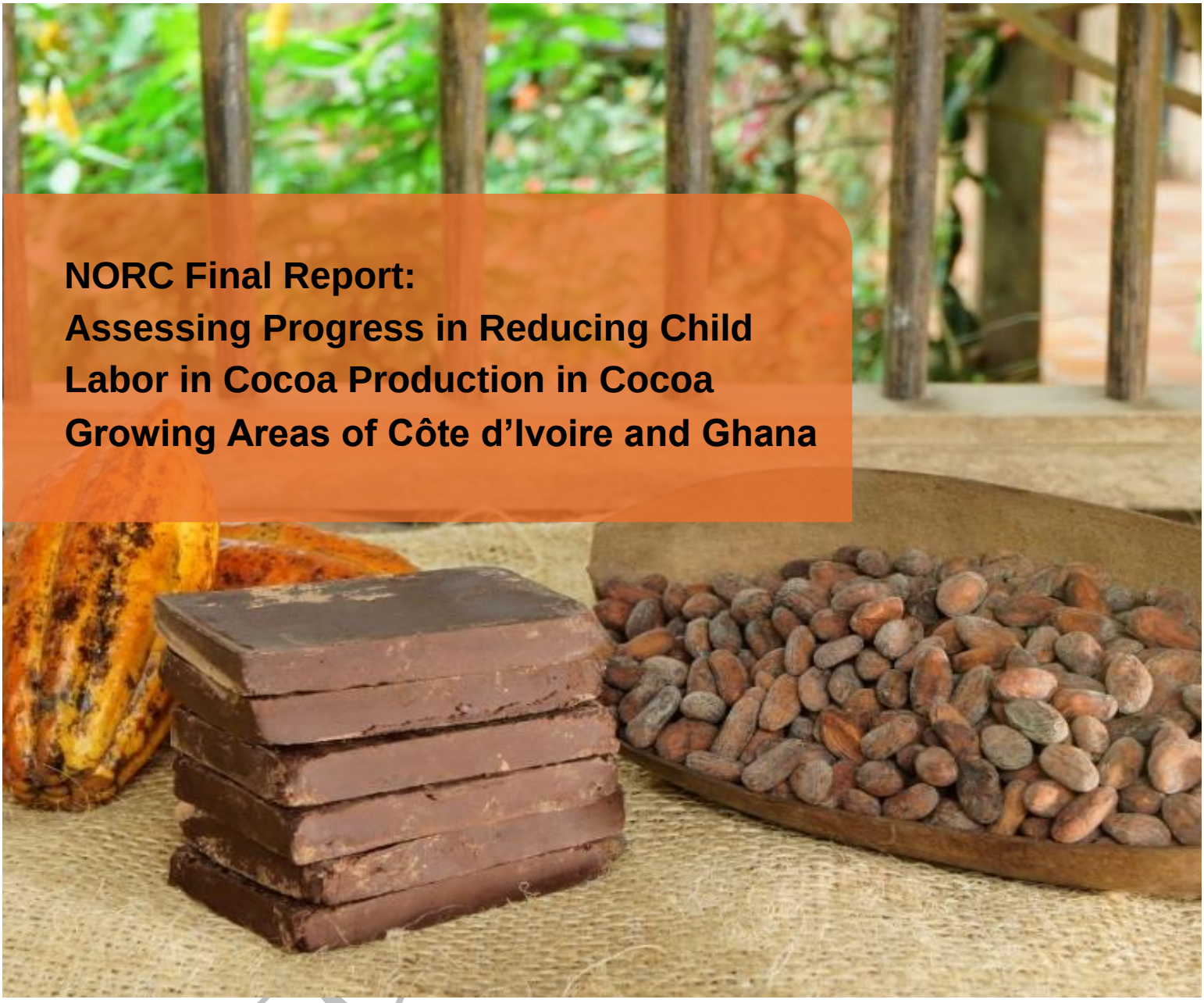

NORC Final Report: Assessing Progress in Reducing Child Labor in Cocoa Production in Cocoa Growing Areas of Côte d'Ivoire and Ghana

OCTOBER 2020

FINAL REPORT 2018/2019 SURVEY ROUND

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Table of Contents

Table of Figures

Table of Tables

Acronyms

CAPI	Computer Assisted Personal Interviewing
CCP	Cocoa Communities Project
CDI	Côte d'Ivoire
CEA	Census Enumeration Areas
CIT	Cognitive Interview Technique
CIM	Interministerial Committee to Combat Trafficking, Exploitation and Child Labour
CL	Child labor
CLCCG	Child Labor Cocoa Coordinating Group
COCOBOD	Ghana Cocoa Board
CNS	Comité National de Surveillance des Actions de Lutte contre la Traite, l'Exploitation et le travail des Enfants
CSOs	Civil Society Organizations
DC	District of Columbia
DOL	Department of Labor
EA	Enumeration Area
ECLIC	Eliminating Child Labor in Cocoa
EG	Expert Group
ENSEA	Ecole Nationale de Statistique et d'Economie Appliquée
FGD	Focus Group Discussion
GAP	Good Agricultural Practices
GAWU	General Agricultural Workers' Union of Ghana
GCLMS	Ghana Child Labor Monitoring System

GDP	Gross Domestic Product
GLM	Generalized Linear Model
GSS	Ghana Statistical Service
GPS	Global Positioning Satellite
HCL	Hazardous child labor
HH	Household
ICCO	International Cocoa Organization
ICI	International Cocoa Initiative
ICLS	International Conference of Labor Statisticians
ILAB	Bureau of International Affairs, U.S. Department of Labor
ILO	International Labour Organization
INS	Insitut National de la Statistique de Côte d'Ivoire
IPEC	International Programme on Eliminating Child Labour
IRB	Institutional Review Board
ISSR	Institute of Statistical Social and Economic Research
JHS	Junior High School
KG	Kindergarten
KII	Key Informant Interviews
KM	Kilometer
MOCA	Mobilizing Community Action and Promoting Opportunities for Youth in Ghana's Cocoa Growing Communities
NGOs	Non-governmental organizations
NORC	NORC at the University of Chicago

NPA	National Plan of Action for the Elimination of the Worst Forms of Child Labor
OCFT	Office of Child Labor, Forced Labor and Human Trafficking
OSH	Occupational Safety and Health
PSM	Propensity Matching Score
PSU	Primary Sampling Unit
PTA	Parent Teacher Association
SHS	Senior High School
SOSTECI	Système d'Observation et de Suivi du Travail des Enfants en Côte d'Ivoire
SSU	Secondary Sampling Unit Data Science
STATA	Statistical Software for
TOT	Training of Trainers
WCF	World Cocoa Foundation
WFCL	Worst forms of child labor
UNICEF	United Nations Children's Fund
USD	United States Dollars
USDOL	United States Department of Labor

1 Executive Summary

1.1 Background

In 2010, in response to evidence of children working under hazardous conditions in the West African cocoa sector, the Governments of Côte d'Ivoire and Ghana, representatives from the International Chocolate and Cocoa Industry (Industry), and the U.S. Department of Labor (DOL) signed a Declaration and Framework tied to the Harkin-Engel Protocol, under which Industry publicly acknowledged child labor in the cocoa sector and committed to take steps to address it.

In the signing of the Declaration and Framework, these partners committed to take action to reduce child labor and the worst forms of child labor (WFCL) in cocoa production towards the goal of achieving a 70 percent reduction in the WFCL in the cocoa sectors of the two countries in the aggregate by 2020. The Child Labor Cocoa Coordinating Group (CLCCG) was established to coordinate efforts among the partners working under the Declaration and Framework.

The Framework lays out multiple goals to support implementation of the Declaration and further the aims of the original Protocol. Among those goals was the continuation of nationally representative child labor surveys, recurring at least every 5 years. The aim of the surveys was to provide comparable data for ongoing assessments of child labor prevalence in cocoa growing areas of Côte d'Ivoire and Ghana and included a commitment to make publicly available the related survey methodologies, data, and reports based on the findings of these surveys.

Under this goal, surveys were carried out by Tulane University during the 2008/09 and 2013/14 cocoa harvest seasons in Côte d'Ivoire and Ghana. In 2016, NORC at the University of Chicago (NORC) was awarded a four-year cooperative agreement by the USDOL Bureau of International Labor Affairs [1] (ILAB) to implement the 2018/2019 Assessing Progress in Reducing Child Labor in Cocoa Production in Cocoa Growing Areas of Côte d'Ivoire and Ghana project.

1.2 The Present Study: Objective and Important Considerations

1.2.1 Objectives

The first objective of this study is to assess and measure changes in the prevalence of working children, children in child labor, and children in hazardous work in the cocoa growing areas of Côte d'Ivoire and Ghana between 2008/09 and 2018/19. The second objective of the study is to assess interventions implemented between 2008/09 and 2018/19, providing stakeholders and

[1] ILAB's mission is to promote a fair global playing field for workers in the United States and around the world by enforcing trade commitments, strengthening labor standards, and combating international child labor, forced labor, and human trafficking. For more information please refer to the ILAB website: https://www.dol.gov/agencies/ilab/about-us/mission

policymakers with information on the efficacy of programming during that period. The final objective of this project is to provide accurate point estimates of child labor and hazardous child labor in the cocoa producing areas of Côte d'Ivoire and Ghana for 2018/19.

NORC spent the last five years working closely and collaboratively with ILAB, the governments of Côte d'Ivoire and Ghana, Industry (represented by the World Cocoa Foundation (WCF)), Civil Society Organizations (CSOs), and multiple international organizations with an interest in child labor (including UNICEF, the International Cocoa Initiative (ICI), and the International Labour Organization (ILO)). This report is the outcome of that collaborative effort to accurately measure and report on the issue of child labor and hazardous child labor in the cocoa growing areas of Ghana and Côte d'Ivoire.

1.2.2 Important Considerations

There are several important considerations any reader of this report needs to be aware of. First, it is important to stress the difference between child labor in general and forced labor (or forced child labor/child slavery). **Child Labor** is defined by ILO Conventions 138 on the Minimum Age for Admission to Employment and 182 on the Worst Forms of Child Labor.[2] These key international conventions prohibit the employment of children below a minimum age (as established by national legislation), define the worst forms of child labor, prohibit older children who are permitted to work from engaging in hazardous work which is likely to harm the health and safety of children, protect all children under 18 from WFCL, and forbid hazardous unpaid household services. **Forced Labor** is defined by ILO Convention 29 as "all work or service exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily" (for children under menace of penalty the idea of "voluntariness" becomes moot and is not applicable).

Focus: Child Labor

This study focuses on child labor and hazardous child labor as defined by ILO conventions and does not cover forced child labor, child slavery, or child trafficking.

This research focuses on child labor and hazardous child labor, not forced child labor/child slavery and other forms of the WFCL. Although the issue of forced child labor in cocoa production is important and deserves attention, the research methodology required to accurately measure forced child labor is very different from the methodology[3] adopted for the current scope of our research which was determined at the onset of this research in 2008/09. To remain

[2] Article 3(a) of Convention 182 includes forced or compulsory labor as a WFCL.

[3] Forced child labor is, by definition, an illicit activity with a vulnerable and hard-to-reach population. Probability based research methods would need to account for that from the outset and focus on areas where vulnerability would be highest (for example, encampments and forest land).

consistent with previous rounds of the survey, this report only speaks to the issue of child labor in cocoa production in Côte d'Ivoire and Ghana and uses hazardous child labor (HCL) as a proxy for WFCL. A child is considered to be involved in hazardous child labor if they have participated in any hazardous work activities.[4]

A second important consideration is understanding the difference between aggregate and individual country statistics presented in this report. Aggregate statistics combine data from the cocoa growing areas of Côte d'Ivoire and Ghana, per the Harkin-Engel Protocol, using a common definition of child labor and hazardous child labor. Individual country statistics are estimated using both a common definition of hazardous child labor, as well as country-specific definitions of hazardous child labor presented in more detail in Sections 3.3.3 and 3.3.4.

Finally, it is important to note what longitudinal data can be compared and what data cannot be compared in the current study. First, due to issues in survey implementation during the 2013/14 data collection round, it is not possible to compare the data from **all agricultural households**[5] between 2013/14 and 2018/19. Instead, we only compare data collected from **cocoa growing households**[6] during this time period.[7] Consequently, the comparison of recent trends between 2013/14 and 2018/19 is based on data from cocoa growing households only.[8] Additionally, the sampling frames for 2008/09 and 2018/19 survey rounds were not exactly identical and thus population counts of the number of children in child labor are not comparable between rounds and, for the purposes of the report and analysis, we cannot make claims in terms of changes found in population counts. However, it is possible to undertake the comparison of the prevalence rates (ratios between all children and children in child labor or hazardous child labor) between 2008/09 and 2018/19 as the difference in sampling frames are unlikely to influence the inferences made from the comparison of ratios and thus are presented throughout the report.[9]

A second issue with the comparability of data from the 2008/09 round is due to a lack of documentation from the 2008/09 survey round.[10] Due to this lack of documentation, we were

[4] See Section 3.3.3 for more details on the different types of hazardous work activities considered.

[5] Agricultural households are defined as households where at least one member (adult or child) was involved in work in any type of agriculture/farming in the past 12 months.

[6] Cocoa growing households are defined as households where the head of household indicated that cocoa farming was a type of agriculture carried out by the household.

[7] This report focuses on multiple levels of analysis moving from the child labor situation among all agricultural households in the cocoa growing regions of Côte d'Ivoire and Ghana down to the child labor situation in only those households that are active in cocoa production.

[8] Please refer to the Section 4.33.3.1 for a detailed description of the issues.

[9] Please refer to the Section 4.3 for a detailed description of the issues. Additional information on comparability can also be found in the expert group's finding in Annex 10.12.

[10] Please refer to the Section 4.3 for a detailed description of the issues.

unable to generate the child labor and hazardous child labor estimates separately for cocoa growing and non-cocoa growing households. What this means for the report is that we are unable to compare **cocoa growing households** in terms of prevalence rates between 2008/09 and 2018/19.

To summarize, we are able to compare the estimates of prevalence rates between 2008/09 and 2018/19 for **all agricultural households**, and between 2013/14 and 2018/19 for **cocoa growing households**. Therefore, the statistics in this report are split into two segments; 2008/09-2018/19 comparisons for **agricultural households** and 2013/14-2018/19 for **cocoa growing households**.

1.3 Methodology

Towards meeting the two-fold objectives of this study, NORC conducted a sectorally representative survey designed to be representative of all children age 5-17 living in agricultural households in the cocoa growing areas[11] during the 2018/19 main cocoa harvest season in Côte d'Ivoire and Ghana in order to develop population estimates for the prevalence of child labor and hazardous child labor in those regions. A detailed description of our methodology can be found in Section 4 and information on the number of surveys completed by country and comparisons to the 2008/09 round can be found in Section 4.2.

The data from the 2018/19 was then compared with the data from the previous survey rounds to assess how the main outcome indicators of interest – the prevalence of children in child labor and the prevalence of children in hazardous work in the cocoa sector[12]– changed between 2008/09 and 2018/19. The subsequent analysis of child labor and hazardous child labor rates are presented in Chapter 4 and 5 of this report.

For addressing the second main objective of this report – assessing relative effectiveness of various interventions funded by the members of the CLCCG and other stakeholders in addressing child labor issues – NORC utilized a mixed-methods approach based on quantitative and qualitative analysis. A detailed description of the methods used is presented in Chapter 8 of this report.

1.4 Preliminary estimates, Stakeholders' concerns and the Independent Expert Group

NORC completed preliminary analysis on the data in late 2019 and early 2020, and, as part of the collaborative process, shared the preliminary results with stakeholders in early 2020 in a draft report. As the analysis in the draft report was not yet finalized, data and findings from the draft

[11] Including children working on cocoa farms, children performing other work and children who are not working.

[12] Cocoa sector is defined as the cocoa growing areas of Côte d'Ivoire and Ghana

report should not have been considered final or complete. Unfortunately, this draft report was leaked to news sources and the preliminary results were circulated beyond the intended recipients, leading to concerns being expressed outside of that group.

To alleviate resulting stakeholder concerns on the draft report, some of which are expressed again in the stakeholder statements that follow this Executive Summary, NORC proposed the formation of an Expert Group to review aspects of the NORC sampling methodology.

In July 2020, the Fundamental Principles and Rights at Work Branch of the International Labour Organization graciously agreed to organize this Expert Group comprising statisticians and survey professionals to look carefully at the sampling methodology, assess the validity of the 2018/19 prevalence estimates, and assess the comparability of the 2018/19 survey round with the prior rounds.

The Expert Group's complete findings can be found in Annex 10.12. Their main recommendations were:

1. Include household selection probabilities when estimating sampling weights for the 2018/19 surveys.
2. Include estimates of population counts and prevalence rates for 2018/19 using the weights based on the household selection probabilities and construct variance estimates accordingly.
3. Attach to the major outcomes of interest (e.g. number of working children, number of children in child labor, number of children in hazardous work, child labor rate, and hazardous work rate) a precision measure (such as variance, standard error, confidence internal or coefficient of variation) so readers can form their own conclusions on the accuracy of the data.
4. Add clarification on the methodological limitations of comparison of prevalence rates and proportions of different variables across survey rounds due to the difference between the sampling frame used by NORC for the 2018/19 survey round and used by Tulane University in previous survey rounds, which could lead to potential bias in the comparison of point estimates across survey rounds.

Following the guidance provided by the Expert Group, we revised our sampling weight construction and generated population estimates of counts, prevalence rates, and proportions for 2018/19. The corresponding updated estimates are presented in this final report.

Additionally, following the recommendations of the Expert Group, the tests of significance of difference between the prevalence rates/proportions of the 2008/09-2018/19 and 2013/14-2018/19 survey rounds used Rao-Wu bootstrap standards errors of 2018/19 survey round. Further, we only present differences on key outcomes of interest found to be significant at a 1

percent level of significance (i.e. p-values less than or equal to 0.01). This ensures that the conclusions of the study regarding the change in prevalence rates and proportions of different variables across survey rounds are unlikely to be affected by methodological limitations.

Finally, given the issue of comparability of sampling frames and its implication on the comparability of population counts within survey rounds, this report does not present population counts of the previous survey rounds (2008/09 & 2013/14).

NORC is fully committed to research transparency. Data for this report is publicly available and estimates presented herein are fully replicable. It is our hope that researchers will use the data for additional research on child labor and hazardous child labor in cocoa production.

