Traceability and transparency of cocoa supply chains in Côte d'Ivoire and Ghana

EUREDD Facility

EFI

nitidæ landscapes & value chains

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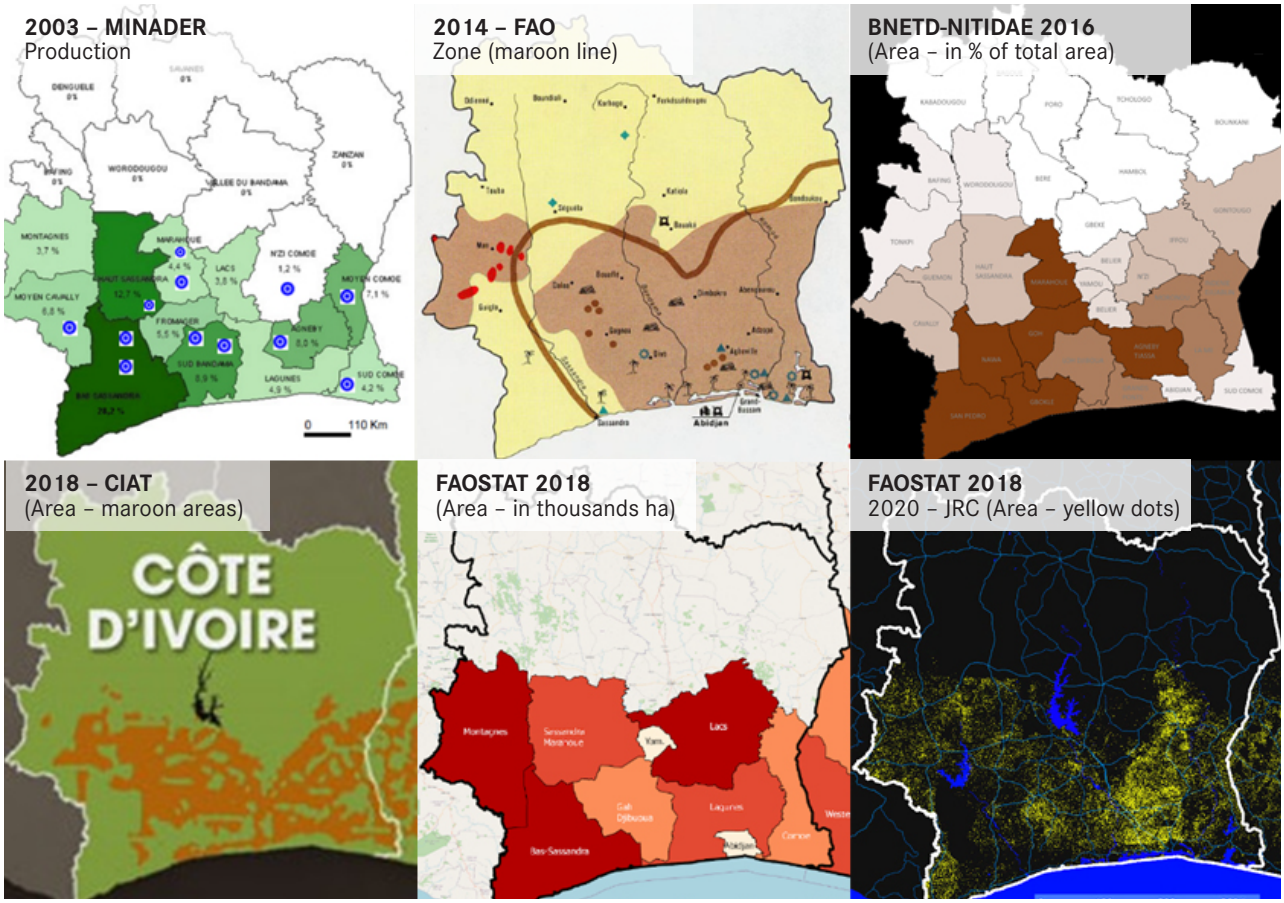
1.1 Côte d'Ivoire

Production

Cocoa is produced almost everywhere in the southern half of Côte d'Ivoire. Unfortunately, accurate information on the geographical extension of production by region or department is unavailable.

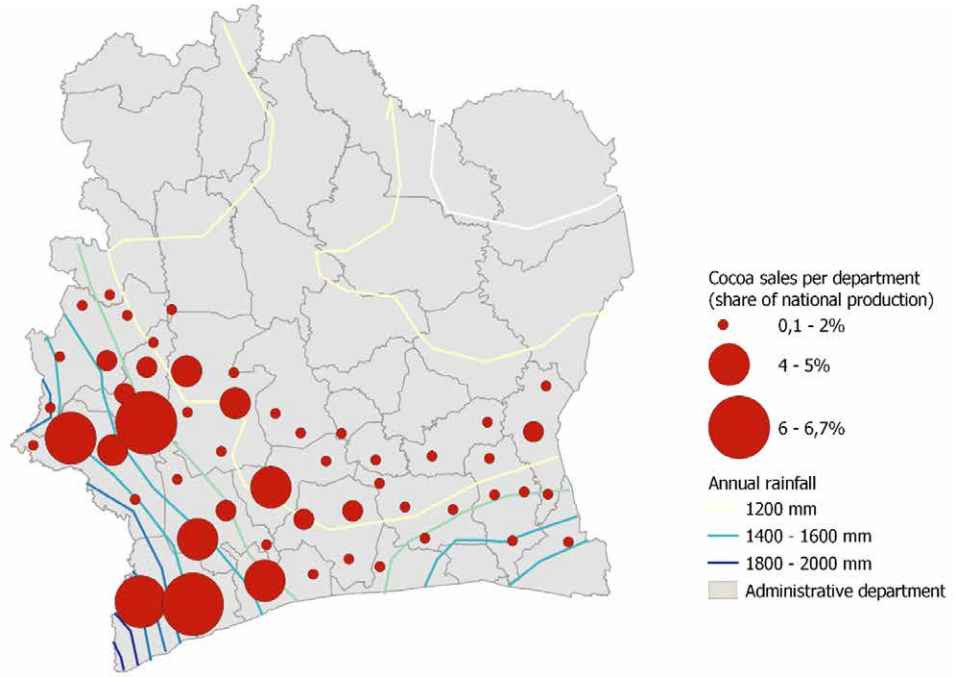
This study could only gather limited information on the number of farmers involved in cocoa production by region from national agriculture surveys (RNA 2014 and 2016). Further, remote sensing data and several maps from different sources, compared below, provide an inaccurate image of cocoa acreage by region (BNETD 2016, Vivid Economics 2017, JRC).

Figure 1. Comparison of different mapping of cocoa production and acreage from different sources



When compared with the cocoa trading data by department provided by the Coffee-Cocoa Board (in French, Conseil du Café et du Cacao or CCC), all these maps seem to be relatively inaccurate.

Figure 2. Size of cocoa trade by department in share of national production, average of three seasons 2017/2018 – 2018/2019 – 2019-2020. **Source:** Mapping of CCC data by IED-Nitidae[1]



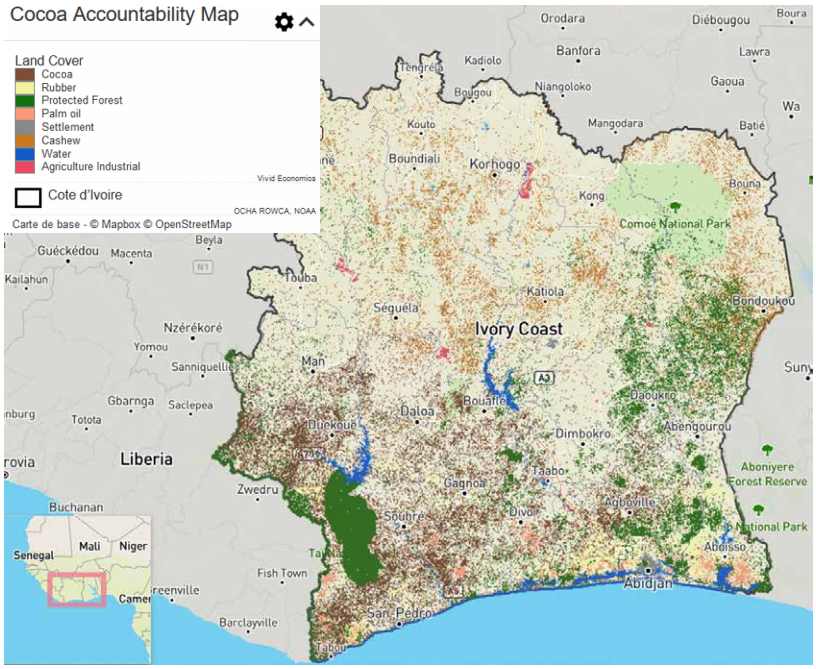
Various reasons can explain the differences between several data sources and this more accurate mapping of production areas:

- **Differences in yields** between older production areas in the east, and younger cocoa production areas in the west. In the west, more cocoa plantations are in their first cycle. The cocoa trees were planted more recently and including in forest areas in the west, taking advantage of post-forest fertility and lower pest pressure. They are also better maintained. Average yields in the east and the centre of the country are probably much lower than in the west. This can explain, in part, the difference between acreage and production data.
- **Shaded cocoa production** in classified forests of the west is harder to detect by remote sensing. Nonetheless, three to four years after planting, most shade trees are dead (either burnt or slowly killed by farmers who cut their bark). Remote sensing should therefore now be able to identify most productive areas.
- **Concerns of Ivorian authorities** and cocoa exporting companies about the increased awareness of other stakeholders (final buyers, retailers, consumers, NGOs, governments) of the higher deforestation risks of the west. In the east and the centre of the country, most forests were converted to cocoa, rubber and palm oil production many years ago.

The recent land use/deforestation mapping carried out by the Ministry of Planning and Development, Vivid Economics and the UK Space Agency in 2017, and updated in November 2020, seems much more accurate, as shown below.

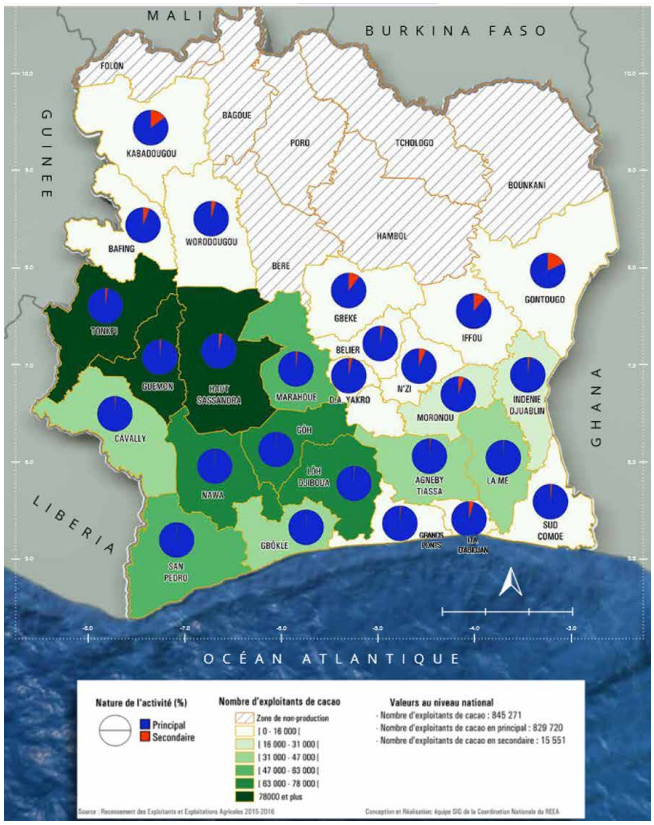
[1] IED-Nitidae, Rapport d'Evaluation du Potentiel Biomasse Energie en Côte d'Ivoire, 2021 (unpublished)

Figure 3. Land cover of Côte d'Ivoire. **Source:** Mighty Earth with data from Image (Vivid Economics, UK Space Agency & Ministry of Planning and Development)



A map from the National Farm Survey report (REEA 2016[2]) also shows the concentration of cocoa production in the West. This is despite being based on the number of cocoa farms only, and not on production or acreage data.

Figure 4. Cocoa farms number by region in Côte d'Ivoire. **Source:** REEA 2016 - FAO



[2] http://www.fao.org/3/ca3111fr/CA3111FR.pdf

The combination of these three maps confirms that nowadays, most cocoa production is concentrated in the west of Côte d'Ivoire. This finding is confirmed by the land productivity dynamics map below, which shows that in southern Côte d'Ivoire, those regions are the ones with the highest decline in productivity.

It can be concluded from the above that around 60% of Côte d'Ivoire's cocoa production - or 37% of global cocoa production - is concentrated in the western regions of the country. Only 8% of the Ivorian output is sourced in the eastern regions.

Figure 5. Land productivity changes NDVI-USGS 2018. **Source:** www.earthmap.org

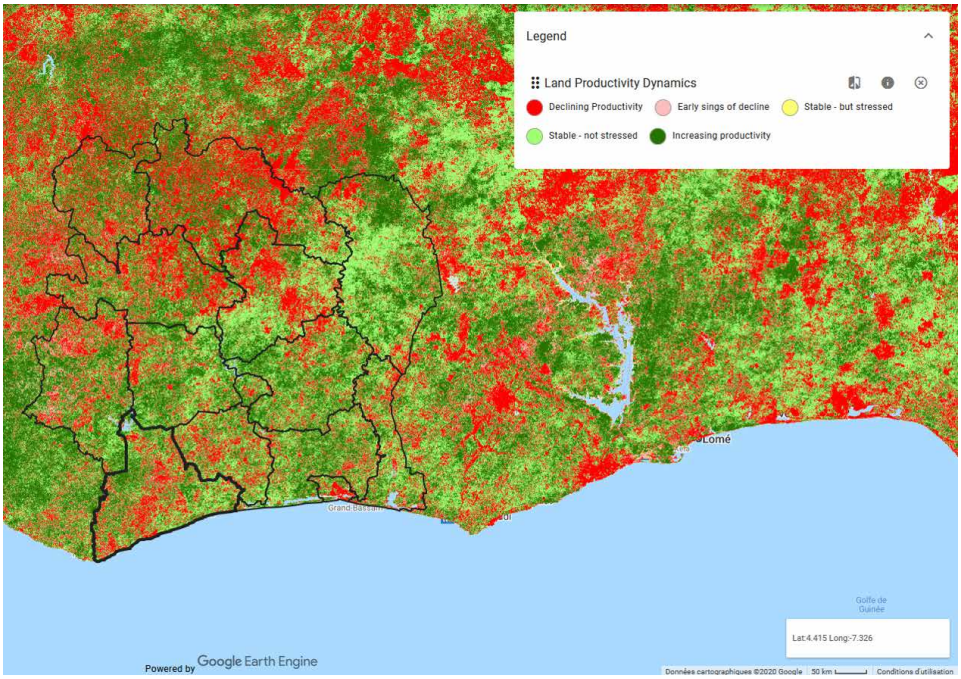


Figure 6. Geographical distribution of cocoa production in southern Côte d'Ivoire during 2017 to 2020. **Source:** Nitidae based on CCC data

