TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

The Social Impacts of Cocoa Production

A Systematic Review

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Executive Summary

Cocoa beans are a major agricultural commodity with an export value of almost US$ 10 billion in 20191. Cocoa production is largely concentrated in Western Africa, Latin America, and Southeast Asia (Fairtrade Foundation 2020). It creates important revenues for countries such as Cote d'Ivoire, Ghana, Nigeria, and Cameroon, who together have a market share of 74% of total cocoa bean production (Fountain and Hütz-Adams 2020). About 90% of the world's cocoa is grown by smallholder farmers and close to 50 million people depend on cocoa for their livelihood (Weiligmann et al. 2010). Although cocoa has proven to be a significant contributor to GDP for producing countries, there are also negative socio-economic impacts associated with it that hinder the sustainability of its production and trade (Nkamleu et al., 2010).

Such negative impacts have been tackled by various policy and private sector initiatives which are designed to encourage sustainable and fair cocoa trade and production. These policy and initiatives, called here with the more general term "interventions", include certification initiatives, corporate responsible sourcing, producer support, public sector regulation and policy, and multi-stakeholder governance initiatives. This report focuses on interventions implemented mainly by civil society organization that directly affect cocoa farmers, which primarily comprise cocoa certification schemes, farmer's cooperatives and other types of contract farming which aim to shorten the value chain and training that focus on modifying agricultural practices and implement agroforestry.

This report, as part of UKRI GCRF TRADE Hub's work on the impact of global agricultural trade on people, presents a systematic literature review of the direct social impacts of cocoa agricultural production for trade. The report employs the concept of multi-dimensional well-being to classify the various direct social impacts that have been found in the literature.

The main findings of the review are:

1. The empirical evidence of direct social impacts is overall positive especially regarding material well-being dimensions such as living standards and income, but some negative impacts are reported especially when trade-related interventions are not in place. Other tangible dimensions such as nutrition and health are less studied, and the evidence recorded shows a mixed picture of impacts which includes both negative and positive impacts.

2. The empirical evidence for trade-related interventions, including training on agricultural practices, the creation of cooperatives and implementation of certifications such as FairTrade and UTZ/Rainforest shows a clear picture of positive impacts associated with production and trade of cocoa (cf. section 3.1 and table 5 for detailed results).For example, certification schemes seem to have a positive impact on reducing child labour and engagement of children in hazardous tasks (Ingram et al., 2018, Gockowski et al., 2006)

3. Trade-related interventions have a positive impact mainly on living standards and income by ensuring higher and more stable income, however most of the evidence does not provide a comparison of this income to the cost of living and/or poverty line, so that contributions to SDG1 and poverty reduction remain unquantified.

[1] https://oec.world/en/profile/hs92/cocoa-beans

4. The evidence base is mainly focused on cocoa producers, e.g., Ghana and Cote d'Ivoire and it employs mainly quantitative methods to assess impacts. As such, the analyses are focused on well-being dimensions that can be easily measured with quantitative methods but leave out more intangible dimensions such as social relations and freedom of choice.

Further research on identifying how different dimensions of well-being are impacted by cocoa production is needed, especially to understand the trade-offs among well-being dimensions that are affected by an economic development based on international trade. Further research is also needed to understand the impacts across all well-being dimensions and to explore the role of income increase in relation to well-being outcomes.

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1. Introduction and background

Cocoa beans are a major agricultural commodity with an export value of almost US$ 10 billion in 2019[2]. This creates important revenues for countries such as Cote d'Ivoire, Ghana, Nigeria, and Cameroon, who together have a market share of 74% of total cocoa bean production (Fountain and Hütz-Adams 2020). Most of the world's cocoa is grown by smallholder farmers, with most farms smaller than 5 ha, and close to 50 million people depend on cocoa for their livelihood (Fountain and Hütz-Adams 2010). Despite the large export values, cocoa farmers often work below living income levels (Waarts et al., 2019), and get only between 40 to 50% of the world market price and 6% of the price of chocolate paid by final consumers[3]. Moreover, cocoa market prices are volatile and depend on weather patterns, pests, pesticide and fertiliser prices and availability, as well as political stability, and speculative trading (Sellare et al., 2020). Cocoa production also makes use of child labour leading to detrimental effects on the child's education and health (Nkamleu et al., 2006; Mull et al., 2005). Child labour affects the ability of children to go to school while expose them to hazardous agrochemicals used on farms and chemicals risks are poorly managed through the use of PPE equipment (Nkamleu et al., 2006; Mull et al., 2005).

The impacts of cocoa production on deforestation and biodiversity loss have been discussed widely (Asigbaase et al. 2019). Deforestation for establishing cocoa plantations leads to land fragmentation, loss of wildlife corridors, and forest connectivity (Kroeger et al., 2017). Much of cocoa production occurs in so-called biodiversity hotspots. Soil loss is another issue, not only leading to stream sedimentation, but also to declining yields (Tondoh et al. 2015). Climate change is expected to make planting and maintenance of cocoa trees more difficult, and potentially shift cocoa production areas (Schroth et al. 2016). To address such issues, different organisations and companies promote agroforestry, sustainable intensification, and climate-smart cocoa practices, with mixed success (Franzen et al. 2007, Gockowski et al. 2013, Vera-Vélez et al. 2019).

Moreover, critique from consumers toward chocolate companies who cannot guarantee that their cocoa has provided fair incomes and is free from child labour is growing (Berlan 2013, Ansong 2020). In response to this, various trade-related interventions ranging from government regulation to private sector pledges, to certification have been adopted (Voora et al. 2019). The participation of smallholder farmers in certification schemes is increasing, and four standards (UTZ, Organic, Fairtrade and Rainforest Alliance) certify around 25% of the area in which cocoa is produced (Willer et al. 2019). However, lack of upscaling, monitoring and enforcement, traceability, and accountability in the supply chain, as well as the voluntary nature of initiatives, mean that poverty among cocoa farmers remains a systemic issue (Willer et al. 2019, Fountain and Hütz-Adams 2020).

There is evidence of both positive and negative impacts associated with production and trade of cocoa but given the potential negative impact to people's well-being and livelihoods more information is needed to understand the overall impact of cocoa production on people and how trade, agricultural production and development interventions may influence positively well-being. In this report we undertake a systematic review of both peer-reviewed academic and grey literature to identify the social impacts associated with the production of cocoa beans in producing countries. We focus on all impacts that are empirically measured using the concept of multidimensional well-being. We aim to assess first what are the

[2] https://oec.world/en/profile/hs92/cocoa-beans
[3] http://nl.makechocolatefair.org/issues/cocoa-prices-and-income-farmers

negative and positive impacts associate with trade and production of cocoa and secondly whether broadly defined trade-related initiatives and interventions help to mitigate negative social impacts of cocoa production. To assess the sustainability of cocoa production we map the results of our review to Sustainable Development Goals (SDGs).

2. Methodology

We performed a systematic literature review with the aim to understand the socio-economic impacts associated with cocoa agricultural production and expansion for international trade in the cocoa bean producing countries. The literature review was guided by the following research questions:

1) What tools and metrics are used to assess the impacts of cocoa agricultural production and expansion on population's well-being?
2) What are the impacts of cocoa agricultural production and expansion on people's well-being (direct impacts)?
3) How do these impacts differ across different stakeholders?
4) What are the effects of policy and non-government interventions on direct impacts associated with cocoa agricultural production and expansion?

2.1. Search strategy

The focus of the literature review is on empirical studies measuring direct impacts of cocoa agricultural production with a global focus, i.e., including all producing countries. The review included two main sources of literature: peer-reviewed literature and grey literature produced by NGOs, non-academic institutes, and key trade-related organizations, such as certification bodies and private sector actors.

