

The impacts of cocoa sustainability initiatives in West Africa

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Abstract

As solutions to the multiple, long-running challenges facing cocoa growers and cocoa production, sustainability initiatives, including associations platforms and networks, voluntary sustainability standards, corporate and non-governmental and civil society initiatives have been developed. Largely implemented by cocoa farmers and groups, these initiatives are often supported by traders, government agencies, certification organisations and other not-for-profit organisations. This chapter looks at the such different sustainability initiatives and their social, economic and environmental impacts on cocoa farmers, cocoa farms and cocoa ecosystems. Examples of impacts in Ghana and Ivory Coast are provided. Trends in research on sustainability initiatives include increasingly multi-disciplinary collaborations, such as on climate smart cocoa, improved soil fertility and productivity and living incomes. Trends in practice include the harmonisation between standards and a move to “standards plus”, going beyond certification towards integrated, farmer specific targeted interventions combining standards with farm and livelihood support, and policies and regulations that go beyond certification such as pricing, child and slave labour.

Key words: cocoa, certification, voluntary sustainability standards, value chain

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1. Introduction: What are cocoa sustainability initiatives?

The cocoa sector faces a number of deeply embedded, interrelated challenges, including old trees with low tree productivity, low farmer and worker incomes, pests and diseases, political instability in many of the main origin countries, persistent poor labour conditions and negative environmental impacts, such as deforestation, soil degradation and pollution, tight relationship between supply in the face of growing demand, and long term cyclical recession and expansion booms affecting global market and farm gate prices (Ruf and Siswoputranto 1995, Nkamleu, Nyemeck et al. 2010, Matissek, Reinecke et al. 2012, Fountain and Hutz-Adams 2015). Organising smallholders into groups and introducing voluntary initiatives, such as certification, often accompanied by training and improved access to agricultural inputs, have been some solutions proposed to address some of these multiple, long-running “wicked” problems. These sustainability interventions have been implemented largely by international traders in the cocoa value chain, government agencies, certification organisations and NGOs. But do they work? What has been the impact of the multitude of sustainability based interventions in the last decade on different types of farmers, and how to untangle the impacts of different interventions?

1.2 Historical context for the rise of voluntary sustainability standards

The majority of cocoa is produced on small farms average farm size varying from 2.8 hectares (Alonghi 2011) to 3.7 hectares (KPMG 2012). An estimated 20% of such farmers are members of associations or cooperatives (ICCO 2014). Farms generally have low and decreasing productivity rates of 300 to 500 kg per ha (Ruf 2007, Mejia 2011, KPMG 2012). Decades of work on breeding and developing high yielding, disease and pest resistant, and climate proof varieties, replacing old trees and providing more appropriate farm inputs (fertilisers and crop protection products) this has resulted in only marginal yield improvements, particularly in the main West African producing countries (Wessel and Quist-Wessel 2015). Farm to market infrastructure is generally lacking, as is finance for inputs and support for higher-yielding, disease resistance varieties for replanting and regenerating of cocoa trees.

The cocoa value chain continues to be characterised by generally small-scale farmers in tropical countries, dominated by West Africa (73% of total production estimated in 2015), followed by southern America (16%) and Asia and Oceania (10.2%)(ICCO 2016), selling to individual traders or cooperatives, who sell to traders or major exporters. Traders then sell to major confectionary and production companies such Mars, Mondelez and Nestlé which are further processed into food and cosmetic products (Abbott, Wilcox et al. 2005). Profits from farm gate prices for farmers and farmer groups are generally low compared to the value-adding process and profits made on semi-processed and final products (FAO 2007, Kessler, Brons et al. 2012, Quarmin, Haagsma et al. 2014, Squicciarini and Swinnen 2016).

Although the context of cocoa farming has changed little, virtually every dimension of international cocoa value chains has changed in the two decades (Wilcox and Abbott 2004). In major producing countries such as Ivory Coast, Ghana, Indonesia and Cameroon until 1990, exports, market power and price setting was shared between exporters and the government (Ton, Hagelaar et al. 2008). Credit, pricing, export licensing and consumer behaviour are now largely determined by the private sector. Although there has been an overall 10% increase in production from 2003 to 2013 (ICCO 2013), sufficient quality supply has increasingly become an issue due to increasing demand (FAO 2007, Eberhard Krain 2011). Supply variability is due to large annual fluctuations, caused by multiple factors, particularly the weather. Quality has generally been increasing, due to training, increasing use of drying equipment and market and regulatory standards. In the past the governance of production and quality aspects, input credit and supply, extension services and market infrastructure has often been state-controlled in the cocoa producing countries. Public bodies in producer countries used globally recognised quality standards and territorial (ecological and technically based) reputations to enhance their position in the global market. However, producing country governments have gradually lost their ability to manage the international cocoa market and shape their own domestic markets. Since the late 1990's market-based corporate governance and price negotiation system has developed in many production countries with the breakdown of national institutions, failed cocoa harvests and pressure from the World Bank and International Monetary Fund for economic structural adjustment. Foreign companies used the room to increase investments and increase their integration and position in the chain. Exporters (including major traders such as Cargill, Barry Callebaut, Olam and Armajaro) were then free to buy and sell based on London market price. The fully liberalised system has left farmers exposed to the international cocoa price set in London. This resulted in reforms to the sector in Ghana and Ivory Coast in 1999 and 2012 respectively, including privatising buying and setting minimum export prices (Vellema, Admiraal et al. 2006, Vellema and Laven 2012). Fluctuations in international prices are adjusted during mainly in processing, manufacturing and distribution stages of the chain with increases in cocoa prices more fully and rapidly transmitted to consumers than decreases: a manifestation of the market power of traders and chocolate manufacturers (Jean-François and Bonjean 2014).

In the global cocoa chain an increasing trend towards concentration can be observed in the last decade. Many of the cocoa and chocolate companies have merged and been taken over by competitors both on vertical and horizontal levels. Horizontal integration is a strategy where a company creates or acquires production units which are similar - either complementary or competitive. Vertical integration is where activities up and down a value chain are owned by that company. Often each organisation in a chain produces or engages in different product or market-specific activities in a chain. The strongest concentration has occurred in processing of beans to ingredients for chocolate (butter, powder and liquor). Two processors, Barry Callebaut and Cargill (after Cargill's merger with ADM) now account for 70% to 80% of cocoa processing worldwide. Other companies dominating the processing sector include Blommer, Ecom, Cargill, Olam, Barry Callebaut (who purchased Petra Foods cocoa ingredients in 2015), and Armajaro (whose cocoa business taken over by Ecom in 2014). Globally between 60%-80% of cocoa is in hands of seven traders and grinders (Barry Callebaut, Cargill, Olam, Ecom, Touton, Blommer and Continaf). The six biggest chocolate manufacturers transform 40% of worldwide chocolate products (Fountain and Hutz-Adams 2015). This market

concentration by buyers, processors and manufacturers weakens the positions of largely unorganised farmers (Fountain and Hutz-Adams 2015). Demand for chocolate and cocoa has also changed and despite large fluctuations in demand and supply (Ruf and Siswoputranto 1995), an upward trend is apparent with an annual growth rate of 3.3 from 2002-2011 (ICCO 2012). There is strong growth in Russia, Brazil, China, India and also in origin countries (ICCO 2012, Naprta 2015, Squicciarini and Swinnen 2016).

These institutional, economic and market changes and restructuring in the chain have created space for innovation, particularly different relationships and the introduction of voluntary sustainability initiatives (as opposed to the wealth of tax, health, cultivation, manufacturing, health and food safety and composition regulations in both origin and consumer countries) by different types of organisations in the value chain.

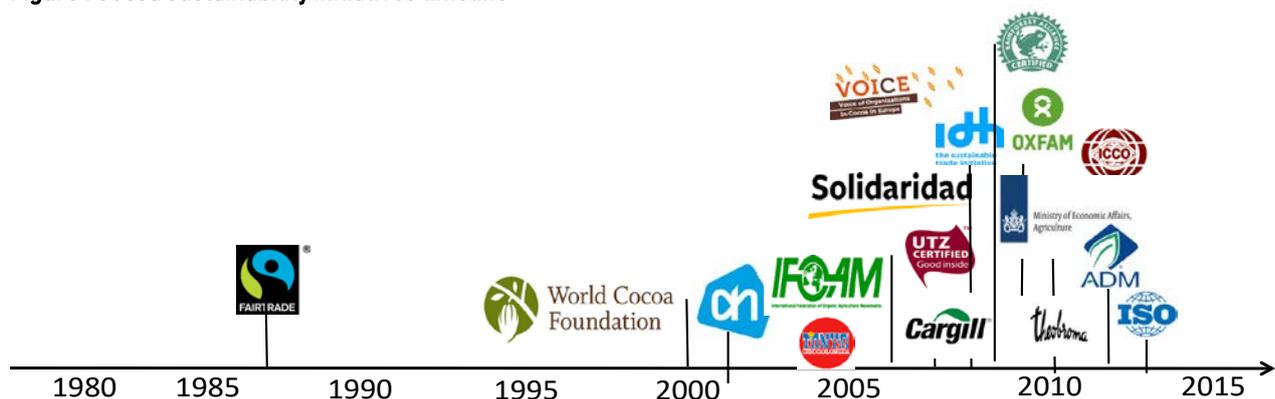
1.2 What are sustainability initiatives?