1.5 CLCCG Stakeholder Engagement

There has been extensive engagement by the CLCCG stakeholders to confront child labor over the last ten years. Given the depth and breadth of projects that may impact child labor, we are unable to list all of the projects and programs funded by the stakeholders over a ten-year period and across two countries. Examples of this engagement include major initiatives from the Governments of Côte d'Ivoire and Ghana, the USDOL, and the International Cocoa and Chocolate Industry to confront the issue of child labor in cocoa supply chains. Note that these examples were provided by each stakeholder and **not independently assessed by NORC**:

Provided by the Government of Côte d'Ivoire

Over the past ten years, the Ivorian government has designed three successive national action plans to fight child labor and trafficking of children, with a major impact on reducing child labor. In 2019, Côte d'Ivoire was one of 12 countries that received from USDOL the highest assessment of "Significant Advancement" for its work on child labor in cocoa production in addition to other efforts to address the worst forms of child labor. The country has achieved this designation each year from 2014 to 2019. Important changes in its education system and massive construction of schools in rural areas resulted in dramatic improvements in school enrolment rates from 59 percent to 85 percent. The government also established SOSTECI, a mechanism for monitoring child labor in cocoa, strengthened its child labor laws, and allocated additional financial and material resources to anti-child labor police. Today traffickers are facing up to 20 years in jail. Regionally, the government signed bilateral agreements with neighboring countries to eradicate child trafficking at its source. Since 2019, an important mechanism is gradually being implemented nationwide by the government to establish transparency and traceability in the cocoa supply chain.

Provided by the Government of Ghana

Initiatives by the Government of Ghana include the Cocoa Productivity Enhancement Programme which attempts to reduce children's exposure to agro-chemicals through government-funded mass spraying in high cocoa productivity regions. The Ghana Cocoa Board Child-Education Support Programme was designed to provide support to children of cocoa farmers in all seven cocoa growing regions and districts to be in school and relieve farmers of financial encumbrances associated with schooling. Finally, the Government of Ghana has had a strong focus on increasing school attendance through multiple school initiatives over the last 20 years. These initiatives have led to a dramatic increase in school attendance for children across Ghana, which are also reflected in this study's findings.

Provided by the USDOL

Initiatives undertaken by the United States Department of Labor (USDOL) to combat child labor in the cocoa sectors of Ghana and Côte d'Ivoire under the Declaration and accompanying Framework of Action include funding the Towards Child Labor Free Cocoa Growing Communities in Côte d'Ivoire and Ghana project (Cocoa Communities Project or CCP) implemented by the International Labor Organization (ILO), the Eliminating Child Labor in Cocoa (ECLIC) project in Côte d'Ivoire implemented by the International Cocoa Initiative (ICI), and the Mobilizing Community Action and Promoting Opportunities for Youth in Ghana's Cocoa Growing Communities (MOCA) projects implemented by Winrock International. These projects had a specific focus on community mobilization through community action plans and committees, the provision of relevant, quality education for children engaged in or at risk of child labor and enhanced sustainable livelihoods for their households. USDOL also funded all three survey rounds described in this report.

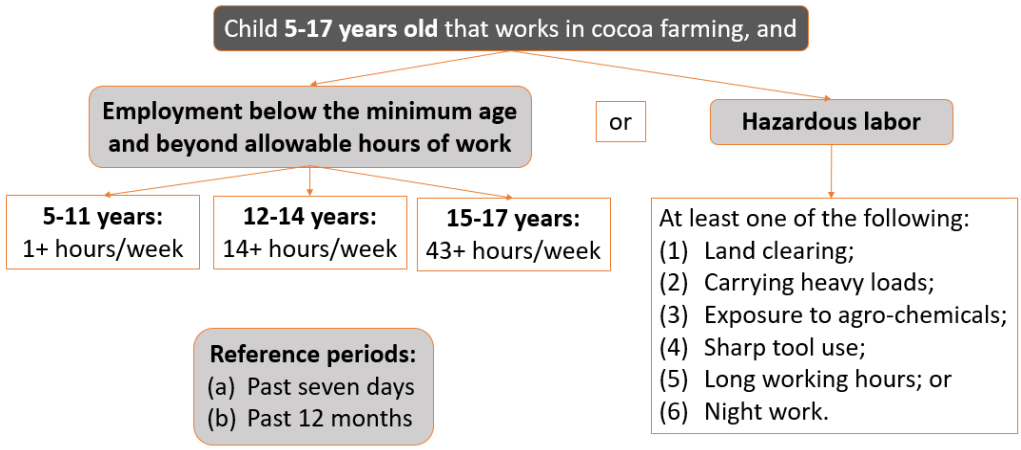
Provided by Industry

Over the past decade, Industry funded the construction and rehabilitation of schools and provision of school supplies and other education support services in hundreds of communities in Côte d'Ivoire and Ghana. In addition to implementing child labor awareness-raising activities, Industry supported child labor data collection and monitoring through community and supply chain-based child labor monitoring and remediation systems, including an ILO-IPEC project that developed and expanded community-based child labor monitoring systems. Industry supported activities to increase the incomes of households with at-risk children and provided supplementary funding to the International Cocoa Initiative to expand its work to implement community action plans, train community child protection committees and build classrooms.

1.6 Definitions of Child Labor and Hazardous Work

The graphic below is helpful for understanding the component parts of child labor and hazardous child labor discussed in this report. Our study defines child labor in the cocoa sector as any child 5-17 years old who works in cocoa farming and is a) economically active below the age for allowable work or b) taking part in one of the six hazardous activities listed below.

Figure 1: Graphic Representation of Common Definition of Child Labor



The current study uses a "common definition" of child labor and hazardous child labor focusing on the "common ground" between the Ghanaian and the Ivorian legal definitions within a broader ILO framework.[13] According to the common definition, a child is categorized as participating in child labor if they have exceeded the maximum allowable working hours for their age group and/or are exposed to hazardous work activities. Children are categorized as participating in hazardous work if they are exposed to at least one subcategory of the common definition as described below:

1. Conducting land clearing,
2. Carrying heavy loads,
3. Using agro-chemicals,
4. Using sharp tools,
5. Engaging in long working hours, or

[13] The common definition was developed by Tulane University. For more details, please consult the study report: Survey Research on Child Labor in West African Cocoa Growing Areas, Final Report, 2013-14, Tulane University: https://www.dol.gov/sites/dolgov/files/ILAB/research_file_attachment/Tulane%20University%20-%20Survey%20Research%20Cocoa%20Sector%20-%2030%20July%202015.pdf

6. Engaging in night work.

Before moving to the main findings, it is important to present some key demographic information from our 2018/19 sample as well as cocoa production and price dynamics to aid in understanding the main findings of the study:

- 61 percent of child respondents (59 percent in Ghana and 64 percent in Côte d'Ivoire) were in the 5-11 year old age group with 17 percent in the 5-6 year old age group (overall age ranges followed a normal distribution reflective of the population of children).
- The majority (99 percent) of children aged 5-17 were living with their parents or another relative at the time of the interview.
- Among the children who were economically active, 78 percent (82 percent in Ghana and 74 percent in Côte d'Ivoire) were working for their own family's farm.
- Among the children who were working in cocoa farming, 81 percent (83 percent in Ghana and 78percent in Côte d'Ivoire) were working for their parents (father/mother) and 94 percent (97 percent in Ghana and 90 percent in Côte d'Ivoire) reported working for either their parents or other relatives.
- The median farm size of households was 12.5 acres (approximately 5 hectares) in Côte d'Ivoire and 7 acres (approximately 3 hectares) in Ghana.

Overall, these demographics indicate that most children in this study were from families of smallholder farmers[14] conducting farming activities as part of their household's normal economic activity.

Quantitative Insight

Cocoa is a key part of agriculture in the cocoa growing areas of both countries as demonstrated by the fact that a predominant majority of agricultural households grow cocoa.

Over the same ten-year time period (2008/09 and 2018/19), cocoa production across Côte d'Ivoire and Ghana, measured as estimated tons of cocoa produced, increased from 1.9 million tons in 2008/09 to 3.1 million tons in 2018/19.[15] The global price of cocoa over the same time period increased from $2,263 USD/ton to $2,626 USD/ton. The increase in production and price may explain this study's finding that the proportion of agricultural households involved in any type of cocoa production (with or without child labor) increased from 55 percent in 2008/09 to 84 percent in 2018/19 in cocoa growing areas of Côte d'Ivoire and Ghana.

[14] Smallholder farmers are defined to be owning land up to 5 hectare in Côte d'Ivoire: (https://www.cgap.org/sites/default/files/Working-Paper-Survey-and-Segmentation-Smallholders-Coted%27Ivoire-Jul-2017.pdf) and up to 3.2 hectares Ghana: http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/37971/filename/37972.pdf).

[15] According to the estimates reported by the International Cocoa Organization (ICCO).

We present the study findings below starting with the population estimates of key outcomes of interest including child labor and hazardous child labor in cocoa production in 2018/19. This is followed by a summary of key findings on the comparison of the prevalence rates of child labor and hazardous child labor in cocoa growing areas of Côte d'Ivoire and Ghana between survey rounds. We then present more detailed findings from the survey and the assessment of effectiveness of interventions implemented by the key stakeholders in both countries.

1.7 Main Findings

The 2018/19 data from agricultural households (with at least one child in the 5-17 age group) in the cocoa growing areas of Côte d'Ivoire and Ghana indicate that approximately:

- 1.56 million children were engaged in child labor in cocoa production (including approximately 790,000 children in Côte d'Ivoire and 770,000 in Ghana).
- 1.48 million children were exposed to at least one component of hazardous child labor in cocoa production (including approximately 770,000 children in Côte d'Ivoire and 710,000 in Ghana) under the common definition.

The data on the prevalence of child labor in cocoa production (proportion of children in cocoa growing areas age 5-17 engaged in child labor in cocoa production) indicates that in 2018/19:

- 45 percent of children living in agricultural households in cocoa growing areas age 5-17 were engaged in child labor in cocoa production in aggregate across Côte d'Ivoire and Ghana.
- The country-specific data indicates that in cocoa growing areas 38 percent of children in Côte d'Ivoire and 55 percent of children in Ghana living in agricultural households were engaged in child labor in cocoa production.

The data on prevalence rate of hazardous child labor in cocoa production (proportion of children in cocoa growing areas age 5-17 engaged in hazardous work in cocoa production) indicates that in 2018/19:

- 43 percent of children living in agricultural households in cocoa growing areas age 5-17 were engaged in hazardous work in cocoa production in aggregate between the two countries.
- The country-specific data indicates that in cocoa growing areas 37 percent of children in Côte d'Ivoire and 51 percent of children in Ghana living in agricultural households were engaged in hazardous work in cocoa production.

Below we present the comparison of changes in the prevalence rates over time, first focusing on the recent trends during the past five year period (2013/14-2018/19) and then presenting the long-term trends based on the comparison between 2008/09 and 2018/19 periods.[16]

1.7.1 Recent Trends with Children in Cocoa Growing Households (2013/14-2018/19)

1.7.1.1 Child Labor

Between 2013/14 and 2018/19, the prevalence rate of child labor in cocoa production among cocoa growing households of Côte d'Ivoire remained stable at around 41 percent. During the same period, there was no statistically significant change in the child labor rates in cocoa production among cocoa growing households in Ghana (remaining stable at around 58 percent).

Recent Trends: Child Labor in Cocoa Growing Households

Amid a 14 percent increase in cocoa production between 2013/14 and 2018/19 in Côte d'Ivoire and Ghana in aggregate, the prevalence rate of child labor in cocoa production among cocoa growing households in each individual country remained stable.

1.7.1.2 Hazardous Child Labor

While cocoa production during this period increased 14 percent in aggregate across Côte d'Ivoire and Ghana, there was no significant increase in hazardous child labor in cocoa production among cocoa growing households in Côte d'Ivoire and Ghana between 2013/14 and 2018/19 (remaining stable at around 39 percent in Côte d'Ivoire and 55 percent in Ghana). The fact that the percentage increase in hazardous child labor was not statistically significant and the increase in cocoa farming was large may indicate the positive impact of increased interventions, including a higher priority given to reducing child labor in the cocoa sector of Côte d'Ivoire and Ghana by the national governments, international organizations, and the Industry stakeholders in recent years.

Recent Trends: Hazardous Child Labor in Cocoa Growing Households

Amid a 14 percent increase in cocoa production between 2013/14 and 2018/19 in Côte d'Ivoire and Ghana in aggregate, the prevalence rate of hazardous child labor in cocoa production among cocoa growing households remained stable in each individual country.

[16] It is important to note that as per the Expert Group recommendation, while comparing the data between two rounds, we will consider a difference to be statistically significant if the difference is found to be significant at a 1 percent level of significance (corresponding to p-value of 0.01 or smaller).

1.7.2 Historic Trends with Children in All Agricultural Households (2008/09-2018/19)

As the main objective of the study, we compare the trend in prevalence rate of child labor and hazardous child labor between 2008/09 and 2018/19 using data from all agricultural households with at least one eligible child age 5-17 (including both cocoa growing households and other agricultural households that did not grow cocoa).

Historic Trends: Child Labor in Agricultural Households

Amid a 62 percent increase in cocoa production between 2008/09 and 2018/19 in Côte d'Ivoire and Ghana in aggregate, the prevalence of child labor in cocoa production among all agricultural households increased 14 percentage points.

1.7.2.1 Child Labor

The prevalence rate of child labor (proportion of children age 5-17 in child labor) in cocoa production among agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana increased by 14 percentage points between the 2008/09 and 2018/19 survey rounds (from 31 percent in 2008/09 to 45 percent in 2018/19). It is important to consider that there was a 62 percent increase in cocoa production during this same time in Côte d'Ivoire and Ghana in aggregate.

In Côte d'Ivoire the prevalence rate of child labor in cocoa production among all agricultural households increased from 23 percent in 2008/09 to 38 percent in 2018/19, while in Ghana the prevalence rate increased from 44 percent in 2008/09 to 55 percent in 2018/19.

Historic Trends: Hazardous Child Labor in Agricultural Households

Amid a 62 percent increase in cocoa production between 2008/09 and 2018/19 in Côte d'Ivoire and Ghana in aggregate, the prevalence rate of hazardous child labor in cocoa production among all agricultural households increased 12 percentage points.

1.7.2.2 Hazardous Child Labor

The prevalence rate of hazardous child labor in cocoa production in agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana increased by 13 percentage points in aggregate between 2008/09 and 2018/19 (from 30 percent in 2008/09 to 43 percent in 2018/19). It is important to consider that there was a 62 percent increase in cocoa production during this same period in Côte d'Ivoire and Ghana in aggregate.

In Côte d'Ivoire the prevalence rate of hazardous child labor in cocoa production among all agricultural households increased from 23 percent in 2008/09 to 37 percent in 2018/19, while in Ghana the prevalence rate increased from 43 percent in 2008/09 to 51 percent in 2018/19.

Comparison of trends over time indicate that despite the efforts made by the governments, Industry, and other key stakeholders in combating child labor and hazardous child labor during the past 10 years, the child labor and hazardous child labor prevalence rates did not go down.

1.8 General Quantitative Insights

1.8.1 School Attendance

Between 2008/09 and 2018/19, in the cocoa growing areas of Côte d'Ivoire and Ghana, school attendance among children 5-17 increased significantly. In Côte d'Ivoire, school attendance among children in agricultural households in cocoa growing areas increased by 22 percentage points (from 58 percent in 2008/09 to 80 percent in 2018/19) and school attendance among Ghanaian children in cocoa growing areas increased from 89 percent to 96 percent between 2008/09 and 2018/19. The school attendance data suggests that reforms in both countries and a greater push for education have led to significant gains in levels of school attendance among children in agricultural households in the cocoa growing areas of the two countries.

Quantitative Insight

School attendance among children in agricultural households increased from 58 percent to 80 in Côte d'Ivoire and from 89 to 96 percent in Ghana.

School attendance among children in agricultural households:

- For the 5-11 age group, school attendance increased from 60 percent to 81 percent for Côte d'Ivoire and 89 percent to 97 percent in Ghana.
- For the 12-14 age group, school attendance increased from 68 percent to 88 percent in Côte d'Ivoire and 93 percent to 98 percent in Ghana.
- For the 15-17 age group, school attendance increased from 39 percent to 66 percent in Côte d'Ivoire and remained stable at 87 percent in Ghana.

1.8.2 Hours of Work Exceeding Maximum Allowable Hours

1.8.2.1 Children in the 5-11 Age Group

The ILO guidelines classify children under the minimum age for light work (in this case, children 5-11) undertaking any types of work for at least one hour per week as engaged in child labor. The proportion of children in cocoa production in agricultural households in the 5-11 age group who undertook at least one hour of work per week in any economic activity increased from 17 percent in 2008/09 to 26 percent in 2018/19 in aggregate. Average number of hours worked in any economic activity by children in the 5-11 age group who worked in cocoa production in the reference week before the survey decreased from 8.7 hours in 2008/09 to 6.3 hours in 2018/19.

In Côte d'Ivoire, the proportion of children engaged in cocoa production in the 5-11 age group who undertook at least one hour of work in any economic activity during the reference week increased from 13 percent to 21 percent. The average hours worked in the reference week by

children working in cocoa production in this age group decreased from 11 hours in 2008/09 to 7 hours in 2018/19.

In Ghana, the proportion of children engaged in cocoa production in the 5-11 age group who undertook at least one hour of work in any economic activity during the reference week remained constant at around 30 percent. The average hours worked in the reference week by children working in cocoa production in this age group decreased from 7 hours in 2008/09 to 5 hours in 2018/19.

1.8.2.2 Children in the 12-14 Age Group

The proportion of children engaged in cocoa production in the 12-14 age group working more than ILO recommended hours (14 or more hours per week) in any economic activity classified as child labor remained stable at around 14 percent in aggregate. The average number of hours worked in any economic activity in the reference week before the survey by children working in cocoa production in this age group also remained stable at around 10 hours.

In Côte d'Ivoire, the proportion of children age 12-14 working in cocoa production and working more than the ILO recommended maximum hours per week in any economic activity increased from 13 percent in 2008/09 to 20 percent in 2018/19. The average hours worked in the reference week by children in this age group in cocoa production remained stable at approximately 13 hours.

In Ghana, the proportion of children in the 12-14 age group working in cocoa production and working more than the ILO recommended maximum hours per week in any economic activity remained stable at approximately 11 percent, and average hours worked in the reference week by children in this age group in cocoa production also remained stable at approximately 7 hours.

1.8.2.3 Children in the 15-17 Age Group

The proportion of children in the 15-17 age group[17] in cocoa production working more than the ILO recommended hours (42 hours per week) in any economic activity, which classified them as child labor, remained stable at approximately 2 percent in aggregate. However, the average number of hours worked in the reference week by children in this age group in cocoa production decreased from 14 to 12 hours per week.

In Côte d'Ivoire, the average number of hours worked in any economic activity in the reference week by children aged 15-17 who were working in cocoa production dropped by approximately

[17] Children in the 15-17 age group are allowed to undertake regular work (42 hours or less) as per the ILO framework.

6 hours in the week prior to the survey (from 20 hours in 2008/09 to 14 hours in 2018/19), although there was no statistically significant change in the proportion of children in that age group working more than the ILO recommended maximum hours (remaining stable at approximately 3 percent).