2.1.1. Peer-reviewed literature

ISI Web of Knowledge's database was selected as the (only) search engine and database to conduct a comprehensive search of the peer-reviewed literature.

For the review on direct impacts, we developed an initial list of search terms by reviewing the terms used in comparable systematic literature reviews on well-being/poverty topics, for instance Roe et al. (2013). The search was refined iteratively through filtering by disciplines, document type (article) and publication years (2000-2021) to gain an applicable and manageable number of hits. The search terms presented in Table 1 generated a refined number of hits of 2,189 for the first abstract screening.

Table 1: Search terms – well-being

Well-being/MPI		Product
"wellbeing" OR "well-being" OR "well being" OR "income" OR "poverty" OR "human well*" OR "nutrition" OR "livelihood*" OR "security" OR "vulnerab*" OR "(social) capital" OR "human capital" OR "asset*" OR "social welfare" OR "social impact" OR "economic impact" OR "welfare" OR "poor" OR "quality of life" OR "well living" OR "living standard*" OR "utility" OR "life satisfaction" OR "prosperity" OR "progress" OR "needs fulfillment" OR "development" OR "empowerment" OR "capabilit*" OR "poverty" OR "happiness" OR "deprivation*" OR "educat*" OR "mortality" OR "wealth*" OR "marginalis*" OR "disadvantage*" OR "*equity" OR "*equal*"	AND	"cocoa" and "cacao"

2.1.2. Grey literature

The strategy for the grey literature search involved using e-libraries and online repositories of key organizations selected from lists that have been developed by comparable systematic literature reviews on well-being/poverty topics, for instance Bottrill et al. (2014)

(https://environmentalevidencejournal.biomedcentral.com/articles/10.1186/2047-2382-3-16/tables/2), and the SSRN repository (https://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm) refined by publication years (2000-2021). Moreover, we searched grey literature across cocoa sector specific sources such as private sector actors, certification bodies, sector-wide multi-stakeholder bodies and NGOs, non-academic research institutes (Table 3). The search of these repositories generated a total number of reports of 514.

Table 2: List of organizations used for grey literature search

International organizations	NGOs
Biodiversity international	Solidaridad
CGIAR	Oxfam international
CIFOR	Africa Cocoa Coalition
FAO	HIVOS
IIED	
IMF	**Non-academic institutes**
IUCN	IDH - trade initiative
UNEP	IISD - International Institute for Sustainable Development
WorldBank	International trade centre
UNCTAD	IITA - International Institute of Tropical Agriculture
AidData	CABI
Care International	International Centre for Trade and Sustainable Development
Conservation Evidence	**Sector-wide bodies**
UNEP-WCMC	ICCO
	World Cocoa Foundation
	Cocoa Agroforestry library

Certification bodies	Private sector actors
UTZ	Mars
FairTrade	Nestle
Rainforest Alliance	Lindt&Sprungli
UN Global compact	Barry Callebaut
	Cargill

2.2. Inclusion and exclusion criteria

The literature was screened using two sequential screening processes. The first step involved screening the article title and the abstract while the second step screened the article content. The exclusion and inclusion criteria used for the first screening process (abstract and title) differed across academic and grey literature, while the criteria for the second screening (article/report content) were the same for the two types of literature.

2.2.1. Peer-reviewed academic literature – first screening

The criteria applied for the first screening (title and abstract):

- Inclusion: Empirical studies that use primary data or present a new analysis of existing secondary data, quantitative and qualitative, based in one or more countries,

and that measure some form of poverty/well-being/resilience etc. at country, sub-national, household and/or individual level, focusing on cocoa production.

- Exclusion: As well as opposites on the above, studies using mechanistic models, scenarios, or attitudinal reviews without providing new empirical data or new analysis of secondary data sources for links between cocoa production and well-being/poverty; existing reviews or meta-analyses; inaccessible papers; non-English papers.

No studies are excluded based upon quality. We assumed that the academic publishing process provides a sufficiently rigorous assessment, though we acknowledge that ideas of what constitutes quality are not homogeneous.

2.2.2. Grey literature – first screening

The grey literature selection included only reports as a document type (and excluded documents such as policy briefs). To screen the grey literature, we used a three sequential screening process. First, we screened the article title, then the abstract and next the article content.

The title criteria involved:

- Inclusion: Titles must mention the relevant product (i.e., cocoa).
- Exclusion: Titles which suggest that the study focuses on chemical or genetic analysis or suggest that the report does not provide an analysis of primary or secondary data (but rather, a review or meta-analysis).

The criteria applied to the abstracts are the same as for the peer-review academic studies.

2.2.3. Second screening

The criteria for the content screening were largely the same as for the title and abstract screening. The reasons for exclusion in the second screening were likely to concern not being empirical, no mention of any link of cocoa to human well-being, and article inaccessibility.

After these steps (Figure 1), 22 academic articles and 8 reports about well-being impacts remained for the analysis.