Sustainability is defined broadly in the terms embraced by the United Nations sustainable development goals as including ending poverty and hunger, improving health and education, water and sanitation, reducing inequalities, decent work and economic growth combating climate change, responsible consumption and production, and protecting and restoring marine and terrestrial ecosystems and reversing degradation and biodiversity loss. Four types of sustainability initiatives have been found in the cocoa value chain (Ingram, Luskova et al. 2016):

- (1) Platforms, networks and associations refer to groups of private, public, research and/or civil society (CSO) or non-governmental (NGO) organisations collaborating on a common goal of sustainability with a declared policy or programme and plan of action.
- (2) Voluntary sustainability standards (VSS) refers to sustainability standards agreed for business-to-business transactions as well as those used for business-to-consumer transactions such as UTZ, RainForest Alliance and FairTrade; management system standards as well as product standards such as ISO 14001 - whether owned by government, NGO or business interests, so long as they are voluntary in nature; Environmental product declarations, such as the Dutch Albert Heijn supermarket's "healthy choice" label, as well as independently certified labels such as Organic, and labels developed by producers or retailers as well as those with independent governance (Salmon 2002).
- (3) Individual corporate initiatives are a form of corporate social responsibility and self-regulation, whereby a business monitors and ensures its active compliance with the spirit of the law, ethical standards and national or international norms. A firm may engage in actions that appear to further some social good, beyond the interests of the firm and that which is required by law (McWilliams and Siegel 2001).
- (4) NGO and CSO campaigns have aimed to raise awareness, such as the TCC, which pushed many companies to work together and created amino for changes on a sector wide level.

As Figure 1 shows, the majority of sustainability initiatives in the cocoa value chain started in the mid-2000s and have upscaled significantly mainly by replication of similar projects and initiatives by different companies, NGOs and service providers, and outscaling into more cocoa producing communities and countries since 2008. Precise figures of the numbers of farmers and cooperatives participating and volumes produced are not available, as farmers participate in more than one trader's initiative and in several voluntary certification schemes at one time. Corporate data is unfortunately also not comparable as definitions of throughput volumes and particular, farmers and producer organisations participating in initiatives differ widely, and data are not available and comparable for given years nor for specific geographic locations.

Figure 1 Cocoa sustainability initiatives timeline



1.2.1 Platforms, networks and associations

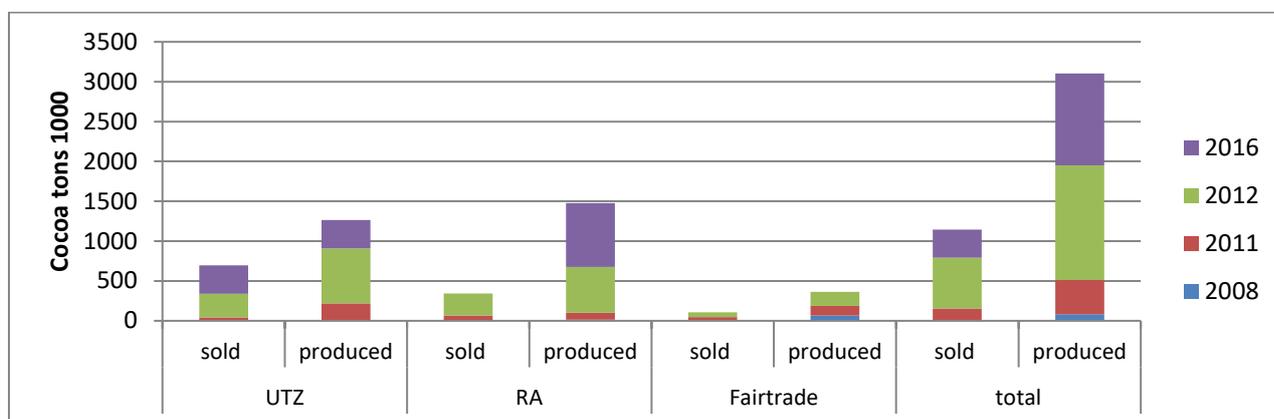
The last two decades have seen a rise in the number and activities of platforms, networks and associations engaged in cocoa and in particular with an explicit focus on sustainability. Platforms have been established to bring together organizations from different segments of the value chain in the hope of encouraging collectively discussing and addressing specific sustainability issues. Examples of platforms include the World Cocoa Foundation (WCF) and its Cocoa Action, and the Sustainable Trade Initiative (IDH). Networks include International Cocoa Initiative (ICI), Women in Cocoa & Chocolate Network (WINCC), the international cocoa researcher's network- a linked in group, and CacaoNet, a global network for cacao genetic resources, and the Voice Network of NGOs and trade unions concerned with sustainability in cocoa. Networks have tended to bring together stakeholders from different backgrounds, disciplines and sectors in the value chain. International trade associations and inter-governmental organisations increasingly act and speak on behalf of their members and have increasingly consolidated to have national, regional and global voice representing all segments of the chain, for example the International Cocoa Organisation (ICCO) representing governments which in the mid-2000 highlighted sustainability issues in the sector with a number of studies,

discussion documents, a global cocoa agenda roadmap and declarations made during international conferences. On the private sector, The VBZ has made corporate social responsibility a priority for manufacturers of cookies, candy and chocolate, focusing on the raw material supply chain, innovation and employees and has been supporting its members to adopt sustainable practices. The nested scale of associations is illustrated by the Association for Bakery and Confectionery Industry (Vereniging voor de Bakkerij- en Zoetwarenindustrie (VBZ), a member of the Association of Chocolate, Biscuit and Confectionery Industries of Europe (CAOBISCO), and European Cocoa Association (ECA), a trade association grouping the major cocoa bean traders and processors, warehousing and related logistical activities in Europe. Cocoa farmer organisations have also seen some of the most rapid revitalisation in the last decade, particularly due to the role that farmer groups play in certification and feelings of marginalisation in the face of industry consolidation, many new cooperatives and associations have been created or re-stimulated with the support of traders, leading to (revitalised) national associations such as the Federation Ivoirienne des Producteurs de Café Cacao, Ivory Coast and Cocoa Organic Farmers Association Ghana, and the umbrella World Cocoa Farmers Organisation (WCFO) and World Cocoa Producers Organization, representing cocoa farmers globally. The re-emergence of local, national and international cocoa farmer organisations and their consolidation, such as the merger of International Cocoa Farmers Organisation (ICCF) with the WCFO, has aimed to counterbalance the consolidation of power and voice among traders and manufacturers. All these types of organisations have engaged in European and International fora related to their member's contributions to a sustainable cocoa economy. This has been manifested practically – such as starting their own programmes, studies and supporting members, as well as engaging and lobbying in (inter)national fora such as the World Cocoa Conferences. The support of both international trade associations and inter-governmental organisations has been instrumental in the upscaling of voluntary certification schemes and standards. Vertical upscaling has occurred as projects have become institutionalised as corporate and sector wide programs and standard practices for both the Dutch importers, processors, manufactures and retailing companies and their farmer suppliers.