In Ghana, for children in the 15-17 age group working in cocoa production there was no statistically significant difference in the proportion of children working in any economic activity more than the ILO recommended hours (remaining stable at 2%). Average hours worked remained stable at around 9 hours.

1.8.3 Types of Hazardous Work in Cocoa Production

Comparison of the six types of hazardous work among children involved in cocoa production in this study indicate:

- Use of sharp tools (36 percent), carrying heavy loads (29 percent), and exposure to agro-chemicals (24 percent) were the most common sources of hazardous work in 2018/19 in aggregate.
- Use of sharp tools, the most commonly performed hazardous activities in cocoa agriculture, increased by 8 percentage points between 2008/09 and 2018/19 in aggregate (from 28 percent in 2008/09 to 36 percent in 2018/19).
- Exposure to agro-chemicals became more pervasive between 2008/09 and 2018/19 as the proportion of children exposed to agro-chemical products increased by approximately five-fold between 2008/09 and 2018/19, from 5 percent to 24 percent in aggregate.
  - Similar trends were found in both countries, with exposure to agro-chemical products increasing from 4 percent to 19 percent in Côte d'Ivoire and from 7 percent to 32 percent in Ghana. This increase is aligned with findings showing a significant increase in agro-chemical use among cocoa growing households between 2013/14 and 2018/19.

1.9 Analytical Findings on Context

1.9.1 Importance of Cocoa Agriculture

Comparison of survey data from 2008/09 to 2018/19 indicates that children in the study areas shifted away from other agricultural activities to cocoa production, potentially due to the increasing importance of cocoa farming. In the cocoa growing areas of Côte d'Ivoire and Ghana, there was a 9 percentage points decrease (from 29% to 20%) in the proportion of children involved in agricultural work outside of the cocoa sector between survey rounds.

1.9.2 Cocoa Production Stratum[18]

An analysis of child labor by cocoa production stratum reveals important insights into how child labor manifests within the study areas. The prevalence of child labor between 2008/09 and 2018/19 did not see a statistically significant increase in the high production stratum (remaining stable at around 45 percent), while it increased substantially in the medium and low production strata (by 16 and 27 percentage points respectively). There was a similar trend in the change in prevalence of hazardous child labor within each production stratum during the same period. This may indicate the importance of focusing intervention efforts on areas where cocoa production has not been as historically high.[19]

Analytical Insight

The prevalence rate of child labor did not increase in the high cocoa production stratum while we observe substantial increases in prevalence within the low and medium production areas between 2008/09 and 2018/19. There was a similar trend in the change in prevalence of exposure to hazardous work during the same period.

These findings suggest that as high production areas become increasingly saturated with cocoa farming, cocoa production activities are expanding into new areas where the infrastructure is weak, and awareness related to child labor and hazardous work is limited. Additionally, interventions targeting child labor over the past ten years (2008 to 2018) have likely focused on the high production areas where prevalence is more widespread and the perceived need for such interventions is greatest. Thus, it seems the increase in production that led to expansion into new less saturated areas may have resulted in increased child labor and exposure to hazardous work in cocoa production.

1.9.3 Use of Agro-chemical Products

Use of agro-chemical products by cocoa growing households increased significantly between 2013/14 and 2018/19 in both Côte d'Ivoire and Ghana. In aggregate, use of pesticides and herbicides (percentage of household reporting use of the input) each increased by around 20 percentage points and fertilizer usage increased by 10 percentage points between 2013/14 and 2018/19. Household-level agro-chemical use is important because it is highly correlated with children's exposure to agro-chemicals and helps explain why children's exposure to agro-chemical products increased significantly from 2013/14 to 2018/19.

[18] Cocoa production stratum is determined by the amount of cocoa produced per district and department. Districts and departments are placed into high, medium, and low production stratum with high producing the most cocoa and low producing the least cocoa.

[19] Intervention data collected by NORC from the stakeholders indicate that the interventions implemented by different partners between 2010- 2018 were mostly concentrated in the high production stratum with some in the medium stratum and very few in the low production stratum.

Self-reported data from the household survey indicate an overall increasing trend in expenditures (per ton of cocoa produced) on fertilizer, pesticides, and herbicides between 2013/14 and 2018/19. In aggregate, there were statistically significant increases in expenditures on fertilizer (from USD $556 to $1,254 per ton of cocoa per year), pesticides (from USD $267 to $745 per ton of cocoa per year) and herbicides (from USD $230 to $481 per ton of cocoa per year).[20]

1.10 Assessment Findings

The comparisons of descriptive statistics presented above provide a rich overview of the prevalence of child labor and hazardous child labor in the cocoa sector in Côte d'Ivoire and Ghana in 2018/19 and how they compare to the situation in previous survey rounds. The second major objective of this study is to assess the role of interventions implemented by key stakeholders in confronting the issues of child labor and hazardous child labor in the cocoa sector. Our assessment of the effectiveness of various interventions focuses on how different types of interventions, rather than specific interventions implemented by any individual organization, were effective in addressing child labor issues in general, and hazardous child labor in particular, in the two countries. NORC employed a suite of quantitative and qualitative analytic tools to generate robust conclusions to assess whether particular categories of interventions implemented to address child labor and hazardous child labor were effective in reducing child labor and hazardous child labor prevalence.[21]

The quantitative analysis is based on a quasi-experimental design used to assess the impact of different categories of interventions on child labor and hazardous child labor, while the qualitative analysis uses Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) to provide complementary evidence and deep contextual insights.

1.10.1 Quantitative Assessment

The quantitative analysis considered the effectiveness of different types of interventions including education material assistance, livelihood support, and occupational safety and health projects. Results derived from the quasi-experimental evaluation based on data from Côte d'Ivoire indicate that **when multiple interventions were implemented in a community, it led**

[20] The reported values of expenditures were adjusted for inflation (reported in real USD figures) and generated after dropping the households with cocoa production in the bottom 10 percentile of the distribution to avoid over-estimation of expenditure per-ton of cocoa production.

[21] Please see Section 8.2 and Annex 10.8 for a description of the assessment methodology.

to a statistically significant reduction in the rates of child labor and hazardous child labor in cocoa production[22]:

- Households in communities with multiple interventions were 25 percentage points less likely to have at least one child engaged in child labor and 28 percentage points less likely to have at least one child engaged in hazardous child labor[23] than the households from comparison communities.[24]
- The rate of child labor among households in communities with multiple interventions was approximately 17 percentage points lower than the rate of child labor among households in the comparison communities.[25] The rate of hazardous child labor among households in communities receiving multiple interventions was approximately 17 percentage points lower than the rates of hazardous child labor among households in the comparison communities.[26]

> **Quantitative Insight**
>
> When multiple interventions were implemented in a community, it led to a statistically significant reduction in the rates of child labor and hazardous child labor in cocoa production.

1.10.2 Qualitative Assessment

Our qualitative assessment analyzed data collected from FGDs with beneficiaries and from KIIs with a variety of stakeholders in Côte d'Ivoire and Ghana. The qualitative aspect offers complementary insights on the effectiveness of interventions and efforts related to the reduction of child labor and hazardous child labor in the two countries.

> **Qualitative Insight**
>
> The improved accessibility and affordability of schools allowed children who would otherwise be working during school hours to enroll and spend less time working.

In both countries, school-based interventions were reported to be very successful in addressing child labor, especially when coupled with community mobilization and deep engagement with caregivers, teachers, and community leaders. School-based interventions, including school construction, feeding programs, and infrastructure

[22] The results presented here on multiple interventions are based on data collected from Côte d'Ivoire since the available sample size in Ghana was too small for undertaking the analysis of impact of multiple interventions.

[23] The results were based on multivariate regression, where we control for the household, community, and school characteristics that are expected to influence the likelihood of engaging children in child labor and in hazardous child labor by a household.

[24] Comparison communities were similar to the treatment communities in certain observable community characteristics, but did not receive such interventions.

[25] The results were based on multivariate regression, where we control for the household, community, and school characteristics that are expected to influence rates of child labor and in hazardous child labor within a household.

[26] The results were based on multivariate regression, where we control for the household, community, and school characteristics that are expected to influence the rates of hazardous child labor and in hazardous child labor within a household.

improvement facilitated an increase in school attendance in Côte d'Ivoire and Ghana. In many communities, parents reported taking their children to the farm because they could not afford to enroll them in school or pay for costs of school materials. Parents residing in communities where the nearest school is self-reported to be far from home also report having no choice but to take their children with them to the farm. The improved accessibility and affordability of schools allowed children who would otherwise be working during school hours to enroll and spend less time working.

Community leaders, implementers, donors, and government officials report that in most cases, factors related to poverty and truancy contribute to high child labor rates. Notably, respondents thought that some of the most effective interventions were those addressing the root causes of child labor but not necessarily designed to support child labor prevention only. These include school construction, good agricultural practices training, and road construction between cocoa communities and larger communities.

While vocational training programs were not offered frequently, when offered they enable youth to explore post-education opportunities in their own communities. Vocational training programs were most impactful for girls, as they provide a foundation for future income generation.

Qualitative Insight

Respondents recommend that engaging community leaders, including representatives for women and youth, early in the design of the intervention helped promote sustainability.

Families receiving livelihood support spoke of improved cocoa yields, improved access to credit, and improved financial outcomes leading from those interventions. Livelihood support also facilitates off-season income generation, which in combination with improved financial outcomes, allows households to reinvest in their farms and hire farm labor. Caregivers who were able to hire farm laborers report engaging their children in farm work less often.

Interventions engaging community members in their design and implementation are also considered more effective, while those taking a more top-down approach were less effective. Interventions promoting alternative income generation and school enrollment are believed to be most sustainable. Working groups, national action plans, and coordinated activities also hold significant potential for facilitating current and future sustainability, provided these groups focus on activity coordination and resource mobilization.

1.11 Conclusions

It is important to note that the Framework of Action to Support Implementation of the Harkin-Engel Protocol calls for a 70 percent reduction in the worst forms of child labor over a ten-year period. In part, this metric is an aspirational, although important, goal to work towards. However,

it is only one among many possible metrics useful in measuring progress in reducing the worst forms of child labor.

Policymakers and stakeholders are often required to make decisions to confront critical issues, such as child labor in important value chains, before rigorous research is conducted to truly understand the scope, contextual reality, and potential interplay of factors surrounding the issue and impacting the targets. When policymakers and stakeholders set a target without forecasting the complex and dynamic relationship of contextual factors that may influence long-term trends, they can underestimate the time and resources needed to achieve a particular target, such as 70 percent reduction in the worst forms of child labor over a ten-year period amid a 62 percent increase in cocoa production.

This problem is compounded when the focus becomes realizing a metric rather than understanding the scope of the problem and the interrelated contextual factors driving it. Although reducing hazardous child labor in the cocoa sector is important, understanding what is driving high rates of hazardous child labor and what is and is not working to improve children's lives in cocoa growing areas is equally important in order to focus interventions most effectively.

In addition, the targets set in the Declaration and Framework focus on a reduction in the rate of the WFCL which requires a total withdrawal of children from all types of hazardous activities related to cocoa production. That one metric alone may not be sufficient to document the progress made in fighting child labor and the worst forms of child labor in cocoa production in Côte d'Ivoire and Ghana. For example, if an intervention reduces a child's exposure to one component of hazardous work (defined in Section 3.3 of this report), this progress would not be reflected in the overall measured rate of hazardous child labor unless the child is involved in *only* that particular hazard. For example, if a child engages in both sharp tool use and agro-chemical spraying, they are categorized under hazardous child labor conditions. If an intervention then focuses on reducing agro-chemical use, and changes behavior around that metric, the child will still be categorized in hazardous child labor because of the sharp tool use. In essence, the targets may overshadow what is actual working on the ground to reduce hazardous child labor and improve the lives of children within the cocoa sector.

Consideration

Child labor is a complex problem requiring multiple interrelated interventions to achieve significant impacts.

The next point requires taking a step back and viewing the cocoa sector from a broader vantage point. Cocoa production accounts for 10 percent of the gross domestic product (GDP) of Côte d'Ivoire and 7 percent of the GDP of Ghana. Fluctuations in the cocoa sector not only impact the lives of children but also the lives of millions of cocoa farmers and the economies of both Côte d'Ivoire and Ghana (thus impacting the populations of those countries regardless of their relationship to cocoa production).

This report hopes to provide a broader perspective by not only presenting the overall numbers of children involved in child labor and in hazardous work in the cocoa sector, but also the interrelated factors that might influence the observed prevalence rates, different initiatives by stakeholders to address the issues, and where and how interventions are effectively impacting child labor and hazardous child labor.

In conclusion, this report makes a strong case for understanding child labor and hazardous child labor in cocoa production as a complex problem requiring multiple complementary solutions. Survey findings show an increase in both child labor and hazardous child labor in cocoa production in the cocoa growing areas of Côte d'Ivoire and Ghana between 2008/09 and 2018/19, while cocoa production increased significantly over the same period.

We also find child labor and hazardous child labor rates in cocoa production stabilizing within areas with historically high cocoa production while increasing in medium and low production areas. The increased prevalence of child labor and hazardous child labor rates in the medium and low cocoa production areas underscores the importance of investing in child labor interventions within medium and low production areas. This is further supported by findings looking at the 2013/14 to 2018/19 period, which show child labor and hazardous child labor rates within cocoa growing households stabilizing even in the face of increased cocoa production.

The findings also indicate that the fight against child labor becomes effective when a suite of interventions targeting livelihoods, education, awareness, legislation, and community monitoring and multiple stakeholders such as governments, NGOs, CSOs, Industry stakeholders, and international organizations come together to confront child labor issues.

Our work in assessing the progress made from 2010 to 2020 makes the complex nature of the problem apparent and evidence laid out in this report supports the need to take a system approach to the issue of child labor, in which multiple overlapping solutions and interventions are needed in order to address the complex issue at hand.

Throughout the report, the findings suggest the importance of continued investments focused on child labor in cocoa production using a holistic system-based approach. Such an approach would consider various push factors such as limited access to education and poverty in relation to pull factors such as an increase in the global price of cocoa and increasing cocoa yields (for example provision of low cost and easily available agricultural inputs) and how those factors relate to production stratum, educational opportunities, and hazardous child labor.

Although the Harkin-Engel Protocol is coming to an end, the success of the protocol in bringing together government, international, and Industry stakeholders to address the issue of child labor and hazardous child labor in the cocoa sector can serve as a model for continued engagement by all stakeholders.

2 Stakeholder Statements

3 Study Objectives

The cooperative agreement between USDOL and NORC had two overarching goals. Those goals defined the work of this report and parameters of the analysis. In short, the two goals were:

1. **Goal 1**: Conduct a sectorally-representative survey during the 2018/2019 harvest season, which covers the previous 12-month reference period, to develop population estimates for the prevalence of working children, child labor, and the worst forms of child labor (using hazardous labor as a proxy) in agriculture, including the cocoa sector, in the cocoa growing areas of Côte d'Ivoire and Ghana, and then use those estimates to measure percent changes in the prevalence in the worst forms of child labor compared to data collected in these same areas in 2008/09 and 2018/19.
2. **Goal 2**: Assess the relative effectiveness of projects contributing to reduced child labor and the worst forms of child labor in Côte d'Ivoire and Ghana, and progress toward achievement of the goals and targets of the Declaration and Framework. The assessment also seeks to address a set of major research questions, developed between USDOL and NORC, on the efficacy of funded interventions.

3.1 Measuring the Progress Toward Achieving the Goals and Targets of the Declaration and Framework

The main objective of this report is to use data from the three survey rounds to assess how the main outcome indicators of interest – the prevalence of children in child labor and the prevalence of children in hazardous work in the cocoa sector[27]– changed between 2008/09 and 2018/19. Towards that objective, NORC conducted a survey during the 2018/19 harvest season to develop population estimates of the prevalence of working children, child labor, and hazardous child labor (as a proxy of the worst forms of child labor) in agricultural households, in the cocoa growing areas of Côte d'Ivoire and Ghana. The main data collection efforts across Ghana and Côte d'Ivoire, and the subsequent analysis of child labor rates are presented in Chapter 4 and 5 of this report. The primary research questions associated with the data collection and analysis include:

- What is the population of economically active children in cocoa growing areas during the 2018/19 harvest seasons?
- What is the population of children in agricultural households in cocoa growing areas in each country in 2018/19 disaggregated by employment status (i.e., working, non-working)?

[27] Cocoa sector is defined as the cocoa growing areas of Côte d'Ivoire and Ghana

- What is the population of children working in agriculture in cocoa-growing areas disaggregated by the sector of engagement (i.e., cocoa sector, and agriculture other than the cocoa sector)?
- What is the population of children working in sectors other than agriculture?
- How many children were working, were engaged in child labor, and were engaged in the worst forms of child labor (using hazardous labor as a proxy) in the cocoa sector during the 2018/19 harvest seasons?
- What is the percentage change in the proportion of children that were working, were engaged in child labor, and were performing hazardous work in cocoa production in cocoa growing areas between the 2008/19 and 2018/19 main harvest seasons?

3.2 Assessment of Effectiveness of Interventions Funded Toward Achieving Goals and Targets of the Declaration and Framework

The second main objective of this report is to assess the relative effectiveness of various interventions funded by the members of the CLCCG and other stakeholders. Under this objective, we address specific research questions (see Section 8.3 for a list of the research questions) with the aim of understanding how different types of interventions were effective in addressing child labor issues.

It is important to note that our analysis does not assess the effectiveness of individual interventions or implementers. Given both the disparate types and overall number of interventions conducted between 2008/09 and 2018/19, it was not feasible to assess the effectiveness of each one due to data limitations. Rather we assess the effectiveness of different categories of interventions (such as education related interventions, livelihoods programs, and occupational safety and health interventions, to name a few).

3.3 Definitions: Working Children, Child Labor and Hazardous Child Labor based on Common and Local Definitions

This section presents the definitions of working children (children in employment), child labor, and hazardous child labor used throughout the report[28]. Data on working children, child labor, and hazardous child labor were collected using both a twelve-month and seven-day reference period to allow for comparisons of the estimates based on two reference periods commonly reported for measuring children's engagement in work and to understand children's activities during the peak harvest season versus throughout the year. While data were collected for both

[28] The definitions of working children, child labor, and hazardous child labor are from the International Labour Organization (ILO), Report III: Child Labour Statistics, 18th International Conference of Labour Statisticians, Geneva, (November 24 – December 2008).

reference periods, in most instances, **data analysis focuses on the twelve-month reference** period to remain consistent with previous survey rounds and to address the seasonality of various tasks performed in cocoa agriculture.