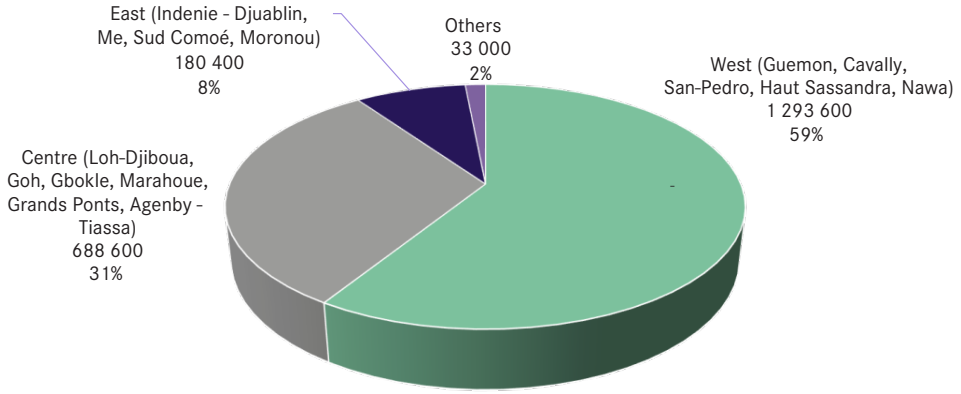
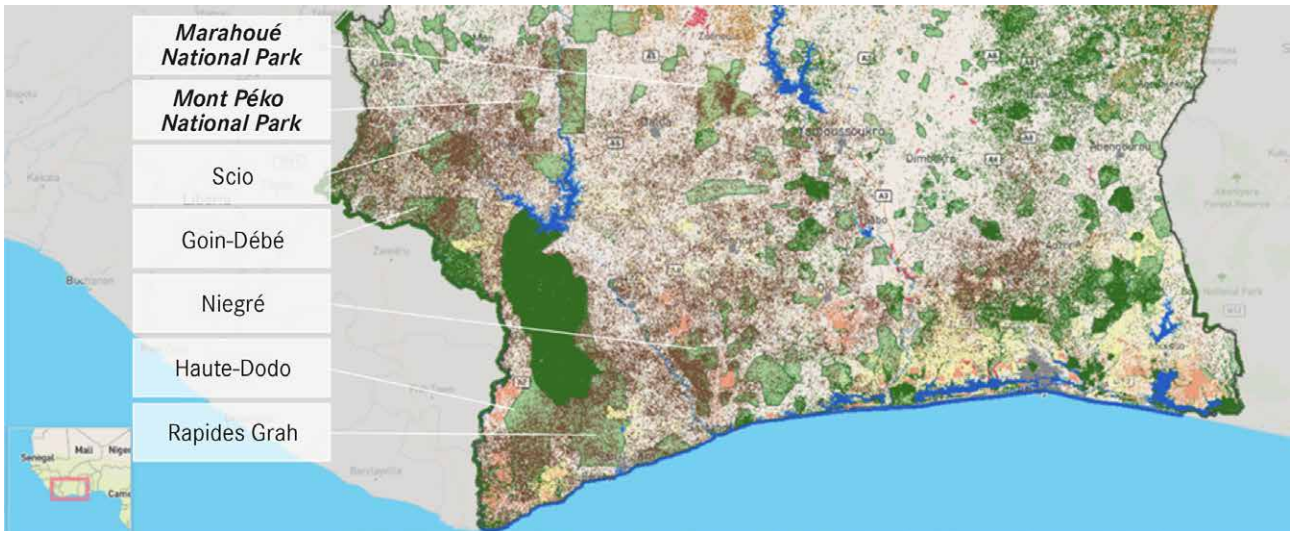


Figure 6 indicates that a large share of the production in the west comes from classified forests. In informal interviews, most stakeholders in the cocoa sector, including cocoa exporters and processors, estimated that at least one third of Ivorian cocoa comes from classified forests. This figure is likely to be slightly inflated. Considering that 25% to 30% of cocoa is produced in these protected areas would be a more accurate estimate. The concentration is particularly high in several classified forests that were (re)categorised as 'agroforests' during the 2019 forest reform (see list below), but also in national parks (see in bold and italic below).

Figure 7. Snapshot of cocoa acreage and classified forests layers combined in IMAGE platform. **Source:** Mighty Earth with data from IMAGE (Vivid Economics, UK Space Agency & Ministry of Planning and Development)



In April 2019, the CCC initiated a national census of cocoa farmers, including georeferencing of all cocoa farm plots. This census is conducted by a team of 800 enumerators and is expected to be completed by March 2021. At the time of writing (December 2020), two point four million hectares had already been georeferenced. CCC estimates these to represent around 60% of the total acreage. In October 2020, CCC's enumerators were georeferencing cocoa plots in classified forests.

The census also covers socioeconomic indicators. These include issues related to the household and its 'leader' (including ID documentation), production factors (inputs, storage capacity, cost of manpower) and presence of swollen shoot virus and other pests affecting cocoa yields.

CCC's medium-term objective is to build a complete identification system of cocoa farmers, with a unique identification number for each farmer and full traceability from plot to port. After the census, unregistered farmers will be required to register in a CCC regional office to be able to sell their production. A CCC officer will geo-reference their cocoa plots during the registration process. In the long term, the CCC intends to use this traceability system to promote the complete digitalisation of payments in the cocoa sector.

CCC contracted a consulting firm to design the architecture of the traceability and payment system. It is in the process of gathering information on the traceability systems developed by the different exporting companies. However, they will propose a new system to replace the multiple and independent traceability systems.

National trade

A handful of large farms (over 10 ha) sell directly to the local cooperative or to a wholesaler. Otherwise, most cocoa farmers sell their beans to small local traders called '*pisteurs*' (literally, 'trackers') and to 'cooperative sections'.

Cooperative sections exist in most villages and even in informal hamlets in former forest areas called '*campements*' or camps. Many cooperatives have sections close to, or inside protected area/classified forests as documented in a 2013 report co-authored by GIZ and the Ivorian Agriculture Ministry[3].

As a result of the traceability and certification programmes implemented by almost all the cocoa exporting companies during the last decade, cooperatives' market share has grown. Based on our interviews, around 45% of cocoa beans is estimated to have been traded through cooperatives during the last two seasons.

Generally, the cooperative's headquarters is based in a middle-sized city or sub-prefecture. But the cooperative's supply is spread among several villages, sometimes farther than 100 km from the headquarters, where the cooperative has 'sections' and where the cleaning, grouping and often the storage of the cocoa beans are organised before purchase and transportation.

Most farmers sell their cocoa beans to both local traders and cooperatives. Cooperatives can compete with local traders thanks to the certification premium they can offer, at least for part of the farmers' production. However, they are usually unable to collect their members' entire production for various reasons: their shorter period of activity (they often start buying cocoa beans several weeks after the start of the trading season due to limited funding); higher operational costs in comparison to local traders who trade other commodities than cocoa; and their ability to pay certification premiums only for part of the cocoa beans delivered. Furthermore, local traders can often provide other services to farmers, such as credit, advantages in the sale or purchase of food crops, supply of inputs, more efficiently and consistently than cooperatives. This allows them to keep a good market share.

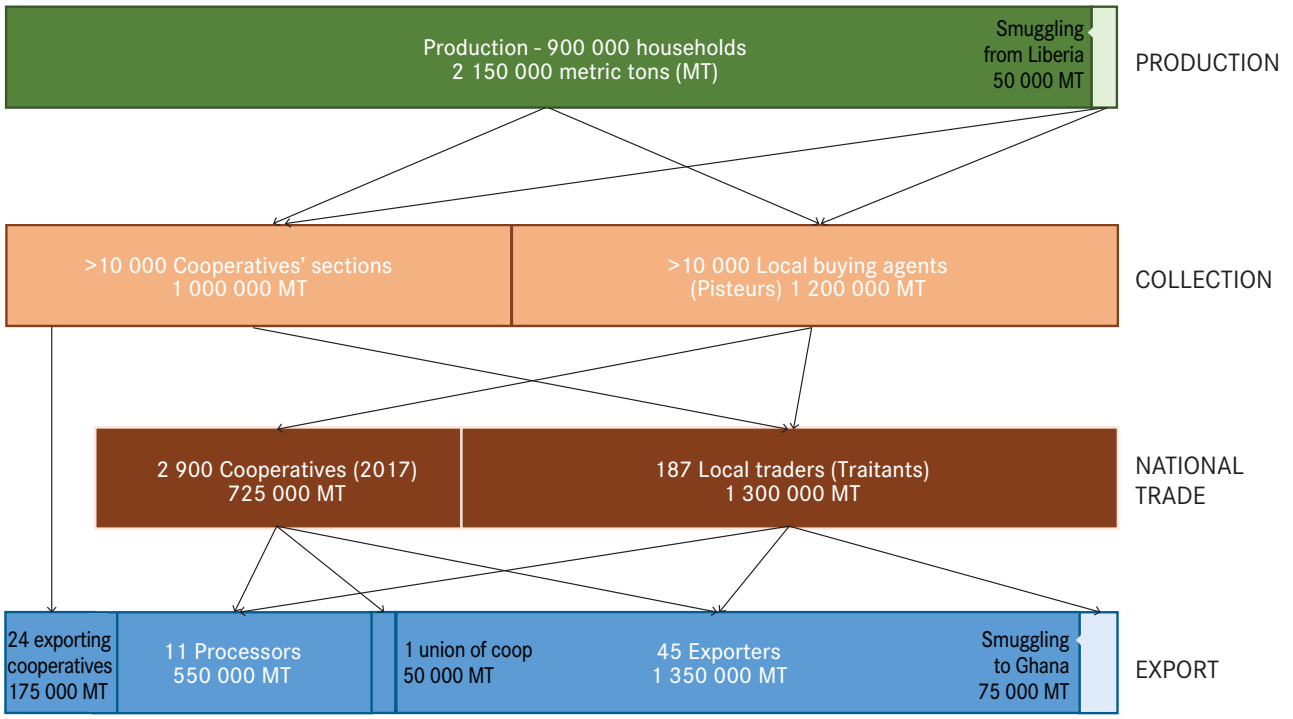
As explained in a research article by Ruf and al. of 2020[4], cooperatives have to purchase cocoa beans outside their sections (to small local traders or even large wholesalers) to respect the quality requirement of the exporter or processor to whom they sell certified beans. In parallel, some cooperatives' sections sell their members' production to wholesalers when the payment from the cooperative takes too long, or if those wholesalers can propose a higher certification premium.

Finally, even if the national supply chain could be simplified by referring to a 'cooperative supply chain' and an 'independent trader supply chain', both are interdependent. All exporters interviewed recognised that even if they wanted to increase the share of cooperatives in their supply chain, they would maintain part of their supply from local wholesalers. This is because the latter are more efficient in terms of trading cost and delivery time, less risky in terms of financial embezzlement, and partly or even entirely self-funded. The most ambitious exporters and national processors indicated they could source up to 90% of their cocoa beans through cooperatives in the medium term, but none mentioned a 100% target.

[3] Étude de la production de cacao en zone riveraine du Parc national de Taï, février 2013. Auteurs : Frédéric Varlet et Georges Kouame, publication du GIZ en collaboration avec le Ministère ivoirien de l'Agriculture et la Coopération allemande.

[4] Ruf François, Uribe Leitz Enrique, Gboko Kouamé Casimir et al., « Des certifications inutiles ? Les relations asymétriques entre coopératives, labels et cacaoculteurs en Côte d'Ivoire », *Revue internationale des études du développement*, 2019/4 (N° 240), p. 31-61. DOI : 10.3917/ried.240.0031. URL: https://www.cairn-int.info/revue-internationale-des-etudes-du-developpement-2019-4-page-31.htm

Figure 8. National cocoa supply chain with estimated shares in 2019/2020. **Source:** Nitidae



Processing and export

Available data on processing and export shows that this activity is very concentrated, even if the concentration decreased in comparison to the 2000s.

Figure 9. Evolution of the market shares of the eight main cocoa exporters/processors in Côte d'Ivoire[5]

	2004 / 2005	2006 / 2007	2016 / 2017	2017 / 2018	2018 / 2019	2019 / 2020
Market share of the eighth-largest cocoa exporters /processors	73%	76%	59%	61%	63%	62%

Furthermore, the main clients (importers) of the Ivorian exporting companies are the sister companies of the top six international trading companies (Barry Callebaut, Olam, Cargill, ECOM, Touton and SUCDEN[6]).

The market share of Ivorian cocoa trade of these six companies is therefore probably greater than what appears in the export statistics of Côte d'Ivoire. Among the top 16 exporters/processors, which represent 78% of the cocoa exports, most are involved in or implementing a certification and traceability scheme (see Figure 10).

[5] https://www.scirp.org/html/htmltables/3-2120190Templetes/3-2120190_table_5.htm and customs data processed by Nitidae.

[6] https://www.africasourcing.net/our-clients/our-references/

Figure 10. Certification and 'transparency' initiatives of the main cocoa exporters of Côte d'Ivoire. **Source:** Nitidae based on companies' websites. RA= Rainforest Alliance; FLO= Fairtrade

Rank	Group name	CTY	Website	Name in CI	Market share	UTZ	RA	FLO	Organic	Map of cooperative for direct supply
1	**CARGILL**	US	www.cargill.com	CARGIL WA (beans) & CARGILL COCOA SA (grinding)	11.9%	x	x	x		https://www.cargill.com/sustainability/cocoa/partner-cooperatives
2	**Barry Callebaut**	CH	www.barry-callebaut.com	BCN (beans) + SACO (Process)	11.8%	x	x	x		https://www.barry-callebaut.com/en/group/forever-chocolate/sustainable-range/transparency-and-traceability-our-cocoa-supply-chain
3	**Olam**	SG	www.olamgroup.com	OUTSPAN. + Olam Cocoa Processing + UNICAO	10.3%	x	x	x		https://ofis.olamdigitalcom/#/login Access restricted to clients
4	**Société Agricole de Café et de Cacao**	CI	http://sacc-ci.com	SACC + SAF CACAO + CIPEXICI	7,6%	x	x	x		No website – no data
5	**Touton**	FR	www.touton.com	TOUTON NEGOCE CI (TNCI)	6,3%	x	x	x		https://touton.com/touton-cocoa-sourcing-map-cote-d-ivoire
6	**Sucre & Denrées**	FR	www.sucden.com	SUCDEN CÔTE D'IVOIRE	5,8%	x	x	x		Access restricted to clients
7	**S3C**	CI		S 3 C	5.4%	x	x	x		No website – no data
8	**Cémoi**	FR	www.cemoi.fr	CEMOI TRADING S.A.	3.4%	x	x	x	x	https://www.mightyearth.org/cocoa-accountability
9	**Africa Sourcing**	CI	www.africasourcing.net	ARMAJARO NEGOCE	2,9%	x		x		No data on suppliers
10	**ECOM**	CH	www.ecomtrading.com	ZAMACOM S.A.	2,7%	x		x		www.ecomsms.com Access restricted to clients
11	**ECOOKIM**	CI	http://ecookim.com	Union des Sociétés Coopérative Kimbe	2,5%	x	x	x	x	http://ecookim.com/notre-reseau/
12	**EUROFIND**	CI		Ivory Cocoa Product	2.0%	x		x		No website – no data
13	**Tan Mondial**	SG	www.tanmondial.com	TAN IVOIRE SARL	1,7%		x			No data
14	**Société de négoce de matières premières**	CI		SONEMAT	1,7%					No website – no data
15	**SCAT**	CI		STE COOP AGRI DE TOUIH	1,6%		x			No website – no data
16	**CNEK**	CI	https://www.facebook.com/cnekci	COOPÉRATIVE NOUVEL ESPRIT DE KETESSO	1,5%	x	x	x		No data

Published data by exporters provides some indication of the size of the certified procurement.