1.2.2 Voluntary sustainability standards

Among VSS, four standards (UTZ Certified, Rainforest Alliance, Fairtrade and Organic) dominate and have increasingly been adopted by cocoa trading and chocolate manufacturing and retail companies as a way to achieve more sustainable practices in their operations and their supply chains. Combined, they certified a minimum of 1.2 million hectares and a maximum of 2.7 million hectares in 2013 (average 2 million hectares), mainly in the largest cocoa production countries in West Africa, Brazil, Peru, Honduras, Dominican Republic, Indonesia and Vietnam, (Potts, Lynch et al. 2014, International Trade Centre (ITC) 2015). A new standard, the Sustainable Cocoa Standard is currently being developed concurrently by national committees, the European Committee for Standardisation (CEN) and International Standards Organisation (ISO). Out-scaling has occurred with an increase in the number of certification schemes for cocoa over time, since Fairtrade began with cocoa in 1987. UTZ Certified cocoa grew sevenfold in the period 2010 to 2014 and had a 15% of the global cocoa area and thus the largest VSS certified cocoa area, with Rainforest Alliance the largest area growth (2008–2013) (International Trade Centre (ITC) 2015). Three certification schemes (UTZ, Fairtrade and Rainforest Alliance) dominate the voluntary standards adhered to in terms of volumes produced and numbers of farmers covered, with a fourth standard (ISO-CEN) currently in development. The organisations who initiated VSS, such as UTZ, were smaller companies and NGOs, such as Rainforest Alliance translated experiences from timber, coffee and banana to cocoa, and Fairtrade/Max Havelaar which also grew from working with coffee farmers. The Dutch government has participated in the member NEN meetings. The current standards in operation have been set without any direct role of governments, founded largely by NGOs, with some business interests. The four main schemes initially had different focuses on environmental and social issues: Fairtrade on ethical issues, Rainforest Alliance on deforestation, IFOAM Organic on pesticide free farming and UTZ on mainstreaming sustainability in farming practices. All of the four main standards have a strong focus on farmer practices, with chain of custody approaches, traceability and transparency also playing an important role, reflecting concerns by consumers and NGOs about how the chain is governed. A comparison in 2014 of the main certification schemes globally standards shows more harmonisation, with 47% of the 15 main environmental, social and economic issues and 27% of the 346 criteria commonly shared (ICCO 2014). The revisions to UTZ and Rainforest Alliance standards in 2014, and the draft ISO/CEN standard, show that harmonisation towards an even more common framework has further increased, with the ISO standard promoting itself as “one standard to bind them” (Neiburg 2016). Most of the major traders/exporters and processors have now adopted existing certification schemes, indicative of replication scaling among stakeholders in the chain. Small scale, speciality, fine flavour cocoa and chocolate produces have been less involved in certification schemes, partly due to the costs involved, as well as different marketing and consumer engagement strategies (Abdulmalik, Ingram et al. 2016). Complaints by industry, farmers and support organisations about the complexity and proliferation of certification standards have also led different platform organisations in the chain (such as ISEAL Alliance (ISEAL Alliance 2010) and ICCO) to understand differences and complementarities between standards, and harmonise requirements such as auditing and data provision to reduce the cost and time of certification (KPMG 2012, Resolve Inc. 2012, ICCO 2014). Vertical upscaling has occurred as certification has become mainstreamed and institutionalised as standard practices for the cocoa chain from Dutch importers, processors, manufactures and retailing companies to their farmer suppliers, shown in Figure 2.

Figure 2 Scaling up of certified cocoa production and sales globally 2008 to 2016



Source: (Fountain and Hutz-Adams 2015)

1.2.3 Corporate sustainability initiatives

The most varied type of sustainability initiatives are individual corporate initiatives, programmes and projects. Companies demonstrate their commitment to address sustainability and scale up their initiatives in different ways, often combining corporate programs with certification, using one or multiple third party voluntary certification schemes to demonstrate their own practices and those of their suppliers. Corporate-based sustainability initiatives including own brands and programs appear to be the result of the short chain between trader, manufactures and consumers. Many smaller companies are not involved in platforms or certification standards. Instead they voice their opinion through professional trade associations or their own branding and approach to addressing the sustainability side of business. Large traders and processors such as Cargill and ADM have developed their own certification standards to increase the possibilities for compliance at a lower cost while protecting their own corporate interests. Large manufacturing and retail companies such as Unilever and AHold have also set their own sourcing guidelines which place stringent requirements on their suppliers.

Some of the earliest corporate programmes and projects focussed on setting up certification schemes e.g. PUK and UTZ, often in partnerships with CSOs and via consumer country government agencies (such as the Swiss, Dutch and German), and partnerships with CSOs such as Cargill (with Solidaridad), Continaf, Ferrero and Petra Foods (with Oxfam). Companies have also partnered with international NGOs (for example Care International and VSO) and local NGOs in origin countries, as well as with national governments (such as Cocobod and extension services in Ghana, the Conseil du Café Cacao in Ivory Coast). Some initiatives by the large trading and manufacturing companies have been supported by governments such as the Dutch. Most corporate initiatives first focussed on “sustainable cocoa farming”, a wide-ranging term which intertwines disseminating techniques (through classroom and field training, demonstration plots and pilots) to raise productivity via good agricultural practices (GAP), quality and some small scale public relations orientated community development activities. In the last few years more initiatives focus on professionalising farmer organisations and farmers, access to and supply of inputs including credit. The initiatives have the following characteristics in common:

Most have corporate initiatives been implemented or scaled up horizontally and vertically significantly, doubling or trebling the number of farmers included in programs and the financial costs of providing services) in the period from 2007 to 2010 to date. Although a few of initiatives existed prior to 2007, they were much smaller and seen mainly as ad-hoc activities, than sustainability programs today. Data about the numbers of farmers, the organisations, activities and costs of these programs is difficult, and financial data on activities tends to be reported in global terms in corporate reports and not broken down per farmer or producer organisation, or compared over time. For example, Mondelez Cocoa Life program started in 2012, building on support to farmers commencing in 2008 in Ghana and growing from 38,000 farmers in 2014 in six countries, and aims to reach 200,000 farmers in the six countries by 2022. Cargill’s Cocoa Promise program which started in 2012, developed from activities in Ghana and Ivory Coast dating back to 2003. 60,000 farmers were supported in the Ivory Coast in 2008, growing to 115,000 farmers in the two countries in 2014.

The majority of the initiatives have used and scaled up activities by supporting certification schemes at farmer group level since 2007, often this has meant also supporting farmers to organisation into groups, and providing support to develop the management, business and organisational skills of farmer groups. Many corporate initiatives have recently slowed down on scaling up and turned to scaling out and horizontal scaling; increasing the types of services and support provided to farmers and producer organisations. Most corporate initiatives have involved significantly scaling up (extending and replicating) the support provided by Dutch based traders, processors and buyers to small-scale cocoa farmers, almost exclusively via their producer organisations (cooperatives and unions). In the last four years, certification GAP based initiatives have increasingly been accompanied and combined with the vertical scaling up of access for farmer organisations to (directly or via providers) inputs such as approved fertilizers, pesticides and credit. Corporate sustainability initiatives have out-scaled in the last two years to include not just GAP but also management, and organisational aspects of producer organisations. Increasingly companies have been vertically and horizontally scaling up and replicating their sustainability initiatives, some with support of public sector – such as the Dutch IDH, German GIZ, Swiss Contact and internationally via ICCO and through making more direct contact at farmer level with producer country governments – for example contracting government agencies in Ghana and Ivory coast to provide training to farmers.

1.2.4 NGO and CSO initiatives

Strong NGO and CSO lobby and advocacy have played an important role in highlighting the main sustainability issues. They have accomplished this through targeted public campaigns directed at both consumers and companies. Examples are the 1995 US State Department and ILO, and news items by the BBC and CNN, and subsequent campaigns regarding slave and child labour in

the cocoa sector dating from the mid-1990s; Oxfam's 'chocolate letter' campaign in 2009. The creation, intensification and/or upscaling of sustainability initiatives shows a degree of correlation with consumer awareness campaigns. CSOs are of the opinion that industry crises caused by campaigns and negative press coverage (such as child labour, the "green Sint"), generate consumer awareness which results in pressure to transition to more sustainable supply strategies and government involvement. The approach of the vocal social and environmental movement concerning cocoa and chocolate – exemplified by NGOs such as Oxfam Novib, Solidaridad, the Tropical Commodity Coalition (TCC), Voice Network and trade unions (such as the Dutch FNV) has changed. From using traditional opposition and campaigning to highlight critical issues such as labour conditions, environmental awareness and living wages; they now tend to take a more partnering approach to exert more influence within the cocoa chain and to mainstream sustainable cocoa initiatives. For example the Tropical Commodity Coalition (TCC) pushed many companies to work together and created amino for changes on a sector wide level in The Netherlands, such as the 2010 Letter of Intent for sustainable cocoa (Ministerie van Landbouw Natuur en Voedselkwaliteit 2010, Logatcheva and Ingram 2014). The commitment comprised of convening a working group of companies, trade unions, NGOs and governmental bodies who then signed a declaration of intent stating that by 2025 all chocolate sold in the Netherlands will be sustainable. The commitment was instrumental in bringing together multiple stakeholders and stimulating them to both adopt certification and examine other ways of making cocoa more sustainable. The 'consensus based' approach, particularly in the form of a voluntary agreements with a facilitating role of the government, often leading to public-private and CSO partnerships - has been common approach in environmental policy making during the last two decades to improve the sustainability of international commodity value chains (Vermeulen and Seuring 2009).