For generating aggregate estimates on hazardous work performed by children in cocoa production, we use a common definition focusing on the "common ground" between Ghanaian and the Ivorian definitions within a broader ILO framework.[29]

Additionally, we present estimates of child labor and hazardous child labor based on Ivorian and Ghanaian country specific definitions using individual country national legislations as the base for defining child labor and hazardous child labor. This country specific analysis, based solely on the 2018/19 survey round, is helpful for Ghanaian and Ivorian stakeholders addressing national programs around child labor and is found in Chapter 6 of this report.

3.3.1 Working Children (Children in Employment)

Working children, as per an ILO and ICLS framework[30], are defined as children (5 – 17 years old) who have worked at least one hour during the reference period in any economic activity, either paid or unpaid. The research team then further differentiated within this broad category to account for agricultural work, cocoa work, and non-agricultural work. It is important to note that, the definition of "work" by children does not include household chores within their own households.

3.3.2 Children in Child Labor

The definition of child labor is also based on an ILO and ICLS framework.[31][32] For the purpose of this report, children engaged in child labor are defined as (a) children working below minimum age (if they are under 12), (b) children exceeding the number of working hours allowable for their age group based on the ILO Convention 138 on the Minimum Age on Admission to Employment[33] (if they are between 12-17), (c) children of any age performing hazardous work[34]

[29] The common definition was developed by Tulane University. For more details, please consult the study report: Survey Research on Child Labor in West African Cocoa Growing Areas, Final Report, 2013-14, Tulane University.

[30] International Labour Organization (ILO), Report III: Child Labour Statistics, 18th International Conference of Labour Statisticians, Geneva, (November 24 – December 2008).

[31] International Labour Organization (ILO), Report of the Conference, 18th International Conference of Labour Statisticians, (2008).

[32] The research team relied on the 18th ICLS to remain consistent with previous survey rounds. The most current and up-to-date iteration of the ICLS is the 20th

[33] International Labour Organization (ILO), Convention 138 Concerning Minimum Age for Admission to Employment, (June 26, 1973).

[34] Based on ILO Convention 182, Article 3(d) and Recommendation 190.

in the cocoa growing areas of Côte d'Ivoire and Ghana. **The worst forms of child labor other than hazardous work and hazardous unpaid household services are not included in this measure**.

3.3.3 Children in Hazardous Child Labor: Common Definition

As a proxy for the WFCL, hazardous child labor is constructed, using the common definition, from six subcategories and a child is determined to have participated in hazardous work if they have been exposed to at least one subcategory of the common definition as described below.

1. Land clearing
2. Carrying heavy loads
3. Using agro-chemicals
4. Using sharp tools
5. Long working hours
6. Night work

Exposure to land clearing: A child is exposed to a land clearing related hazard if the child engages in clearing of land, felling and chopping of trees, or burning within the reference period.

Exposure to carrying Heavy loads: A child is exposed a heavy load related hazard if the child carries a heavy load of wood and other loads while working in agriculture within the reference period. The definition of "heavy" is based on the child's own perception on whether the load carried was heavy or not.[35]

Exposure to agro-chemical products: A child is exposed to agro-chemicals if the child is engaged in spraying, carrying water for spraying, or working with agro-chemicals during the reference period.

A child is considered to be engaged in spraying if the child:

- Was involved in spraying of pesticides or insecticides
- Was present or worked in the vicinity of a farm during pesticide spraying, or
- Reentered a sprayed farm within less than 12 hours of spraying.

[35] It is the research teams' view that this is the most valid way to measure "heavy loads" without necessitating the use of scales and diary-based data collection methods.

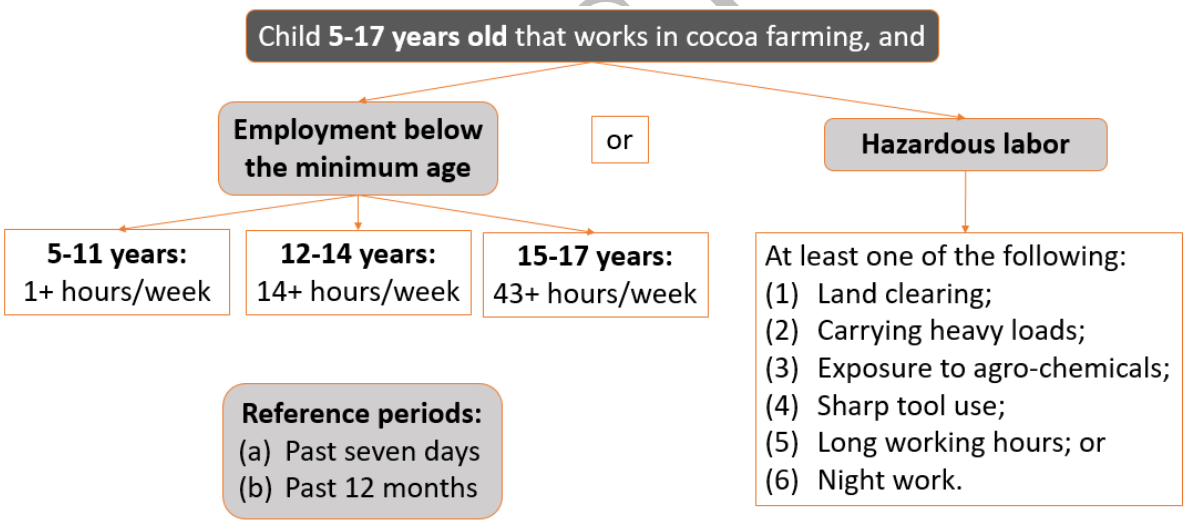
Working with agro-chemicals includes a child having been involved in handling agro-chemical products such as purchase, transport, storage, mixing, loading, washing of containers and spraying machine, and/or disposal.

Exposure to sharp tools: A child is exposed to sharp tool use if the child uses machetes/long cutlasses for weeding, handling motorized equipment or machines, knapsack sprayer and/or chainsaw, harvesting with a machete or sickle, harvesting overhead cocoa pods with a harvesting hook, or breaking cocoa pods with a knife or a sharp object/tool during the reference period.

Exposure to long working hours: A child is exposed to long working hours if a child works 43 hours or more per week during the reference period.

Exposure to night work: A child is exposed to night work if a child goes to or returns from the farm alone, or working on the farm between 6.00 p.m. and 6.00 a.m.[36]

Figure 2: Child Labor Common Definition



3.3.4 Children in Hazardous Child Labor: National Definitions

We provide the national definitions below to understand the metrics the local governments find most important. The Ghanaian definition of hazardous work is broken into ten subcategories and the Ivoirian definition of hazardous work is broken into seven subcategories based on country specific legislation. Children are considered exposed to hazardous work if they are exposed to at

[36] According to the 18th ICLS, a child is considered to be working at night if the work schedule includes hours of work defined as night work prohibited for children under national definition, where it exists. In the case of children, the period of time spent commuting unaccompanied between work and home should be considered as part of the work schedule.

least one subcategory of a country specific definition. There are also minor changes to the definition of child labor based on country specific definitions of child labor, but this section focuses on hazardous child labor only. In this report statistics disaggregated by country use the common definition and information on country specific statistics can be found in Section 7. A detailed description of country specific hazardous child labor definitions can be found in Annex 10.3.

3.3.4.1 Ghanaian National Legislation (Local Definition) and Sub-Categories of Hazardous Work

The Ghanaian definition of hazardous child labor consists of ten sub-categories:

1. Working full time and not attending school,
2. Withdrawing from school during cocoa season to do farm work,
3. Land clearing,
4. Carrying heavy loads,
5. Spraying and agrochemicals,
6. Use of sharp tools,
7. Climbing trees,
8. Night work,
9. Working in isolation, and
10. Working without protective clothing.

A child is considered exposed to hazardous work if they were exposed to at least one subcategory during the reference period. A complete crosswalk for the definitions of child labor can be found in Annex 10.3.

3.3.4.2 Ivorian National Legislation (Local Definition) and Sub-Categories of Hazardous Work

The Ivorian definition of hazardous child labor consists of seven sub-categories:

1. Inadequate rest,
2. Land clearing,
3. Charcoal production,
4. Carrying heavy loads,
5. Use of agrochemicals,

6. Use of sharp tools, and
7. Night work (between 7 p.m. to 7 a.m.) or work during school/business hours.

A child is considered exposed to hazardous work if they were exposed to at least one subcategory during the reference period. The Côte D'Ivoire definition differs from international norms because if a child is 16 or 17 years old and has received appropriate training relating to use of hazardous materials in agriculture, they are not considered to have been exposed to hazardous work. A complete description of the definitions of child labor can be found in Annex 10.3.

4 Methodology

In order to develop population estimates for the prevalence of working children, child labor and hazardous child labor in the cocoa growing areas of Côte d'Ivoire and Ghana, and use those estimates to measure changes in child labor prevalence between 2008/09 and 2018/19, NORC undertook a sectorally representative survey during the 2018/19 cocoa harvest season in cocoa growing areas of Côte d'Ivoire and Ghana. The following sections briefly describe the activities and methodology undertaken during the 2018/19 round of data collection.

4.1 Sampling Methodology and Implementation of the 2018/19 Survey Round

4.1.1 Sampling Approach and Stratification[37]

In brief, NORC used a multi-stage stratified cluster sampling technique. In this approach the primary sampling unit (PSU) was the census Enumeration Areas (EAs) in the cocoa producing areas of Côte d'Ivoire and Ghana and the secondary sampling unit (SSU) was agricultural households. The first step was identifying a given number of Enumeration Areas (EAs) from which the SSUs (households) were selected. NORC formally requested the assistance of the Ghana Statistical Service (GSS) and the Insitut National de la Statistique de Côte d'Ivoire (INS) to select the EAs based on a defined sampling plan designed to keep the survey frames as similar as possible across rounds. In the first stage, NORC stratified the cocoa-growing districts of Ghana and departments of Côte d'Ivoire into high, medium, and low cocoa production strata based on the most recent available cocoa production data.[38] Using the district/department level production data, the rural EAs in each of the districts/departments were classified into high, medium and low production strata by GSS in Ghana and INS in Côte d'Ivoire.

[37] Please note that our sampling approach did not include encampments (unless directly under an EA administrative classification) or protected forest lands.

[38] The data on recent production provided by COCOBOD in Ghana and the Coffee-Cocoa Council in Côte d'Ivoire.

In the second sampling stage, drawing from the list of all EA stratified into high/medium/low cocoa production, GSS and INS randomly drew a total of 150 EAs respectively, specifically drawing:

- 80 EA from high cocoa production stratum
- 50 EA from medium cocoa production stratum
- 20 EA from low cocoa production stratum

Next, half of each stratum of EAs was randomly assigned to target EAs and the other half kept as the replacement EAs. The final target sample for each country consisted of:

- 40 EAs from high cocoa production stratum
- 25 EAs from medium cocoa production stratum
- 10 EAs from low cocoa production stratum

A more detailed description of the sampling approach adopted by NORC is provided in Annex 10.1.

4.1.2 Types and number of interviews completed

The research team administered six survey instruments during the 2018/19 data collection round;

1. Household roster,
2. Household head,
3. Child,
4. Community,
5. Cocoa Shed, and
6. School[39].

Coverage of Survey

There were 2,821 roster surveys, 2,809 household head surveys, 5,543 child surveys, 158 community surveys, 372 cocoa shed surveys, and 260 school surveys administered across Ghana and Côte d'Ivoire.

The number of total child and household head interviews completed by region for Côte d'Ivoire and Ghana in the 2018/19 survey round can be found in Table 41 in Annex 10.4.1. There were 2,809 child and 1,314 household head interviews completed in Ghana spread across six regions. For Côte d'Ivoire there were 2,734 child and 1,495 household head interviews completed across fifteen regions. Overall, there were 2,821 roster surveys, 2,809 household head surveys, 5,543 child surveys, 158 community surveys, 372 cocoa shed surveys, and 260 school surveys administered across Ghana and Côte d'Ivoire. Additional information on the number of surveys completed by country and comparisons to the 2008/09 round can be found in Section 4.2.

[39] Please see Annex 10.1 for a complete description of each survey instrument

4.1.3 Implementation of 2018/19 Survey Round

Once enumeration areas (the PSUs) were identified, NORC conducted a complete household listing of each EA for 2018/19. For the purpose of sampling, only households identified as agricultural households having at least one child 5-17 during the listing were determined to be eligible households (both cocoa growing households and other agricultural households). There were 8,858 total households and 6,399 eligible households listed in Côte d'Ivoire across 75 EAs and 9,200 total households and 3,969 eligible households in Ghana across 75 EAs. After the listing exercise, agricultural households (the SSUs) with at least one eligible child aged 5-17 were randomly selected in each EA. In Côte d'Ivoire 25 eligible agricultural households (of which 5 were replacements) and in Ghana 23 eligible agricultural households (of which 5 were replacements) were randomly drawn for data collection.

Table 1 below shows the listing data for all eligible households in our sample and reflects the importance of cocoa agriculture in Côte d'Ivoire and Ghana. Looking at the percentage of agricultural households that grew cocoa, in Côte d'Ivoire approximately 7,500 out of 8,900 households (85%) grew cocoa, and similarly in Ghana approximately 8,000 out of 9,200 households (87%) grew cocoa during the 2018/19 survey round. Overall, cocoa is a key part of agriculture in the cocoa growing areas of both countries as can be seen from the fact that a predominant majority (more than 85 percent) of agricultural households grow cocoa.

Table 1: Distribution of Sample*: Agricultural Households, Cocoa Growing Households and Non-Cocoa Growing Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

	Total	Côte d'Ivoire	Ghana
All agricultural households	18,058	8,858	9,200
Number of cocoa growing households	15,528	7,547	7,981
Percentage of cocoa growing households	86%	85%	87%
Number of non-cocoa growing agricultural households	2,530	1,311	1,219
Percentage of non-cocoa growing agricultural households	14%	15%	13%

Source: NORC sample 2018/2019, strata 1-3

**Only households with children were surveyed, which dropped the eligible households for Ghana to 6,125 and Côte d'Ivoire to 6,399.*

Data collection took place in Ghana from November 23rd, 2018 to January 27th, 2019 and for Côte d'Ivoire from February 9th, 2019 to March 7th, 2019. Data collection timing was purposive and conducted during the main harvest season in both countries. The household roster was first administered to each sampled household to determine which children would be eligible for

interviews and to identify the household head. A household was complete once there was a household roster survey, household head survey, and a child survey for each eligible child. Table 42 in Annex 10.4.1 details the household head and child survey response rates by household roster survey. Overall, at least 99% of the sampled eligible households had a household head survey and over 90% of sampled eligible households have at least one child survey for Côte d'Ivoire and Ghana.

The community, cocoa shed, and school interviews were all conducted at the EA level. The EA level surveys were then linked to the households from the same EA to provide additional information on the communities those households are a part of. Additional information on data collection and survey implementation can be found in Annex 10.1.

4.2 Description of Sample

4.2.1 Comparison of Sample Sizes between 2008/09 and 2018/19 Round of Survey

Below we present a comparison of sample sizes between the baseline (2008/09) and endline (2018/19) survey rounds. The 2008/09 and 2018/19 survey round each had five of the same surveys administered (roster, household head child, community, and cocoa shed) with the school survey being added in the 2018/19 survey round. A target of 1,500 households in Côte d'Ivoire and 1,300 households in Ghana was set to obtain at least 2,300 child surveys per country for the 2018/19 round (see Annex 10.1.1 for additional information on the sample size calculations). Data collection in 2018/19 ended with 1,504 completed households in Côte d'Ivoire and 1,317 completed households in Ghana resulting in 2,734 and 2,809 completed child surveys respectively. The comparisons of sample size by survey type can be found in Table 2 below where the number of surveys increased between rounds for each type of survey.

Table 2: Comparison of Sample Sizes by Survey Type, All Agricultural Households With At Least One Child Age 5-17, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

	Total		Côte d'Ivoire		Ghana	
	2008/09	2018/19	2008/09	2018/19	2008/09	2018/19
Household Roster	1,656	2,821	806	1,504	850	1,317
Head of Household	1,638	2,809	803	1,495	835	1,314
Child	4,443	5,543	2,165	2,734	2,278	2,809
Community	82	140	40	79	42	79
Cocoa Shed	61	372	32	168	29	204
School	N/A	260	N/A	158	N/A	102

Source: Survey 2008/09 and 2018/2019, strata 1-3

4.2.2 Respondent Characteristics

The median age of child respondents in Côte d'Ivoire and Ghana was 10 years. On average, both countries had an almost equal proportion of male and female child respondents.

Table 3 shows a breakdown of the household head characteristics in Côte d'Ivoire and Ghana and Table 4 shows the characteristics of the child respondents).[40] The median age of respondents was approximately 44 years in Côte d'Ivoire and 46 years in Ghana. There was a higher percent of male respondents in Côte d'Ivoire (approximately 90%) than in Ghana (approximately 75%).

The median age of child respondents in Côte d'Ivoire and Ghana was 10 years. On average, both countries had an almost equal proportion of male and female child respondents.

Table 3: Respondent Characteristics: Head of Household, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

			Côte d'Ivoire	Ghana
Average age (years)			46.3	48.3
Median age (years)			44.0	46.0
Sex	**Male**	**Number**	1,338	982
		Percent	91%	75%
	Female	**Number**	135	322
		Percent	9%	25%

Source: NORC Roster survey 2018/2019, strata 1-3

Table 4: Respondent Characteristics: Children 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

			Côte d'Ivoire	Ghana
Average age (years)			10.2	10.5
Median age (years)			10.0	10.0
Sex	**Male**	**Number**	1,425	1,478
		Percent	52%	53%
	Female	**Number**	1,309	1,331
		Percent	48%	47%

Source: NORC Child survey 2018/2019, strata 1-3

[40] Note that these are self-reported head-of-household and most likely suffers from gender bias in reporting.

4.2.2.1 Nationality of the Child Respondents

Examining the nationality and birthplace of children sheds light on how much immigration is present in the cocoa growing areas of each country. Table 43 in Annex 10.4.1 shows birthplace and current nationality of children in the 2018/19 survey round. The majority of child respondents were natural-born citizens in their respective countries (Ghana and Côte d'Ivoire). However, Côte d'Ivoire does have some children born outside of Côte d'Ivoire and of another nationalities, mostly representing immigration from Burkina Faso and Mali.

4.2.3 Area of Land Under Cultivation

Given that the sample consists of agricultural households and most of these households were cocoa growing households, we present the data of land under cultivation and land under cultivation for cocoa farming in

Table 44 in Annex 10.4.1. The average size of land under cultivation in Côte d'Ivoire was 20.5 acres and 8.4 acres in Ghana. The average area under cocoa cultivation in Côte d'Ivoire was 8.6 acres and 6.4 acres in Ghana. The difference in area of land under cultivation indicates that the average agricultural household in Ghana operated on much larger plot size for cocoa cultivation.

4.3 Limitations and Methodological Consideration: Coverage of Data and Comparison of Data Across Rounds

Before moving on to the comparison of study rounds, there are a few important methodological considerations the reader should understand. The first issue deals with the comparison of 2013/14 data to 2018/19 data. The second consideration deals with the comparison of 2008/09 data with 2018/19 data.