Figure 11. Farm mapping and certified volumes of the main cocoa exporters in Côte d'Ivoire.
Source: Nitidae based on company reports and websites

Rank	Group name	Quantity of cocoa exported/processed in 2019/2020	Number of plots/ farms mapped in CI 2019/2020	Quantity certified (all certification, in metric tons, if available)
1	CARGILL	245 835	122 000	105 000
2	Barry Callebaut	243 135	87 160	110 000
3	Olam	212 012	76 373	
5	Touton	129 254	34 552	
6	Sucre & Denrées	119 774	17 297	
8	Cémoi	70 419	13 984	
10	ECOM	56 170	30 000	
	Total	**1 075 600**	**381 366**	

Figure 12. Extract from the Olam-CFI progress report 2019/2020

A significant challenge is the double reporting of the mapping, certification and other sustainability actions and projects, by the trading/grinding companies and the confectionery companies. Few companies provide financial information on sustainability actions. The Olam-CFI progress report indicates that, these actions are mostly funded by chocolate manufacturers.

Also, as traders do not share and compare their data, many farms/plots are mapped several times by different exporting companies. UTZ/RA in Abidjan is the only organisation to receive most of the mapping/ GPS points from all the companies. It reported that over 20% of the farms registered in their platform are mapped by several exporting companies.

These multiple counts hinder efforts to estimate the number of cocoa plots and farms that have been mapped so far by the numerous sustainability and certification initiatives, programmes or projects. However, it can be asserted that, at present, they amount to less than 50% of all cocoa farms in Côte d'Ivoire and that most cocoa beans are not traced 'from the farm'. In addition, current company commitments under the Cocoa Forest Initiative (CFI)[7] not to source from national parks and protected areas are limited to their direct supply.

1.2 Ghana

Production

Currently, finding up-to-date and accurate information on production data by jurisdiction (cocoa region, cocoa district, etc.) in Ghana is challenging. Information collected is predominantly paper-based and scattered at various points in the value chain. This is in part because the data is currently collected at the local level and its collation into a national database is a very slow process.

The Ghana Statistical Service (GSS) organised the first agricultural census in 33 years in 2018.[8&9] Although the GSS recently announced the first results,[10] it did not publish any detailed dataset. As for the Ghana Cocoa Board (Cocobod), although it possesses some information for its forecasting and planning, it is usually kept confidential.

Following the liberalisation of cocoa trade in the 1990s, the system established by the Cocobod to monitor the national cocoa beans supply chain has mainly aimed at preserving the quality of Ghana's cocoa. Based on these reforms, the system is still largely paper-based. Data entry of collected forms does not provide detailed statistics on production by locality or district. The only available figures are cocoa production by region, which are published annually on the Cocobod's website[11].

This data is mapped in Figure 13 below (based on the 10 administrative regions that existed up to 2019, there are currently 16), which also shows the historical evolution of cocoa trade by region.

[7] On the sideline of the UN Climate Change Conference in November 2013 in Bonn, the Governments of Côte d'Ivoire and Ghana and the world's leading cocoa and chocolate companies signed agreements to end deforestation and promote forest restoration and protection in the cocoa supply chain. They committed to harmonise their individual sustainability programmes and to work together beyond competition. This partnership is called the Cocoa & Forests Initiative (CFI).

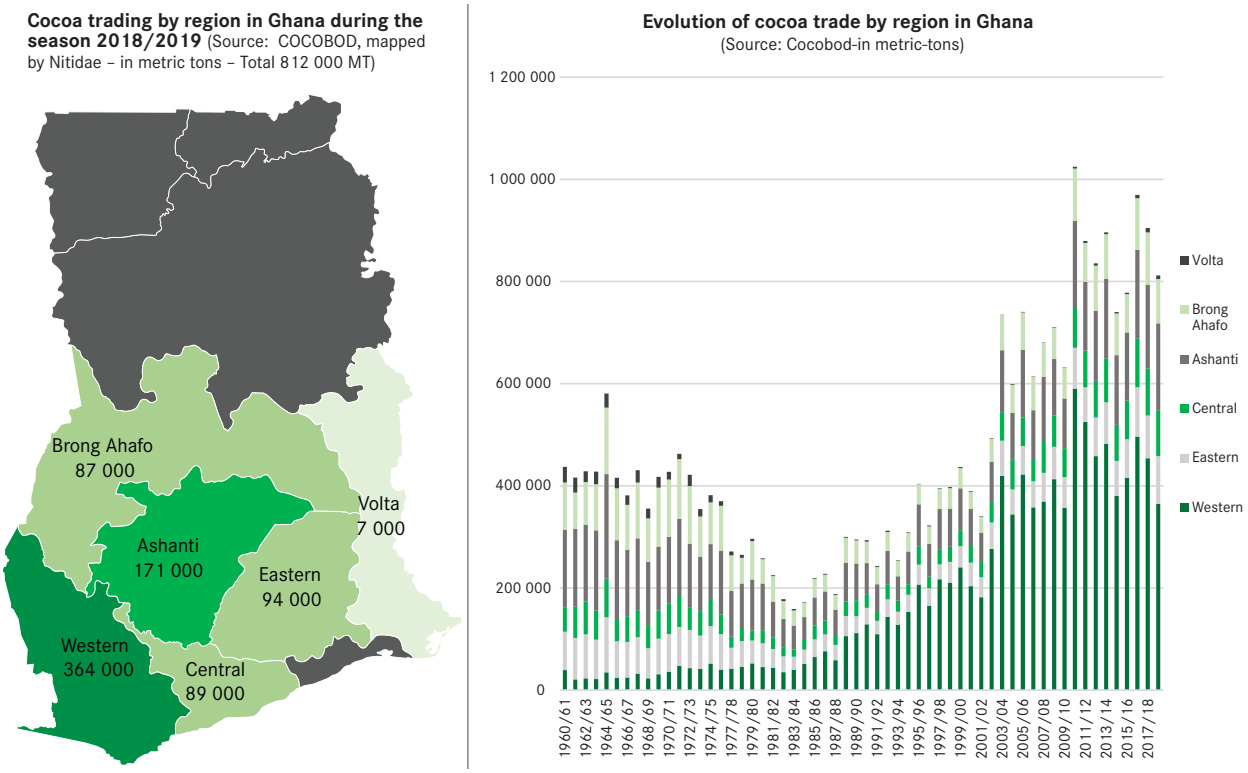
[8] https://statsghana.gov.gh/gssmain/fileUpload/pressrelease/Press%20Release%20on%20Agric%20Census.pdf

[9] http://www.fao.org/3/ca6708en/ca6708en.pdf

[10] https://allafrica.com/stories/202010220253.html

[11] https://cocobod.gh/cocoa-purchases

Figure 13. Cocoa map production by region and chart of the evolution of cocoa production by region from 1960/1961 to 2018/2019. **Source:** Cocobod



Apart from the ongoing national census, some data on farmers has been collected in a survey led by IFPRI of 2845 farmers over 60 districts in 2011/2012[12]. Datasets are available on Harvard University's website[13].

They provide some information on some socioeconomic aspects of households, age of cocoa plantations, diversification, etc. in each region. However, the datasets' representativeness is limited as they cover a relatively small number of agricultural households compared to the +2.5 million estimated during the recent census. Over the last decade, cocoa companies have collected information on the farmers they source cocoa from. Several efforts have been made to consolidate this data but have faced challenges. First, companies are reluctant to share information due to data privacy laws and the commercial nature of this information. Second, there have been concerns about how this information was collected and the methods used.

Under the Forest 2020 project, work is underway to map cocoa production areas in Ghana. The project's platform features information on cocoa production areas but not on cocoa production at the farm level or on farmers. The potential of improving the platform to offer information on farmers and farms is in the pipeline. The Forest 2020 project is jointly implemented by Ecometrica, the UK Space Agency and the Ghanaian Government.[14]

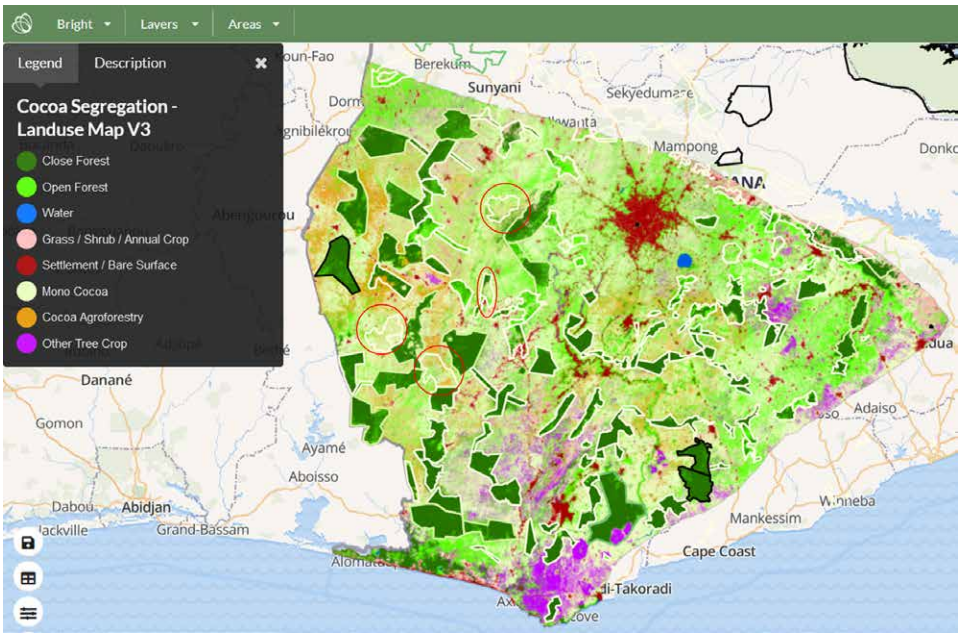
[12] https://gssp.ifpri.info/gaps/

[13] https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/26623

[14] More information available at https://ecometrica.com/forests-2020/

Raw data from the Forest 2020 project is unavailable, however, the project's map confirms that cocoa plantations have replaced several forest reserves (yellow line polygons) (as indicated by red circles on the map in Figure 14).

Figure 14. Land-use map with distinction between full sun cocoa and agroforestry cocoa in Southern Ghana. **Source:** Forest 2020 project, available on Mighty Earth website, amended by the authors



National trade

The national cocoa supply chain in Ghana follows a particular scheme. As Cocobod has a monopoly on exports and supply of processing factories, all cocoa beans go through Cocobod warehouses called "takeover points" located in Kaase (industrial area in Kumasi suburbs), Takoradi or Tema. Cocoa collection and transport to takeover points are managed by approximately 40 licensed buying companies (LBCs).

The list of active LBCs during the 2016/2017 season extracted from the 2017 Annual report of the Cocobod is Figure 15.

Figure 15. List of active LBCs during the 2016/2017 cocoa season in Ghana. **Source:** Cocobod[15]

1.	Produce Buying Company	(PBC)	23..	Brosaman Company Ltd.	(BRCL)
2.	Federated Commodities Ltd.	(FCL)	24.	Nyonkopa Comm. Buyers Ltd.	(NCBL)
3.	Kuapa Kokoo Ltd.	(KKL)	25.	M-Ghazzalli Ghana Ltd.	(BRCL)
4.	Adwumapa Buyers Ltd.	(ABL)	26.	NTHC Commodities Ltd.	(NTHC)
5.	Transroyal Ghana Ltd.	(TGL)	27.	Liberty Commodities Ltd.	(LCL)
6.	Cocoa Merchant Gh. Ltd.	(CMGL)	28.	Edebo Kokoo Company	(EKC)
7.	Olam Ghana Ltd.	(Olam)	29.	Farmers Alliance Co. Ltd.	(FACL)
8.	Armajaro Ghana Ltd.	(AGL)	30.	Hyperlink Company Ltd.	(HCL)
9.	Royal Commodities Ltd	(RCL)	31.	Unicom Commodities Ltd.	(Unicom)
10.	Sika Aba Buyers Ltd.	(SABL)	32.	Countryside Investment Ltd.	(CIL)
11.	Evadox Ltd.	(EVL)	33.	Nkwa Dua Ghana Ltd.	(NDGL)
12.	Yayra Glover Ltd.	(YGL)	34.	Fludor Ghana Ltd.	(FGL)
13.	CDH Commodities Ltd.	(CDH)	35.	Kokoo Aba Buyers Ltd.	(KABL)
14.	Universal Co-operative Ltd.	(UCCL)	36.	First Sky Company	(FSL)
15.	Splendid Business Services	(SBS)	37.	Yemon Ghana Ltd.	(Yemon)
16.	Fredako Cocoa Company Ltd.	(FCCL)	38.	Demeter Commodities Ltd.	(Demeter)
17.	Farmers Star Ltd.	(FSL)	39.	Akyaamah and Sons	(AAS)
18.	Kumankuma Company Ltd.	(KCL)	40.	Doxa Worldwide Movers Ltd	(Doxa)
19.	Fortune Tree Company Ltd.	(FTCL)	41.	Five Star Produce Buying Co.	(FSPBC)
20.	Akuotech Ghana Ltd.	(AKCL)	42.	Sassh Alliance Ltd.	(Sassh)
21.	Abrempong Commodities Ltd.	(Abrempong)	43.	Adinkafo Company Ltd.	(Adikanfo)
22.	Nhyira Dua Ghana Ltd.	(NHDGL)	44.	Cargill Kokoo Soucing Ltd.	(Cargill)

[15] https://cocobod.gh/resources/annual-report

Recently, the market shares of these LBCs have changed as an increasing number of international traders invest in LBCs (known within the sector as sister companies) to be able to build a "direct procurement supply chain" in Ghana and provide surety for beans supply.