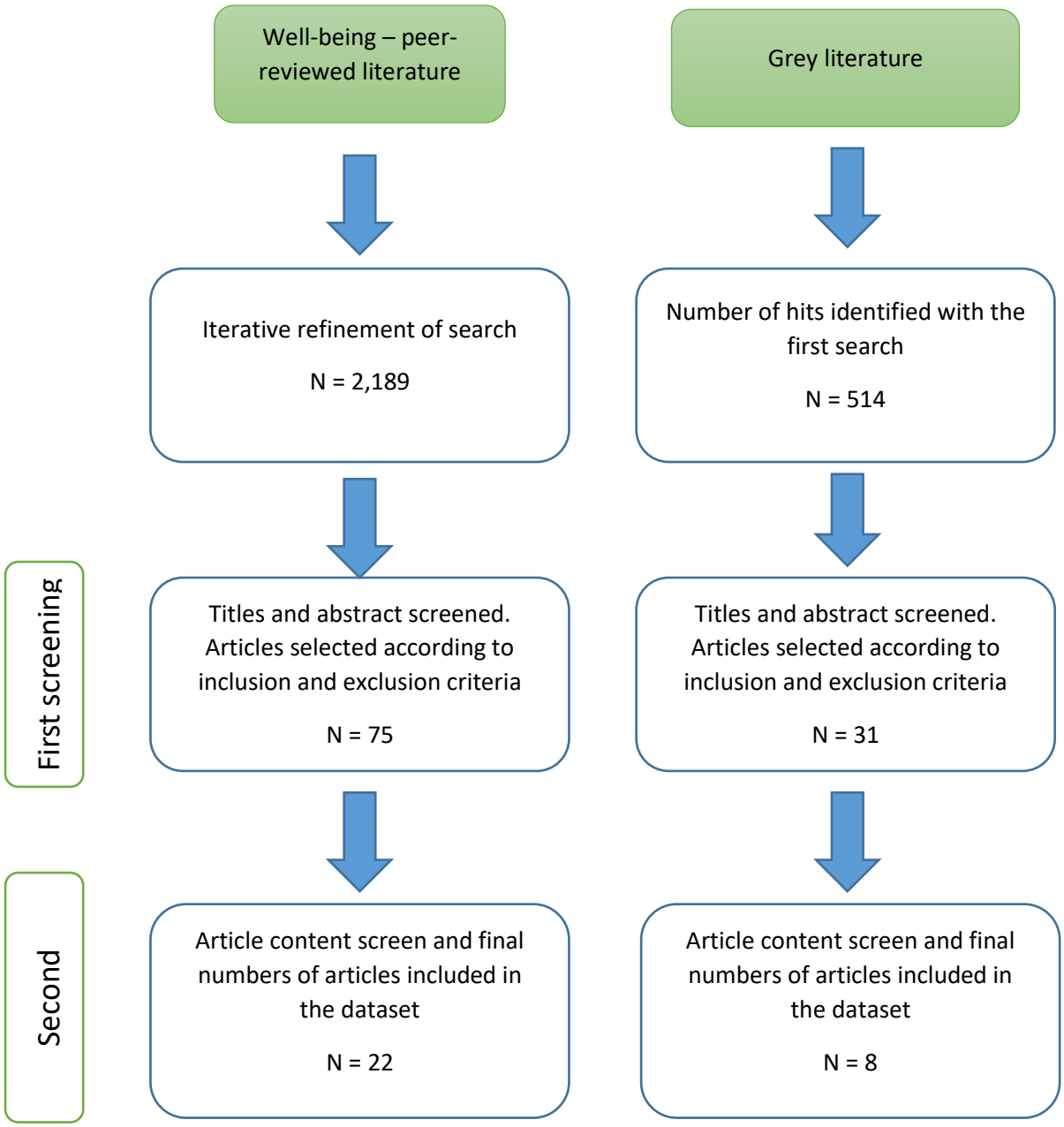

Figure 1: Systematic review process

2.3. Literature dataset and coding scheme

The articles selected after the second screening were included in a literature dataset by first extracting all relevant information using an online survey tool (google form) and next by coding that information in a standardised way such that the literature included could be examined through quantitative methods.

2.3.1. Impacts on well-being (direct impacts)

To classify the direct impacts of cocoa agricultural production and expansion reported in the literature, we employed a multidimensional concept of well-being (Schaafsma and Gross-Camp, 2021; Watts et al., 2019) which includes 9 different well-being dimensions classified as outcomes and 1 well-being dimension classified as output, income (Table 4).

Table 3: Classification of well-being impacts

Well-being dimension – outcomes	Description
Health (physical)	Feeling strong and well; able bodied; and your ability to maintain your health
Food/Nutrition	The ability to provide in your personal and your households food and nutritional needs throughout the year, including food that you buy, produce yourself or collect in the area in and around your village.
Education	The ability to obtain the schooling you want personally, to send your children to school, including the required materials (e.g. books, uniforms, materials, fees)
Living standards	Shelter (adequate flooring, roofing and walls, sanitation, electricity); motorbikes or bicycles; mobile phones; farming/fishing equipment; livestock; safe drinking water; fuel.
Cultural value	Your freedom to conduct traditional, cultural, tribal and religious practices, and spiritual values, including those attached to nature.
Freedom of choice and actions	Your ability to live the life you want, with a sense of power to control and agency over your own life; according to your values and norms; being independent from the goodwill of others; including your livelihood such as a self-sustaining farmer/fisherman; the ability to choose and achieve your goals in life; and your ability to influence decisions that are made by others in your community and beyond that affect your life; to be empowered; a life without discrimination (race, gender, etc.)
Security, safety from other people (Sense of security)	Safety and confidence in the future; peace and harmony – free from harm inflicted by other people, such crime, mugging, physical violence (incl. rape), lack of protection from police, lack of justice.
Living in safety from risk inflicted by nature, and in a clean, healthy environment (Environmental risk)	Extensive harm or psychological stress created by exposure to environmental risk Your ability to feel that your life is safe from droughts, floods, heatwaves, mudslides, storms, tsunamis, earthquakes, etc. Your ability to live surrounded by clean water in rivers and lakes, breathe clean air, i.e., live in a safe and healthy environment free from pollution Your ability to live without suffering crop losses, killings (by elephants, hippos, lions, etc.)
Social relations	Your ability to have meaningful relationships with your family and friends, to have family cohesion and respect within families, communities and external actors, your ability to help or rely on others in times of need. This includes for example your ability to care for, raise, marry and settle children, and to participate fully in society and social events such as celebrations, weddings and festivities.
Well-being dimension – outputs	**Description**
Income/expenditure	change in income or expenditures expressed it in monetary terms

For each article or report, we recorded as a single impact every empirical measure of change in the well-being dimensions described above that was associated with cocoa production. The assignment of measured impact extracted from literature to a well-being dimension was done by the same person who performed the systematic review, based on the definition of each category as presented in Table 1. In some cases, the link between well-being dimensions in Table 1 and impact of cocoa production described in the papers required some interpretation which was performed by the reviewer according to the

information provided in the paper. We recorded the impacts either as positive, negative or no effect. In addition, we collected information about methods, including indicators used and qualitative themes explored, geographical location and scale of analysis of the study, sampling strategy and type of actors involved in the study, as well as the direction of impact for each of these actors when heterogeneous impacts for different actors were reported.

Finally, we mapped the direct and indirect impacts identified in the literature to the Sustainable Development Goals. We compared indicators employed by the literature that we systematically reviewed with the indicators used to monitor progress toward global SDGs (https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/). For this exercise we excluded direct impacts measured using qualitative indicators.

3. Results

3.1. Direct impacts of cocoa production on well-being

3.1.1. Descriptive statistics of the sample

The direct impact dataset is composed of a total of 27 papers and reports published between 2006 and 2021 (figure 2) and includes 69 different impacts on well-being. There are 11 papers that include multiple measures of well-being associated with different dimensions.