To start, there was incomplete documentation on the exact methods used in previous survey rounds and NORC was unable to recover data required for an exact replication of the sampling frame used in the earlier rounds. This lack of information made it challenging at times to design the 2018/19 survey to allow for precise comparisons across rounds. NORC approached this issue by striking a balance between precision and comparability, allowing for comparability on key metrics while improving upon the sampling frame construction with an aim of increasing the precision of the 2018/19 estimates. This balance allows stakeholders to use 2018/19 data as a strong base with more precise estimates moving forward while also allowing for comparisons across study rounds.

4.3.1 2013/14 Data Quality Issues[41]

Due to an error in survey implementation during the 2013/14 data collection round, the survey collected data only from cocoa growing households in Côte d'Ivoire (omitting the non-cocoa growing agricultural households from the sample).

This error was discovered after data collection was complete, and, in an attempt to correct the error, a different sampling method was adopted for selecting non-cocoa households to be surveyed as part of the 2013/14 data collection round. 15 clusters (from 60 clusters that were part of the 2013/14 data collection round) were sampled to supplement the sample of non-cocoa agricultural households. The sampling method selected 11 purposively sampled clusters and 4 randomly selected clusters (rather than 15 randomly selected clusters). This raises a concern regarding the reliability of such a sampling method and potential bias involved in generating population estimates where a high proportion of sampled clusters were purposively selected.

[41] NORC was not involved in the 2008/09 or 2013/14 data collection rounds and these issues were discovered in an attempt by NORC to recreate the statistics found in the earlier reports

In addition, the survey of non-cocoa households was conducted one year after the main survey was done in 2013/14 cocoa harvest season. This affects the comparability of data from the cocoa growing households and non-cocoa agricultural households.

Based on analyses of 2013/14 data, we concluded that the sampling of non-cocoa households and weighting schema used for the clusters selected for the supplemental sample potentially introduced bias and that the estimate of child labor was not of the most accurate population estimate of child labor in cocoa in agricultural households in the cocoa growing areas.

As such, and to err on the side of caution, the data collected on non-cocoa growing households from 2013/14 was not used and this report avoids making any direct comparisons between 2013/14 and 2018/19 survey rounds in terms of **non-cocoa growing households**. These issues did not impact the estimates of cocoa growing households between rounds, which is presented throughout the report.

A detailed explanation of the issues in the 2013/14 round can be found in Annex 10.2.

4.3.2 2008/09 and 2018/19 Comparability Issues with Population Estimate of Counts

The 2008/09 (and 2013/14 rounds) used regions as the primary stratification level and the 2018/19 round used districts/departments (which are geographically smaller and could be assigned to a stratification level more precisely than the larger area).

This implies that the sampling frames were not exactly identical across survey rounds (one started at the regional level and the other at the district/department level) and thus population total estimates are not comparable. For the purposes of the report and analysis, this means we cannot make claims in terms of changes found in population counts across rounds and hence, we have not presented any comparison of population counts across survey rounds. It is important to stress here the difference between counts and prevalence rates (and ratios). While the data comparability issue affected the comparison of population counts across survey rounds, it was still possible to make a statistically valid comparison of the prevalence rates (ratios) across the 2008/09 and 2018/19 rounds (described in more detail in Section 4.3.3 and in Annex 10.2).

A second issue with the comparability of data from the 2008/09 round is due to the lack of documentation of the 2008/09 survey round. Although NORC received the data from 2008/09, the “key” linking individual children to their respective cocoa growing households was not available in the data. As a result, it was not possible for NORC to generate the child labor estimates for cocoa growing and non-cocoa growing households. What this means for the report is that we are unable to compare cocoa growing households in terms of child labor from 2008/09–2018/19.

Table 5: Comparisons for Population Count and Prevalence Rate

	All agricultural households		Cocoa growing households	
	Population count	Prevalence rate	Population count	Prevalence rate
Survey Round	**Comparison to be done**			
2008/09 vs 2018/19	No	Yes	No	No
2013/14 vs 2018/19	No	No	No	Yes

Table 5 above indicates that we can compare the estimates of prevalence rate for all agricultural households (cocoa and non-cocoa growing households combined) between 2008/09 and 2018/19. However, we are not able to differentiate between the cocoa and non-cocoa growing households in the 2008/09 data and hence, not able to make a comparison of cocoa growing households between 2008/09 and 2018/19.

The issue is inversed for the comparison of 2013/14 data to 2018/19 data. For the 2013/14 to 2018/19 comparison, we can compare the estimates of prevalence rate for only cocoa growing households between 2013/14 and 2018/19 and not for all agricultural households. However, we are not able to compare the estimate of population counts between 2018/19 and 2008/09 and between 2018/19 and 2013/14 round.

We can compare the estimates of prevalence rates between 2008/09 and 2018/19 for all agricultural households, and between 2013/14 and 2018/19 for cocoa growing households.[42] However, our numbers can differ to those previously published by Tulane. The difference is mainly due to two factors: (i) the Tulane reports did not consider all children working in cocoa farming as children working in agriculture, but this report does; and (ii) the Tulane reports did not include knives as a subcategory of sharp tools, but this report includes knives in calculating sharp tool use.

A detailed explanation of comparability issues between the 2008/09 and 2018/19 rounds can be found in Annex 10.2.

4.3.3 Expert Group Review of limitations on the statistical comparisons of prevalence rates and ratios across survey rounds

As described in Sections 4.3.1 and 4.3.2, the sampling frame between the 2018/19 survey round used by NORC and the previous survey rounds used by Tulane University were not identical. Thus, the prevalence estimates of 2008/09 and 2013/14 rounds are not fully comparable to that of the 2018/19 round. While the difference in sampling frames undermine the comparability of

[42] Prevalence rate comparisons are done only using households with at least one child in the age group 5-17.

population counts, empirical illustrations indicate that the variance is unlikely to significantly affect the point estimates of prevalence rates and ratios. However, it is still possible that comparisons of prevalence rates/ratios may involve some degree of bias (even though, negligible).

Given the methodological complexities described in those sections and above, an Experts Group of statisticians and survey professionals was formed in July 2020 to look carefully at the sampling methodology and comparisons made in this report. The Expert Group's complete findings can be found in Annex 10.12. Their main findings and recommendations were:

1. Include household selection probabilities when estimating sampling weights for the 2018/19 surveys.
2. Include estimates of population counts and prevalence rates for 2018/19 using the weights based on the household selection probabilities and construct variance estimates accordingly.
3. Attach to the major outcomes of interest (e.g. number of working children, number of children in child labor, number of children in hazardous work, child labor rate, and hazardous work rate) a precision measure (such as variance, standard error, confidence internal or coefficient of variation) so readers can form their own conclusions on the accuracy of the data.
4. Add clarification on the methodological limitations of comparison of prevalence rates and proportions of different variables across survey rounds due to the difference between the sampling frame used by NORC for the 2018/19 survey round used by NORC and that used by Tulane University in previous survey rounds, which could lead to potential bias in the comparison of point estimates across survey rounds.

Following the guidance provided by the Expert Group, we revised our sampling weight construction and generated population estimates of counts, prevalence rates and proportions for 2018/19 survey round. The corresponding updated estimates are presented in this final report.

Additionally, following the recommendations of the EG, for undertaking the tests of significance of difference between the prevalence rates/proportions of 2018/19 -2008/09 and 2018/19-2013/14 survey rounds appropriate test statistics have been used. Further, we only present differences on key outcomes of interest found to be significant at a 1 percent level of significance (i.e. p-values less than or equal to 0.01).This ensures that the conclusions of the study are unlikely to be affected by methodological limitations.

Acknowledging this methodological limitation, NORC outlined a procedure to make the comparison analyses as robust as possible to ensure inference closely approximates that of the true differences between survey rounds. Specifically, for hypothesis testing between rounds, approximations for the standard errors of point estimates for previous rounds were based on the

calculated standard errors of the 2018/19 point estimates that are in turn based on sampling weights that account for household selection probabilities. In addition, to reduce the probability of falsely identifying a difference in ratios between survey rounds (that is, a Type I statistical error), we used a level of significance of 1 percent (implying there is a 1% or smaller probability of incorrectly inferring that differences in ratios exist even though they are not truly different). This ensured that the conclusions drawn from the study observations and analyses of changes are less likely to be affected by any methodological limitations.

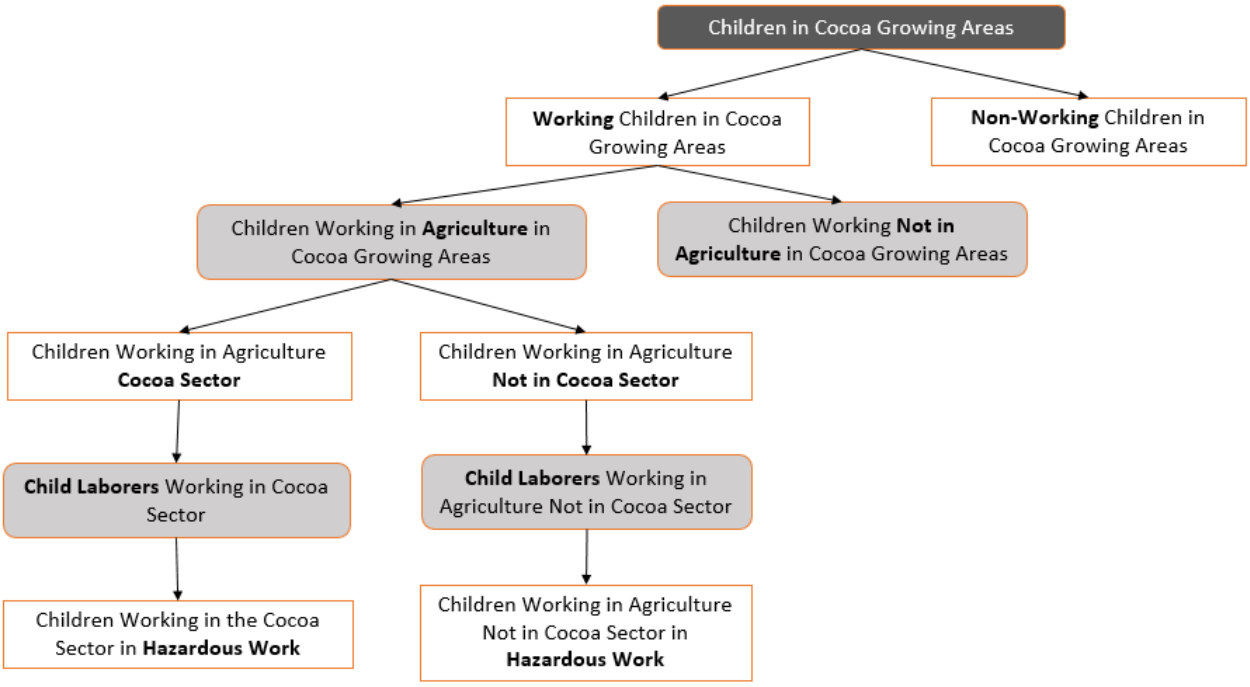
While this approach reduces the likelihood of making incorrect inferences, it is always the fact that the point estimates of the differences between survey rounds are an approximation for the true differences. However, that possibility does not affect the high-level objectivity of this study – to assess whether and how the prevalence rates changed over time.

5 Main Findings

In the following section we present the main findings starting with population estimates for the 2018/19 survey round and then presenting the comparison of prevalence of child labor and hazardous child labor over the study period between survey rounds. The analysis begins from the highest level looking at children in all agricultural households and moves down towards more focused analysis on only those children involved in cocoa production.

Figure 3 below outlines each level of analysis found in this section and can help orient readers on the analytic framework used for this study.

Figure 3: Measurement Framework on Child Labor in Cocoa Growing Areas



Population estimates for the 2018/19 survey round are included below in Table 6 for the sample in aggregate and individually by country using the common definition. There are an estimated 1.41 million agricultural households with at least one eligible (age 5-17) child in the cocoa growing areas of Côte d'Ivoire (847,719 households) and Ghana (566,591 households) in aggregate. The majority of agricultural households in the cocoa growing areas of Côte d'Ivoire and Ghana are cocoa households with 1.22 million cocoa growing households in aggregate.

The estimates for the number of children working in 2018/19 is also important to note. In aggregate 2.33 million children are estimated to have worked in the past 7 days, including 1.32 million in Côte d'Ivoire and 1.01 million in Ghana. More children have reported working in the past 12 months in the cocoa growing areas of Côte d'Ivoire and Ghana with 2.78 million in aggregate estimated as working in the past year (1,619,127 children in Côte d'Ivoire and 1,159,216 children in Ghana).

In 2018/19 in the cocoa growing areas of Côte d'Ivoire and Ghana there were approximately 1.56 million children working in child labor in cocoa production, including 790,647 children in child labor in Côte d'Ivoire and 765,754 children in child labor in Ghana. Additionally, 1.48 million children were estimated to be in hazardous child labor with 765,233 in Côte d'Ivoire and 713,419 in Ghana. In aggregate the most common hazardous work activity was working with sharp tools (1,244,040 children), followed by carrying heavy loads (991,000 children), working

with agro-chemicals (839,927 children), night work (80,027 children), and long working hours (22,800 children).[43]

[43] Note that children can be involved in multiple activities, so the number of children in hazardous child labor is not the sum of the children involved in each activity.

Table 6: Population Count and Prevalence Rate Estimates for Households, Working Children, and Children Exposed to Child Labor and Hazardous Child Labor, in Côte d'Ivoire and Ghana, 2018/19

	Total			Côte d'Ivoire			Ghana		
	Estimate	95% Confidence Interval		Estimate	95% Confidence Interval		Estimate	95% Confidence Interval	
Population Counts									
Number of agricultural households with eligible child	1,414,310	1,273,244	1,555,376	847,719	731,215	964,223	566,591	488,448	644,733
Number of cocoa households with eligible child	1,216,506	1,064,105	1,368,906	707,873	580,731	835,014	508,633	425,927	591,339
Children working in the past 7 days	2,333,811	2,081,748	2,585,874	1,324,497	1,129,514	1,519,480	1,009,314	847,279	1,171,348
Children working in the past 12 months	2,778,343	2,480,096	3,076,590	1,619,127	1,376,699	1,861,555	1,159,216	979,135	1,339,297
Children in child labor in cocoa	1,556,401	1,330,386	1,782,415	790,647	619,932	961,362	765,754	617,017	914,491
Children in hazardous child labor in cocoa	1,478,651	1,264,529	1,692,774	765,233	598,297	932,168	713,419	577,916	848,922
Children involved in land clearing in cocoa (V1)	651,453	527,459	775,447	458,718	342,720	574,716	192,735	150,530	234,940
Children involved in heavy loads in cocoa (V2)	991,000	845,480	1,136,519	541,487	431,964	651,009	449,513	353,787	545,239
Children involved in agro-chemicals in cocoa (V3)	839,927	716,138	963,717	394,503	308,157	480,848	445,425	355,643	535,207
Children involved in sharp tools in cocoa (V4)	1,244,040	1,062,462	1,425,619	646,413	499,330	793,496	597,628	485,740	709,515
Children involved in long working hours in cocoa (V5)	22,800	13,696	31,905	17,375	8,588	26,161	5,426	1,897	8,955
Children involved in night work in cocoa (V6)	80,027	58,914	101,140	41,784	28,529	55,039	38,243	21,582	54,904

	Total			Côte d'Ivoire			Ghana		
	Estimate	95% Confidence Interval		Estimate	95% Confidence Interval		Estimate	95% Confidence Interval	
Prevalence Rates									
Children working in the past 7 days	67%	64%	70%	64%	60%	67%	72%	67%	78%
Children working in the past 12 months	80%	78%	82%	78%	75%	81%	83%	79%	87%
Children in child labor in cocoa	45%	41%	48%	38%	34%	42%	55%	50%	60%
Children in hazardous child labor in cocoa	43%	39%	46%	37%	32%	41%	51%	47%	56%
Children involved in land clearing in cocoa (V1)	19%	16%	21%	22%	18%	26%	14%	12%	16%
Children involved in heavy loads in cocoa (V2)	29%	26%	31%	26%	23%	29%	32%	27%	37%
Children involved in agro-chemicals in cocoa (V3)	24%	22%	26%	19%	16%	22%	32%	28%	36%
Children involved in sharp tools in cocoa (V4)	36%	33%	38%	31%	27%	35%	43%	39%	47%
Children involved in long working hours in cocoa (V5)	1%	0%	1%	1%	0%	1%	0%	0%	1%
Children involved in night work in cocoa (V6)	2%	2%	3%	2%	1%	3%	3%	2%	4%

Source: Head of Household and Child surveys, 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

5.1 Understanding Contextual Factors

Before presenting the comparison of the main outcome variables of interest, the prevalence rate of child labor and the prevalence rate of children's exposure to hazardous work, it is important to consider some key contextual factors the research team believes are useful for a better understanding of the observed changes in the prevalence of child labor and hazardous child labor, keeping in mind that correlation does not indicate causation

5.1.1 Cocoa Production and Cocoa Price

According to the International Cocoa Organization (ICCO) production figures, this research took place during a period of notable cocoa industry expansion, as overall cocoa production and cocoa price increased significantly over the course of the research period from 2008/09 to 2018/19 (Table 7). It should be noted that while ICCO provides cocoa production figures separately for Ghana and Côte d'Ivoire, cocoa price figures are not available at the country-level and are thus presented overall.

Cocoa production, as measured as estimated tons of cocoa produced, increased 62 percent during the ten-year evaluation period in Ghana and Côte d'Ivoire, from 1.89 million tons in 2008/09 to over 3 million tons in 2018/19. The increase was more pronounced in Côte d'Ivoire where cocoa production increased 76 percent from 1.22 million to 2.15 million tons, versus a 36 percent increase from 662,400 to 897,000 tons in Ghana. In Ghana, estimated production in terms of tons of cocoa produced reached a peak in the 2013/14 round and then decreased slightly (approximately 2.5%) by 2018/19.

During this period of cocoa expansion, ICCO figures also show a more modest but still significant 16 percent increase in cocoa price from $2,263 USD/ton to $2,626 USD/ton on the global market.[44] According to ICCO, price per ton of cocoa jumped 26 percent after 2008/09 to peak in 2013/14 before deflating slightly by 2018/19. These changes in production over time and upward trend in cocoa price are important to understand the findings related to child labor as part of this study.

Quantitative Insight

Estimates of cocoa growing households as a proportion of all agricultural households experienced a large statistically significant increase between 2008/09 and 2018/19, from 55 percent to 84 percent.

[44] The reported prices were adjusted for inflation (reported in real USD figures) and generated after dropping the households with cocoa production in the bottom 10 percentile of the distribution to avoid over-estimation of expenditure per-ton of cocoa production.