As visible below, in its annual report, Cocobod published the quantity of cocoa traded by LBCs which shows a strong concentration within a few companies. Export statistics from Ghana, confirmed that **six companies represent around 75% of Cocobod's sales.**

Figure 16. Snapshot of Cocoa Board Annual reports with traded quantities by LBCs. **Source:** Cocobod Annual reports

List of **licensed buying companies** (**LBCs)** in good standing during the 2012/2013 crop year were as follows:

TABLE I

S/N	LBC	ABBRE.	PURCHASE (MT)
1	PBC LTD.	PBC	295,251.4400
2	AKUAFO ADAMFO MKTG CO. LTD	(AAMC)	107,099.3200
3	ARMAJARO GHANA LTD.	AGL	88,984.0700
4	OLAM GHANA LIMITED.	OLAM	63,294.6300
5	FEDERATED COMMODITIES LTD.	FCL	52,673.5800
6	TRANSROYAL GHANA LTD.	TGL	49,266.0800
7	KUAPA KOKOO LTD.	KKL	48,257.7000
8	COCOA MERCHANTS GHANA LTD.	CMGL	37,380.1800
9	ADWUMAPA BUYERS LTD.	ABL	31,251.1300
10	SIKA ABA BUYERS LTD.	SABL	20,237.0800
11	ROYAL COMMODITIES LTD.	RCL	15,480.8000
12	CDH COMMODITIES LTD.	CDH	7,692.2000
13	DIABY COMPANY LTD.	EVL	4,274.2600
14	EVADOX LTD.	DJC	2,882.3900
15	DIO JEAN CO. LTD	FTCL	2,298.5600
16	FORTUNE TREE CO. LTD.	BRCL	1,799.4500
17	BROSAMAN COMPANY LTD.	FCCL	1,011.1300
18	FREDAKO COCOA COMPANY LTD	NHIDL	910.0800
19	NHYIRA DUA GHANA LTD.	SBS	807,2000
20	SPLENDID BUSINESS SERVICES LTD.	ABGL	719.7500
21	ABAPA GOLDEN LTD.	ABCL	716.6300
22	ABOAFO BUYERS CO. LTD.	KCL	616.4400
23	KUMANKOMA CO. LTD	FSL	601.5700
24	FARMERS' STAR LTD.	YGL	565.7100
25	YAYRA GLOVER LTD.	AKCL	522.9500
26	AKUOTECH COMPANY LTD.	NCBL	332.1300
27	NYONKOPA COCOA BUYING CO. LTD	UCCL	305.0000
28	UNIVERSAL CO-OP. COM. CO. (GH) LTD.	(ENCL)	181.5600
29	ENYIDADO COMMODITIES LTD.		53.1300
	TOTAL		**835,466.1500**

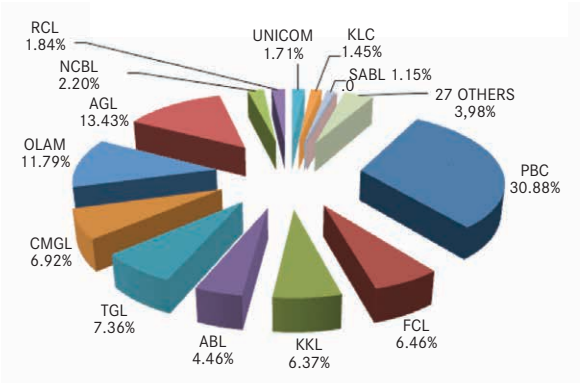
TABLE II - DORMANT LBCs for 2012/2013

S/N	LBC	ABBRE.	PURCHASE (MT)
1	ALHAJI SULEMANA IND. LTD	ASIL	-
2	BLOSSOM EXPORTS LTD.	BEL	-
3	SOMPA KOKOO LTD	SKL	-
4	GHANA CO-OP MKTG ASSOC	GCMA	-
5	FARMERS ALLIANCE LTD.	FAL	-
6	MARPIE ENTERPRISE LTD.	MEL	-
7	M-GHAZALLI COMPANY LTD.	MGGL	-
8	ABAFUABA LTD.	ABFL	-
9	DUAPA BUYERS COMPANY LTD.	DBCL	-

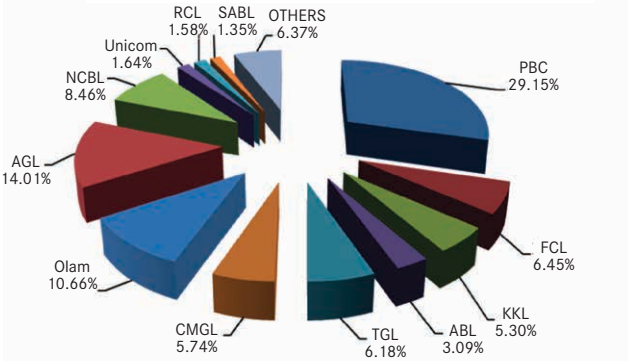
Performance of LBCs 2014/2015 season

LBC	Tonnage	LBC	Tonnage
1. PBC Limited	297,131	22. Liberty Company Ltd.	685
2. Akuafo Adamfo Mkting Ltd.	117,673	23. Aboafo Buyers Limited	625
3. Armajaro (Gh) Limited	98,029	24. Marpie Enterprise Limited	595
4. Kuapa Kokoo Limited	67,237	25. Akuotec Company Limited	507
5. Olam (Gh) Limited	56,560	26. Yayra Glover Limited	465
6. Federated Commodities Ltd.	55,355	27. M-Ghazalli Company Ltd	383
7. Transroyal (Gh) Limited	52,869	28. Universal Co-op Ltd.	211
8. Adwumapa Buyers Limited	41,826	29. Fredako Cocoa Co. Ltd.	204
9. Cocoa Merchants (Gh) Ltd	35,337	30. Edebo Kokoo Co. Ltd.	75
10. Brossaman Company Ltd.	15,055	31. Enyidado Commodities Ltd	47
11. Royal Commodities Limited	14,400	32. Evadox Company Ltd.	10
12. Sika Aba Buyers Ltd.	10,732	33. Sompa Kokoo Ltd	0
13. Kumankoma Company Ltd	7,754	34. Dio Jean Company	0
14. CDH Commodities Ltd.	7,133	35. Diaby Company Ltd	0
15. NTHC Company Ltd.	5,606	36. Duapa Buyers Co. Ltd.	0
16. Nyonkopa Cocoa Buying Co.	4,756	37. Blossom Exports Limited	0
17. Nhyira Dua Ghana Ltd	3,973	38. Alhaji Sulemana Ind. Ltd.	0
18. Splendid Business Services	1,800	39. Tradeco International Co. Ltd.	0
19. Fortune Tree Company Ltd.	1,508	40. Farmers Alliance Ltd.	0
20. Abapa Golden Limited	1,467	41. Ghana Co-op Mktg. Assoc.	0
21. Farmers Star Limited	1,215		

Performance of LBCs - 2015/2016 season



Performance of LBCs - 2016/2017 season



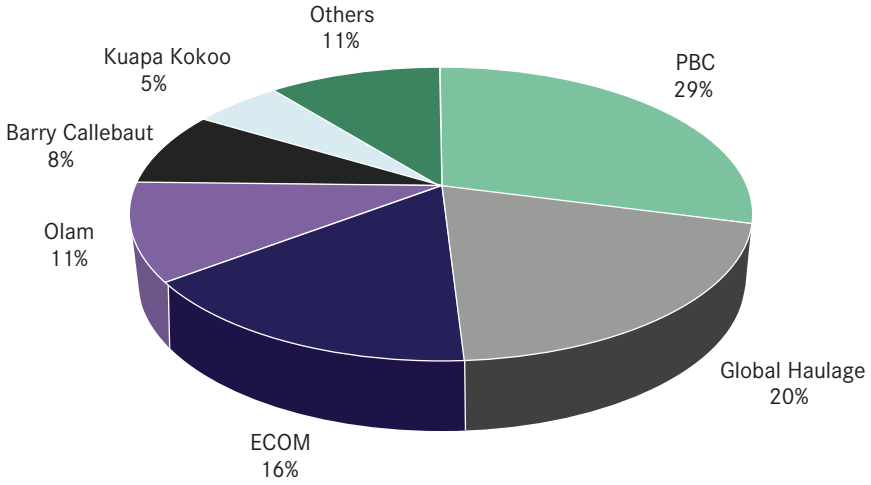
The main LBC, Produce Buying Company, is a public enterprise whose shares are mainly held by the Social Security & National Insurance Trust and the Ministry of Finance of Ghana. Other major LBCs are a mix of historical local trading companies and sister companies of international traders. Farmer Cooperatives are beginning to appear in Ghana following Cocobod's recent directive to work through cooperatives to reach farmers, but this is a very recent trend. These cooperatives could become LBCs. But at present, only Kuapa Kooko, one of the major LBCs, is owned by a cooperative (see Figure 17).

Figure 17. List of the main LBC during the 2016/2017 cocoa season in Ghana. **Source:** Cocobod.
Note: Cargill sister company was newly created, its market share increased during the last two seasons

Rank	Company Name	Acronym	Website	Ctry	Kind	Market Share
1	Product Buying Company	PBC	https://www.pbcgh.com	GH	Public	29%
2	Armajaro Ghana	AGL	www.ecomtrading.com	NL	Sister Cie	14%
3	Olam Ghana	Olam	https://www.olamgroup.com	SG	Sister Cie	11%
4	Nyonkopa Commodities Buyers	NCBL	www.barry-callebaut.com	CH	Sister Cie	8.5%
5	Federated Commodities	FCL	https://fedco.com.gh - https://globalhaulagegroup.com	GH	*Subsidiary*	6.5%
6	Transroyal Ghana	TGL	https://transroyalghana.com/ - https://globalhaulagegroup.com	GH	*Subsidiary*	6%
7	Cocoa Merchant Ghana	CMGL	https://cmlghana.com - https://globalhaulagegroup.com	GH	*Subsidiary*	5%
8	Kuapa Kokoo	KKL	https://www.kuapakokoo.com	GH	Coop	5%
9	Adwumapa Buyers	ABL	http://adwumapabuyers.com	GH	Private	3%
10	Unicom Commodities	Unicom	www.ecomtrading.com	NL	Sister Cie	1.5%
11	Royal Commodities	RCL	http://royalcommodities.com - https://globalhaulagegroup.com	GH	*Subsidiary*	1.5%
12	Sika Aba Buyers	SABL	www.sikaababuyers.com	GH	Private	1.5%
13	Cargill Kokoo Sourcing	Cargill	www.cargill.com	US	Sister Cie	1%

One should note that since Global Haulage owns four subsidiary companies as an LBC and Ecom owns two sister companies, the cocoa procurement market in Ghana is extremely concentrated. This concentration is even more pronounced than in Côte d'Ivoire and is also seen on the international market. Five companies concentrate 85% of the total procurement.

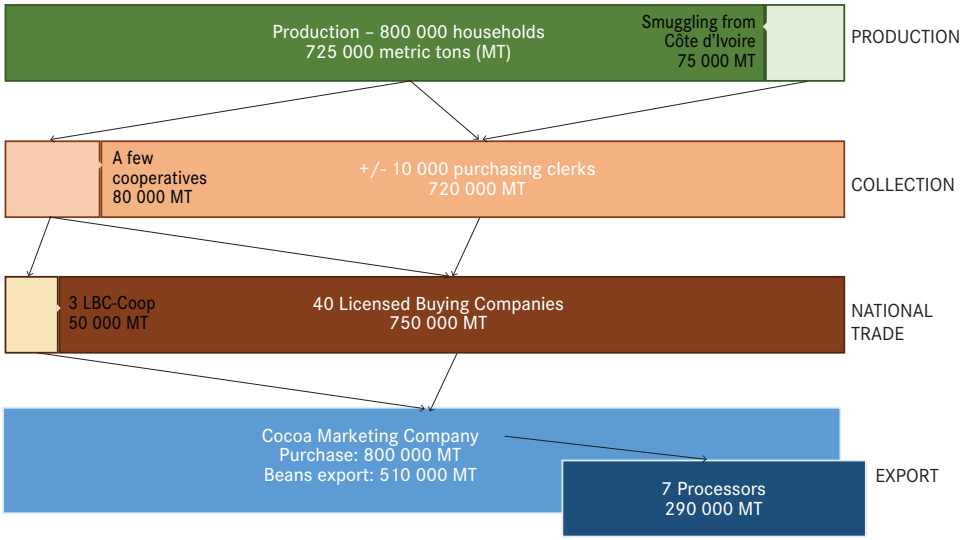
Figure 18. Share of national trade in cocoa by corporations. **Source:** Nitidae research based on Cocobod data



The main international traders who do not own an LBC have strong links with some of them. Cargill recently procured a licence to operate an LBC. Before that, it mainly worked with Global Haulage and Produce Buying Company. Touton, on the other hand, recently partnered with Elihor Company (a new entrant and possibly a sister company) and only purchases a small amount of beans from Produce Buying Company. Cocoanect is mainly working with the Global Haulage group and Kooko Pa, which is linked to a farmers' union in the Ahafo Region of Ghana.

LBCs are represented by a network of purchasing clerks that operate at the local or communal level (these purchasing clerks sheds are known as 'society' in the sector). They purchase and collect beans and organise the transportation to their district warehouses called "depot". All the main LBCs have hundreds of purchasing clerks in more than 50 districts in the country.

Figure 19. Cocoa supply chain in Ghana, based on Cocobod and LBCs data. **Source:** Nitidae



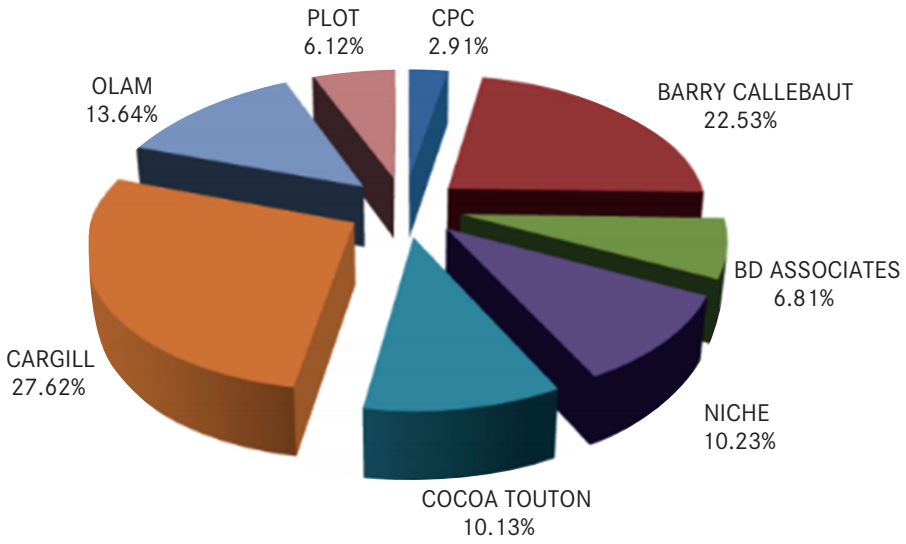
Segregation of cocoa beans: all LBCs can ask for the segregation of the cocoa beans they have bought when they sell them to the Cocoa Marketing Company paying an additional cost to the LBC due to special handling by Cocobod of these beans. This allows importers and processors to build traceability in their supply chain even though all the beans transit through the Cocoa Marketing Company.

Processing and export

Seven companies process cocoa in Ghana. After purchasing the cocoa beans from the Cocoa Marketing Company and processing them, they can freely export processed products at their price.

In contrast, cocoa beans are almost exclusively exported by the Cocoa Marketing Company. The only exception are the beans rejected at the processing level, which can be exported by national processors but in very limited quantities.