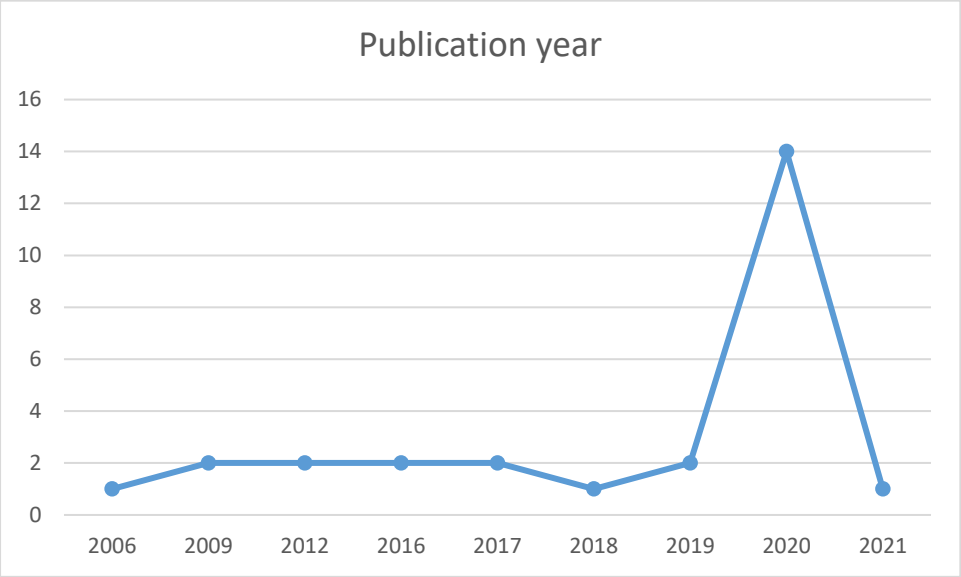

Figure 2: Publication year of studies included in the impact dataset

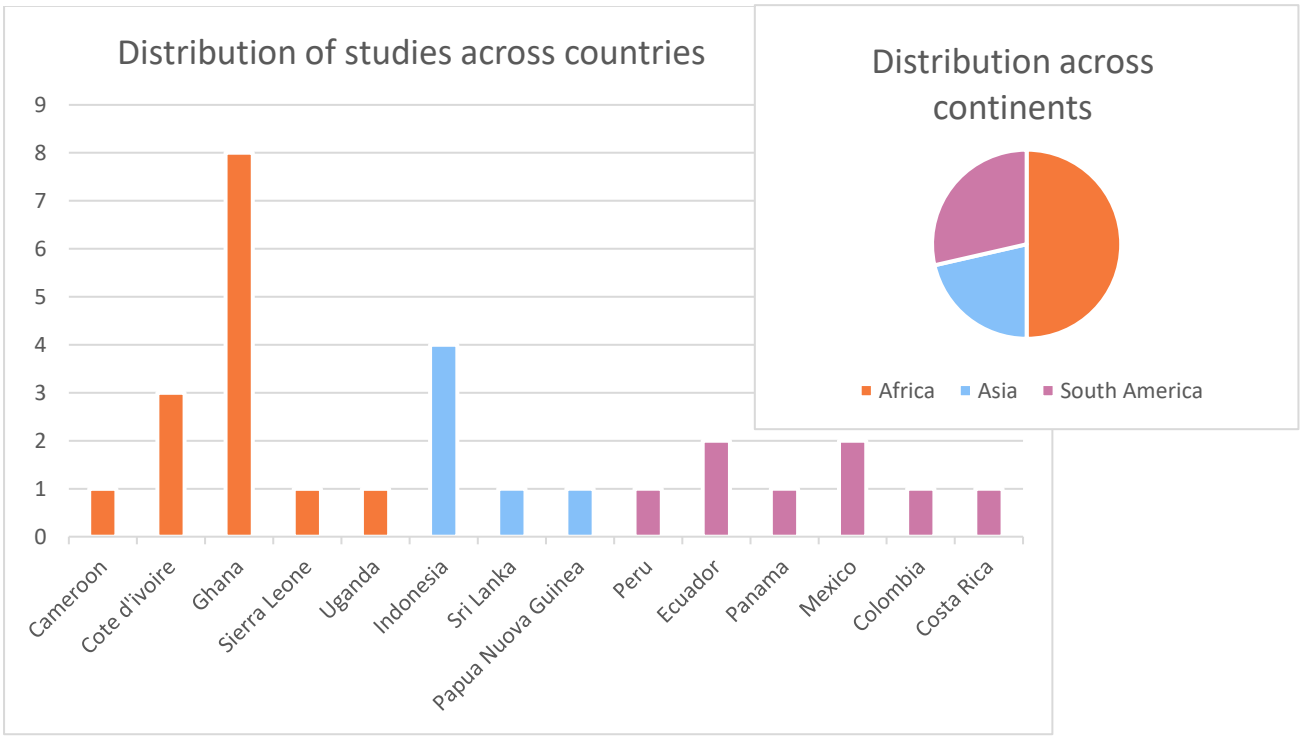

Figure 3: Distribution of studies across countries and continents

Half of the articles assess cocoa production in Africa, with a specific focus on well-being impacts of cocoa production in Ghana, and about half of the studies focus on just three countries (Ghana, Indonesia, and Côte d'Ivoire). These countries are also the three largest cocoa producers globally.

3.1.2. Methods and metrics

Figure 4 shows the number of times that the impact of cocoa production for each well-being dimension has been measured in the studies in our sample. Overall, our evidence shows that the impact of cocoa production and expansion for international trade on well-being is multidimensional, although some well-being dimensions have not been measured at all in

the cocoa literature, i.e., social relations. The dimension that is most often measured is income followed by living standards, which are both dimensions that refer to material needs. Other more intangible dimensions such as cultural value, sense of security and environmental risk are much less studied.

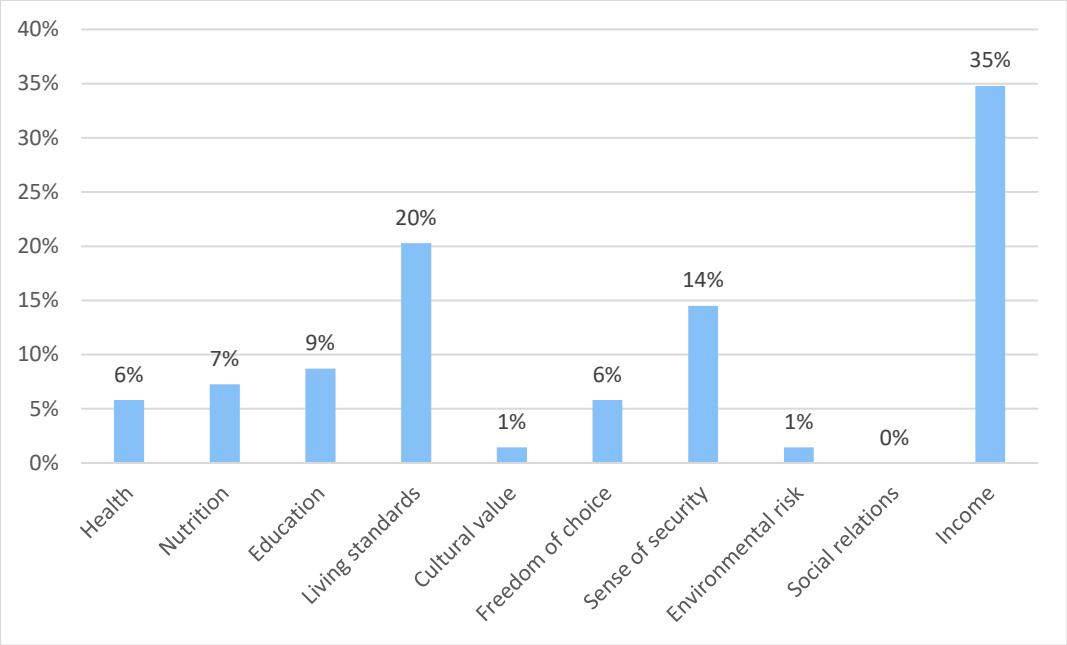

Figure 4: Counts of well-being dimensions measured

Most of the studies focus mainly on impact of well-being for smallholder cocoa farmers (59 entries out of 69 impacts recorded in total) and the role of cocoa production in determining well-being outcomes. Two studies focus on the well-being impacts on cocoa farm workers (Amfo et al., 2020; Mulyoutami et al., 2020), and examine the income, freedom of choice and sense of security dimensions, while one study focuses on the determinants of profitability, for local market intermediaries and it is included in the income dimension (Lenou Nkouedjo et al., 2020).

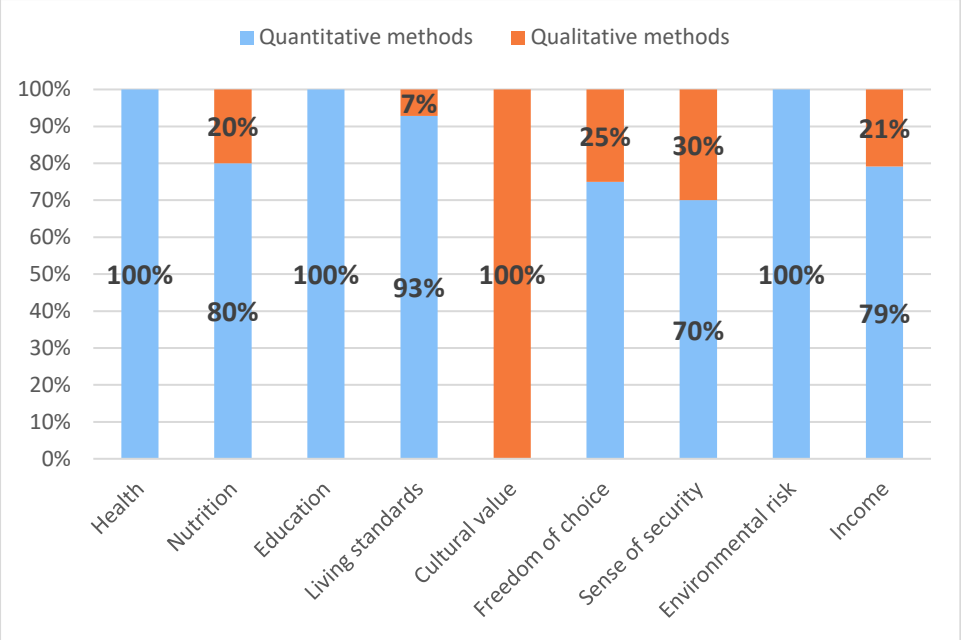

Figure 5: Type of method used in cocoa production social impact studies for each well-being dimension.