5.1.2 Significance of Cocoa Production among Agricultural Household

Given the increase in production mentioned above, it is useful to explore whether increased production led to changes in the importance of cocoa farming in agriculture and whether cocoa cultivation expanded among new agricultural households over time.

To explore changes in prevalence estimates in relation to the growth of cocoa and non-cocoa agricultural households between survey rounds we present Table 7. In 2018/19, there were approximately 1.41 million agricultural households with at least one eligible child in cocoa growing areas of Côte d'Ivoire and Ghana, and a majority of these were cocoa growing households (86%). Estimates of cocoa growing households as a proportion of all agricultural households experienced a large and statistically significant increase between 2008/09 and 2018/19, from 55 percent to 86 percent, mirroring the increases in production. This increase in the share of cocoa growing households among agricultural households, and possibly new cocoa farms, most likely contributed to the increase in production over the same period.

At the country level, the change in estimates of cocoa and non-cocoa growing households as a proportion of agricultural households mirrored the same trend as the aggregate trend discussed above. A significantly greater proportion of households in Côte d'Ivoire and Ghana were cocoa growing households in 2018/19 than 2008/09.

Table 7: Cocoa Production by Tons of Cocoa and Prices by USD/Ton, and the Percentage of Cocoa Growing Households, in Côte d'Ivoire and Ghana, 2008/09, 2013/14, and 2018/19

		Total				Côte d'Ivoire				Ghana			
		2008/09	**2018/19**	**Sig of diff^**	**2013/14**	**2008/09**	**2018/19**	**Sig of diff^**	**2013/14**	**2008/09**	**2018/19**	**Sig of diff^**	**2013/14**
Tons of Cocoa	Number	1,885,600	3,050,000	N/A	267,000	1,223,200	2,150,000	N/A	1,746,000	662,400	900,000	N/A	897,000
	Percent change^^	62%		N/A	N/A	76%		N/A	N/A	36%		N/A	N/A
Price of Cocoa (USD/ton)*		2,263	2,626	N/A	2,819	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Percentage of cocoa growing households		55%	86%	***	N/A	50%	84%	***	N/A	63%	90%	***	N/A

Source: Head of Household survey, 2008/09 and 2018/2019, strata 1-3

*^Significance of Difference *** p<0.01*

^^Calculated by dividing the difference between the 2008/09 and 2018/19 figures by the base (2008/09) figure

**ICCO estimates for January 2009 and 2019, not available at the country level*

5.1.3 Use of Agro-Chemical Products

Quantitative Insight

The likelihood of agro-chemical use increased among the cocoa growing households. This lends further evidence to the claim that agro-chemical use and increased cocoa production are related.

Given that cocoa production increased by approximately 70% in aggregate across Côte d'Ivoire and Ghana, it is expected to find increased usage of agro-chemical products among cocoa growing households. Hence, we explore whether there was any increase in agro-chemical use among cocoa growing households. Increased production and increasing use of agro-chemical products influences the likelihood of children's exposure to agro-chemicals and, therefore, exposure to hazardous work and is useful for understanding the complex interrelated factors impacting children. For this purpose, we compare the recent trends in use of agro-chemical products between the 2013/14 and 2018/19 survey rounds.

In the survey, household heads of cocoa-growing and non-cocoa-growing households were asked to self-report on usage of agro-chemicals including fertilizers, pesticides, and herbicides. Data reported in Table 8 shows that agro-chemical usage increased significantly between 2013/14 and 2018/19 in both Ghana and Côte d'Ivoire among cocoa growing households. This lends further evidence to the hypothesis that agro-chemical use and increased cocoa production are related.

Table 8: Estimates of Change in Household Use of Agro-Chemicals in the Last 12 Months in Cocoa Households, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Percentage of households using	Total			Côte d'Ivoire			Ghana		
	2013/ 2014	2018/ 2019	Sig of diff^	2013/ 2014	2018/ 2019	Sig of diff^	2013/ 2014	2018/ 2019	Sig of diff^
Fertilizer(s)	25%	35%	***	22%	35%	***	32%	34%	
Pesticide(s)	54%	77%	***	49%	73%	***	66%	82%	***
Herbicide(s)	46%	71%	***	44%	67%	***	51%	75%	***

Source: Head of Household survey, 2013/14 and 2018/19, weighted, strata 1-3
*^Significance of Difference *** p<0.01*

Among cocoa growing households in both countries between 2013/14 and 2018/19, there was a statistically significant increase in proportion of all groups using each agro-chemical except for fertilizer in Ghana (Table 8). Usage of pesticides and herbicides (percentage of household reporting using the input) each saw increases of over 20 percentage points overall, with over 20 percentage points each in Côte d'Ivoire in just five years. Fertilizer usage increased less, by 13 percentage points in Côte d'Ivoire and 2 percentage points in Ghana, though as mentioned the increase in Ghana is not statistically significant.

The data reported in Table 8 clearly indicates that a greater proportion of cocoa producing households are using agro-chemical products, especially pesticides and herbicides. Given that increased usage of agro-chemical products by the household is likely to increase children's exposure to agro-chemicals, this may have implications on the child labor and hazardous child labor rates described in Section 5.2.

Qualitative Insight

Qualitative findings indicate that households are using more agro-chemicals in their cocoa production practices. Households in Ghana reported that government-subsidized inputs and mass spraying efforts resulted in more consistent agrochemical use on farms. Households in Côte d'Ivoire and Ghana reported that good agricultural practices training significantly changed their cocoa production practices, as they were encouraged to use agrochemicals to maximize yield and manage diseases and pests.

5.1.4 Trend in School Attendance

One notable survey finding was a significant improvement in school attendance estimates in both countries between 2008/09 to 2018/19 (Table 9). These increases were seen for both sexes and across each age bracket but were especially notable in Côte d'Ivoire.

Table 9: School Attendance for All Children in the Last 12 Months, All Agricultural Households, Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children attending school	Côte d'Ivoire			Ghana		
	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^
Children	58%	80%	***	89%	96%	***
Sex						
Boys 5-17 years	61%	83%	***	90%	96%	***
Girls 5-17 years	53%	78%	***	89%	96%	***
Age Group						
Children 5-11 years	60%	81%	***	89%	97%	***
Children 12-14 years	68%	88%	***	93%	98%	***
Children 15-17 years	39%	66%	***	85%	89%	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

In Côte d'Ivoire, overall school attendance among children 5-17 years increased 22 percentage points as school attendance for children in each sex and age category experienced highly statistically significant increases of at least 20 percentage-points.

Qualitative Insight

Qualitative findings attribute increases in school attendance to government-and NGO-sponsored school reforms, including new school construction, school materials provision, and school rehabilitation. Teachers, children, and their caregivers report that due to these changes, children attend school more consistently.

In Ghana, school attendance increased a more modest but still statistically significant 7 percentage-points, with highly significant increases of

at least 5 percentage-points in every age and gender group except for children 15-17 years. Groups with larger than average increases include younger children 5-11 years (8 percentage points increase) and girls 5-17 years (7 percentage points increase).

The improvement in school attendance indicates improvements in access to schools and/or improvements in school infrastructure, both of which can help fight child labor and exposure to hazardous work. Ghanaian education reforms around pre-k and kindergarten education are most likely the direct cause of the increases seen in the 5 – 11 age group.[45] According to the Ghanaian Constitution and the Education Act, primary education is free and compulsory from kindergarten through junior high school. Additionally, the government extended free education through high school in 2017. In recent years, Ivoirian education reforms include making school attendance compulsory for all children aged 6-16 years and significant increases in education spending.

5.2 Main Findings: All Agricultural Households

5.2.1 Children's Engagement in any Economic Activities

In order to understand how children's engagement in economic activities changed between the 2008/09 and 2018/19 study rounds, we present the estimate of children who worked for at least one hour during the reference period in **any** economic activity,[46] either paid or unpaid. We construct the estimate of their engagement based on **usual activity status** (reference period of last twelve months) and **current activity status** (reference period of last seven days).[47]

Table 10 shows that approximately 80 percent of children in cocoa growing areas were economically active in 2018/19 in Ghana and Côte d'Ivoire, performing any type of work in the twelve-month reference period before the survey.

Overall, from 2008/09 to 2018/19, there is a 14 percentage point increase (from 66% to 80%) in the proportion of children who were usually working in cocoa growing areas in the last twelve months. During 2008/09, 58 percent and 78 percent of children were economically active in Côte d'Ivoire and Ghana, respectively. The proportion of children working in the last twelve months in Côte d'Ivoire increased by 19 percentage points, while it increased in Ghana by 5 percentage points, between 2008/09 and 2018/19.

[45] https://www.earlychildhoodworkforce.org/sites/default/files/resources/Brief-Ghana_0.pdf

[46] Note that this includes both cocoa and non-cocoa activities as well as non-agricultural activities.

[47] Please see the 18th ICLS for use of these terminologies: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_099577.pdf

Table 10: Estimates of Change in Children Working in the Last 12 Months and in the Last 7 Days, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

	Last 12 Months				Last 7 Days			
	2008/09	2018/19	Diff (pp)*	Sig of diff^	2008/09	2018/19	Diff (pp)*	Sig of diff^
Total Children Working								
Percent	66%	80%	14	***	52%	67%	15	***
Côte d'Ivoire Children Working								
Percent	58%	78%	19	***	40%	64%	24	***
Ghana Children Working								
Percent	78%	83%	5		71%	72%	1	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

In aggregate, the proportion of children who were working in cocoa growing areas in the last seven days is lower than those working in cocoa growing areas in the last twelve months, indicating the seasonal nature of working in cocoa growing areas.

Analytic Insight

In aggregate, the proportion of children who were working in cocoa growing areas in the last seven days is lower than those working in cocoa growing areas in the last twelve months, indicating the seasonal nature of working in cocoa growing areas.

Between 2008/09 and 2018/19, the proportion of children working in cocoa growing areas in the last seven days increased by 15 percentage points (from 52% to 67%) in aggregate. There was a significant increase in the proportion of children currently active from 2008/09 to 2018/19 in Côte d'Ivoire, increasing 24 percentage points (from 40% to 64%). There was no statistically significant change in the proportion of Ghanaian children currently active during the same period.

5.2.2 Estimate of Working Children in Agriculture

Next, we explore children's engagement in agriculture in cocoa growing areas in Côte d'Ivoire and Ghana including both cocoa and other non-cocoa agriculture. Table 11 presents their usual engagement (in the last 12 months) and current engagement (in the last 7 days) in agriculture.

Table 11 shows that the proportion of children working in agriculture (both cocoa and non-cocoa agriculture) in the last twelve months increased by 6 percentage points, while the proportion of children working in agriculture in the last seven days decreased by 5 percentage points in aggregate between 2008/09 and 2018/19. In Côte d'Ivoire there was a 10 percentage points increase (from 54% to 64%) in children working in agriculture in the last twelve months. In

Ghana, there was no significant change in children working in agriculture in the last twelve months between the 2008/09 and 2018/19 rounds.

Consistent with the trends in children working in cocoa growing areas discussed earlier, the proportion of children working in agriculture in cocoa growing areas in the last twelve months was much higher in Ghana (73% in 2008/09 and 2018/19) than in Côte d'Ivoire (54% in 2008/09 and 64% in 2018/19). The trend in children's engagement indicates that, while children's usual engagement in Ghana remained stable between 2008/09 and 2018/19, a higher proportion of children were engaged in agriculture in Côte d'Ivoire during the 2018/19 round.

The estimate of current engagement shows that while in 2018/19 a higher proportion of children worked in economic activities in general (Table 10), a smaller proportion of children were engaged in agriculture in 2018/19 compared to 2008/09. This indicates an increased engagement in non-agricultural activities contributes to an increase in economically active (or working) children. While there was no change in the proportion of Ivoirian children working in agriculture in cocoa growing areas in the last seven days, there was a 16 percentage-point decrease in the proportion of Ghanaian children working in agriculture in cocoa growing areas in the last seven days.

Table 11: Estimates of Children Working in Agriculture in the Last 12 Months and the Last 7 Days, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

	Last 12 Months				Last 7 Days			
	2008/09	2018/19	Diff (pp)*	Sig of diff^	2008/09	2018/19	Diff (pp)*	Sig of diff^
Total Children Working in Agriculture								
Percent	61%	68%	6	***	48%	43%	-5	***
Côte d'Ivoire Children Working in Agriculture								
Percent	54%	64%	10	***	40%	41%	1	
Ghana Children Working in Agriculture								
Percent	73%	73%	0		61%	46%	-16	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

5.2.3 Estimate of Child Labor in Agriculture

To allow a deeper understanding of the nature of work undertaken by children in agriculture in the cocoa growing areas of Côte d'Ivoire and Ghana, we compare the data on children's engagement in child labor in agriculture. Respondents were asked to report their working hours and engagement in different types of activities in agriculture, including hazardous activities. Using the estimates of working hours and responses of children relating to their exposure to activities considered hazardous, we generated estimates of children's engagement in child labor in agriculture.

Table 12: Estimates of Change in Children Working in Agriculture, and in Children Engaged in Child Labor in the Last 12 Months, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

		Children Working in Agriculture			Children Engaged in Child Labor in Agriculture		
		Percent	Diff. (pp)*	Sig of diff^	Percent	Diff. (pp)*	Sig of diff^
Total	2008/09	61%	7	***	58%	2	
	2018/19	68%			60%		
Côte d'Ivoire	2008/09	54%	10	***	52%	5	***
	2018/19	64%			57%		
Ghana	2008/09	73%	0		68%	-3	
	2018/19	73%			65%		

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 12 above presents the estimate of children engaged in child labor in agriculture (including cocoa and other non-cocoa agriculture) in the past twelve months. In Ghana and Côte d'Ivoire, children working in agriculture in the last twelve months increased by 7 percentage points between 2008/09 and 2018/19. Children engaged in child labor in agriculture in cocoa growing areas increased by 5 percentage points in Côte d'Ivoire and remained stable in Ghana at around 68 percent.

Quantitative Insight

In cocoa growing areas of Côte d'Ivoire and Ghana, a higher percentage of boys were engaged in child labor in agriculture than girls.

More information on the breakdown of how children's engagement in child labor evolved over time and varies by sex and across age group can be found in Table 45 of Annex 10.4.2. The data indicates that in cocoa growing areas of Côte d'Ivoire and Ghana, a higher percentage of boys were engaged in child

labor in agriculture than girls (57% versus 43% in 2018/19). There was no change in the proportion of boys and girls who were engaged in child labor between 2008/09 and 2018/19.

To reduce child labor, various stakeholders including the governments of Côte d'Ivoire and Ghana, the international chocolate industry and other multilateral organizations focused on improving access to education as well improving quality of education. Annex 10.4.2 presents school attendance of children engaged in child labor in agriculture by age group to understand whether there were any improvements in school attendance among the children engaged in child labor in agriculture.

Data presented in Table 46 in Annex 10.4.2 indicates that 92 percent of children in the 5-11 age group were attending school overall in 2018/19, including 88 percent in Côte d'Ivoire and 99 percent in Ghana. In the 12-14 age group in 2018/19, 93 percent of children were attending school in aggregate, including 89 percent in Côte d'Ivoire and 98 in Ghana. Finally, in the 15-17 age group 77 percent of children were attending school in aggregate, including 66 percent in Côte d'Ivoire and 89 percent in Ghana.

To explore whether the prevalence of child labor is lower among those attending school, we present a comparison of the prevalence of child labor by school attendance in Annex 10.4.2. The data presented in

Quantitative Insight

There was a much higher prevalence of child labor among children in agricultural households who were attending school (65%) than among children in agricultural households who were not attending school (50%).

Table **47** in Annex 10.4.2 shows that there was a much higher prevalence of child labor among children in agricultural households who were attending school (65%) than among children in agricultural households who were not attending school (50%) in cocoa producing areas of Côte d'Ivoire and Ghana in 2018/19. The age-group disaggregation indicates that this trend was mostly driven by the difference within the 5-11 years age group where the child labor prevalence rate was 24 percentage points higher among those attending school compared to the children that were attending school. A similar trend was found among the older age groups (12-14 and 15-17 years), however the differences were not statistically significant. However, given the counterintuitive nature of these findings, it is important to note that these naïve differences may be driven by other factors not accounted for in our research.

5.2.4 Estimate of Working Children, and Average Hours of Work Among Children Working in Cocoa Production

One of the main objectives of this report is to measure the progress made in reducing child labor and hazardous child labor in cocoa production. We now present data on children's engagement in cocoa production related activities.

5.2.4.1 Estimate of Working Children in Cocoa Production

Child respondents who worked in agriculture were asked whether they were engaged in cocoa production related activities in the twelve-month period before the surveys were fielded during the main cocoa harvest season in both countries. Using the responses of children relating to engagement in cocoa production, we generated estimates of children's engagement in child labor and in hazardous child labor in cocoa production related activities. Table 13 presents how children's engagement with cocoa production changed between 2008/09 and 2018/19 reporting on both children's usual (in the last twelve months) and current (in the last seven days) engagement in cocoa production.

We find a substantial increase in the proportion of children engaged in cocoa production using a twelve-month reference period. In aggregate, the proportion of children in agricultural households usually active (in the last twelve months) in cocoa production increased significantly, by 16 percentage points between 2008/09 and 2018/19.

Quantitative Insight

The proportion of children in agricultural households usually active (in the last twelve months) in cocoa production increased significantly, by 16 percentage points between 2008/09 and 2018/19.

In Côte d'Ivoire, children's engagement in cocoa production in the last twelve months increased from 23 percent to 40 percent while in Ghana it increased from 46 percent to 60 percent. It is important to note again that the current study focused on a 12-month recall period to remain consistent with previous rounds as well as to capture the seasonal aspects of labor in cocoa production.

This naturally leads to higher rates of child labor when compared to using a 7-day reference period because a 7-day reference period would not capture labor associated with land preparation, land maintenance, and post-harvesting activities. For a description of such activities related to cocoa production, see Table 15.

While a larger proportion of children in agricultural households were usually active in cocoa production in 2018/19 (over 12 months), there was not a notable change in the proportion of children who were currently active (over 7 days) in cocoa production.

These trends indicate that while more children were engaged in cocoa production related activities throughout the year, there was not much change in children's engagement during the main cocoa harvest season between 2008/09 and 2018/19. This finding indicates greater involvement of children in land preparation, planting and maintenance activities over the entire cocoa season. This could also be due to the possibility that as production expands and new farms start, children participate more in the pre-harvest activities. In Section 6 we look closely at the role of new cocoa farms and the level of cocoa production which supports these claims.