Figure 20. Processing shares of local processors in Ghana during 2016/2017 season. **Source:** Cocobod

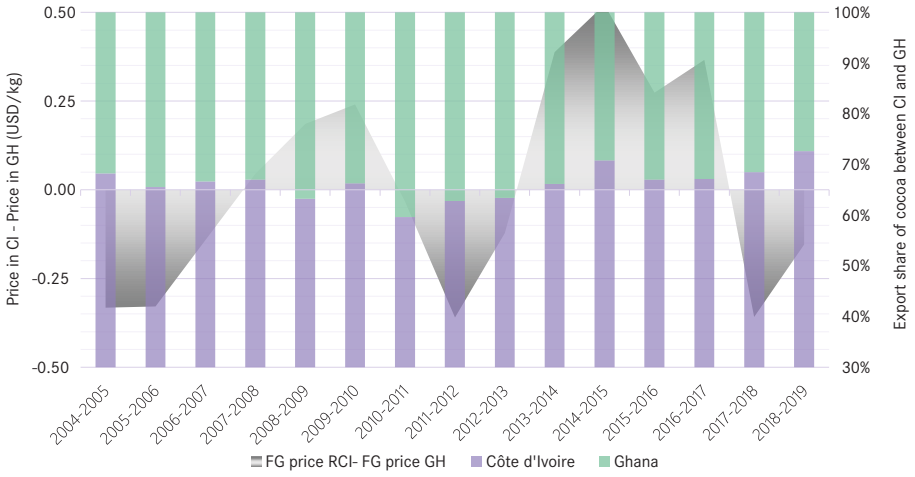


1.3 Smuggling between Ghana, Côte d'Ivoire and Liberia

A comparison of farm-gate prices in Côte d'Ivoire and Ghana with the share of total exports of cocoa beans in the two countries (taking into account processed cocoa) could shed some light on potential cocoa smuggled each season (see Figure 21).

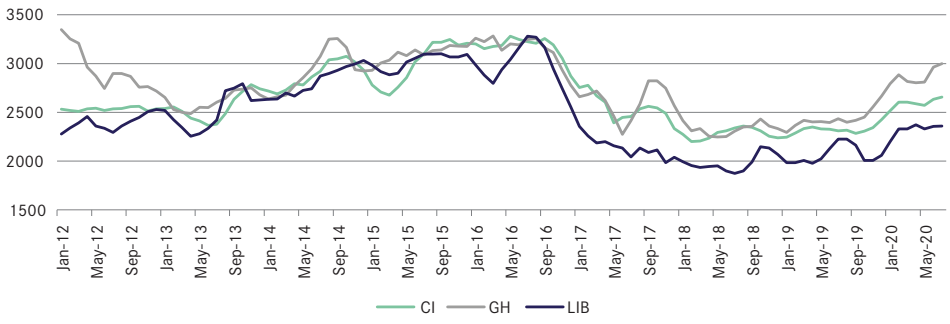
This analysis shows that apart from some years, like the season 2010/2011 marked by the Ivorian political crisis, there is little correlation between cocoa prices and the shares of cocoa traded by both countries, which could indicate that smuggling is limited. In the 2014/2015 season, Ghana's market share was at its lowest, at 29%, which was when the price difference in favour of Côte d'Ivoire was the highest. Ghana's highest market share (apart from the 2010/2011 season) was 37% in the 2011/2012 and 2012/2013 seasons, when Ghana priced much higher than Côte d'Ivoire.

Figure 21. Evolution of share of cocoa beans traded by Côte d'Ivoire and Ghana % with price spread between the two countries in USD/kg. **Source:** Nitidae



With regards to smuggling between Côte d'Ivoire and Liberia, interviews with cocoa traders confirmed that smuggling is happening in both directions. Cocoa beans exported through Monrovia port are generally lower grades ones rejected by Ivorian traders in the West of the country, while good quality Liberian cocoa is sold in Côte d'Ivoire. This explains the lower prices of Liberian cocoa on the international market (see Figure 22).

Figure 22. Comparison of cocoa beans export price between Ghana, Côte d'Ivoire and Liberia. **Source:** Trademap



1.4 Consumer markets

Importers and chocolate manufacturers

Data about cocoa importers is unavailable in Côte d'Ivoire as the customs statistics service considers it confidential. Such data is not available in the European Union either for the same reason. Ghanaian customs statistics include importers' names, confirming the concentration of the international trade of cocoa beans.

Six international trading companies control around 74% of the cocoa beans trade and 68% of the cocoa products trade in Ghana. International trade of Ghanaian cocoa seems even more concentrated than Ivorian cocoa.

Figure 23. Ghana cocoa beans and cocoa product imports by main importers. **Source:** Nitidae based on customs' data

Metric Tons	Beans		Processed products		Together	
Touton	85 363	16%	35 638	14%	124 564	16%
CARGILL	58 775	11%	58 415	24%	123 032	16%
BC	61 516	12%	41 545	17%	107 216	14%
ECOM	63 450	12%	17 690	7%	82 909	10%
Olam	66 532	13%	13 061	5%	80 899	10%
SUCDEN	46 800	9%	1 960	1%	48 956	6%
Others	136 293		80 259		224 578	
Total	518 729		248 568		792 154	
Market share of the top six traders		74%		68%		72%

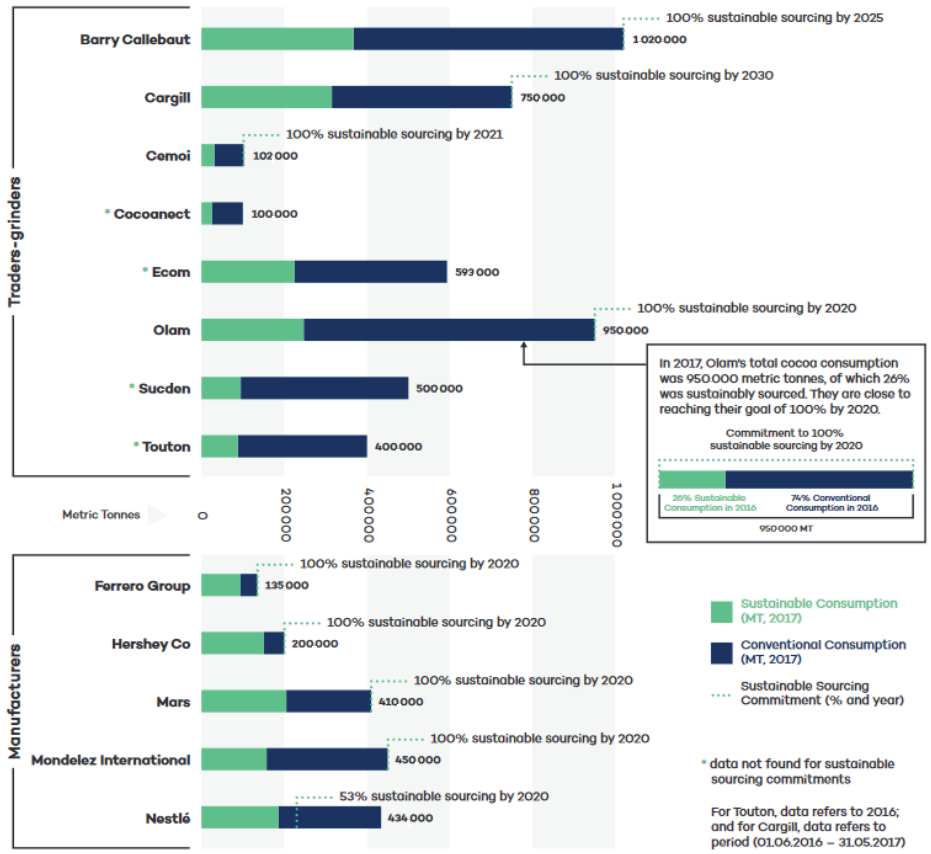
A 2019 study of the International Institute for Sustainable Development (IISD)[16] finds that, through their sister companies, which does not always bear the name of the parent company, those six main trading companies concentrate more than 80% of the global bean trade and crushing.

All are members of the Cocoa & Forest Initiative and implement both their own and their clients' sustainability programmes. However, there is no available data on the share of their 'certified' and/or 'sustainable' sourcing. Most communicate mainly on their actions: number of farmers certified and/or monitored in terms of mapping and child labour monitoring and remediation system; number of farmers trained; number of trees distributed; and number, names and location of the headquarters of the cooperatives they work with. Nonetheless, none provide accurate quantities of beans being traced, certified or coming from their 'indirect procurement supply chain'.

Indeed, most of the objectives/indicators they communicate about concern only their 'direct procurement', which is carried out through cooperatives in Côte d'Ivoire and farmers' associations in Ghana.

[16] Global Market report – Cocoa, IISD, 2019, https://www.iisd.org/system/files/publications/ssi-global-market-report-cocoa.pdf

Figure 24. Estimation of quantity of beans traded and declared percentage of 'sustainable' cocoa for main cocoa trading companies and main chocolate manufacturers. **Source:** Global Market report – Cocoa, IISD, 2019



Note: these numbers might reflect double counting of sustainable consumption volumes as traders listed might sell to listed manufactures. Manufacturers and traders tend not to disclose to whom/from whom they sell/source sustainable volumes of cocoa due to confindentiality reasons.

Some companies, like Cargill, Barry Callebaut and Cémoi, provide figures about the share of certificated cocoa they trade, which is below 50% of their total volumes.

All the trading companies offer different kinds of 'sustainable products' to their clients, without disclosing which share of their procurement is 'sustainable' or which certification/referential they use to classify cocoa as 'sustainable'.

None of those companies is poised to reach the targets presented in IISD's Global Market report – Cocoa.

Similarly, most chocolate manufacturers label their most famous brands as certified cocoa (mainly UTZ and RFA) but do not provide accurate figures about their entire supply chains.

2. Traceability initiatives and trends

2.1 Côte d'Ivoire's Conseil Café Cacao (CCC)

Cooperatives and local traders register bags and phytosanitary treatment in an online system called **SICOPS** (*Système d'Information et de Contrôle des Operations de Distribution des Produits Phytosanitaires et de la Sacherie*).

Cocoa sales at the farmer level are registered in three copies of a purchase receipt provided by CCC to cooperatives and traders. These paper-based receipts are not digitalised. However, CCC field agents carry out random controls to check that all farmers have those receipts, and that cooperatives and traders keep them archived.

Since the 2015/2016 season, the CCC has set up an online system called **SYDORE** (*Système de Gestion des Données Régionales*) to monitor national trading of cocoa and coffee. All cooperatives and national traders (*'traitants'*) must enter in the system the quantity they purchased indicating from which subprefecture the beans are coming from. Cooperatives and traders that have no computer or internet access can do the data entry at the CCC regional office.

After entering the data, cooperatives and traders can print an official document summarising the quantity of a load and its origin called a *'connaissement'*. All land transport of cocoa beans must be accompanied by a *connaissement.*

Cooperatives' sections transporting cocoa beans to the main warehouse of the cooperative must also register in SYDORE. Local traders transporting their production to the warehouse of a wholesaler must do the same. But the system does not include the registration of farmers.

This system allows to track the cocoa beans from the first buyer (local trader or cooperative). It is also to cover subsequent sales among cooperatives and traders.

Below is the main information that must be entered by an operator in the system to be able to print a *connaissement.*

Figure 25. Screenshot of SYDORE. **Source:** SYDORE user guide on CCC website

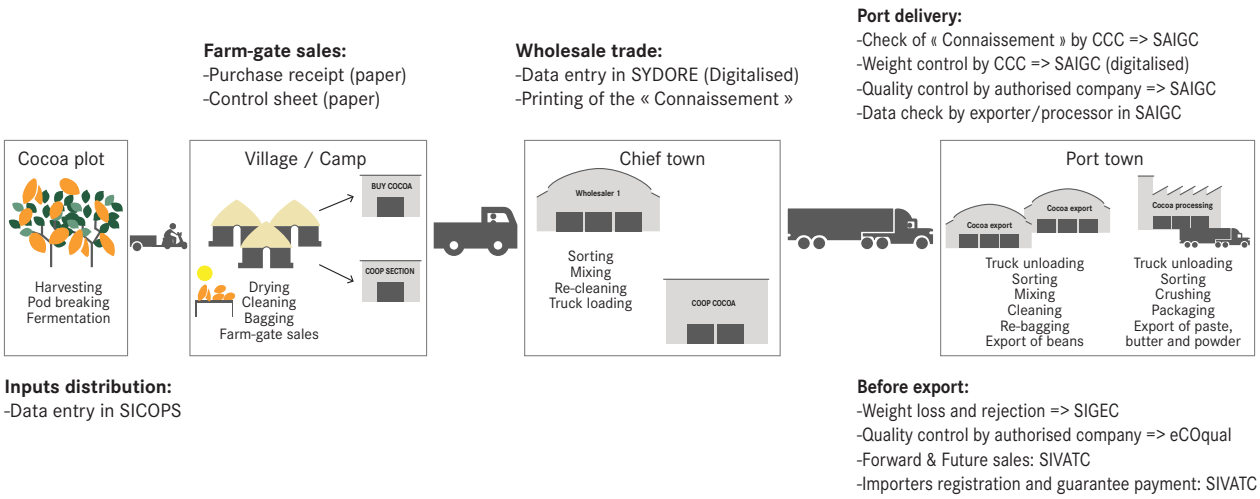
At port level, cocoa beans' quality and weight are checked before transport to exporters/processors warehouses. Weight is controlled by CCC officers while quality is controlled by authorised quality control companies (Veritas, ACE, SGS, KMS, Phyto-Ci et CWT). The data from these controls is entered in a system called **SAIGC**. After cleaning and bagging for export, another quality control is done by control companies. This information, required to authorise the export, is entered into another system called **eCoqual**. To justify weight losses and quality differences, exporters must also register the results of their cleaning, sorting and mixing in another dedicated system called **SIGEC**.

Finally, all the export sales are done following the selling orders of the CCC (decided by CCC traders) in a platform called **SIVATC** where authorised importing companies must also register.

SYDORE has a dedicated website, but all the other systems are accessible from the same CCC webpage (see screenshot in Figure 26).

Figure 26. Screenshot of CCC web platform to monitor quality, input distribution, export, processing and international sales. **Source:** CCC website

Figure 27. Scheme of CCC's current monitoring system. **Source:** Nitidae



2.2 Ghana's Cocobod

Overview of Ghana's Cocoa Traceability System

Cocobod, formerly the Cocoa Marketing Board, used to be the sole actor in the cocoa sector, giving the Government total control. Through the Cocoa Marketing Board, the Government carried out its purchases and exports of cocoa in Ghana. The Cocoa Marketing Board conducted its activities through its subsidiaries, the Produce Buying Company and the Cocoa Marketing Company. In addition, the Quality Control Division, another subsidiary, was also solely responsible for controlling the quality of cocoa. With support from the World Bank, reforms were carried out in 1984 and 1985 to restructure the Cocoa Marketing Board. Downsizing the number of employees from around 100 000 to 6 000 led to a drastic reduction in the number of quality-control officers who worked at community level to ensure 'Ghana Quality'.

The current system in Ghana to trace beans is focuses mainly on quality and only reaches the company level. There is no legislative requirement to implement traceability within the sector. The push for developing and implementing traceability systems has come from private standards, public control and voluntary actions. Over the last 25 years or so, Cocobod has improved the control system enabling segregation of cocoa by district. It has also built special systems tailored to the needs of a specific quality of cocoa currently being produced in Ghana.

At the district level, cocoa could be traced back to the farmer level with a good level of certainty. However, this is sometimes hindered by the inability of purchasing clerks to keep aggregation/bulking records at the community level. As a result, a bag of cocoa arriving at the district level is a mix of beans from several farms. This impedes the tracking of cocoa coming from specific farms and even illegal sources (smuggled from Côte d'Ivoire or grown in forest reserves).

Current Cocoa Traceability System in Ghana

The current system implemented by Cocobod through the Quality Control Division is predominantly paper-based. There is physical evidence of chain of custody. However, paper-based documentation could be lost through fire or flood, or tampered or destroyed by any agent in case of controls.

