/A	152	887	7	N/A	1,238	N/A	251	1,230	2	1,473	N/A	2,887	N/A
	Import growth North America	CAGR (2014 - 2018)	8.5%	4.4%	5.7%	N/A	10.4%	13.7%	8.3%	N/A	6.9%	N/A	5.8%	4.5%	-14.4%	-4.0%	N/A	4.3%	N/A
	Import value Middle East	USD (M)/year	14	130	52	N/A	96	4,233	14	N/A	1,822	N/A	151	5,929	10	5,098	N/A	1,019	N/A
	Import growth Middle East	CAGR (2014 - 2018)	13.2%	8.3%	3.5%	N/A	10.2%	6.6%	-4.5%	N/A	0.1%	N/A	-6.1%	1.2%	-9.1%	6.7%	N/A	8.5%	N/A
	Import value EU	USD (M)/year	114	3,177	423	N/A	347	9,495	56	N/A	7,753	N/A	341	1,935	176	19,940	N/A	7,084	N/A
	Import growth EU	CAGR (2014 - 2018)	5.8%	2.0%	6.0%	N/A	14.0%	6.0%	-1.0%	N/A	1.0%	N/A	7.2%	1.7%	25.6%	1.1%	N/A	-0.5%	N/A
	Ghana export value	USD (M)/year	1.4	0.1	0.1	N/A	0.1	0.2	0.0	N/A	79.7	N/A	0.1	N/A	N/A	2.6	N/A	9.7	N/A
	Ghana export growth	CAGR (2016 - 2018)	3.3%	307.8%	492.9%	N/A	754.4%	66.2%	274.2%	N/A	-16.5%	N/A	706.2%	-66.5%	0.0%	-41.2%	N/A	6.5%	N/A
	Ghana import value	USD (M)/year	0.5	0.3	0.0	N/A	0.1	22.8	0.4	N/A	225.4	N/A	0.0	448.2	0.1	64.5	N/A	49.1	N/A
	Ghana import growth	CAGR (2016 - 2018)	165.9%	31.7%	8.5%	N/A	-50.2%	6.5%	-51.7%	N/A	39.1%	N/A	N/A	8.6%	-93.8%	89.1%	N/A	-10.9%	N/A

Method of crop selection

Selected the crops with

1. CAGR growth in the highest percentile range; and
2. Import/export value within the medium to high percentile range.

Rationale for crop selection

- The CAGR is an indication of changing demand for the respective crop and therefore a proxy for market potential
- The import and export value serves as an indication of market growth in absolute value

Medium sized list

1. Cassava
2. Chili (dried and fresh)
3. Ginger
4. Maize
5. Oil Palm
6. Plantain
7. Soybeans
8. Tomato

Selection refinement based on competitiveness and compatibility



- ☐ Least competitive
☐ Least compatible with cocoa

		Units	Cassava	Chili (fresh)	Chili (dried)	Ginger	Maize	Oil Palm	Plantain	Soybeans	Tomato
Competitive advantage	Price ¹	USD/Tonne	253	N/A	N/A	1,151	370	1,554	429	N/A	1,127
	Ghana average yield ¹	Kg/ha	20,180	9,366	7,526	1,208	1,947	7,033	11,196	1,680	7,664
	Ghana production ¹	MT ('000)/year	20,846.0	123.4	115.1	0.1	2,306.4	2,604.4	4,170.0	152.0	381.0
	Gross production value	USD (M) 2018	5,264	26	54	0.1	854	1,487	679	N/A	429
	Gross production value growth	CAGR (2014 - 2018)	4.0%	0.2%	1.7%	2.2%	7.0%	1.6%	2.4%	N/A	1.0%
	Government priority crop	Yes, No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Crop suitability	Regional coverage ²	#/10 regions	8	N/A	N/A	N/A	10	N/A	6	4	N/A
	Regional coverage compared to cocoa growing regions ²	#/6 regions	6	N/A	N/A	N/A	6	N/A	6	1	N/A
	Nutritional value	Kcal/100g	160	40	40	80	365	884	122	446	18

Crops were dropped from the shortlist when:

1. Production volume and value were too small; and
2. Regional coverage compared to cocoa growing regions was too low

Rationale for crop selection

- The production volume and value indicate that Ghana does not have a competitive advantage
- Low regional coverage indicates low suitability for scaling under Ghanaian cocoa farmers