Table 13: Estimates of Children in Cocoa Production in the Last 12 Months and in the Last 7 Days, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

	Last 12 Months				Last 7 Days			
	2008/09	2018/19	Diff (pp)*	Sig of diff^	2008/09	2018/19	Diff (pp)*	Sig of diff^
Total Children Working in Cocoa Production								
Percent	32%	48%	16	***	21%	22%	2	
Côte d'Ivoire Children Working in Cocoa Production								
Percent	23%	40%	17	***	14%	18%	4	
Ghana Children Working in Cocoa Production								
Percent	46%	60%	14	***	32%	30%	-2	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

5.2.4.2 Average Hours Worked by Children in Cocoa Production

In the earlier discussion we saw that in 2018/19, overall, a significantly higher proportion of children were working in cocoa production compared to 2008/09 (Table 13). However, an important consideration to determine whether the nature of their work constitutes child labor or hazardous child labor is the number of hours worked per week. According to ILO guidelines[48], children under the age of twelve should not be engaged in any work, and older children may only work in non-hazardous activities and for a specified number of working hours per week depending on their age. Therefore, it is useful to explore the data on hours worked in any economic activity by children in different age groups.

Table 14 presents the data on average hours worked in any economic activity by children working in cocoa production by age-group. While presenting this table, for each age group, we also present the percentage of children working in cocoa production that exceeded the maximum hours of work for any economic activity allowed by ILO guidelines – a violation that would classify children in a given age group as child labor.

Overall, the percent of children in cocoa production age 5 to 17 working more than the allowable number of hours increased from 14 to 20 percent between 2008/09 and 2018/19. These changes were persistent in Côte d'Ivoire where the percent working more than the allowable number of hours increased from 11 to 18 percent, while there was no statistically significant change in Ghana. The average number of hours that children working in cocoa production reported having worked in the past week declined overall from 11 to 8 hours. Additionally, the average number of hours worked decreased in Côte d'Ivoire from 14 to 10 hours and in Ghana from 8 to 6 hours. The overall increase in the percentage of children working in cocoa production combined with the decrease in hours worked in any economic activity suggests that although new children started working, they may not have been working very many hours.

Quantitative Insight

Overall, the proportion of children who were working more than the ILO recommended maximum hours per week increased from 14 percent to 20 percent between 2008/09 and 2018/19. Average hours worked per week significantly dropped by approximately 2 hours in the week prior to the survey.

According to ILO standards, children under the age of 12 years, or the minimum age of light work[49], should not be engaged in any work activities. Consequently, any children in that age

[48] International Labour Organization (ILO), Convention 138 Concerning Minimum Age for Admission to Employment, (26 June 1973).

[49] According to Article 7 of ILO Convention No. 138, national laws or regulations may permit the work of persons as from 13 years of age (or 12 years in countries that have specified the general minimum working age of 14 years) in light work which is: (a) not likely to be harmful to their health or development; and (b) not such as to prejudice

group who worked for at least one hour in any economic activity during the reference period are considered as child labor. Between 2008/09 and 2018/19, the proportion of children, 5-11, in agricultural households in cocoa production working one hour or more per week in any economic activity increased by 8 percentage points in Côte d'Ivoire. Simultaneously, the average number of hours worked in the week prior to the survey by children 5-11 (who worked at least one hour) decreased significantly, from 11 hours to 7 hours. In Ghana, the proportion of children in agricultural households, 5-11, working in cocoa production for one hour or more per week in remained stable. Similar to Côte d'Ivoire, the number of hours worked by children in Ghana in cocoa production in the 5-11 age group decreased from 7 to 5 hours in the week prior to the survey.

Based on ILO standards, children 12-14 years can undertake up to (but not including) 14 hours of non-hazardous activities weekly which is considered *light work*. In Côte d'Ivoire, there was an increase in the proportion of children working in cocoa production in agricultural households in the 12-14 age group who worked 14 hours or more per week in any economic activity, from 13 percent to 20 percent. There was no change in the average number of hours worked per week which remained stable at around 12 hours. In Ghana, on the other hand, there was no change in the proportion of children in cocoa production in agricultural households in the 12-14 age group who exceeded ILO's recommended weekly working hours in any economic activity, remaining stable at around 11 percent, indicating that those who are working in cocoa production in this age group are mostly undertaking light work. The average number of hours worked per week remained stable for children working in cocoa production in the 12-14 age group at around 7 hours in the week prior to the survey.

Children in the 15-17 age group can undertake regular work and can engage in up to (but not including) 43 hours of non-hazardous work weekly, per ILO standards. In Côte d'Ivoire, the proportion of children, 15-17, in cocoa production who were working more than the ILO recommended maximum hours per week in any economic activity remained constant at 3 percent. Average hours worked per week in any economic activity dropped from 20 hours to 14 hours in the week prior to the survey. Between 2008/09 and 2018/19, there was no change in the proportion of children in this age group working 43 hours or more per week in Ghana, remaining constant at around 1 percent of children in cocoa production in agricultural households in the 15-17 age group. Consequently, there was no significant change in the average number of hours worked in any economic activity per week among the 15-17 year olds in Ghana, which remained constant around 9 hours per week.

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their attendance at school, their participation in vocational orientation or training programs approved by the competent authority, or their capacity to benefit from the instruction received.

Sex disaggregation of data on average hours worked can be found in Table 48 in Annex 10.4.2. In Côte d'Ivoire, there was a statistically significant increase in the proportion of Ivoirian male children in cocoa production working more than the allowable number of hours in any economic activity which increased from 12 to 22 percent. This increase was mostly driven by increases for males in the 5-11 and the 12-14 age groups. A similar trend was found for the female Ivorian children in cocoa production working more than the allowable number of hours which increased from 11 to 14 percent. The average number of hours decreased for both male children from 14 to 11 hours overall and female children from 14 to 9 hours overall.

In Ghana, there was no change in the percent of male children in cocoa production working more than the allowable number of hours in any economic activity in any age group, which stayed constant at around 22 percent overall. Male children in Ghana in the 5-11 age group in cocoa production worked fewer hours overall in 2018/19 than in 2008/09 (from 7.1 to 5.1 hours). The proportion of female children in Ghana in the 5-11 age group working in cocoa production increased in 2018/19 compared to 2008/19 (from 21% to 32%). Female children working in cocoa production in Ghana also worked fewer hours in 2018/19 than in 2008/09 (decreased from 7 to 6 hours).

Data presented in Table 49 in Annex 10.4.2 shows the trends in the proportion of children aged 12-14 years in cocoa production engaged in less than 14 hours of non-hazardous light work and children of legal age group (15-17 years) engaged in less than 43 hours of non-hazardous regular work in cocoa production between 2008/09 and 2018/19. Overall, there were statistically significant increases in the proportion of children in cocoa production engaged in light work in aggregate. However, there was no statistically significant change in the proportion of children in cocoa production engaged in regular work.

Table 14: Working Hours in Any Economic Activity and Minimum Age, Children Working in Cocoa Production, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

		Total			Côte d'Ivoire			Ghana		
		2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
5-11 years	% Working 1+ hour per week	17%	26%	***	13%	21%	***	26%	33%	
	Average # of hours worked	8.7	6.3	***	10.7	7.4	***	6.9	5.1	***
12-14 years	% Working 14+ hour per week	13%	15%		13%	20%	***	13%	9%	
	Average # of hours worked	10.3	9.3		13.6	11.6		7.9	6.6	
15-17 years	% Working 43+ hour per week	2%	3%		3%	3%		1%	2%	
	Average # of hours worked	14.4	11.5	***	19.9	14.0	***	9.7	9.2	
All years	% Working more than allowable hours per week	14%	20%	***	11%	18%	***	18%	22%	
	Average # of hours worked	10.6	8.3	***	13.9	10.1	***	7.9	6.4	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

5.2.4.3 Activities Performed by Children in Cocoa Production

In this section we present estimates on child involvement in various work activities in cocoa production for Côte d'Ivoire and Ghana to gain insights on whether there was more or less involvement in certain types of work in different phases of cocoa agriculture. The activities cover pre-harvest, harvest, and post-harvest activities that are broadly classified in six categories: land preparation (land clearing, felling and chopping, burning, and stumping); planting (preparing seedlings, planting seedlings, and sowing at stake); farm maintenance (weeding, working with insecticides/herbicides/fungicides/other chemicals, and carrying water for spraying), cocoa harvest activities (plucking, gathering, or breaking cocoa pods), and post-harvest activities (carting fermented cocoa beans, drying cocoa beans, and carting dry cocoa beans to shed).

Table 15: Child Work Involved in Cocoa Production, All Children 5-17 Years Working in Cocoa Production, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Percentage of children	Total			Côte d'Ivoire			Ghana		
	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^
Land preparation activities in cocoa production	38%	40%		64%	56%	***	16%	25%	***
Planting activities in cocoa production	17%	29%	***	28%	27%		9%	31%	***
Farm maintenance activities in cocoa production	57%	56%		52%	53%		61%	59%	
Harvest activities in cocoa production	79%	92%	***	79%	91%	***	79%	93%	***
Post-harvest activities in cocoa production	45%	60%	***	53%	64%	***	39%	56%	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3
*^Significance of Difference *** p<0.01*

Table 15 shows there is a significant increase in the involvement of children in Côte d'Ivoire and Ghana in pre-harvest, harvest, and post-harvest activities in cocoa production between 2008/09 and 2018/19. The largest change in children involvement is in harvest and post-harvest activities – such as, plucking, gathering, heaping, and breaking cocoa pods with involvement in harvest activities increased 13 percentage points (from 79% to 92%) between 2008/09 and 2018/19 in aggregate and involvement in post-harvest activities increased 15 percentage points (from 45% to 60%). Similar trends are found in both countries.

Table 50 in Annex 10.4.2 presents the breakdown of different activities under each of the six groups of activities reported in Table 15. Among various types of activities done by children in 2018/19, the five most common activities children were involved in were gathering and heaping cocoa pods, breaking cocoa pods and fermentation, drying cocoa beans, weeding, and carting fermented cocoa beans.

Although children involvement in farm maintenance activities was primarily in weeding, the proportion of children involved in weeding significantly increased in aggregate between 2008/09 and 2018/19. In 2018/19, carrying water for spraying became the second most prevalent farm maintenance activity among children working in cocoa production. This, in part, can be explained by the increase use of agro-chemicals discussed in Section 5.1.3[50].

Quantitative Insight

In 2018/19, the five most common cocoa production activities children were involved in are; gathering and heaping cocoa pods, breaking cocoa pods and fermentation, drying cocoa beans, weeding, and carting fermented cocoa beans.

Harvest activities consistently involved a large proportion of children in Côte d'Ivoire and Ghana. Between 2008/09 and 2018/19, there is a significant increase in the proportion of children engaged in gathering and heaping cocoa pods (from 16% to 36% in Côte d'Ivoire and 33% to 53% in Ghana), and children's involvement in breaking cocoa pods also increased over the period. Among the post-harvest activities, there is a significant increase in children's engagement in carting fermented beans (from 9% to 19% in Côte d'Ivoire and 14% to 25% in Ghana) and drying cocoa beans (from 9% to 23% in Côte d'Ivoire and 13% to 24% in Ghana).

5.2.5 Estimate of Child Labor and Hazardous Child Labor in Cocoa Production

In this section we present the data on children engagement in child labor and in hazardous work in cocoa production - the primary outcomes of interest of this report.

Quantitative Insight

Between 2008/09 and 2018/19, the proportion of children in agricultural households engaged in child labor in cocoa production increased by 14 percentage points

Children who exceed the maximum allowable working hours (specific to each age group) in any economic activity, and/or who are exposed to any of the six different types of hazardous activities in cocoa production are considered as child labor in cocoa production. The data presented in Table 16 compares the prevalence rates of child labor and exposure to hazardous work in cocoa production between the 2008/09 and 2018/19 rounds of survey for children in agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana.

[50] The research team believes that it is possible that some of the variance associated with earlier findings of very limited child involvement in agro-chemical use may be related to an issue in survey administration in previous rounds.

In 2018/19, 45 percent of all children in agricultural households in cocoa growing areas were engaged in activities which placed them within child labor in cocoa production. Between 2008/09 and 2018/19, the proportion of children in agricultural households engaged in child labor in cocoa production increased by 14 percentage points (from 31% in 2008/09 to 45% in 2018/19).

Between 2008/09 and 2018/19, there was a 17 percentage point increase in the proportion of Ivoirian children in agricultural households who were working in cocoa production (from 23% to 40%). The proportion of children engaged in child labor in cocoa production increased by 15 percentage points between 2008/09 and 2018/19 in Côte d'Ivoire (from 23% to 38%).

In Ghana, 60 percent of children in agricultural households were working in cocoa production in 2018/19 which increased by 14 percentage points between 2008/09 and 2018/19. Among the children in agricultural households who worked in cocoa production 55 percent were engaged in child labor in 2018/19, an increase of 11 percentage points between 2008/09 and 2018/19.

Between 2008/09 and 2018/19, in the cocoa growing areas of Côte d'Ivoire and Ghana, the proportion of children engaged in hazardous work in cocoa production increased by 13 percentage points, with 43 percent of children in agricultural households in 2018/19 exposed to any of the six types of hazardous work in cocoa production in the last twelve months in aggregate between the two countries.

In Côte d'Ivoire, the proportion of children engaged in hazardous work in cocoa production increased by 14 percentage points (up from 23% in 2008/09 to 37% in 2018/19). In Ghana, the proportion of children engaged in hazardous work in cocoa production increased by 8 percentage points between 2008/09 and 2018/19 with 51 percent of children from agricultural households engaged in hazardous work in cocoa production in 2018/19.

Thus, in both countries, children's exposure to hazardous work in cocoa production increased between the 2008/09 and 2018/19 survey rounds conducted during the main cocoa harvest season.

Data reported in Table 51 in Annex 10.4.2 presents the changes in children engaged in child labor and in hazardous work in cocoa production in Côte d'Ivoire and Ghana, disaggregated by sex and age group. In both countries, there was no significant change in the gender-disaggregated proportion of children engaged in child labor and hazardous work. Overall, there were predominantly more male children engaged in child labor and hazardous child labor, in 2018/19 61 percent of children engaged in hazardous child labor were male while 39 percent were female.

Quantitative Insight

In 2018/19, 61 percent of children engaged in hazardous child labor were male while 39 percent were female.

Table 16: Estimates of Change in Children Working in Cocoa Production, Children Engaged in Child Labor in Cocoa Production, and Children Engaged in Hazardous Work in the Cocoa Sector in the Last 12 Months, 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children in all agricultural households		Children Working in Cocoa Production			Children Engaged in Child Labor in Cocoa Production			Children Engaged in Hazardous Work in Cocoa Production		
		Pct	Diff (pp)*	Sig of diff^	Pct	Diff (pp)*	Sig of diff^	Pct	Diff (pp)*	Sig of diff^
Total	2008/09	32%	16	***	31%	14	***	30%	13	***
	2018/19	48%			45%			43%		
Côte d'Ivoire	2008/09	23%	17	***	23%	15	***	23%	14	***
	2018/19	40%			38%			37%		
Ghana	2008/09	46%	14	***	44%	11	***	43%	8	***
	2018/19	60%			55%			51%		

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Quantitative Insight

Comparison of data indicates that there was an increase in children's exposure to hazardous work in cocoa production between 2008/09 and 2018/19.

Table 51 shows that there were some significant changes in the age-disaggregated proportion of children engaged in child labor or in hazardous work in Côte d'Ivoire for the 15-17 age group, and no statistically significant change in Ghana. In Côte d'Ivoire, the proportion of children engaged in child labor in the 15-17 age group decreased by 6 percentage points. Similarly, hazardous child labor prevalence decreased by 5 percentage points in the oldest age group in Côte d'Ivoire.

Comparison of data across rounds indicates there was an increase in children's exposure to the worst forms of child labor[51] in cocoa production between 2008/09 and 2018/19 and thus, the targets of the *Declaration and Framework* of reducing hazardous child labor by 70 percent between 2008/09 and 2018/19 within agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana were not met.

5.2.5.1 Children's Engagement in the Components of Hazardous Labor in Cocoa Production

Comparison of 2008/09 and 2018/19 data shows the prevalence rate of children's exposure to hazardous work in cocoa production increasing by 12 percentage points between 2008/09 and 2018/19. This change in exposure to hazardous work can be better understood by investigating the changes in the six different types of hazards related to cocoa agriculture. Table 17 presents the data on exposure to each of the six different types of hazards related to cocoa production among all children in agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana.

Quantitative Insight

Overall, use of sharp tools was the most commonly performed hazardous activities in cocoa agriculture followed by carrying heavy loads, exposure to agro-chemical, and land clearing activities. A very small proportion of children were exposed to long working hours or night work in cocoa production in both periods.

In 2018/19, 43 percent of children in agricultural households were exposed to at least one of the six hazardous activities involved in cocoa production, up 13 percentage points from the corresponding estimate from 2008/09. Comparison of data indicates increased exposure to five of the six hazard types that are prominent in cocoa agriculture. Overall, use of sharp tools was the most commonly performed hazardous activities in cocoa agriculture (with exposure rate of 36% in 2018/19 and 28% in 2008/09), followed by carrying heavy loads, exposure to agro-chemicals, and land clearing activities. A small proportion of children were exposed to long working hours or night work in cocoa production in both periods.

[51] Note that we used for hazardous child labor as a proxy for WFCL per the Harkin-Engel Protocol.

Comparison of data shows that among these components, exposure to agro-chemical products has become pervasive between 2008/09 and 2018/19 as the proportion of children exposed to agro-chemicals increased by approximately five times between 2008/09 and 2018/19, from 5% to 24%. As described in Section 5.1.3 there was a significant increase in agro-chemical use among cocoa growing households during this period.

Quantitative Insight

In Ghana, use of sharp tools, exposure to agro-chemicals and carrying heavy loads were the most prominent sources of exposure to hazardous work. The trends in exposure indicate that similar to Côte d'Ivoire, among various categories of hazardous activities, exposure to agro-chemical increased by the greatest extent.

Exposure to land clearing, sharp tool use and carrying heavy loads increased during the same period as well, but by a much smaller extent - approximately between 6 to 8 percentage points. This indicates among the six hazardous activity categories, exposure to agro-chemicals increased by the greatest extent.

Disaggregation of data by country using the common definitions indicates that consistent with the overall trend, the most commonly performed hazardous activities in Côte d'Ivoire were using sharp tools (31% in 2018/19 and 21% in 2008/09), followed by carrying heavy loads (26% in 2018/19 and 18% in 2008/09), land clearing (22% in 2018/19 and 15% in 2008/09), and exposure to agro-chemicals (19% in 2018/19 and 4% in 2008/09). Among the six different categories of hazard, the increase in exposure to agro-chemicals was most prominent.

In Ghana, similar to the overall trend, use of sharp tools (remained stable at around 39%), exposure to agro-chemicals (32% in 2018/19 and 7% in 2008/09) and carrying heavy loads (32% in both 2018/19 and 2008/09) were the most prominent sources of exposure to hazardous work. The trends in exposure indicate that like Côte d'Ivoire, among various categories of hazardous activities, exposure to agro-chemical increased by the greatest extent (by more than six times) – an increase from 7 percent to 32 percent.