Farm Level: Cocoa is prepared for sale at the farm level and sent to the purchasing clerk[17] at the community buying centre. The farmer is in control of the processes at this point, with little or no help from extension officers. The only document kept is the farmer's passbook.

[17] A purchasing clerk is a representative of a Licensed Buying Company who is stationed at the community level to purchase cocoa on behalf of the company. The purchasing clerk is usually a farmer but with entrepreneurial skills and willing to earn extra for his services.

The **farmer's passbook** (see Figure 28) contains information on the farmer and the farm, as well as cocoa sales records. The passbook is usually in the custody of the farmer although sometimes it is kept by the purchasing clerk for safe keeping and timely update. Even with these safe keeping measures, this documentation is usually unreliable since there is no proper verification system in place and usually few controls in the issuance of the booklet to farmers. For example, a farmer with illegal farm(s) could still possess a passbook and sell cocoa through the official channels without any detection by officials.

Figure 28. Sample Farmer's Passbook issued by Cocobod. **Source:** Nitidae

Community Buying Point (purchasing clerk shed): Farmers travel to the purchasing clerk shed to sell their cocoa. Cocoa is weighed and bought at this point. If cocoa supplied by one farmer does not fill the entire bag (64 kilos), the purchasing clerk bulks cocoa from several farmers (recorded on a bulking sheet). The purchasing clerk records all cocoa bean purchases at their sheds (or 'society') on a **daily schedule** (see Figure 29).

Figure 29. Sample Daily Stock book kept by purchasing clerks at the clerk's shed level. **Source:** Nitidae

Daily Stock Book (To be completed by PC)				
Date of purchase	Name of farmer	Qty delivered		Amount paid
		kilos	bags	

Cocoa kept at the purchasing clerk's shed is mixed and further processed to ensure uniformity and quality. After that, the farmer's identity is lost. To be able to keep a semblance of farmer identity, the **bulking sheet** (Figure 30) will list the number of farmers whose cocoa has been bulked and bagged on a specific day and given a code. The last four digits on the drop mark refer to the farmer's numbers. The marks are stamped on the sack before bagging.

Figure 30. Bulking Sheet sample. **Source:** Nitidae

BRANCH…… …… **ZONE**……

DISTRICT ……. …… **SOCIETY:** ……

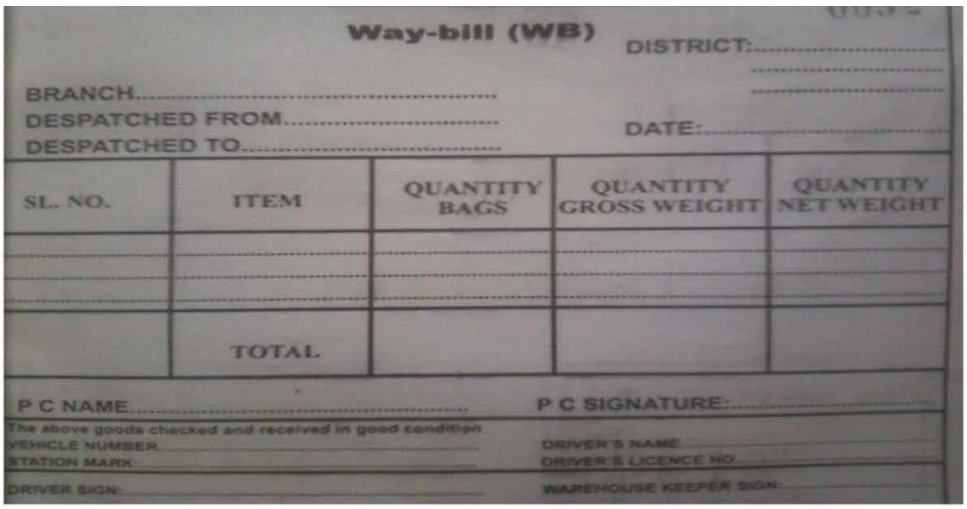
SOCIETY MARK…… **WEEK ENDING**……

S/N	Bulking Date	Name of farmer(s)	Passbook Number	Qty kilos	DROP MARK (No. of bags)
1					
2					
3					
4					
5					
6					

Name of PC…… Signature ……

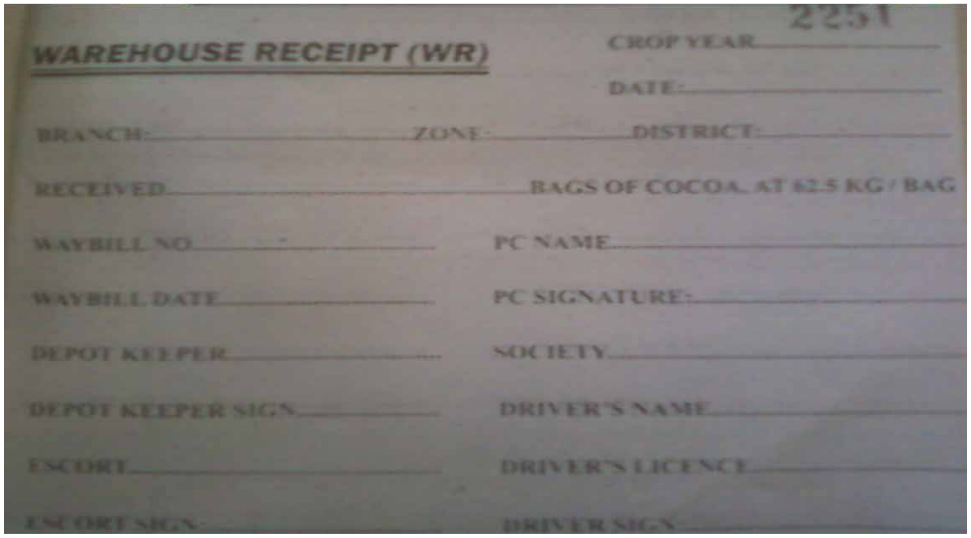
Cocoa leaving every purchasing clerk shed is accompanied with a completed waybill duly signed by the purchasing clerk. Normally, the 'society' issues a **waybill to the purchasing clerk** (Figure 31) that is kept in his custody. The bulking sheet duly prepared by the purchasing clerk is also attached.

Figure 31. Waybill accompanying cocoa from the purchasing clerk shed level. **Source:** Nitidae



District depot: A depot usually receives cocoa from multiple communities or purchasing clerk sheds ('societies'). For each cocoa bag received at the depot, a receipt (Figure 32) is issued to the purchasing clerk, acknowledging receipt of the consignment. The receipt of the bags is usually done by a depot manager assisted by a bookkeeper and a few casual hands.

Figure 32. Sample warehouse receipt. **Source:** Nitidae



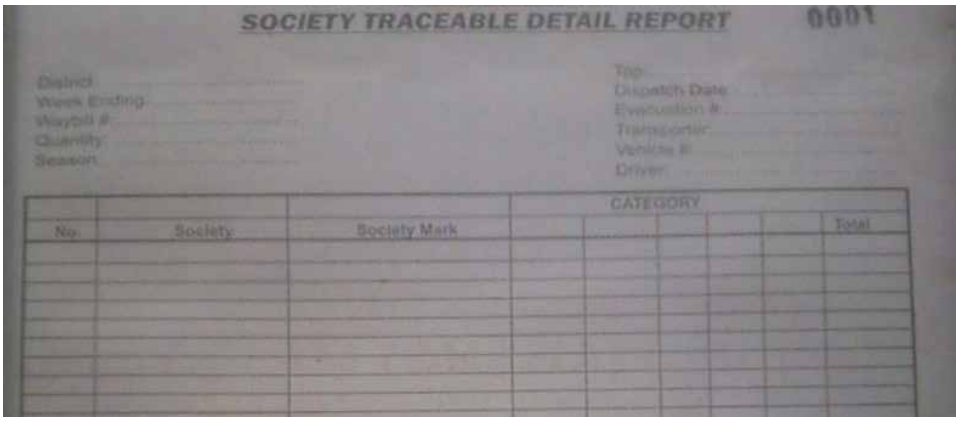
The district depot staff arranges weekly transport to carry cocoa from the purchasing clerk sheds to the district depot. This movement is called primary evacuation and is documented by a primary evacuation waybill. The purchasing clerk attaches to this waybill the daily schedule of the 'society' or purchasing clerk shed, which details farmer-by-farmer purchases. This schedule is filed at the district office. Bulked cocoa beans arriving at the district depot are graded and sealed by a staff member of the Quality Control Division of Cocobod based on several quality tests. A Certificate of Inspection is issued by the Cocobod Quality Control Company (QCC) to test the cocoa beans before they are handed to the custody of the Cocoa Marketing Company. A copy is retained and filed at the district depot. A mark is stamped on the sack with information on its source and results of the quality test. A random second testing of graded cocoa can be performed by a QCC supervising officer at any time to confirm the grade of sealed sacks before the cocoa leaves the district warehouse to the takeover point. Up to this step in the supply chain, LBCs can segregate certified and conventional beans.

Cocoa from the district depots goes through one of the three takeover points (Kaase, Takoradi or Tema) before arriving at the port. Traceable beans can only be sent to Takoradi and Tema takeover points. Each consignment must be accompanied by four copies of a secondary evacuation waybill. For traceable cocoa beans, the secondary evacuation waybill is marked 'traceable cocoa'. In addition, traceable cocoa is accompanied by a 'society' (purchasing clerk shed) traceable detail report, also referred to as a tally sheet.

At the takeover point, all cocoa arrivals are check-sampled by QCC port staff (moisture, bean count, cut test, bag weight, bag quality). Cocoa of acceptable quality is issued with a QCC purity certificate.

Port level: On dispatch to port, the certified stocks are accompanied by the following documents: a 'society' (purchasing clerk shed) traceable detail report/tally sheet (Figure 33); a material transfer note transfer (Figure 34); and a siding depot waybill (Figure 35).

Figure 33. 'Society' (purchasing clerk shed) detailed report (tally sheet). **Source:** Nitidae


SOCIETY TRACEABLE DETAIL REPORT 0001

District
Week Ending
Waybill #
Quantity
Season

Top
Dispatch Date
Evacuation #
Transporter
Vehicle #
Driver

No	Society	Society Mark	CATEGORY					Total

Figure 34. Sample material transfer note. **Source:** Nitidae


Material Transfer Note -T 0001

Despatch Branch | Product
Despatch Warehouse | Date
Destination Branch | Serial No
Destination Warehouse | Siding Depot Waybill
Transporter | Vehicle No
Driver's Name | Evacuation Cert
Quantity (Bags) | Quantity (MT)

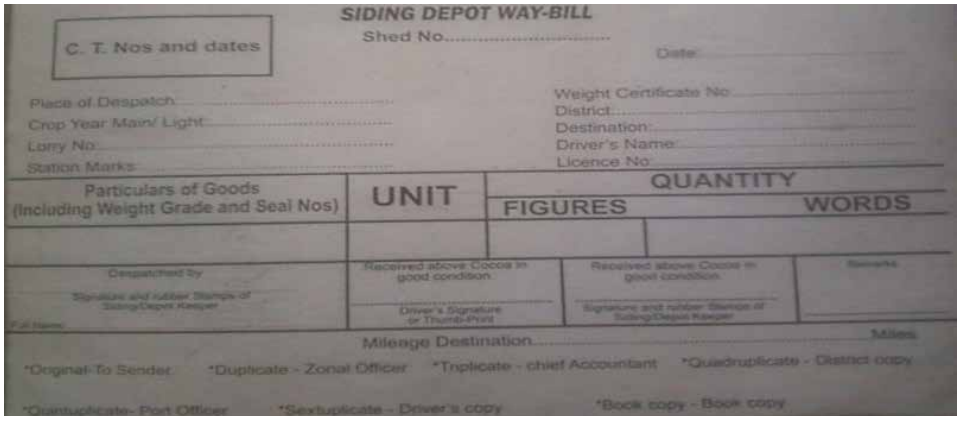
Sending W/ House Incharge ..... Signed Driver ..... Signed QCI ..... Signed

Mtn - R Details

Receiving Branch | Serial No
Receiving Warehouse | Date Received
Quantity (Bags) | Date Offloaded
Quantity (Mts) | Vehicle No
BIN No. | Licence No
Freight Payable | Transporter
Freight Paid | Accountant
Receiving W/House Incharge | Driver

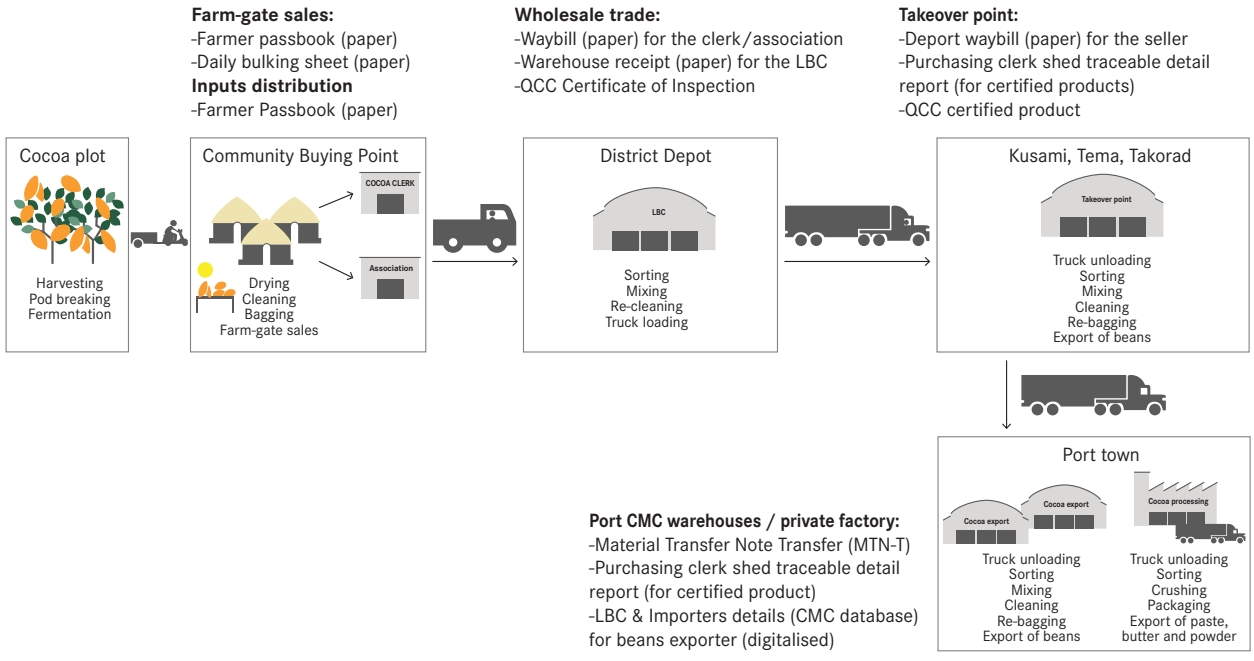
BC

Figure 35. Sample siding depot waybill. **Source:** Nitidae



This allows the cocoa to be taken over into port warehouses by Cocobod's trading and export arm, the Cocoa Marketing Company Ghana Ltd. The Cocoa Marketing Company issues a certificate of takeover, which in turn allows the LBC to invoice the Cocoa Marketing Company for the cocoa beans.