1.2.5 Interlinking initiatives

There is high degree of links and overlaps between the three types of sustainability initiatives, illustrated in Figure 3. Platforms, networks and associations have been intensely used to both launch initiatives and to support the implementation, replication and upscaling of corporate and voluntary certification. For example certification standards partnering with traders and international NGOs, service providers and consultants – for example Cargill, Solidaridad, UTZ and IDH. Traders have collaborated with certifiers, such as Cargill with UTZ and Rainforest Alliance and private sector companies partnering with research organisations, such as The Sustainability Consortium (TSC) and the community of practice learning group financed by IDH.

Figure 3 Interlinking sustainability initiatives in West African cocoa



2. Case study: The impacts of cocoa sustainability initiatives in West Africa

This section introduces a case drawing on studies of the impact of voluntary certification and associated sustainability initiatives on cocoa farmers and their cooperatives in Ghana from 2011 to 2014 (Waarts, Ge et al. 2013, Waarts, Ingram et al. 2015, Ingram, van Rijn et al. 2016) and in Ivory Coast from 2013 to 2016 (Ingram, Waarts et al. 2013, Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, van Rijn et al. 2016).

2.1 Approach

Shown in Table 1, the quantitative and qualitative interview-based evaluation of impacts was based on the development of impact logics for each country with a certifying organisation (UTZ Certified), cocoa traders, and a financing organisation (IDH, the Initiative for Sustainable Trade), followed by two rounds of interviews (in 2012 and 2015 in Ghana, and 2013 and 2017 in Ivory Coast) with 725 in 97 cooperatives in Ivory Coast in 2013, and 385 farmers in 6 cooperatives in Ghana in 2012 and 352 farmers in

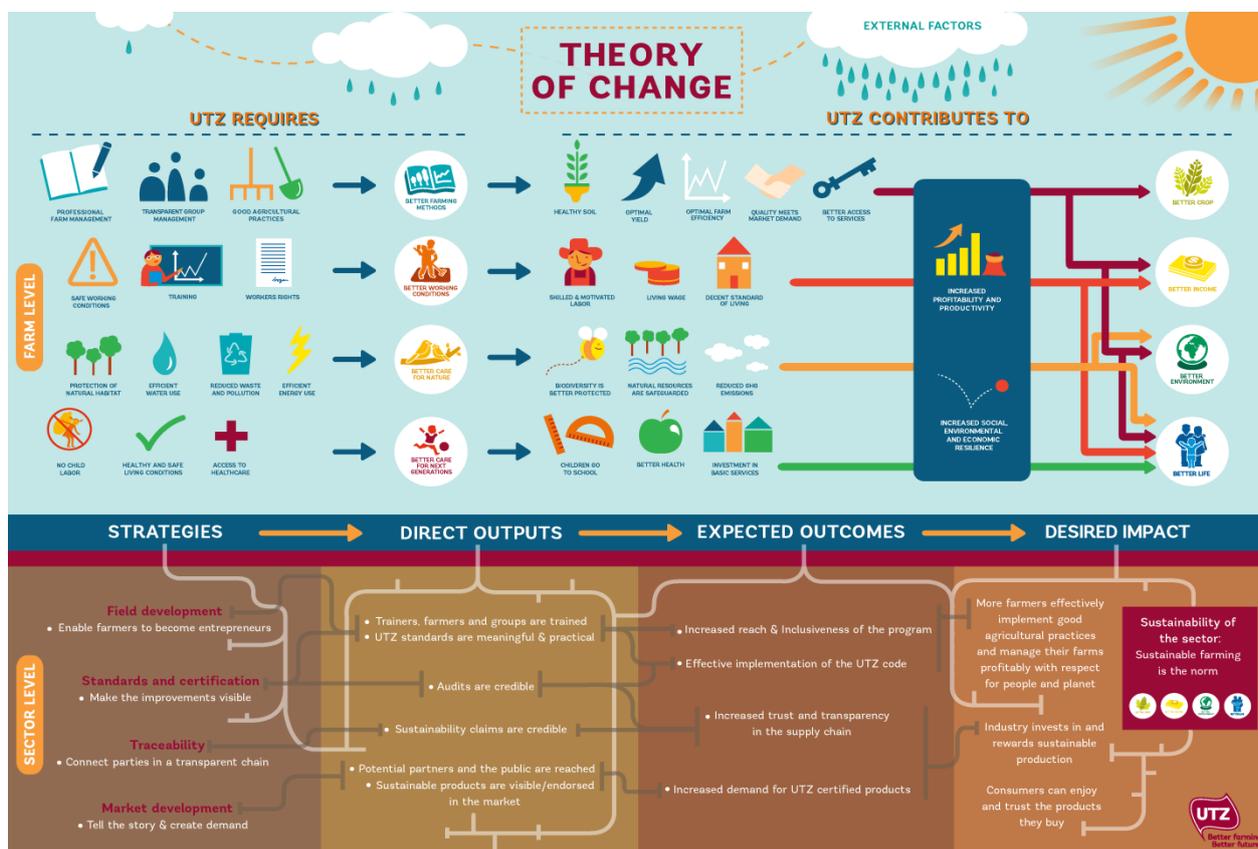
6 cooperatives in 2015) who were participating in UTZ Certified certification for different periods of time and situated in the three main agro-ecological zones in both countries. In Ghana 120 farm labourers and 41 farmers were also interviewed in 2015 specifically about working conditions. Certified farmers were compared to non-certified farmers (55 in Ivory Coast and 127 in Ghana in 2012 and 117 in 2015) who had not participated in the certification, were cooperative members, and situated in the same three agro-ecological zones at least 10 kilometres from certified cooperatives. The size of 99 farms was measured in Ivory Coast. In-depth interviews were also conducted with 6 cooperative managers (6 in Ivory Coast), 12 traders (7 in Ivory Coast and 5 in Ghana), 4 support organisations (2 in Ivory Coast and 2 in Ghana, including COCOBOD, the Ghanaian Cocoa Board). 18 focus group meetings were held with villages in the communities where farmers and their cooperatives are located (10 in Ivory Coast in 2013 and 8 in Ghana in 2015), and in Ivory Coast with 8 school teachers to obtain more qualitative information on interventions and impacts.

Table 1 Data collection sources

Country	Ghana		Ivory Coast		Total
	2012	2015	2013	2017	
Year / Interviews					
Certified farmers	385	352	725	450	1912
N° cooperatives	6	6	97	50*	159
Uncertified farmers	127	117	55	50	349
N° cooperatives	2	2	6	6	16
Farm labourers	-	161	-	-	161
Coop. managers	5	5	7	7	24
Focus groups		8	10	14	32
Traders	5	5	7	6	23
Support organisations	2	2	4	4	12
School teachers	-	-	8	-	8
Farm measurements	-	-	99	-	99
Total	532	658	1018	587	2795

In both countries, fifteen environmental, economic, and social indicators were used to measure the outcomes of the activities implemented between 2008 and 2013. These correspond to UTZ Certified's "Better farming, better future" theory of change, see Figure 4. Statistical and qualitative analyses of the indicators at farm household level were then conducted. Using the results of the interviews, farmer's perceptions of changes in the indicators were analysed. Comparisons of the indicators were made to see whether any significant differences could be found by comparing: farmers participating in the programme for different periods of time (ranging from zero to five years); farmers located in different agro-ecological zones; farmers participating in the UTZ programme and farmers not participating (the comparison group); and farmers participating in the UTZ programme who are certified and those not-yet certified. The results were benchmarked to grey and peer reviewed literature data about the indicators to provide context and comparison with other cocoa farmers in each country. Preliminary results were presented and verified at meetings in Ivory Coast with cooperative managers and representatives of traders, NGOs in Abidjan and Amsterdam in October 2013, and in Ghana in June 2012 and 2015. During these meetings an assessment of external influences which could affect farmers' performance on the indicators, such as the Ivorian government's reform of the sector and the weather effects on cocoa production, was also conducted.

Figure 4 UTZ Theory of Change



Quantitative data was analysed two ways. First farmers in the baseline studies were grouped and an agglomerative hierarchical cluster analysis to estimate clustering into different groups based on the indicators using euclidian distance, Ward's Linkage method of aggregation and ANOVA tests. Second, using a difference-in-difference analysis was used to compare changes in indicators over time (2011 and 2014 in Ghana) for UTZ-certified farmers compared with non-certified farmers. A t-test was used to verify the statistical significance of the difference between years and the difference-in-difference between UTZ certified and uncertified farmer groups. For each indicator, statistical analyses, including t-tests and regression analyses were conducted to examine the impact, to test whether the impact might be attributed to different factors and to gain insight into the robustness of the results. Propensity score matching tests (Kernel Matching, Nearest Neighbour and Stratification methods) were used to assess the influence of specific interventions: whether farmers participated in trainings, total number of trainings they participated in, and whether or not farmers are lead farmers in the programme.