Most of the studies included in the dataset employed quantitative methods for measuring well-being impacts (82%) while qualitative methods were used in just eight of the 27 studies selected. The qualitative studies mainly focused on measuring impacts on specific dimensions, as shown in Figure 5, such as cultural value, freedom of choice and sense of security. Most of the reports selected from the grey literature use qualitative methods in combination with quantitative analysis, i.e., in a mixed methods approach, to investigate more tangible dimensions such as living standards, nutrition and income in more depth.

Table 4: Most common indicators used to measure social impacts of cocoa production

Well-being dimensions	Indicator
Income/expenditure	Satisfaction with remuneration
	Satisfaction with working benefits
	Consumption expenditure
	Income (measured in various ways)
	Marketing margins of intermediaries
	Statements from household survey on satisfaction with specific well-being dimension
	Net income per hectare
Health	Under 5 years mortality
	Perceived adequateness of access to health care
	Statements from household survey on satisfaction with specific well-being dimension
Nutrition	Household Food Insecurity Access Scale (HFIAS)
	Adequate amount of food in the last year
	Adequate variety of food in the last year
	Statements from household survey on satisfaction with specific well-being dimension
Education	Access to secondary education
	Household head literacy
	Child less likely to miss school in the last year
	School attendance rates
	Composite indicator based on individual's satisfaction about specific well-being dimension
Living standards	Value of durable goods
	Access to electricity
	Access to improved sanitation
	Access to drinking water
	Assets (standardised list)
	House ownership
	House construction material
	Access to toilette
	Composite indicator based on individual's satisfaction about specific well-being dimension
	Ownership of various goods (mobile phones, radios, tv)
Freedom of choice	Satisfaction with working hours
	Satisfaction with general freedom (to work for others, public holidays, to own a farm, etc.)
	Statements from household survey on satisfaction with specific well-being dimension
	Satisfaction about female participation in decision-making and cocoa production
Sense of security	Knowledge and use of protective equipment
	Satisfaction with health and safety (e.g., provided with PPE)
	Use of Personal Protective Equipment
	Participation rate of children in hazardous tasks
	Knowledge of child labour rights (e.g., minimum age)
Environmental risk	Diversification of farm income to mitigate risks associated with climate change

3.1.3. Direct impacts of cocoa production

Most of the impacts recorded are positive (67% of our sample) and we found a larger number of positive than negative impacts for all well-being dimensions, except environmental risk for which we only recorded one negative impact.

Dimensions such as health, nutrition and education are often studied together with income factors to understand the relationship between income derived from cocoa trade (outputs) and various well-being dimensions (outcomes). Health outcomes such as mortality of children under five years and perceived adequateness of access to health care, measured through household surveys, are examined by Morel et al. (2019) who found that an increase in income does not lead to improvements in these dimensions of health. At the same time, the income derived from cocoa production is likely to be used for supporting access to healthcare, as shown in a FAO report that examines the impact of a farmers training on agricultural practices as well as on business management and marketing in Sierra Leone (FAO, 2009). Most of the farmers interviewed declared that cocoa income is normally used for health expenses and that expected additional income would also be used to that end, indicating a potential positive impact of improved cocoa production and marketability due the project's intervention. However, the report also highlights how the project participants perceived the direct impact on health as negative because of the more intense farming work required by different agricultural practices that may lead to more health problems. On the contrary, Ingram et al. (2018) found that UTZ certified farmers in Cote d'Ivoire scored higher on life satisfaction, measured as a composite indicator that also includes satisfaction for family health.

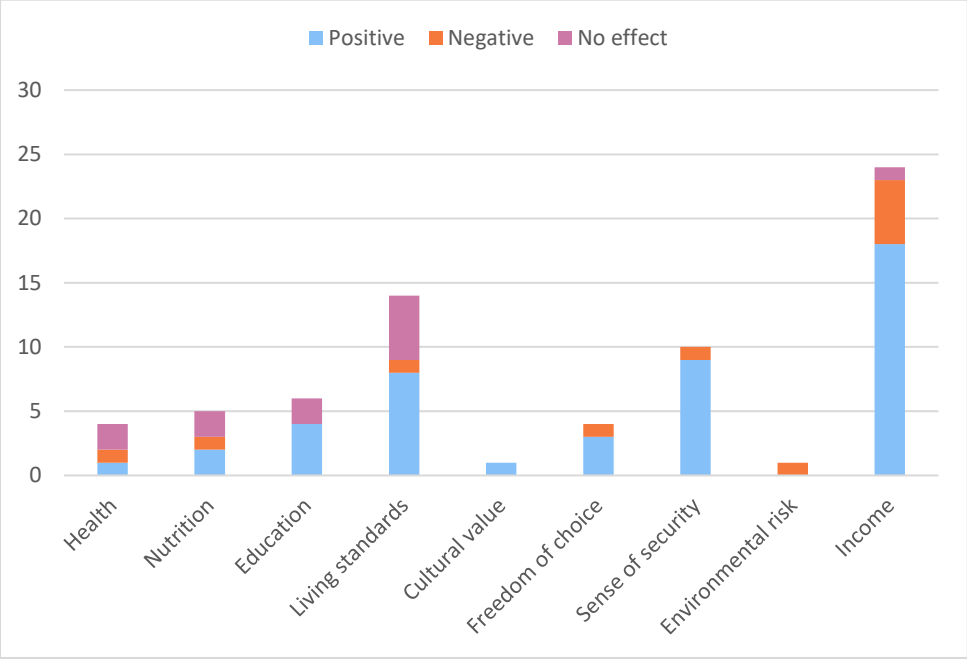

Figure 6: Direction of social impact of cocoa production for each well-being dimension

The wellbeing dimension of nutrition is also associated with mixed impacts where in some case there is a positive impact associated with cocoa production while in others there is no relation or a negative impact (see Figure 6). Walton et al. (2020) found that in Papua New Guinea about half of the cocoa farmers interviewed were classified as food insecure. The group of food secure households was characterised by a statistically significant higher cocoa production level, indicating that more cocoa production may lead to more food security. Similarly, Morel et al. (2019) found that farmers who experienced an increase in income from

cocoa production were more likely to have adequate access to food throughout the year. On the contrary, Arango Vásquez (2020) found a negative impact associated with cocoa production among farmers in Colombia. These farmers transitioned fully to cocoa production and stopped producing food crops which increased their vulnerability to economic shocks and the possibility of buying food when cocoa trade is not profitable.

Finally, on the education dimension, we found that the studies reviewed mainly recorded positive impacts associated with cocoa production. Laroche et al. (2012) examined the differences in education level between certified and non-certified farmers in Peru and found that certified farmers are characterised by higher attendance of secondary education. Morel et al. (2019) also found a positive relationship: when income derived from cocoa increases, children are less likely to have missed school in the previous year.