Figure 36. Summary of the Cocobod supply chain monitoring system in Ghana. **Source:** Nitidae



Gaps in the current system

The main gap in traceability efforts is between the farms and the purchase clerks. Due to the spatial distribution of cocoa farms around the country, collecting and digitalising data between the farms and the purchasing clerk sheds/community buying points level is extremely difficult and resources intensive (requiring both financial means and well-implemented technological innovations).

Proposed reforms to cocoa traceability in Ghana

Cocobod is in the process of developing a Cocoa Management System (CMS). The CMS is an integrated cocoa farmer database aimed at managing internal trading operations. Financed by the African Development Bank, the system will collect data on every transaction within the industry with the aim of informing decision making by the Government.

One of the key features of the system is its ability to collect farm data in almost real time with spatial dimensions. It will therefore allow productivity and yield output calculations in comparison to seasonal forecasted yields. This in turn will enable the detection of illegal sourcing. If, throughout a season, a farmer located just outside an area at risk of deforestation is selling significantly more than his forecasted yield output, there is a risk that much of the cocoa sold is illegal. This can be flagged in the system, and remediation measures can be taken. The details of this compliance mechanism are still to be developed. The three-tier quality assurance of Ghana cocoa will be integrated in the CMS, allowing a migration from paper-based documentation to a digital one. Lastly, Cocobod will develop and implement a payment platform, one of the last modules of the system.

The CMS project includes the development of a software and a database, a census of all cocoa farmers in Ghana and a mapping of all cocoa farms. For the first time, there will be an accurate record of the land size, geographic locations, population, and record of cocoa farms and farmers in the country. Cocobod will therefore be able to generate socioeconomic data of all cocoa farmers in Ghana. A national register of cocoa farmers will be developed with separate registers for cocoa found in or outside forest reserves.

The CMS will allow for real time capturing and monitoring of transactions among stakeholders. It will also enable the monitoring of the activities of LBCs and other private service providers, as well as that of compliance with Cocoa Research Institute of Ghana/ Environmental Protection Agency guidelines for handling Cocobod-approved fertilisers, agrochemicals and the provision of services. This in turn is expected to ensure the efficient implementation of good farm practices and increase yields. Cocobod will also carry out forecasts that will allow the system to monitor beans sales timestamping at the point of purchase and link the beans to the farm they come from (in case the farmer has multiple farms).

Cocobod intends to use cooperatives in the delivery of services to farmers through the CMS. They will be recognised and registered in the system, and farmers linked to them. Cooperatives are expected to work on behalf of their members and become eligible for the direct sourcing of Cocobod's assistance, agrochemicals and extension services. They are also to exercise group responsibility in detecting and reporting to local authorities the presence of farms in forest reserves and national parks. Within cooperatives, farmers will be able to sell their beans as deforestation-free and earn a premium. This identity preservation will permit tracing cocoa back to the farmers working within cooperatives.

2.3 Certifications' traceability requirements

Certification schemes use various levels of traceability requirements. In contrast with certified cocoa, 'conventional cocoa' is cocoa sourced without conforming to the traceability requirements of 'mass balance', 'segregation', or 'identity preservation'.

The mass balance system administratively monitors the trade (transaction) of certified cocoa throughout the supply chain. It requires a transparent documentation and justification of the origin and quantity of certified cocoa purchased by the first buyer. The mass balance system allows mixing conventional and certified cocoa at subsequent stages of the cocoa value chain (such as transport, storage and processing). The system consists in comparing volume or weight of certified cocoa between stages of the supply chain to check for consistency. For example, the Fairtrade Label Organization, UTZ and the Rainforest Alliance allow 'mass balance'.

Segregation also requires a transparent documentation and justification of the origin and quantity of certified cocoa purchased by the first buyer. In addition, certified cocoa is kept physically separated from conventional cocoa during transport, storage and processing, to avoid mixing. However, segregation allows mixing cocoa from different origins if subject to the same certification requirements.

Identity preservation is the highest traceability type. It does not allow any mixing of the certified cocoa with conventional one, or mixing of cocoa from other origins. However, if the 'single origin' of the cocoa is set at cooperative level or cocoa-producing area, certified cocoa from this broader origin may be mixed.

For example, some fair-trade certification (FFL, Biopartenaires, Small Farmer Producers, etc.) and organic certification require **identity preservation, where cocoa bags are identifiable by means of a unique identifier. The cocoa identification techniques may include paint, tags, QR codes or barcodes**. Both reconciliation methods are supported by documentary or digital evidence that enables the reconciliation.

Identity preservation requires that, throughout the supply chain, a batch of products are clearly identified, localised and segregated from other products. Organic certification requires more stringent segregation as certified products must be stored in separate rooms and transported in separate transport means (trucks, containers, etc.). Such schemes also require the segregation of batches of certified products until the processing factory. The batches must be tracked after processing to allow the product recall in case of subsequent contamination.

Figure 37. Comparison of the traceability requirements of different certification standards. **Source:** Nitidae based on certification standards' documents.

Requirements	Fairtrade (FLO)	Fair trade (Others)	UTZ/RA	Organic
Reconciliation method	Mass balance	**Identity preservation**	Mass balance	**Identity preservation**
Physical segregation	Optional	Partial (the product must be segregated but can be in the same room, transport means, etc. as non-certified organic products)	Optional	**Complete** (the product cannot be in the same room, transport means, etc. as other non-certified organic products)
Mapping of plots	Optional	Optional	Optional (but is a mid-term target)	**Compulsory**
Detail of production by farmer (quantity, date of sales, etc.)	Partial (quantity sold to the cooperative only)	Partial (quantity sold to the cooperative only)	Partial (quantity sold to the cooperative only)	**Complete** (farmers must justify the destination of the rest of their production)
Documentation on payments to farmers	**Yes**	**Yes**	Partial (only for premiums)	No
Documentation on middlemen	Optional	**Yes**	Optional	**Yes**
Documentation on processing	Optional	**Yes**	Optional	**Yes**
Documentation on distribution	Optional	**Yes**	Optional	**Yes**
Common platform to register all the documentation	No	No	**Yes**	No

In the absence of regulation regarding the control of the supply chain, value chain stakeholders are free to use any software, forms, documentation and internal control methods to set up a traceability system. UTZ certification differs in that it requires stakeholders to register most documentation in a single platform called the Good Inside Portal[18].

In Côte d'Ivoire, UTZ, Rainforest Alliance and Organic certifications rely on the CCC platform SYDORE to check volumes, dates and seller/buyer information. The paper documents given to farmers - Farmer passbook in Ghana and Purchase Receipt in Côte d'Ivoire - are also used to check individual sales to cooperatives during the audits.

[18] https://goodinsideportal.org

2.4 Private exporters and processors traceability systems

All the main cocoa trading companies use a software to track cocoa beans from the certified cooperatives or farmers' associations. They either have developed their own software or use one tailored to commodities. Some of these systems use innovative tools, such as blockchain technology, QR codes and barcodes. They are all based on the same structure.

The table below lists the apps and traceability software developers used by the main international trading companies.

Figure 38. List of software used by the main trading companies for traceability. **Source:** Nitidae based on companies websites and interviews

Trader	App/software	Software developer	Links
Olam	At source (customers) Olam Farmer Information System (*OFIS*) (suppliers)	Internal development	https://www.atsource.io https://ofis.olamdigital.com
Barry Callebaut	Katchilè (suppliers)	SAP (Germany)	Private app https://www.barry-callebaut.com/en/group/media/news-stories/barry-callebaut-collaborates-sap-offer-innovative-app-boost-sustainability
Cargill	Cocoawise (specific access for suppliers & customers)	SAP (Germany)	Private app https://www.cargill.com/2020/cocoawise-portal-keeps-sustainability-data-at-the-fingertips
ECOM	Sustainability Management Services (SMS) (suppliers)	Internal development	https://www.ecomsms.com
Touton	Mergdata (suppliers)	Farmerline (Ghana)	Private app
SUCDEN	Responsible Cocoa Platform (RCP) (suppliers) Private platform (customers)	Sourcemap	https://www.sourcemap.com/cocoa
ETG-Beyond beans (formerly Cocoanect)	Mergdata (suppliers)	Farmerline (Ghana)	
Cémoi	MINKA (suppliers)	Ecotierra	Private app www.ecotierra.co

In most cases, either because of the mapping costs or the reluctance of farmers to declare their plots, the companies only map one cocoa plot per farmer. In some cases, it is only one GPS point. However, this approach is disappearing and nowadays, most trading companies tend to map the full plot (polygon) declared by the farmer. In addition, some information about the farmer is included in a farmer identification document. The farmer is also asked if he accepts that his name, picture and/or plot location be shared with customers who desire information about the beans' origin.

In most cases, traders are those implementing the traceability systems and provide the apps to the cooperatives. The cocoa is tracked from this point on. When cocoa beans are delivered to the cooperative/farmers association, the names of the farmers and the volume of beans are entered in the app. Then a batch of cocoa beans will be tracked with the list of farmers who provided the content of the load. To be tracked through the whole supply chain, the batch needs to be of a minimum quantity. In most cases, the minimum volume is 10 metric tons to allow batching during the processing step. The batching of beans covered by certain requirements generates additional work at the factory level. Therefore, identity preservation of batches will be limited to a part of the volume sold by the biggest cooperatives that offer 100% traceability to their customers at a premium. The rest of the production will be tracked through mass-balance approach.

There are no cases where batches can be traced back to a single farmer, as very few could produce a big enough batch. The current schemes trace the batches back to a 'list of farmers'.

As detailed below, there are many ways for cooperatives and traders to circumvent these traceability schemes. This is particularly the case during the minor season (March-September) because of quality issues. To be accepted at the port/factory, loads must be of a minimum weight, which means that several batches of beans have to be mixed.

3. Traceability challenges: an opportunity to enhance transparency

3.1 Challenges faced by current traceability schemes

There are many ways for stakeholders to circumvent traceability schemes, as summarised below:

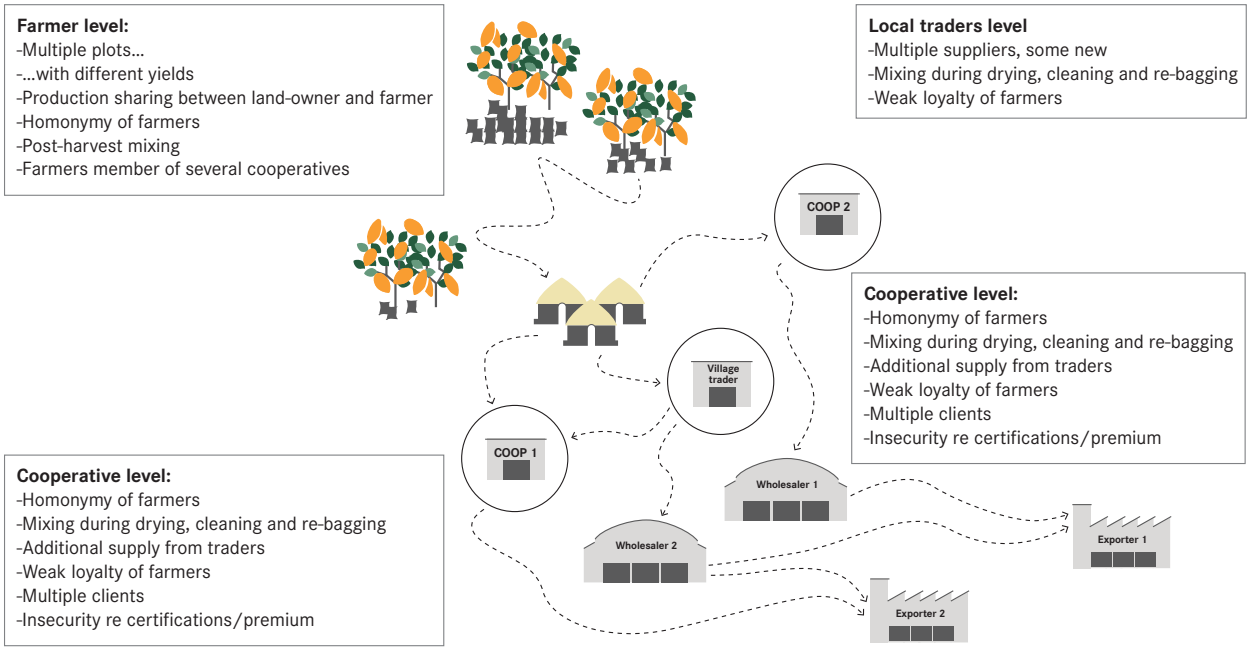
- **Multiple plots:** Most farmers (one third of farmers in Ivory Coast) have several cocoa plots. Some are old (>30 years), in long past deforested areas. Others, more recent, are planted in fallow areas, old cocoa plantation rejuvenation or in forested areas. As most sustainable certification programmes start with awareness and sensitisation actions about deforestation, farmers are well aware that it is in their interest to only mention those plots with no deforestation risks. Many will register production coming from illegal plots, such as those located in classified forests, as production coming from the legal ones (i.e., located in rural domain). This is why most of the cocoa coming from recently-deforested areas can be traded as legal. In addition, many plantations were planted over several years and include trees with very different yields. This hinders the estimation by auditors of the exact yield of a plantation and makes it easy for farmers to exaggerate the production coming from the oldest plots.
- **Land-use rights arrangements:** Various legal arrangements can split land ownership and land-use rights among various people. Many cocoa plots are not managed by the landowner but by a sharecropper, often a migrant worker. Crop sharing varies between 30 and 50% for the landowner. Cocoa from a single plot can therefore be sold by several people. One sharecropper can also manage plots owned by several different people, and a single landowner can have several sharecroppers working on several of his plots. On top of sharecropping, farmers can also set an '*abunu*' contract, also called 'plant/share' of '*planter/partager*' in French. Under these contracts, the landowner lends his land to a worker, who will clear it and plant cocoa. Once it starts producing, the land (or the plantation only) is divided in two parts: one for the landowner one for the worker. Sometimes, when a landowner dies, the plantation is not divided, and the heirs collectively manage it. Finally, using the land as security is also a very common practice (referred to as the '*mise en garantie*' in French). When a landowner needs money, he can 'rent' his plantation for several years. The tenant will work in it and sell cocoa during this period. Because of all these arrangements, it is very hard to link the production from one plot to one single person.
- **Homonymy:** Within a village/community, homonymy is very common in Côte d'Ivoire. Identification of individuals is hindered by the fact that many farmers do not have identity documents, and others have several such documents indicating different identification numbers and dates of birth.
- **Post-harvest mixing:** Cocoa beans are fermented on the plantation, then brought to the farmer's house where they will be cleaned and dried before being bagged in the official jute bags. Often, they are bagged at the coop warehouse when farmers bring their production. During this process, farmers often mix the production of several plots. In some cases, they need to do so to be able to sell an acceptable quality of beans.