2.2 Results: The impacts of cocoa sustainability initiatives in West Africa

A cluster analysis of the baseline studies in Ghana and Ivory Coast (van Rijn, Kuit et al. 2015) identified five main clusters of farmers, based on meaningful differences in cocoa production with clear profiles in terms of age, farm size, income farm ownership, costs, agro-ecological zone location, participation in certification and sustainable GAP.

2.2.1 Ghana

In Ghana, the impact assessment (Waarts, Ge et al. 2013, Waarts, Ingram et al. 2015, Ingram, van Rijn et al. 2016) comparing the indicators of 2011 to 2014 for certified with non-certified farmers, indicated that predominantly older men participated in interventions, attributed to cultural norms regarding farm ownership and cooperative membership, and as farm managers are on average 46 years old. All farmers improved their knowledge and implementation of good agricultural practices by about 30%, but levels remain low. Productivity levels continue to be generally low for all farmers, and the quality of cocoa has deteriorated since 2011. No differences were found between certified and uncertified farmers in changes in knowledge and the implementation of good agricultural practices, nor were there differences in terms of changes in productivity and quality over time. Cocoa farming continued to generate low incomes, although profitability increased per hectare for all farmers but decreased per day spent by family labour. Price increases in 2014 offset the rising costs of production (especially for hired labour) and increased cocoa profitability per hectare for all farmers. However, cocoa farming became less attractive in terms of profit per day spent by family labour, as it decreased over time, also compared to wage levels for hired labour. No differences were found between groups. Income from cocoa and total household income increased for all farmers but remains low. Both the income from cocoa and the total household income have increased over time, and we see similar increases for both certified and uncertified farmers. Per person, income from cocoa is slightly lower than the USD1.25 poverty line in 2014, while the total household income is slightly higher than this poverty line per household member (USD1.40). The minor difference between income from cocoa and total household income indicates cocoa farmers' continued high dependency on income from cocoa.

A positive impact was found regarding working conditions, awareness of child labour issues and health. Certified farmers are more aware of what children should not do on the farm, as well as the benefits of going to school, than uncertified farmers. Children did spend time on cocoa farm activities, but farmers stressed that their work on the farm is important so they can learn about cocoa production. Almost all children (97% of children aged 6-11 and 93% of children aged 12-17) go to school (in 2014). We see no difference over time for and between certified and uncertified farmers regarding school enrolment for both age

groups. As we do not know whether farm activities were done by children instead of going to school, we cannot determine whether these activities should be considered 'child labour'. Certified farmers mentioned that certification has had a positive effect on their health, changes not indicated by uncertified farmers. A few (8%) certified farmers did not comply with the UTZ Code of Conduct regarding child labour and children under the age of 18 conducted hazardous tasks at 19 certified farms in 2014, albeit that these activities are minimal: children on average spending less than one day per year conducting hazardous activities. None of the children under the age of 18 were involved in pest or disease control in either 2011 or 2014. No difference over time was found between certified and uncertified farmers regarding the time children under the age of 18 spent on doing hazardous tasks. Nine certified farmers (4%) had children under the age of 14 assist them in hazardous activities in 2014, compared to 7 uncertified farmers (6%). The total yearly time spent is very low for both groups, 0.15 days versus 0.60 days per year on average, respectively.

Reasons why certification has not left a mark yet in Ghana could be that training uncertified farmers, allowed them to develop in a similar way as certified farmers. The impact of input services provided by traders also probably has not taken effect yet, as not all farmers use these services yet, and it takes time fertilizer use and planting seedlings to effect productivity. Unfavourable climatic conditions were indicated to negatively influenced productivity in 2014, affecting both uncertified and certified farmers and thus not the impact of certification. For the whole sample, enhanced knowledge on GAPs is associated with better GAP implementation. Farmers who improved GAP implementation were more likely to have improved productivity than farmers who had not. There was a positive association between improved knowledge levels and improved profit per kilogram of cocoa. Farmers who improved their GAP were more likely to have lower profit per kilogram. Improvements in efficiency were associated with lower profitability per hectare, and increased productivity per hectare was associated with higher profitability per hectare, due to the 2014 cocoa price increase.

2.2.2 Ivory Coast

Voluntary certification schemes have been implemented in the Ivory Coast through partnerships between UTZ Certification with eight traders, seven also have partnerships with Rainforest Alliance and two also with FairTrade. The traders have working relationships and partnerships with cooperatives from which they purchase beans. All of the traders have their own corporate social responsibility programmes. Of the farmers participating in the UTZ programme, 21% were also Rainforest Alliance certified and 2% were both UTZ and FairTrade certified. This reflects the general trend: as of June 2012, 51% of 86 UTZ Certified cooperatives had multiple certifications. Both prior to, and during the UTZ certification programme, there have and continue to be over 40 sustainability interventions (Hatløy, Kebede et al. 2012, Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, van Rijn et al. 2016), see Table 2. Many interventions occur both nationally and on a very local scale, implemented by multiple partners. There is significant similarity between these interventions and those implemented as part of UTZ and Rainforest certification, which makes it difficult to attribute changes specifically to certification. Specific activities implemented by traders participating in the UTZ Certification programme and other activities. Activities such as cooperative capacity building, farmer training, farmer development, financial support, community development and processing. Strong differences were found between traders' approaches to implementing certification as a standalone activity or as part of a package of activities.

Table 2 Overview of sustainability initiatives in the cocoa sector in Ivory Coast 2008 to 2016

Main implementing organisation(s)	Sustainability initiative
	<i>Network, association and platform initiatives</i>
World Cocoa Foundation (WCF)	Livelihood programme Cocoa Link WCF Empowering Cocoa Households with Opportunities and Education Solutions (ECHOES) WCF African Cocoa Initiative (WCF/ACI) is a public-private partnership, bringing together WCF, cocoa industry members, the Sustainable Trade Initiative (IDH) and U.S. Agency for International Development through its Global Development Alliance Certification Capacity Enhancement (CCE) project African Cocoa Initiative (ACI) African Cocoa Initiative (ACI)
International Cocoa Organisation (ICCO)	Capacity Building Programme on Pesticides Residues and other Harmful Substances in Cocoa in Africa Cocoa productivity and quality improvement: a participatory approach Analysis of the value chain in cocoa producing countries Cocoa germplasm utilisation and conservation: a global approach Improvement of cocoa marketing and trade in liberalizing cocoa producing countries Supply chain management for total quality cocoa: pilot phase Pilot Project on Price risk management for cocoa farmers Preventing and managing the spread of cocoa pests and pathogens: lessons from the witches' broom disease Capacity building programme on pesticide residues and other harmful substances in cocoa in Africa Cocoa of Excellence: promoting diverse high quality cocoa origins SPS capacity building in Africa to mitigate the harmful effects of pesticide residues in cocoa and to maintain market access
National Confectioners Association, CAOBISCO, ECA & farmers	Regional Trade Associations and their memberships
UNDP Green Commodities Facility	Green Commodities Facility, Cote D'Ivoire Sustainable Cocoa Initiative NORAD, World Cocoa Foundation (WCF), International Cocoa Initiative (ICI), Echoes - Youth Education and Livelihoods Programme, UNDP and the Associations of Chocolate Manufacturers from Denmark, Finland, Norway and Sweden
ILO	International Cocoa Initiative
	<i>Voluntary standards schemes</i>
UTZ (+ Solidaridad)	UTZ certification