The school attendance rate of children of cocoa farmers is often used also as a proxy for child labour issues, together with other indicators for children participation in hazardous tasks as defined by ILO (Gockowski et al., 2006; Ingram et al., 2018). Gockowski et al. (2006) looked at how a farmer field school training program administered in Atwima District in Ghana influenced the level of attendance of children in school. We classified this as a study related to the wellbeing dimension of education, while we included studies concerning the participation rate of children in hazardous tasks in the sense of security dimension. Gockowski et al. found that the training did not influence school attendance rates, which are on average already relatively high at around 90% both for farmers who participated in training and those who did not, but it reduced participation rates of children substantially in tasks such as machete clearing, pesticide application and heavy load transport. Similarly, Ingram et al. (2018) found that UTZ certified farmers exposed to training on children rights and child labour decreased the use of child labour over time but 16% of the farmers still used child labour. The fact that child labour is still present may also be explained by the low knowledge of child labour rights both for certified and non-certified farmers.

The living standards dimension includes impacts of cocoa trade related to material living needs such as access to electricity, clean water, and good sanitation facilities as well as house construction materials and other material goods. The literature that examines the effect of certification for cocoa production found that the effect of those interventions on this well-being dimension is generally positive and certified farmers are characterised by better living standards (Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018; Laroche et al., 2012). However, a study looking at the link between income derived from cocoa production and trade and various indicators of living standards such as access to electricity and clean water found that an increase in income does not necessarily lead to positive impacts on the living standard dimension (Morel et al., 2019). On the other hand, Irfany et al. (2020) found that reliance on cocoa production alone has a negative impact on household's living standards, measured by the value of durable goods, because of the low productivity of cocoa trees and thus low production and low income from trade. Farmers who diversify income sources, by complementing cocoa income with livestock or other crops or off-farm wages, have higher wealth.

The diversification of farmer's income sources and farm income more specifically is also a proxy that has been used to measure the ability of farmers to cope with climate change, classified here under the environmental risk dimension. We found one study, Amfo and Ali (2020), that examines the ability of cocoa farmers to cope with climate change by examining the degree of diversification of their farm income under the assumption that farmers that are strongly dependent on cocoa are more exposed to negative climate-related events. The study found that most farmers interviewed diversify their income by diversifying crop

production and source of income. However, income from cocoa trade is on average about 80% of total income, indicating a high dependence as well as exposure to negative climate-related events. The dependency on cocoa as a main source of income is also discussed by Arango Vásquez (2020) who examined the relationship between farm income and debt re-payment in a cocoa producing area of Colombia. The author found that the pressure for debt re-payment incentivised farmers to focus most of their agricultural production on cocoa, given that in the late 90s and the beginning of 20th century cocoa production was providing high income to farmers in that area, but at the same time has increased livelihood dependence on trade and international price trends. When international prices are low, the income available to farmers is low and this limits their ability to re-pay debt which in turn requires farmers to increase devoted to wage work for debt re-payment (negative impact on freedom of choice). Cocoa production in South America is also associated with positive impacts on the cultural value dimension. Valencia (2020) found that in Costa Rica and Panama, the well-being of cocoa farmers is positively influenced by the fact that cocoa production is a family practice and keep practicing make them feel connected to the past experiences of their families and ancestors.

The freedom of choice dimension is characterised mainly by positive impacts both for cocoa farm workers Amfo et al. (2020) and female cocoa farmers (FAO, 2009). Amfo et al. (2020) examined workers of cocoa farms in Ghana and found that workers are generally satisfied with their working hours and the general freedom that they experience given their lifestyle as labourers (e.g., to work for others, to not work during public holidays, to own a farm, etc.). A FAO (2009) report that examines the impact of farmers' association activities on farmers well-being in Sierra Leone highlights how farmers training has increased satisfaction of female farmers because of their higher participation in decision-making and cocoa production.

The sense of security dimension includes impacts related to specific aspects of cocoa production (Aidenvironment, 2016; Amfo et al., 2020; Foundjem-Tita et al., 2016a; Gockowski et al., 2006; Ingram et al., 2018), such as the use of child labour and health risks for farmers, labourers and children performing hazardous tasks such as pesticide application, but also more general well-being impacts such a sense of security and stability generated by the stream of income produced by trade (Laroche et al., 2012). Most of the impacts recorded for this dimension are positive, except from a study focusing on farm labourers (Amfo et al. 2020) where almost 70% of farmer workers declared that they are unsatisfied or highly unsatisfied with health and safety aspects of their working conditions. Studies that investigated the issue of farmers safety focused mainly on the knowledge of risks associated with the application of chemicals and the supply and use of personal protective equipment (Aidenvironment, 2016; Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018). These studies showed that certification interventions have a positive impact, as measured by an increase in the knowledge about health risks as well as an increase in the use of Protective Personal Equipment (PPE) among farmers. Another focal area of these interventions regards improving the sense of security dimension for children and they do so by reducing the use of child labour on cocoa farms, especially for performing hazardous tasks such as pesticide application or machete clearing. A few reports examine the impact of training specifically focused on this issue provided as part of certification training and found that after the training the participation rate of children in hazardous tasks decreases (Gockowski et al., 2006; Ingram et al., 2018), the perception of what activities are suitable for children changes and the only activities considered suitable are fetching water and playing on the farm, and the number of people with knowledge about child labour rights such as minimum age increases (Ingram et al., 2018).

Finally, the income dimension, which has the highest number of impacts recorded over the total sample with 24 entries (37% of the total), includes a diverse set of impacts in terms of the monetary benefits derived from cocoa production and trade. Overall, the impact on income of cocoa trade measured through household survey is found to be positive (Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018; Middendorp et al., 2020; Sankalpa et al., 2020; Wongnaa and Babu, 2020), i.e., cocoa trade increases overall income. But in some case such increase is marginal and the comparison to poverty line thresholds reveal that the increase is not sufficiently high to get out of monetary poverty (Laroche et al., 2012). Similarly, studies that look at whether expenditures for consumption increased because of cocoa production found a positive effect (Laroche et al., 2012; Sellare et al., 2020) indicating overall positive monetary benefits from cocoa trade. Some studies explored the income dimension in more depth by examining subjective satisfaction with remuneration for workers (Amfo et al., 2020) and farmers (FAO, 2009; Ingram et al., 2018) as well as using qualitative methods such as focus groups (Castañeda-Ccori et al., 2020; Ingram et al., 2018; López-Cruz et al., 2021).

The impact of cocoa trade on income is positive overall, as emerges from the literature reviewed and such positive contribution toward monetary outputs generates also positive impacts on well-being outcomes. For instance, Laroche et al. (2012) and López-Cruz et al. (2021) found that certified farmers in Peru and Mexico are satisfied with their incomes from trade given that has been steady and continuous and it has translated in improved living standards (better quality of houses). However, this positive influence of trade on income depends both on international prices trend as well as local intermediaries involved in commercialization, and trade may not always translate into a positive impact. The ability of local producers to profit from cocoa trade depends partly on the volume they produce and on whether their cocoa is considered of high quality on the market and thus able to fetch higher prices (Castañeda-Ccori et al., 2020). Another factor that influences the profitability of cocoa trade is whether the trade relationship is direct or mediated by local market intermediaries. If cocoa is supplied directly to international traders through an agreement between farmer cooperatives and international traders, then income benefits may be higher (Middendorp et al., 2020). This is because local market intermediaries may not be able to guarantee high farm gate prices due to their own business constraints as discussed in Lenou Nkouedjo et al. (2020). The study shows that informal local market intermediaries in two different regions in Cameroon have negative net margins from the trade as opposed to formal ones, such as local business agents and cooperatives, who make profits from commercialising cocoa. Therefore, local informal intermediaries may decrease the price offered to cocoa farmers for their cocoa beans to increase their own profitability while reducing the opportunity to profit for farmers.