Final list suggestion by IDH

1. Cassava
2. Chili (dried and fresh)
3. Maize
4. Oil Palm
5. Plantain
6. Tomato

Final list chosen by SMS

1. Cassava
2. Chili (dried and fresh)
3. Maize
4. Ginger
5. Tomato

Farmer segments assumptions

Segments		 Cocoa baseline	 Scenario 1	 Scenario 2	 Scenario 3	 Scenario 4	 Scenario 5
Description		A farmer involved in sustainable production of cocoa	A farmer involved in sustainable production of cocoa and is willing to diversify into non-cocoa crops				
Crops & land size	Cocoa	3.30	3.30	3.30	3.30	3.30	3.30
	Chili	0.00	0.28	0.28	0.32	0.00	0.00
	Tomato	0.00	0.00	0.00	0.08	0.08	0.00
	Ginger	0.00	0.00	0.12	0.00	0.00	0.20
	Cassava	0.00	0.00	0.00	0.00	0.32	0.00
	Maize	0.00	0.12	0.00	0.00	0.00	0.20
Farmer share (%)			20%	20%	20%	20%	20%

Crop assumptions

Revenue drivers		Cocoa	Chili	Tomato	Cassava	Maize	Ginger
Crop type		Perennial	Annual	Annual	Annual	Annual	Annual
Seasons per year	# of seasons	2	2	2	1	2	1
Time to replanting	Years	30	1	1	1	1	1
Crop starting age	Years	15	1	1	1	1	1
Price	GHS/kg	10.56	4.4	13.0	0.9	1.60	1.2
Average yield	Kg/ha/year	992	11,450	8,377	16,653	5,091	8,907
Post-harvest losses	% of harvest	10%	15%	15%	15%	15%	15%
Own consumption	Kg/farm/year	0	25	25	150	50	20
Of which sold to SMS and partners	%	100%	100%	100%	100%	100%	100%

Glossary

Abbreviation	Meaning
AGL	Agro-ECOM Ghana Limited
c.	circa
CAGR	Compounded Annual Growth Rate
CDI	Côte d'Ivoire
CMC	Cocoa Marketing Company
Cocobod	Ghana cocoa board
emT	Empower Trade
EU	European Union
FAO	Food and Agriculture Organization
g	Gramme(s)
GAP	Good Agricultural Practices
ha	Hectare(s)
ISP	Industry Strategy Paper (ECOM SMS document)
IT	Information Technology
Kcal	Kilocalorie
Kg(s)	Kilogramme(s)
KPI	Key Performance Indicators
LBC	Licensed Buying Companies
LID	Living Income Differential

Abbreviation	Meaning
M	Million
MT	Metric Ton (1,000 kg)
PBC	Produce Buying Company
SDM	Service Delivery Model
SHF	Smallholder Farmer
SMS / ECOM SMS	ECOM Sustainability Management Services
SWOT	Strengths, Weaknesses, Opportunities & Threats
U.S.	United States of America
USD / \$	United States Dollar (currency)
VSLA	Village Savings and Loan Association

Sources

Source	Link (if publicly available)
DataReportal	https://datareportal.com/reports/digital-2020-ghana
Demographic and Health Survey	https://dhsprogram.com/pubs/pdf/fr307/fr307.pdf
FAO	
KIT Document	https://www.kit.nl/project/demystifying-cocoa-sector/
ILO	https://www.ilo.org/africa/countries-covered/ghana/strengthen/WCMS_673136/lang--en/index.htm
International Cocoa Initiative	https://cocoainitiative.org/news-media-post/cocoa-farmers-in-ghana-experience-poverty-and-economic-vulnerability/
KIT Document	https://www.kit.nl/project/demystifying-cocoa-sector/
Research Journal	http://www.researchjournali.com/view.php?id=1985
Royal Tropical Institute	http://www.fao.org/sustainable-food-value-chains/library/details/en/c/262926/
Statista	https://www.statista.com/statistics/262620/global-cocoa-production/#:~:text=The%20timeline%20depicts%20the%20trend,the%20crop%20year%202015%2F16.
The Economist	https://country.eiu.com/ghana
UNICEF	https://www.unicef.org/ghana/prevention-child-labour#:~:text=Of%20all%20children%20in%20Ghana,as%20common%20in%20rural%20areas.&text=In%20all%20regions%2C%20the%20vast,of%205%20and%207%20years.
USAID	https://www.land-links.org/wp-content/uploads/2017/02/TGCC-Cocoa-tenure-deforestation-assessment_Feb-2019.pdf
Wage Indicator	https://wageindicator.org/salary/living-wage/ghana-living-wage-series-september-2019
World Economic Forum	https://www.weforum.org/agenda/2019/05/ghana-is-losing-its-rainforest-faster-than-any-other-country-in-the-world/

Contact details



Wouter van Monsjou
SDM Manager
IDH - Farmfit
vanmonsjou@idhtrade.org



Jesse Arnon
SDM Manager
NewForesight
jesse.arnon@newforesight.com



Mukami Kimani
SDM Analyst
IDH - Farmfit
kimani@idhtrade.org



[Click here](#)