Rainforest Alliance (+ GIZ)	Rainforest Alliance certification
Fairtrade (+ Agro Eco Louis Bolk Institute & Rabobank, the Dutch structure Control Union for organic certification and FAIR TRADE)	FairTrade certification
Organic (+ Agro Eco Louis Bolk Institute)	Organic certification
<i>Corporate sustainability initiative</i>	
Cargill, ADM, Barry Callebaut, Armajaro-CI, Outspan, Ecom, CEMOI & farmers	Corporate programmes with consultants, cabinets, ANADER
Olam International and Blommer Chocolate & farmers	Alliance between cocoa farmers in Ivory Coast, Olam International and Blommer Chocolate
Mondelez (Cadbury), Conseil du Café Cocoa (CCC), CARE farmers	Cocoa Life programme to help farmers increase sustainable cocoa production and create thriving communities
Nestlé & farmers	Cocoa Plan, Action plan responsible sourcing CNRA under the initiative of creating added value
Kraft Foods and Hans Neumann Stiftung & farmers	Sustainability alliance with Rainforest Alliance Market Oriented Promotion of Certified Sustainable Cocoa
Mars & farmers	Sustainable Cocoa Initiative (Cocoa Development Centers (CDC) and Cocoa Village Clinics (CVC): rehabilitation of old and aging farms with good planting material, soil fertility management, solid agricultural practices including pest and disease control IMPACT project with Government of Cdi, ICI, AIECA, AFRICARE, SOCODEVI, STCP, Rainforest Alliance, IFESH, INADES, BFCO
ADM, Barry Callebaut, Cargill, Ferrero, The Hershey Company, Kraft Foods, Mars Incorporated, and Nestlé & farmers	Framework of Action: Harkin-Engel Protocol (Responsible cocoa) and industry partnership and Public Certification: development of a public certification process.
<i>Partnerships</i>	
Sustainable Trade Initiative (IDH) & private sector partners (Cargill, Ecom, Barry Callebaut CEMOI, Mars)UTZ, Rainforest Alliance	Cocoa Improvement program, Cocoa Productivity and Quality Programme (CPQP), Soil Fertility Program
Signatories include governments and representatives of the cocoa industry and witnesses include social activists, NGOs and labour unions	International Cocoa Initiative (ICI) to eliminate the worst forms of child labour and forced labour and the Harkin Engel Protocol
Mars Incorporated, Hershey Company, Kraft Foods and Armajaro Trading	Agriculture Development Programme (CAADP)
Institut Européen de Coopération et Développement IECD/Cargill/M AH, Dutch Ministry of Agriculture, ANADER IECD, PEFACI; Ministry of Agriculture, Department of Animal Production, Ministry of Education, Plate-forme des Ecoles Familiales Agricoles de Côte d'Ivoire (PEFACI)	Projet Ecoles Familiales Agricoles (EFA)
GTZ/GIZ, USAID, ANADER, STCP, Kraft, Armajaro	Market-oriented promotion of certified sustainable cocoa production Côte d'Ivoire (2005-2009)
International Institute for tropical Agriculture (IITA) + USAID, Primature, MINAGRI, CGFCC, FIRCA, GEPEX, ANADER, CNRA ONG, BFCG, INADES, SOCODEVI, Rainforest Alliance, BFCO; GTZ, Technoserve	STCP (Sustainable Tree Crop Programme)
CIRAD & CEMOI	Creation of the cocoa centre of fermentation and sun drying
ICRAF (World Agroforestry Center)	Vision for change Farmer training programme
Tulson Payson Center	Annual Survey of Child Labor in the Cocoa-Growing Areas of Ivory Coast and Ghana.
FAFO	Research Programme on Trafficking and Child Labour. Child labour and cocoa production in West Africa Côte d'Ivoire Sustainable Cocoa Initiative (CISCI)
<i>Government initiatives</i>	
GIZ	Programme de Développement Economique en Milieu Rural (PRODEMIR)
USAID	Towards Child Labour Free Cocoa Growing Communities in Ivory Coast and Ghana through an Integrated Area Based Approach
Ivory Coast Exportation Professional Association (APEXCI), Cocoa & Coffee Interprofessional Board (CICC), Raw Materials Interministerial Board (CIMP), CAISTAB	Implements National Development Plan and regulate all activities of coffee-cocoa sectors
Ministry of Agriculture	Fonds Interprofessionnel pour la Recherche et le Conseil Agricole (FIRCA)
Cocoa and coffee management Council/ Conseil du Café Cocoa (CCC)	Ivory Coast quality cocoa control programme National Programme of Fight against disease of the Cocoa Swollen Shoot
Centre National de Recherche Agronomique (CNRA)	National agricultural centre conducting agronomical research
SOCODEVI, ANADER; NGOs; cooperatives	Mutual and cooperative partnership programme (PPCM)

National Agency for Rural Development (ANADER)	Extension services, promotion of farmer's skills and entrepreneurship by designing and implementing appropriate tools and conducting agricultural extension services. Fight against disease Swollen Shoot (Pilot Project) Project certified sustainable cocoa production
Information Programme on the Cocoa and Coffee Markets (PRIMAC).	Programme for the intensification of local processing 50% of the overall cocoa production in the year 2005, etc.
Ministry of Agriculture	Master Plan for Agricultural Development 1992-2015 (PDDA)
Comité de gestion de la filière <i>Café Cocoa</i> (CGFCC)	Cocoa-related institutions
Ministry of Agriculture	Member of COPAL (Alliance of Cocoa Producing Countries), COPAL activities
<i>NGO initiatives</i>	
Oxfam	Behind the Brands - Cocoa Case Studies
World Vision	Anti-Child labour campaigns
Solidaridad	Cocoa Improvement Programme

In the Ivory Coast, the baseline studies (Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, Waarts et al. 2014, Ingram, van Rijn et al. 2016) comparing certified with non-certified farmers, indicated a similar situation to Ghana of mainly older, men involved in cooperatives and certification. The rapid up-scaling of certification and related activities since 2008 was found, with most farmers receiving training and certification activities and a proportion benefitting from access to crop protection products, fertilisers and seedlings, and community and social programmes. Perceptions were that the quality of training has been variable and lacks minimum standards. Generally higher knowledge levels and improved implementation of record keeping were positively related with increases in farmer productivity. Overall, higher knowledge levels were positively related with improved implementation of GAPs. For specific GAPs (waste management, soil management, water and biodiversity protection), no positive correlation was found. No relationship was found between the implementation of GAPs and post-harvest practices and bean quality. Yields and profitability at farmer and cooperative level are low. By revitalising the sector, certification appears to contribute to making cocoa farming more attractive. Other outcomes of certification was that it provided a means to rapidly upscale sustainable (certified) cocoa production and allowed farmers to access certified markets where they can benefit from premium prices. Certification promoted professional producer associations which farmers perceive as providing a range of benefits, although some of which farmers and cooperatives indicated could be improved. Farmers indicated the certification and associated interventions led to increased productivity and income. 82% of farmers indicated an improvement in their living conditions since participating in certification and 92% of farmers indicated positive changes after certification. Farmers believe that higher incomes from participating led to a larger proportion of the cocoa income given to their spouses, and being used to meet basic family needs, and for children's schooling. Farmers' incomes appeared to increase with certification, but farmers had concerns about the long term viability of cocoa farming and possible discontinuation of the premium for certified cocoa. About 50% of farmers said income increased since certification, with net household income from cocoa for certified farmers on average 1,535,000 CFA (2,343 €) and for non-certified farmers' 1,318,000 CFA (2,013 €) in 2012. The longer farmers participated in the UTZ programme, the higher net income they earned. Programme participants and UTZ certified farmers do not earn a significantly higher net income than non-certified and control group farmers. Average production costs for UTZ programmes participants were 152 CFA per kg, compared to 129 CFA per kg for farmers not participating. The length of participation in the programme did not influence production costs. Average production of UTZ programme participants was 453 kg per hectare, for the comparison farmers 329 kg per hectare, certified farmers have higher yields (467 kg hectare) than non-certified farmers (315 kg per hectare). Cocoa farming formed on average 79% of total gross household income and was the only or the main source of cash income for most farmers.

2.3 Conclusion

The case shows that sustainability interventions in cocoa, such as voluntary sustainability standards, predominantly UTZ Certification and Rainforest Alliance certification accompanied by supporting corporate initiatives, have been extensively scaled up by international traders in Ivory Coast and Ghana. Voluntary standards were later combined with initiatives financed and implemented by government agencies, trader's corporate initiatives, by CSOs and NGOs and network, platform and associations. The outcomes for farmers' incomes, cocoa productivity, farmer's and farm worker's living and working conditions, agricultural practices and environmental effects have been mixed and generally modest, compared over time and compared to outcomes experienced by non-certified farmers in similar agro-ecological regions. The five main farmer clusters found indicate that as most initiatives have been aimed either at all farmers in a producer group, or 'self-selecting' farmers who respond to participate to an initiative, a possibly more effective option could be to invite only targeted farmers with specific profiles to participate in sustainability initiatives.

3. Future trends

Trends matter. Identifying trends can contribute to solve some of the challenges confronting the cocoa sector. Confronted with global forces shaping the cocoa value chain, many stakeholders assume that their ability to sculpt the future is minimal. Whilst changing a demographic trend or widespread shift in consumer consciousness can be difficult, reacting to such forces or, better, anticipating them can be advantageous. Ignoring trends can be perilous.