3.2. Impact of trade-related interventions

The literature reviewed included studies that examine the impact of cocoa trade (n = 30) as well as studies that examine the impact of trade interventions (n = 39 – cf. Figure 4 for a summary of impacts associated with trade interventions), which aim to mitigate negative impacts of trade and enhance positive ones, on all well-being dimensions. The three main types of trade interventions that we identified in the literature are:

- Farmers' cooperatives and other types of contract farming which aim to shorten the value chain and increase bargaining power of smallholder farmers as well as provide technical and financial assistance to farmers (Gibbon et al., 2009; Middendorp et al., 2020)

- Interventions that modify agricultural practices with the aim to increase yield (Kelley, 2020) and developing agroforestry practice to improve productivity (López-Cruz et al., 2021; Sankalpa et al., 2020)
- Certification for sustainable production and trade such as Fair trade or UTZ and other Voluntary Sustainability Standards (Aidenvironment, 2016; Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018; Laroche et al., 2012; Sellare et al., 2020) which often includes training provided by farmer's association on specific topics such as organic agricultural practices and other social sustainability standards such as child labour (FAO, 2009; Gockowski et al., 2006)

Table 4 shows an overview of the impact of these different interventions as well as the no intervention studies on each well-being dimension and indicate with a plus (+) when the majority of impacts recorded is positive, a minus (-) when the majority of impacts is negative and with plus/minus (+/-) when the empirical evidence is mixed and both type of impacts are reported by the literature. The cultural value and environmental risk dimensions are excluded as only one entry was recorded.

Table 5: Summary of effect of cocoa trade and trade-related interventions for each well-being dimension

	No Intervention (n = 30)	Cooperatives and contract farming (n = 3)	Agricultural practices (n = 3)	Certifications and farmer training (n = 33)
Health	**No effect**			**+**
Nutrition	**+/-**			**No effect**
Education	**+/-**		**+**	**+**
Living standards	**No effect**			**+**
Freedom of choice	**+**			**+**
Sense of security	**-**			**+**
Income	**+/-**	**+**	**+**	**+**

The cooperative/contract farming, and agricultural practices categories have a mainly positive effect on the income dimension of wellbeing. This is realized through both improving the commercialization and marketability of cocoa products (Middendorp et al., 2020) as well as increasing the production levels by improving the ecological management and productivity of the farm (Kelley, 2020; López-Cruz et al., 2021; Sankalpa et al., 2020). Kelley (2020) looks at various cocoa intensification initiatives in Southeast Sulawesi, Indonesia, focusing on the effect of those initiatives on income. The cocoa initiatives examined involved mainly farmer training on agricultural techniques such as fertilization, pruning and sanitation. The study found that there is a general lack of satisfaction among farmers about these trainings and little adoption of the proposed techniques as well as little impact on increasing cocoa yield. Based on socio-demographic data collected through a household survey, the authors show that intensification initiatives seem to generally better support cacao growers with the greatest access to land and capital to invest as well as villages located in areas where cocoa trade is already well established and thus access to profitable markets may be easier. The importance of farmers being connected with profitable markets for producing positive impacts on the income dimension is also highlighted by Middendorp et al. (2020), who compared profits of smallholders that engage in mainstream trade through standard intermediaries versus direct trade through contracts established directly with international

traders in Ecuador. The study also found that smallholders that engage in direct trade relations were able to fetch a higher price for cocoa sales compared to farm gate prices received by farmers engaged in mainstream trade, contributing to a higher profit.

Finally, the certification and other farmer training category mainly includes assessments of certification for sustainable trade and other development projects which aim to support farmers' certification. This category includes the intervention for which most impacts were recorded in our dataset. As shown in table 4, the different certification schemes, such as UTZ and Fair trade, seem to have a strong positive impact across all dimensions although this may be due also to the high number of studies that fall into the certification category. As discussed above, with reference to the sense of security dimension, the certification interventions sometimes include training on specific aspects of production and occupational health risks. Such trainings are found to positively influence farmers behaviour and produce positive changes for the security dimension (Aidenvironment, 2016; Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018). Fair trade and UTZ certification are found to increase farm income of certified farmers compared to non-certified farmers, which is mainly due to higher prices in preferential market channels established through certification and cooperatives, but also due to the higher quality of cocoa beans produced as a result of technical training on farming practices as well as bean processing prior to selling (Foundjem-Tita et al., 2016a; Ingram et al., 2018; Laroche et al., 2012; Sellare et al., 2020). Moreover, higher income is often found to translate in higher living standards (Foundjem-Tita et al., 2016a, 2016b; Ingram et al., 2018; Laroche et al., 2012) as well as an increased sense of security due to a secure stream of income (Laroche et al., 2012).

The ability of farmers to appropriate these benefits partly depends on their capital, specifically land suitable for farming purposes and financial capital as well as farming tools. Whether those capitals are distributed equally across the population may influence whether final outcomes can be realised by everyone. Danso-Abbeam et al. (2020) examined the existence of a gender gap in cocoa production in Ghana and investigated whether differences between males and females in realising positive well-being outcomes through trade can be attributed to a different access to capital. They found that the distribution of productive resources such as labour, fertilizer and pesticides among gender is equal, but males use higher quantities of those inputs which results in a higher cocoa production output indicating a higher technical efficiency for male farmers. The study identifies the limited access to farm services for women such as extension services, demonstration farms and agricultural credits as the reason behind these differences in productivity between women and men. In addition, the distribution of land was also found to be unequal between genders; males have on average larger farm plots than female farmers (Danso-Abbeam et al., 2020; Foundjem-Tita et al., 2016b). These studies indicate that certification and other interventions that focus specifically on providing technical farming assistance targeted to women and facilitate women in acquiring land may support their ability to benefit more from cocoa trade. As an example, FAO (2009) reports a higher participation of women in decision-making and cocoa production as a result of a farming training project on improved production and processing techniques with a high attendance of women.

3.3. Impact on Sustainable Development Goals (SDG)

We link the reported direct impacts of trade to the Sustainable Development Goals to further assess the impact of cocoa trade on sustainability (Figure 7). The impacts measured by the literature reviewed suggests an overall positive effect across all the SDG goals that were linked to the social impacts reviewed (about 70% of the total counts are associated with positive impacts). About 37% of impact counts, both positive and negative, refer to SDG 2 (Zero hunger) which includes target 2.3 (Enhance agricultural productivity and incomes) and

these studies include all the entries relative to the income dimension, the most populated category of our review. The second most populated category is SDG 16 (Peace, justice, and strong institutions), where most of the impact counts are recorded as positive. This category includes targets 16.1 (Reduce all forms of violence) and 16.2 (End children's abuse, exploitation, …, violence), which are related to the sense of security dimension and include impacts on health and safety for labourers and farmers as well as issues of child labour. The overall impact on SDG 16 is again positive, mainly due to trade interventions such as certifications and training delivered by farmers' associations. Finally, we recorded a negative impact count for target 1.2 (measured by the proportion of population living below the national poverty line), since the income derived from cocoa trade is not high enough to raise the median and average household income above the poverty line. We also recorded some negative and no-effect impacts for SDG 3 – good health and well-being, which regards mainly aspects of general health, as opposed to specific issues of occupational health which are included in SDG 16 (e.g., children engaging in hazardous tasks and awareness on risks from pesticides application).