- **Multiple buyers:** Very few farmers deliver all their production to their cooperative. Most cooperatives depend on the funding from the traders they work with. As a result, they are unable to pay beans during the whole season. Also, the quantity of beans which will be sold as certified is always uncertain and varies depending on yearly quotas. There is therefore no incentive for farmers to sell their entire certified production to their cooperative as they will receive a premium only for part of it.
- **Multiple cooperatives:** Many farmers are members of several coops. Most coops are not the result of a process of self-organisation with a strong sense of belonging from their members. Rather, they are initiatives of traders and local leaders aimed at benefiting from certification and sustainability programmes.[19] Farmers consider cooperatives as buyers able to pay a premium and deliver social services. Therefore, in their minds, multiple buyers mean more services and premiums. Certification organisations confirmed that data from the different international traders indicates that many (between 10% and 20%) plots are registered twice by several trading companies. Farmers are also registered various times, but homonymy hinders the identification of double registration.
- **Downstream mixing:** Cocoa beans are often mixed at several downstream steps of the value chain: at the coop, local trader, wholesaler, exporter or processor level. The mixing depending on the quality of the batches of beans received, the state of the packaging, the clients' requirements regarding cleaning, sorting or re-bagging. Mixing of beans homogenises or improves quality, compensates weigh losses and package distinct product qualities.
- **Lack of loyalty from suppliers:** Building sustainable trade relations is lengthy and complex for cooperatives, traders, exporters and processors. Suppliers may be unable to respect their commitments because of significant market-price fluctuations between major and minor cocoa trading seasons, yield variability by region, quality issues, timing of delivery or funding. As a result, exporters and processors are often forced to complete their procurement with new, opportunistic suppliers. In this process, they will likely integrate in their procurement quantities whose origin they have little or no information about. When international prices allow exporters and processors to make additional profits (years of upward trend during or at the end of the main cocoa trading season), all will compete to increase their procurement. Even with stable prices, the same competition will occur if procurement targets are not reached fast enough. This can be caused by the inaccessibility of some production areas, lower than expected yields or an increase in smuggling to neighbouring countries. In this fluctuating market, even the most ambitious trading and grinding companies do not expect to source more than 90% of their beans directly from long-term and well-known suppliers.
- **Diversity of clients:** Even if an increasing number of chocolate manufacturers seek certified or/and traceable cocoa products, some of them will always look for the cheapest product or for the best price/quality ratio without paying a premium for a traceable product. Many chocolate manufacturers also tend to diversify their offer by proposing several categories of products with different requirements. Due to the diversity of clients and final customers, most trading companies need to combine an improvement of their supply chain in terms of sustainability with an opportunistic/competitive procurement to be able to supply all their clients in all the country where they sell.

[19] Ruf, François, Enrique Uribe Leitz, Kouamé Casimir Gboko, and Aurélie Carimentrand. 2019. « Des certifications inutiles ? Les relations asymétriques entre coopératives, labels et cacaoculteurs en Côte d'Ivoire ». *Revue internationale des études du développement* 4 (240): 31–61.

The diagram below sums up the challenges to full traceability throughout the supply chain.

Figure 39. Challenges to full traceability. **Source:** Nitidae



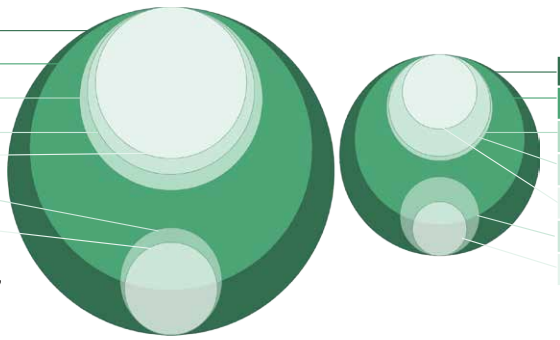
3.2 Transparency as a means to improve traceability

The period from 2010 to 2020 saw an increase in traceability initiatives. In addition, public cocoa authorities in both Côte d'Ivoire and Ghana are determined to set up more efficient and systematic traceability tools. Nonetheless, the current tracing of cocoa beans remains very limited, covering 30 to 40% of the production in both countries (see Figure 40).

Figure 40. Share of the national production bought by the top six international trading companies, directly procured, certified, and sold as certified quantities of cocoa beans in Ghana and Côte d'Ivoire. The circles' size is proportional to quantities of each category. **Source:** Nitidae

Côte d'Ivoire	Metric Tons
Production	2 150 000
Imported by top 6*	1 600 000
Directly sources by top 6*	650 000
Certified by top 6*	550 000
Sold as certified by top 6*	450 000
Certfied by others	250 000
Sold as certified by others	180 000

*Top 6 international traders are Barry Callebaut, Olam, Cargill, Touton, Ecom and SUCDEN



Ghana	Metric Tons
Production	850 000
Imported by top 6*	570 000
Directly sources by top 6*	225 000
Certified by top 6*	200 000
Sold as certified by top 6*	100 000
Certfied by others	125 000
Sold as certified by others	60 000

Current traceability systems and their planned improvements cannot guarantee the segregation of illegal or sustainable cocoa beans from the rest of the production.

The current cocoa supply chains in both countries are characterised by:

1. Complexity and weak formalisation, with a myriad of small players, widely spread geographically, involved in a diversity of trading relationships with a large range of partners.
2. Weak governance, in a key sector of the national economies.
3. Strong concentration of trade within less than 10 companies with sustainability programmes. While these companies support regulation to mitigate reputational risks, they implement low sustainability requirements.
4. Inability of the major trading actors at the end of the supply chain to change their procurement schemes in a liberalised and competitive international market.

The **most efficient way to improve the reliability and efficiency of traceability efforts would be to bring full transparency to the cocoa supply chain. Publishing quantities produced and sold at each point of the supply chain**, with transport documents indicating their origin and destination, from the plot to the final destination (retailers or at least, chocolate manufacturers).

Increased transparency can bring benefits directly to the cocoa supply chain actors and society as a whole.

The direct benefits of increased transparency are the following:

- For **farmer organisations**: Transparency improves trust among their members, employees and boards. It also supports a more integrated governance system, allowing farmers to better control, understand and participate in their organisations.
- For **national traders and farmer organisations**: Transparency facilitates access to loans and grants from local banks and microfinance institutions, decreasing these actors' dependence on exporting and processing companies.
- For **exporting and grinding companies**: Transparency is essential to sustainable and efficient direct supply chains. It supports the uptake of market intelligence tools that can improve their procurement planning and capacity to anticipate and adapt to market changes. Transparency also helps these companies to better communicate their sustainability efforts and their impacts. Finally, it helps reduce corruption in their supply chain.
- For **regulatory authorities**: Transparency lowers information collection and control costs. By reducing corruption, it increases revenue capture.
- For **chocolate manufacturers**: Transparency brings value to their sustainability initiatives, enabling the monitoring of the use by trading companies and NGOs of their sustainability investments. It also supports a better understanding of the cocoa beans' production and supply chain, to anticipate market changes.
- For **the entire value chain**: Transparency increases market efficiency, by reducing information asymmetries; improves governance, procurement planning and logistics; reduces the cost of credit; and makes regulations more adaptive.

To those positive impact of transparency could be added other impacts for indirect stakeholders of the value chain (input suppliers, service providers like transporters, banks, insurances, etc.) as well as for the rest of the society (media, researchers, NGOs, institutions in charge of economic regulation and statistics or even potential investors, etc.).

Due to the significance of the cocoa value chain in the Ivorian and Ghanaian economies, greater **transparency could generate various positive externalities both in terms of economy and governance, which could drive socioeconomic development**.

The TRASE initiative's[20] approach to soy beans in Brazil and the Terpercaya initiative[21] on palm oil in Indonesia are excellent examples of setting transparent approaches which could empower jurisdictional authorities while driving many actions from both public and private sectors.

But the impact of a transparency approach in Côte d'Ivoire and Ghana could be even bigger as both countries have much more informal economies than Brazil or Indonesia, deficient statistical systems as well as much less decentralised governance.

Currently all the main cocoa trading companies are starting transparency initiatives, publishing lists or maps of their suppliers. But without public requirements, they limit this transparency to a very limited quantity of information: only names of cooperative/ farmer associations involved in their 'direct procurement' without any quantity and without contacts.

Many smaller trading companies and chocolate manufacturer like Uncommon Cacao[22], Tony's Chocolonely[23] or Ethiquable[24] are demonstrating that total transparency about the origin of each ingredient in a chocolate product is possible and commercially successful.

The European Union could take advantage of this trend defining minimum transparency requirement or even setting up a definition of transparency (like it was done recently for fair trade) and pushing Côte d'Ivoire and Ghana to complete transparency about the national supply chain and exportation process. The EU could also show the good example by publishing imports and intra-EU trade details.

The economic literature about the positive impact of economic transparency is growing[25] and rooted in old/well-known critics of liberal economies[26], sustainability challenges in forest-risk commodities could be a great opportunity to convert the theory into impactful and game-changing policies.

[20] https://insights.trase.earth/

[21] https://www.euredd.efi.int/publications/demonstrating-and-promoting-district-level-sustainable-commodity-production

[22] https://www.uncommoncacao.com/transparenttrade

[23] https://tonyschocolonely.com/us/en/our-mission/tonys-impact

[24] https://www.ethiquable.coop/producteurs?field_type_de_produit_tid=51&field_adresse_country=All

[25] https://ash.harvard.edu/files/political_econ_transparency.pdf

[26] Akerlof, Spence & Stiglitz won the Nobel Prize in Economics in 2001 demonstrating the negative impacts of information asymmetries, but the first research paper on the topic, Akerlof's study 'The Market for "Lemons", dates from 1970.

4. Sources of information to monitor sustainability risk

There is currently very limited information available to monitor sustainability risk in Côte d'Ivoire and Ghana. Below is a list of existing sources that could provide additional data to inform sustainability indicators and information on their accessibility.

Figure 41. Available data identified during the study. **Source:** Nitidae

Categories	Data & Information	Source	Accessibility
National cocoa production trend & international trade	Export data with destination, names of exporters & importers	Customs of Côte d'Ivoire/CCC Customs of Ghana/ Cocoa Marketing Company	Available on a monthly basis for a charge
	Production estimate & forecast	ICCO	Public - Published by quarter
Regional cocoa production trend	Trade data from primary buyer	SYDORE CCC (exhaustive) Cocobod (trade registry)	Confidential
	Trade data of certified beans from primary buyer & list of producers	Good Inside Portal	Confidential
Price incentive to plant more cocoa	International price of cocoa	Future prices: ICE (NY & London), Physical prices: Reuters, Bloomberg, Commodafrica	Public or available for a charge (Reuters, Bloomberg)
	National prices of cocoa	CCC, Cocobod, Newspaper & Media	Public
Cocoa and other crops acreages	National census with production, acreages, workforce, equipment and socioeconomic data by region and department.	**Côte d'Ivoire:** INS, national agricultural census (RNA 1974, RNA 2001, REEA 2015/2016, REEA 2018/2019) **Ghana:** Ghana Statistical Service (agricultural census 1984/85 & agricultural census 2016/2017)	**Côte d'Ivoire:** Public – Data accessible upon request (INS) **Ghana:** Public report – Data accessible upon request (GSS)
Deforestation & land use	Deforestation monitoring	National Forest Monitoring System (SNSF) – Executive Secretary of the REDD+ office of Côte d'Ivoire	Public www.geoportailsst.com
	Deforestation monitoring in Cavally region (update at national level planned by the end of 2020)	STARLING – Airbus and Earthworm Foundation	Available for a charge.
	National scale – deforestation alerts - update every 12 days	IMAGES	Available upon request – supposed to be public -
Population	Population by region or district (possible to get additional housing and socioeconomic data)	CI: General population and housing census (2014), INS GH: Population census GSS (2010 and 2019)	Population 2014: public http://www.ins.ci/n/templates/docss/RGPH2014D.pdf Other datasets: paying with INS GH: public here

Categories	Data & Information	Source	Accessibility
Income, production factors and living conditions	Incomes, expenses, living conditions at national and regional scales with distinction between urban and rural inside each region	CI: INS (households income survey) 2008 and 2015	http://www.ins.ci/n/templates/docss/ENV2008.pdf http://www.ins.ci/n/templates/docss/env2015.pdf
	Survey of 3045 cocoa-producing households	CI & GH: Demystifying the cocoa sector in Ghana and Côte d'Ivoire 2016-2019	Public report: https://www.kit.nl/project/demystifying-cocoa-sector/ Data sets: https://dataverse.harvard.edu/dataset
Child labour	Unregistered children, preschool, primary and secondary school attendance, health risk, child nutrition, at regional level	CI: UNICEF-INS MICS 2006 and 2016 GH: UNICEF-GSS 2017/2018	Public: https://mics.unicef.org/
	Prevalence of working children, child labour, and the worst forms of child labour in agriculture, comparison between 2008/2009 and 2013/2014 seasons	Assessment of effectiveness of cocoa industry activities aimed at reducing child labour in cocoa-growing areas of Côte d'Ivoire and Ghana, 2020	Public: https://www.norc.org/Research/Projects/Pages/assessing-progress-in-reducing-child-labor-in-cocoa-growing-areas-of-c%C3%B4te-d%E2%80%99ivoire-and-ghana.aspx

Furthermore, the indicators below are currently being tested in the Mé and Cavally regions in Côte d'Ivoire.

Categories	Indicator	Method	More information on the measurement of this indicator
Biodiversity	Shannon-Wiener Index	Measure of flora and fauna diversity on a sampling area	In Mozambique[27],[28]
Agroforestry – Tree cover in cocoa plots	Basal area	Measure of trunk width at 1.3 metres with a wedge prism. Tree cover can be easily deduced from this indicator	In Côte d'Ivoire[29],[30]

[27] https://www.nitidae.org/files/4ec0ad23/an_analysis_of_land_use_changes_and_land_degradation_in_mozambique.pdf

[28] https://www.nitidae.org/files/114e90ee/analyse_des_dynamiques_et_des_facteurs_lies_a_la_regeneration_forestiere_du_miombo_autour_de_la_reserve_nationale_de_gile_au_mozambique_solene_maneau.pdf

[29] https://www.nitidae.org/files/7cfe1a8b/190430_pres_nitidae_optimisation_developpement_saf_cacao_cote_ivoire.pdf

[30] https://www.nitidae.org/files/0b1d232c/formation_theorique_sur_la_surface_terriere.pdf

5. Conclusion

During the last decade, cocoa sustainability concerns led to the creation of numerous public and private monitoring and traceability initiatives.

Despite their sheer number, these initiatives have not succeeded in fully tracking most of the cocoa production in Ghana and Côte d'Ivoire from production areas, and very scarcely from farmers' plots.

Furthermore, there are significant barriers to access to accurate cocoa production and distribution information in both countries. To carry out the present study, Nitidae had to resort to many informal networks and negotiations to obtain production data. Despite these efforts, it was unable to assess the accuracy of the data received from CCC and Cocobod.

More globally, information on cocoa production and trade in West Africa is scarce. Even such partial and incomplete information is secretly kept by all stakeholders. The present study revealed two elements that can explain such secrecy:

- Traceability and sustainability initiatives cover a very limited share of the production.
- A large part of the production in both countries is directly sourced in recently deforested areas where other sustainability indicators (child labour, wages or poverty of farmers) are likely to be the worst.

Transparency will not solve all the numerous and complex sustainability challenges of the sector. However, increased transparency in the West African cocoa value chain could, at least, make traceability efforts more credible and tangible, allowing more accurate monitoring. It would also help inform decision making at all levels and focus action on the most problematic areas.

Cover photo: Unloading cacao from Ivory Coast with crane from a ship into a trailer truck on the river Seine in the port of Rouen in France. Credit: Photoagriculture

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