3.1 Trends in sustainability initiatives

Sustainability initiatives in the cocoa value chain have been dramatically upscaled through replication, extension, horizontal and vertical scaling. This has resulted in an increased number of private sector, as well as civil society organizations, adopting and supporting sustainability initiatives. The coverage of these initiatives has also been significantly scaled up, in terms of the market share of "sustainably produced" products, production volumes, the numbers of farmers and their organizations producing cocoa in a sustainable way, and the area of cocoa produced using sustainable production methods. The location and extent to which

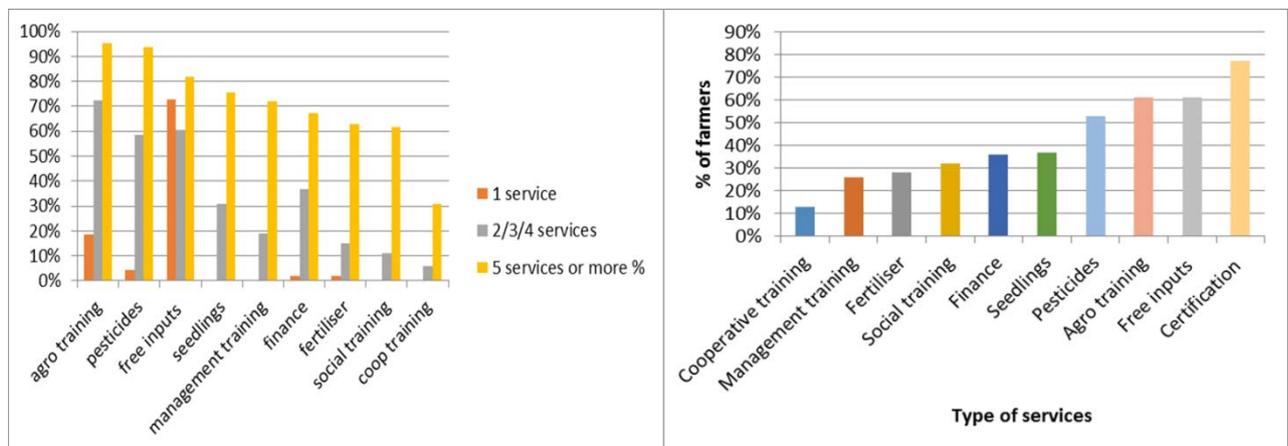
market and technical information is disseminated along the chain has been a key element in determining the balance of power between farmers and processors, with power is mostly concentrated among the large processors and traders.

VSS emerged in the shade-grown production systems of Latin America (notably Organic production), Fairtrade, Rainforest Alliance and UTZ cocoa and have rapidly expanded into mainstream markets in full-sun production systems in West Africa and Indonesia. This development shows promise for the continued growth and relevance of VSS to the two main convergent and challenges of systemic poverty fuelling, among other things, the historical use of unacceptable labour practices and supply based on old trees and exhausted soils, threatening overall global supply. As cocoa purchase is dominated by the global North with a history of promoting VSS (notably the Netherlands – but expanding to other among consumer countries) this points toward continued growth prospects for standard compliant cocoa (Potts, Lynch et al. 2014). With cocoa supplies tight and overall prices relatively high, the current market situation provides an opportunity for increased investment in the sector toward more sustainable practices, and high prices allowing costs of transitioning to sustainable practices to be absorbed and not passed onto consumers (Potts, Lynch et al. 2014). However, to date the largest share of costs of the transition to sustainable cocoa has been borne by farmers, with a proportion of costs carried by traders (Victor, Gockowski et al. 2010, Kessler, Brons et al. 2012, Beukering, Drunen et al. 2013, KPMG Sustainability 2013, Waarts and Kuit 2014). This is despite the largest share of value adding remaining within the later stages in the chain in manufacturing (32%), retail and taxes (44%), in contrast to 6.6% of value with farmers (Fountain and Hutz-Adams 2015), There remains also a significant gap between existing production levels of standard-compliant cocoa and actual sales, and the implementation of commitments to purchase sustainable cocoa (Fountain and Hutz-Adams 2015).

Sustainability initiatives have resulted subtle changes in power, with in an increase in the provision of technical information, disseminating good agricultural practices through strengthened farmer organisations. As more large scale professional farmers emerge, particularly in Latin America, different models have arisen, with a focus on sustainable high quality, speciality niche products and bean-to-bar brands (Naprta 2015, Abdulmalik, Ingram et al. 2016).

The majority of sustainability initiatives are directed at countries supplying the consumer markets in Europe, the North America and Australia. This is the result of the importance placed upon sustainability issues in Europe, as a result of increasing consumer awareness. In emerging wholesale and consumer markets (e.g. Brazil, China, India and other emerging economies) sustainability issues often do not have the same level of importance, which decreases the motivation to upscale sustainability initiatives. One clear trend has been the harmonisation between standards and a move to “certification plus”, looking beyond certification as the silver bullet to solve all of the challenges in cocoa (Barrientos 2011) to certification plus and an increasingly broad range of service delivery by traders and partners, including origin and consumer governments. Figure 5, shows how in Ivory Coast in the last five years, up to ten services have been offered to producer organisations, with the majority offering five or more services together as a package. Most of these are open to all farmers in a producer group. Governments, particularly in consumer countries, have been stimulated by consumer pressure to contribute to more a sustainable cocoa value chain, mainly through facilitating, and mandating policy instruments, rather than regulatory mechanisms (Ingram, Luskova et al. 2016). There are also debates about how and if certification and services marginalise some types of farmers, especially the poorest and should be more inclusive – not just on the largely male farm owners, but also women, youths and workers.

Figure 5 Range of services provided by traders to cocoa producer organizations, Ivory Coast 2012-2017



Some standards in some situations have created welfare gains (Potts, Lynch et al. 2014) but also distributed rent which induces lobbying by interest groups to set the standards at their preferred level. The number of sustainability initiative impact studies has increased and the ways and metrics in which impacts are being measured is being harmonized to be comparable (such as the World Cocoa Foundation’s CocoaMAP cocoa measurement and progress framework based on key performance indicators, work springing from ICCO’s Direct Dialogue Workshop on Certification in 2014 (ICCO 2014), and work by ISEAL Alliance on common core indicators and the Committee on Sustainability Assessment) (Blonk, Scholten et al. 2010, COSA 2013, Maytak 2014, World Cocoa Foundation 2016). However, only a limited number of studies from around the world are available that can be used to reach conclusions on the impact of certification: with reported, observed and measured impacts not being solely attributed to certification, as contract arrangements between traders and farmers also play a role in achieving social, economic and environmental impacts (Kuit and Waarts 2014). Because the counterfactual (“what would have happened with the sustainability initiative”) is seldom rigorously evaluated, most existing research cannot say much about possible causation. A number of studies of sustainability initiatives, largely certification in the main producer countries, provide contradictory evidence (COSA 2013). These factors combine to make it difficult to distinguish socially desirable standards from those resulting from political rent-seeking (Swinnen 2016). Evidence on the impacts of the three other types of initiatives: partnerships, corporate and NGO is

largely either lacking or ad-hoc, and often not scientifically robust. Until (Swinnen 2016) comparable research on the impacts of sustainability initiatives can be measured, most of the fact-based conversations in the sector have revolved around estimates of cocoa household incomes, making it hard to accurately indicate the gap between current and desired income sufficient for a decent standard of living (Fountain and Hutz-Adams 2015). These discussions have led to more individual farmer specific targeted interventions that continue to revolve around voluntary sustainability standards and certification but also look at livelihood diversification. The extent to which this is counterproductive for trader interests in securing supply has however questionable. With the realisation that certification cannot solve some of the most controversial problems such as farm gate pricing, child and slave labour – policies and regulatory mechanisms are being explored. There are also increasing attempts to link sustainability initiatives, especially farm-based certification, to other larger spatial scale orientated sustainability schemes such as landscape approaches, zero deforestation initiatives and reducing emissions from deforestation and degradation (REDD+).

Standards have played an important role in food trade for long. Their rapid growth has triggered vigorous debates on their impacts on international trade and development, with an argument that standards form non-tariff barriers to trade, resulting in differing adoption globally and reluctance of governments to make adherence to standards a legal requirement, instead relying on facilitating them as voluntary, corporate social responsibility measure (ITC 2012). A result is that sustainability practices in the field can differ widely (Ruben 2008, Resolve Inc. 2012, International Trade Centre (ITC) 2010).