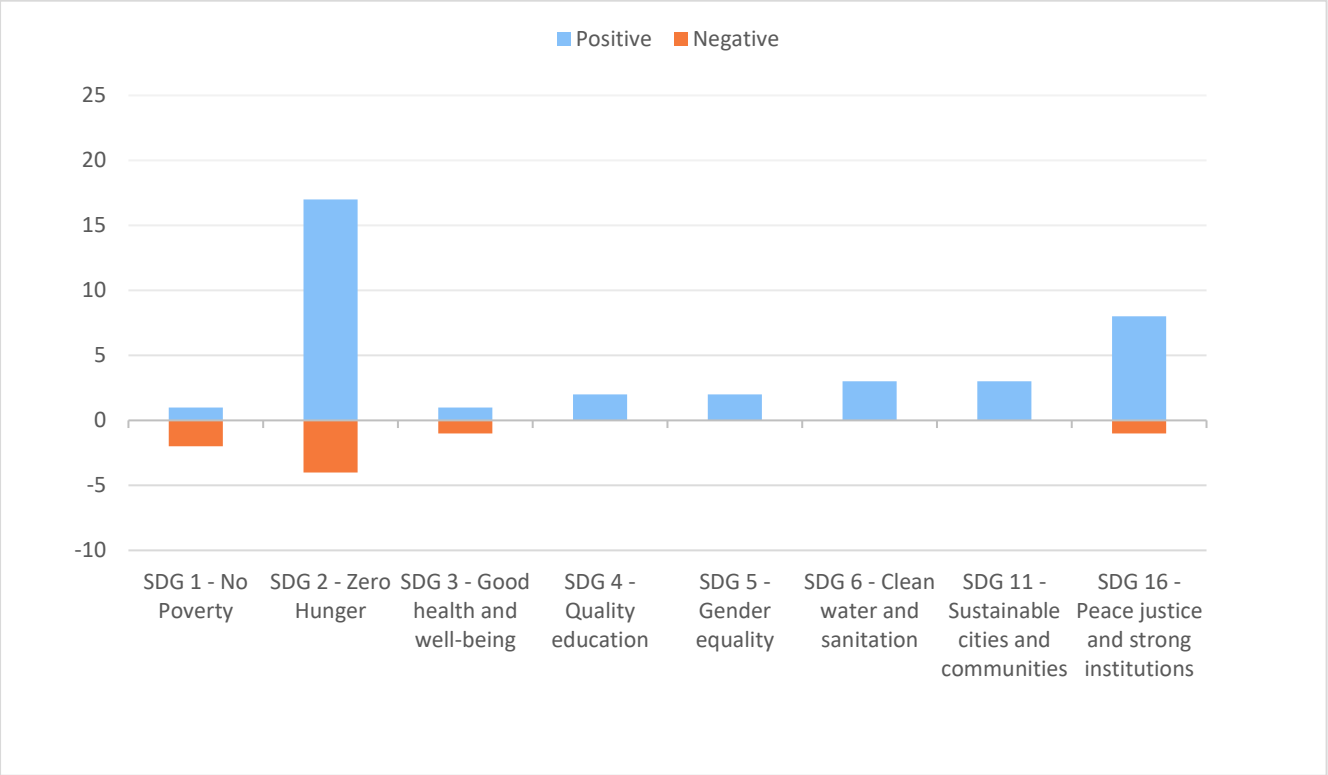

Figure 7: Counts of direct impacts of cocoa production linked to the Sustainable Development Goals.

4. Discussion

The results of our systematic review have highlighted a whole range of well-being impacts associated with cocoa production for international trade that ranges from impacts on material dimensions of wellbeing, such as income and living standards, to more intangible dimensions of wellbeing such as sense of security. We also found evidence associated with the impact of trade-related interventions for almost all dimensions of well-being. The overall picture is that trade in cocoa can lead to both positive and negative impacts but when examining impacts of trade-related interventions we found that almost all impacts recorded are positive (n=36) or no effect (n=12) indicating an overall positive influence of trade-related interventions.

Material dimensions of wellbeing such as living standards and income are the most studied impacts of cocoa production and are always associated with positive impacts when studied as part of a trade-related intervention assessment. However, some negative impacts are reported when such interventions are not in place. The nutrition and health dimensions of wellbeing are much less studied, and the evidence recorded shows a mixed picture of impacts which includes the same number of negative and positive impacts as well as no effects. Some studies show how an increase in income due to improved revenues of trade may not correspond to an increase in health and nutrition well-being outcomes. The third most populated dimension of wellbeing assessed in the literature reviewed is sense of security which includes aspects related to child labour as well as health risks for farmers and labourers due to agricultural practices such as pesticide applications. The evidence shows that all social impacts in this dimension are reported as positive when results of trade-related interventions are studied.

In terms of geographical distribution of the studies reviewed, we found that the literature covers mainly producing countries in Africa, half of the sample, focusing mainly on Ghana and Cote d'Ivoire which together represents about 40% of total cocoa production. The second most studied country is Indonesia which is also the third biggest producer with 17% of global cocoa production. The studies mainly employ quantitative methods for the analysis while qualitative methods are rarely employed. The limited use of qualitative methods to assess impacts of cocoa production may well explain the fact that we found little information on impacts associated with more intangible dimensions such as cultural value, freedom of choice, sense of security and environmental risks. We note that there is no evidence of impact on the social relations dimension. Finally, we also note that the vast majority of impacts recorded regard smallholder farmers and there is very limited evidence of impact on other stakeholders, such as farm workers as well as other actors higher up in the value chain.

In terms of impacts on sustainability, using the Sustainable Development Goals, the evidence collected seems to indicate a mixed effect on SDG 1 (No poverty), although the sample size is very little, a positive effect on SDG 2 (Zero hunger), where most of the positive impact mapped to SDG 2 regard target 2.3 on increasing income and food security for smallholder farmers. It should be noted here that the underlying dimension measured by indicators that map to SDG 1 and SDG 2 mainly refer to the income dimension, but we included income in SDG 1 just when it has been compared to a poverty line and verified that the positive impact due to an increase in income does support pathways out of poverty. We note here that most of the studies do not actually provide that information to assess whether the increase in income is enough to support the realization of well-being outcomes. We found evidence of positive impacts also on SDG 4 (Quality education), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation), SDG 11 (Sustainable cities and communities) and SDG 16 (Peace justice and strong institutions).

The role of policies has been studied extensively in the literature that we reviewed and included interventions such as training on agricultural practices, marketing and commercialization of cocoa products, agricultural practices interventions such as agroforestry, the impact of cooperatives and as the most numerous category, the impact of certifications such as FairTrade and UTZ/Rainforest Certification schemes often include the creation of cooperatives as well as training on agricultural practices so that it can be considered a wider and more general category of trade-related intervention compared to the other two. Finally, as shown in table 5 we found a general positive impact of all interventions reviewed across many different dimensions.

In conclusion, the current literature supports the view that trade-related interventions have a general positive impact on living standards and income by ensuring higher and more stable income. However, most of the evidence does not provide a comparison of this income to the cost of living and/or poverty line, so that contributions to SDG1 and poverty reduction remain unquantified. Incorporating such comparisons would allow to evaluate whether trade in cocoa is able to support farmers livelihoods in terms of covering for all costs of living as well as supporting poverty alleviation. As indicated by van Vliet et al., 2021 in fact about half of cocoa producers in Côte d'Ivoire and Ghana earn a gross income that is below the World Bank extreme poverty line and most of them do not earn a Living Income indicating that trade in cocoa alone may not be able to support poverty alleviation and economic development. As indicated by van Vliet et al., 2021 further research is needed what are the factors that influence ability of households to appropriate of monetary benefits associated with cocoa production, e.g. by understanding resource and capitals availability, as well as understanding what are opportunities for alternative income generation. Finally, as income depends mainly on prices that farmers can fetch on the international market, any intervention which is able to guarantee higher minimum prices for producers will likely benefit the farmers and possibly increase their income up to a Living Income.

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