3.2 Research trends

A survey of cocoa research (Ingram, Jansen et al. 2014) highlights that there are research gaps in genetics and breeding, soil fertility, productivity and climate change. Areas for collaboration noted by respondents include sustainability indicators, standards and guidelines, data sharing and publishing data. The respondents indicated need to assess why over 50 years research on cocoa has not been able to solve the challenges and create more impact to date; the need to prioritise research themes, make data more widely available and translating data into (more) user friendly formats; provide and maintain a map/inventory of which research institutions and researchers are doing what, where and with who; to link up cocoa research with other related and applicable research fields; and to collaborate on contributing to key performance indicators (KPIs) developed by national platforms, making appropriate recommendations when required. The survey revealed the priority research lines (and their links to the themes in the 2012 Abidjan Declaration (ICCO 2012)), shown in Table 3 Priority research themes in cocoa

Table 3 Priority research themes in cocoa

Priority	Research lines	Key themes
1	<i>Vulnerability and productivity</i> Production sustainability	<ul style="list-style-type: none"> • Production systems, performance and risk management • Production system diagnostics and gaining productivity increases • Breeding, productivity, resistance and quality • Pest and disease spread, control and monitoring, management, and early warning systems • Fertiliser and pesticide usage and effects • Land tenure and impact of technology transfer • Increasing productivity (optimising pruning) • Exchange of (new) germplasm by grower governments and improving supply of vegetative material/seedlings
2	<i>Diversity and sustainability of production</i> Production sustainability	<ul style="list-style-type: none"> • Sustainable intensification (including labour requirements) and optimising subsequent effect e.g. upscaling, finance • Assimilating cocoa into total food crop systems • Genetics, national and local Genetic variations • Sensory and organoleptic attributes & regional specificities • Sustainability of production (certification standards & costs) and costs (true price for farmers, industry & governments) • Diversification (crop/income) combined with intensification, impacts (yields, incomes) and costs • Effect of reducing child labour and optimising children's education • Strategies to increase youth farming/involvement • Social, economic and ecological diversity and resilience farmers, production systems, environment, organisations & chains
3	<i>Market transformation and transparency</i> Sector strategic management	<ul style="list-style-type: none"> • Market/chain interactions and economics • Chain of custody and certification • Rural transformation • Increasing gender equity in cocoa farming and inclusiveness of benefits • Transparency of profits and prices along the chain • Governance structures to increase transparency
4	<i>Quality and new business models</i> Consumption & chain sustainability	<ul style="list-style-type: none"> • Quality prognosis and improvement • Risk management (farmer and industry, farm economics, financing) • Production, processing and chain models, their efficiency and impacts • Models to effectively & efficiently upscale access to farm inputs, credit and other services • Models to develop the fine flavour market further • Perceptions (farmers, industry, researchers) of intervention logic of new models • Social-economic aspects of cocoa production¹ • Understanding consumer demands • Value adding at producer country level • Increasing/improving use of cocoa by-products • Enhancing the use of 'big data' and sharing data – particularly for monitoring & evaluation and impact assessment • Why do differences in implementation occur in practice? • Impact of research
5	<i>Service delivery and concerted action</i> Industry chain sustainability & Sector strategic management	<ul style="list-style-type: none"> • Effectiveness of service delivery to small holders - including extension services and ability/capacity to deliver services • Models of and impact of concerted and collective action • In field practical training on the application of (new/improved) technologies • Governance models impact on service delivery and concerted action on production and quality • Scale and connectivity

The challenges in the sector combined with growth in demand and new markets have encouraged researchers to look again at persistent problems such as tree genetics, improved soil fertility, pests and diseases and productivity. They have also opened up new avenues for more multi-disciplinary collaborations and research on cocoa and chocolate economics and markets – particularly for niche, high quality and speciality chocolate products; climate smart cocoa; living income for cocoa farmers and workers; health aspects – such as the growing preference for as dark chocolate; credibility of sustainability claims; transparency on traceability in the chain- linked to both food safety; sustainable production conformity with certification standards and a particular focus on labour rights (child and slave labour).

4. Summary

Sustainability initiatives, particularly voluntarily introduced by companies, NGOs, CSOs and groups, associations and partners of one or several types of organisations of have developed in response to the multiple problems and challenges in producing cocoa in economically, socially and environmentally sustainable way. Such initiatives has sometimes been mandated, supported or facilitated by governments, seeking to avoid regulations, particularly given global trade nature of the cocoa chain and fear of introducing tariffs or non-tariff barriers to internationally traded cocoa and chocolate products. Despite a growing number of

¹ Participants indicated that socioeconomic aspects should be a higher priority than indicated in the survey results.

studies on the impact of different initiatives, particularly scientifically robust impact evaluations of VSS, until comparable research on impacts of sustainability initiatives is produced, evidence of how effective and efficient sustainability initiatives actually are in solving the entwined social, economic and environmental problems besetting the cocoa sector. This calls for more concerted, multi-disciplinary collaboration among researchers to provide a much needed reality check of what is working, where, when, how, and why in terms of sustainability initiatives. Better information on the impacts of sustainability initiatives can help drive uptake, with VSS being one avenue to provide a standardised, credible, verifiable roadmap for sustainability which can result in measurable progress. This has two implications - particularly for scientists – of the need for much more intensive collaboration with public, private and civil sector to gather evidence about on-the-ground impacts, high quality outcomes and measurable progress. Second, is for policymakers - again supported by the research community - to experiment with a wider range of instruments to increase cocoa value chain sustainability alongside voluntary initiatives. For example, consumer awareness campaigns help stimulate demand for sustainable products. Fiscal and monetary instruments, such as lowering trade barriers and providing tax advantages for sourcing and supplying sustainable certified products are little used could stimulate for further upscaling, help to solve barriers such as the (high) costs of participation in voluntary initiatives and uncertain level of return on investments in sustainability schemes. Currently no legislative instruments favour imports of sustainable cocoa, due the complexities of world trade agreements, however they could create a more level playing field for importers and exporters. A wider range of instruments could contribute to upscaling, particularly when applied more at international and pan-regional level.

5. Where to look for further information

The [ISEAL Alliance](#) is an umbrella organisation open to all multi-stakeholder sustainability standards and accreditation bodies that demonstrate their ability to meet the ISEAL Codes of Good Practice and accompanying requirements, and commit to learning and improving. Many of the largest cocoa voluntary sustainability standards are members of ISEAL. ISEAL has developed codes of good practice for standards on credibility Principles, standard-setting, impacts, assurance, independent evaluators and in claims and labelling.

The [ITC Standards Map](#) provides searchable overviews of 234 standards, codes of conduct and audit protocols worldwide addressing sustainability in supply chains and currently has data on 68 standards concerned with cocoa.

The [Sustainability Impacts Learning Platform](#) is collaboration between the Food Lab, ISEAL, and WWF and is intended to facilitate increased knowledge-sharing, collective learning, and collaboration towards increased sustainability in global supply chains. Researchers and practitioners active in the field, including cocoa, are encouraged to contribute their studies to an interactive, searchable global map and use it to learn from and connect with others doing similar work.

The International Cocoa Organization [ICCO](#) is a global organization composed of cocoa producing and cocoa consuming member countries. Recently located to Abidjan, Ivory Coast, ICCO was established in 1973 to put into effect the first International Cocoa Agreement negotiated in Geneva at a United Nations International Cocoa Conference. There have since been seven Agreements, the 7th International Cocoa Agreement came into force provisionally in 2012. Their website provides cocoa production and price statistics, latest global news, basic cocoa information on growing and processing cocoa, pests and diseases, health and nutrition, cocoa trading and a searchable database on projects supported by ICCO.

[Cocoa Connect](#) is a digital platform to share, meet and learn for sustainable cocoa. Cocoa Connect is a knowledge broker and provides space to learn the socio-economic domains of sustainable cocoa: farmers and production, chains and relations and markets and policies and a more technical knowledge domain under crops and soil. The site contains documents in an online repository, news items and matchmaking between organisations and individuals and hosts working groups on gender and fine flavour.

The Linked-In [International cocoa researchers group](#) provides a space for researchers from all disciplines conducting research on cocoa to link up to ensure the visibility of scientific evidence about cocoa, and provide a channel for its application to contribute to solve challenges in the cocoa sector. The group aims to bring together researchers at international fora and dedicated research conferences as well as regional and thematic exchanges.

The [World Cocoa Foundation](#) is an international membership organization that promotes sustainability in the cocoa sector by providing cocoa farmers with the support they need to grow more quality cocoa and strengthen their communities. Representing more than 80 percent of the global cocoa market, WCF's programs works with farmers in Africa, Southeast Asia, and the Americas. The [knowledge centre](#) provides a searchable range of media resources, including research documents and updates, resource manuals, reports, videos, meeting minutes and presentations.

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