Quantitative Insight

Data indicates that consistent with the overall trend, the most commonly performed hazardous activities in Côte d'Ivoire were using sharp tools, followed by carrying heavy loads, land clearing, and exposure to agro-chemicals.

Overall, children were exposed to more types of hazardous work activities on average in 2018/19 than in 2008/09 (from 0.7 to 1.1 activities). This statistically significant increase was found in both Ghana (0.9 to 1.2 activities) and Côte d'Ivoire (0.6 to 1.0 activities).

Table 17: Estimates of Percentages of all Children Exposed to Hazardous Work Activities in the Cocoa Sector, 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19*

Percentage of children in agricultural households:	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
V1: Land clearing	12%	19%	***	15%	22%	***	7%	14%	***
V2: Heavy loads	23%	29%	***	18%	26%	***	32%	32%	
V3: Agro-chemicals	5%	24%	***	4%	19%	***	7%	32%	***
V4: Sharp tools	28%	36%	***	21%	31%	***	39%	43%	
V5: Long working hours	1%	1%		1%	1%		0%	0%	
V6: Night work	0%	2%	***	1%	2%	***	0%	3%	***
Exposed to multiple hazards	30%	43%	***	23%	37%	***	43%	51%	***
Average number of hazards	0.7	1.1	***	0.6	1.0	***	0.9	1.2	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report.*

***Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points*

*^Significance of Difference *** p<0.01*

Comparison of the trends in exposure to various types of hazardous activities in cocoa production indicates that in both countries, agro-chemical use has become a substantial source of exposure to hazardous activities over the past 10 years, while use of sharp tools, exposure to land clearing, and carrying heavy loads remain persistent source of hazardous work in cocoa growing areas of Côte d'Ivoire and Ghana.

Data presented in Table 52 and Table 53 in Annex 10.4.2 show the changes in children's exposure to each of the six different types of hazards related to cocoa agriculture disaggregated by age groups and gender in Côte d'Ivoire and Ghana. Earlier we saw that the most prominent change in exposure to either of the hazardous activities was in exposure to agro-chemicals. There were significantly large increases in the proportion of children exposed to agro-chemicals among the 12-14 years and 15-17 years age group and smaller increases in the 5-11 years age group between 2008/09 and 2018/19. The change in the average number of activities that children were exposed to was also the highest in the 15-17 year old age group (increase from 1.1 to 2.0), followed by the 12-14 year old age group (increase from 1.0 to 1.7), and the 5-11 year old age group (increase from 0.5 to 0.7).

Sex disaggregation shows a much larger increase in agro-chemical exposure among boys than girls between the survey periods. Additionally, in both periods, there was a consistently higher proportion of boys exposed to any of the 6 hazardous activities compared to girls. For instance, in 2018/19, close to half of the proportion of boys in agricultural households were using sharp tools versus a quarter of the proportion of girls in these households. Additionally, 27 percent of boys were engaged in land clearing activities versus 10 percent of girls, and 33 percent of boys were carrying heavy loads versus 24 percent of girls. Consequently, in 2018/19, approximately half of the boys in agricultural households (50%) were exposed to one or more of the six hazardous activities compared to 34% of girls. Additionally, the change in the average number of hazardous activities boys were exposed to was higher than for girls, 70 percent and 43 percent respectively. This indicates that boys were more vulnerable to hazardous work when they were involved in cocoa production.

5.2.5.2 Children's Exposure to Multiple Hazardous Activities Related to Cocoa Production

In addition to the estimate of children exposed to any of the six different hazardous activities, it is also important to compare the incidence of facing multiple hazards, since children may be involved in more than one hazardous activity. Focusing only on the rate of exposure to any one hazardous activity provides an incomplete picture of the realities on the ground. For this purpose, given that the hazards considered here are specific to cocoa production, we present the data on how exposure to multiple hazards changed between 2008/09 and 2018/19 among children working in cocoa production in Table 18.

Between 2008/09 to 2018/19, there was a marginal decrease in the exposure to any hazardous activities among children working in cocoa production. The proportion of children exposed to any hazardous activities decreased from 98 percent in 2008/09 to 92 percent in 2018/19 in Côte d'Ivoire and from 93 percent to 85 percent in Ghana during the same period.

Quantitative Insight

Although the proportion of children working in cocoa production who were engaged in multiple hazardous activities decreased, those who were engaged in hazardous activities were engaged in a greater number of hazardous activities in 2018/19.

The data in Table 18 indicates that children working in cocoa production were vulnerable to being exposed to multiple types of hazardous activities in Côte d'Ivoire and Ghana, as approximately 75 percent of all children working in cocoa production were exposed to more than one hazardous activity in 2018/19 in Côte d'Ivoire while in Ghana, approximately 65 percent of all children working in cocoa production were exposed to more than one hazardous activities in 2018/19.

Although the 2018/19 figures demonstrate the importance of considering multiple hazards, there was a significant decrease in this risk between survey rounds. The proportion of children working in cocoa production exposed to multiple hazards decreased from 87 percent in 2008/09 to 75 percent in 2018/19 in Côte d'Ivoire while in Ghana it remained stable around 65 percent.

However, the proportion of children engaged in four or more hazardous activities more than doubled in Côte d'Ivoire (from 13% in 2008/09 to 29% in 2018/19) and increased by more than 10 times in Ghana (from 1% in 2008/09 to 16% in 2018/19). Thus, the data indicate that while lesser proportion of children working in cocoa production were engaged in multiple hazardous activities, those who were engaged in hazardous activities were undertaking a greater number of hazardous activities in 2018/19 as compared to 2008/09.

Table 18: Estimates of Exposure of Children Working in Cocoa Production, 5-17 Years, to Multiple Types of Hazardous Work, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Percent of children exposed to:	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Not exposed to any hazard	4%	11%	***	2%	8%	***	7%	15%	***
1 type of hazard	19%	18%		11%	17%	***	27%	20%	***
2 types of hazard	39%	25%	***	33%	23%	***	43%	28%	***
3 types of hazard	31%	23%	***	41%	24%	***	22%	22%	
4 types of hazard	6%	19%	***	11%	25%	***	1%	14%	***
5 types of hazard	1%	3%	***	2%	4%	***	0%	2%	***
6 types of hazard	0%	0%		0%	0%		0%	0%	
Average number of hazards	2.2	2.3		2.6	2.5		1.8	2.1	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

5.2.5.3 Children's Exposure to Various Components of Agro-Chemical Products

As reported earlier in this section, among the six hazardous activities related to cocoa agriculture, exposure to agro-chemicals recorded a steep increase in both countries between 2008/09 and 2018/19. However, related to the importance of understanding the component parts of hazardous child labor generally, it is also important in this case to look at the sub-components that constitute agro-chemical related hazards. Table 20 reports data on children's exposure to five sub-components of agro-chemical related hazards.

Comparison of trends in exposure to different sub-components of agro-chemical use among children working in cocoa production indicate that between 2008/09 and 2018/19 there is a significant increase in exposure to spraying pesticides/insecticides (by 6 percentage points), working in the vicinity of a farm during pesticide spraying (by 20 percentage points), re-entering a sprayed farm within less than twelve hours of spraying (by 9 percentage points), carrying water for spraying (by 24 percentage points), and working with agrochemicals (by 16 percentage points) in aggregate.

Disaggregation of data by country shows there was a similar trend in changes in exposure to the various sub-components of agro-chemicals exposure in both countries. The most prominent increase was in the proportion of children who were present or working in the vicinity of farm during pesticide spraying and carrying water for spraying.

Table 54 in Annex 10.4.2 shows breakdowns for exposure to agro-chemical hazards by age group and sex. In Côte d'Ivoire, there was a decrease in exposure to agro-chemical hazards for children in the 5-11 age group, an increase for children in the 12-14 age group, and no statistically significant difference for the 15-17 age group. There was also an increase in exposure to agro-chemicals for male children compared to a decrease for female children in Côte d'Ivoire. There are no statistically significant differences in agro-chemical exposure by sex in Ghana or age group in Ghana. This shows that overall increases in exposure to agro-chemical hazards was mainly driven by the male children and children in the 12-14 age group in Côte d'Ivoire.

Table 19: Disaggregation of Exposure to Agro-Chemicals, Children Working in Cocoa Production in the Last 12 Months, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Number and percentage of children working in cocoa exposed to V3	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Exposed to V3 (agro-chemicals)	15%	50%	***	15%	47%	***	15%	53%	***
Spraying pesticides or insecticides	2%	8%	***	1%	9%	***	2%	7%	***
Present in vicinity of farm during pesticide spraying	4%	24%	***	1%	23%	***	6%	24%	***
Reentering sprayed farm within 12 hours of spraying	2%	11%	***	0%	11%	***	4%	10%	***
Carrying water for spraying	11%	35%	***	13%	31%	***	10%	40%	***
Involved in working with agrochemicals*	1%	17%	***	1%	17%	***	2%	18%	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Such as purchasing, transport, storage, mixing, loading, spraying/applying, washing of containers and spraying machine, and/or disposal*

*^Significance of Difference *** p<0.01*

5.2.6 Injuries Suffered while Working in Agriculture in the Past 12 Months and Health Consequences for Children

As mentioned before in this report, child labor rates are only one factor to consider when trying to understand the lives of children in cocoa production. The following section focuses on injuries and health consequences among children working in agriculture. It is important to note that the majority of these children were working in cocoa production during the 2018/19 survey round.[52]

Children working in agriculture are susceptible to various injuries and it is important to not only reduce child labor but also reduce injuries associated with child labor. As part of our child survey, children were asked to self-report whether they suffered injuries while working in agriculture and whether they suffered specific types of injuries. Below we document the common injuries children report while doing agricultural work and the resulting health consequences. Table 20 presents a comparison of injuries suffered by children while working in agriculture from cocoa growing households (as percentage of working children in agriculture) with those working in agriculture from non-cocoa growing households.

In Côte d'Ivoire and Ghana, the most common injuries for children working in agriculture were wounds/cuts, muscle/back/other pains, and skin itchiness or scratches. Among these injuries, wounds and cuts were most common in agriculture in general as around 30 percent of the children working in cocoa and non-cocoa agriculture sustained wounds/cuts.

In Côte d'Ivoire, children working in agriculture, including in cocoa production, were more likely to suffer broken bones, back pains, or burns, than those working in other non-cocoa agriculture as a higher proportion of children working in cocoa production reported these injuries compared to their counterparts working in non-cocoa agriculture. Children's exposure to hazardous work reported in 4.2.5 indicates that a large proportion of children in cocoa agriculture carry heavy loads, undertake land clearing, and are exposed to agro-chemical products. Although speculative, the injuries reported by children seem to be reflecting the consequences of these hazards related to cocoa agriculture.

Qualitative Insight

Qualitative data reflect these findings, although children reported working in other forms of agriculture, they most often reported injuries specific to cocoa production. In some instances, children stated a preference for other agricultural activities because they were not as physically intensive.

[52] Due to methodological limitations that restrict comparability of data related to injuries, comparison of data with previous rounds of survey are not possible.

Table 20: Injuries Experienced by Children While Working in Agriculture, Children 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children working in agriculture	Total				Côte d'Ivoire				Ghana			
	Cocoa HHs	Non-Cocoa HHs	Diff (pp)*	Sig of diff^	Cocoa HHs	Non-Cocoa HHs	Diff (pp)*	Sig of diff^	Cocoa HHs	Non-Cocoa HHs	Diff (pp)*	Sig of diff^
Number of children	2,046,114	301,480	N/A	N/A	1,119,035	217,400	N/A	N/A	927,079	84,080	N/A	N/A
Type of injury												
Wounds/cuts	30%	29%	1		31%	32%	-1		28%	22%	7	
Back pains	0%	0%	0		0%	0%	0	***	1%	0%	1	***
Muscle pains	1%	1%	-1	***	1%	1%	-1		0%	1%	-1	
Skin itchiness /scratches	8%	4%	3		6%	2%	4	***	10%	10%	0	
Other pains	8%	5%	3		6%	4%	2		9%	6%	3	
Other	4%	3%	1		3%	3%	0		6%	4%	1	
Burns	1%	0%	1	***	1%	0%	1	***	2%	1%	1	***
Snake bites	6%	3%	3		6%	3%	3		6%	4%	2	
Broken bones	4%	4%	0		4%	4%	0		4%	3%	1	

Source: NORC Child survey 2018/19, weighted, strata 1-3

**Calculated as the difference between children in cocoa and non-cocoa in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

In Ghana, both children of cocoa growing households and non-cocoa agricultural households report similar types of injuries and there is no statistically significant difference in incidence of sustaining injuries between children from cocoa and non-cocoa households, except for higher incidence of broken bones and burns among children from cocoa households.

Given the danger involved in hazardous work, we expect that children engaged in hazardous work are more vulnerable to injuries than those who are not exposed to hazardous work. Table 21 presents the data on injuries by children's exposure to hazardous work which supports this expectation.

Overall, in both countries, injuries such as wounds/cuts, back/muscle pains, burns, and skin itchiness or scratches are more common among children working in agriculture and engaging in hazardous work than their counterparts engaging in non-hazardous work in 2018/19.

In Côte d'Ivoire, there are significant differences in experiencing wounds/cuts, back pains, muscle pains, burns, and skin itchiness or scratches between children engaging in hazardous work and those engaging in non-hazardous work. Ivoirian children engaging in hazardous work were approximately six times as likely to sustain back/muscle pains and skin itchiness/scratches compared to those engaging in non-hazardous work. In Ghana, these differences were more pronounced as the difference in proportions between the children working in cocoa and non-cocoa agriculture were at least as high or greater than in Côte d'Ivoire. These significant differences in experiencing back/muscle pains and skin itchiness/scratches among the children exposed to hazardous work clearly indicates they are more vulnerable to work related injuries and need assistance and proper care to mitigate these risks.

Finally, we examine the resulting health consequences of injuries suffered. Children were asked to report what consequences they faced after experiencing an injury while working.

Data reported in Table 22 indicate that facing injuries while undertaking agricultural work activities has several health consequences for the more than 1 million children working in agriculture across the two countries. In 2018/19, the most commonly reported consequences for children working in cocoa production were experiencing tiredness and being in very bad pain. In each country, 41 percent of children working in cocoa production felt very tired due to injuries sustained while working in agriculture. Additionally, 26 percent of Ivoirian children and 42 percent of Ghanaian children working in cocoa production experienced bad pain as a result of injuries sustained while working in agriculture. In Côte d'Ivoire, close to 1 in 5 children working in cocoa production did not feel well for a long time and had to receive treatment at a health center. Moreover, sustaining injuries while working led to 7 percent of children in cocoa production not being able to go to school and 10 percent of children in cocoa production not being able to continue working overall.

Table 21: Injuries Experienced by Children While Working in Agriculture by Exposure to Hazardous Work, Children 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children working in agriculture	Total				Côte d'Ivoire				Ghana			
	Haz Work^^	Non-Haz Work^^^	Diff (pp)*	Sig of diff^	Haz Work^^	Non-Haz Work^^^	Diff (pp)*	Sig of diff^	Haz Work^^	Non-Haz Work^^^	Diff (pp)*	Sig of diff^
Number of children	1,936,326	412,240	N/A	N/A	1,106,329	230,105	N/A	N/A	829,997	182,135	N/A	N/A
Type of injury												
Wounds/cuts	35%	8%	26	***	36%	9%	27	***	32%	7%	25	***
Back pains	0%	0%	0	***	0%	0%	0		1%	0%	1	***
Muscle pains	1%	0%	1	***	1%	0%	1	***	1%	0%	1	***
Skin itchiness /scratches	8%	1%	8	***	6%	1%	5	***	12%	1%	11	***
Other pains	9%	1%	8	***	7%	1%	7	***	10%	0%	10	***
Other	5%	1%	3	***	3%	1%	3	***	7%	2%	4	***
Burns	2%	0%	1	***	1%	0%	1	***	2%	0%	2	***
Snake bites	6%	0%	6	***	6%	0%	6	***	7%	0%	6	***
Broken bones	4%	2%	2		5%	1%	4	***	3%	4%	0	

Source: NORC Child survey 2018/19, weighted, strata 1-3

**Calculated as the difference between children engaged in hazardous work and non-hazardous work in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

^^Engaged in hazardous work activities

^^^Engaged in non-hazardous work activities

Table 22: Health Consequences from Injuries Experienced While Working in Agriculture, Children 5-17 Years Working in Cocoa Production, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children working in agriculture	Total	Côte d'Ivoire	Ghana
Population of children working in agriculture	1,667,575	831,937	835,638
Consequences			
Felt very tired or exhausted	41%	41%	41%
Was in very bad pain	34%	26%	42%
Felt very sick	25%	24%	26%
Other	19%	4%	34%
Had to receive traditional treatment	15%	16%	14%
Did not feel well for a long time	13%	17%	8%
Had to receive treatment at a hospital/health center	12%	13%	10%
Could not continue working	10%	11%	9%
Could not go to school	7%	12%	2%

Source: NORC Child survey 2018/19, weighted, strata 1-3

5.2.7 Children's Engagement in Non-Cocoa Agriculture and Non-Agricultural Sector

Since the proportion of children working in the cocoa sector increased between 2008/09 and 2018/19, it is insightful to look at changes in children's involvement in sectors apart from the cocoa sector in agriculture and non-agricultural sectors in Côte d'Ivoire and Ghana. Table 23 presents the data on children's engagement in non-cocoa agriculture and in non-farm activities.

Overall, in the cocoa growing areas of Côte d'Ivoire and Ghana, there was a 10 percentage points decrease (from 29% to 20%) in the proportion of children involved in agriculture work outside of the cocoa sector between the survey rounds. This indicates that, given the increasing importance of cocoa farming, children shifted away from other agricultural activities to cocoa production (keeping in mind that correlation does not mean causation). In Côte d'Ivoire, around 28% of children engaged in agriculture work outside the cocoa sector in 2008/09 and 2018/19. In Ghana, 13 percent of children engaged in agriculture work outside the cocoa sector in 2018/19, down 14 percentage points from the 2008/09 estimate.

Table 23: Estimates of Change in Children Working in Agriculture Other than the Cocoa Sector, in Non-Agricultural Sector, 5-17 Years, All Agricultural Households, in the Last 12 Months, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children working in		Agriculture other than the cocoa sector			Sectors other than agriculture		
		Pct	Diff. (pp)*	Sig of diff.^	Pct	Diff. (pp)*	Sig of diff.^
Total	2008/09	29%	-10	***	5%	8	***
	2018/19	20%			12%		
Côte d'Ivoire	2008/09	31%	-7		4%	9	***
	2018/19	24%			14%		
Ghana	2008/09	27%	-14	***	5%	5	***
	2018/19	13%			11%		

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Quantitative Insight

There was a 10 percentage point decrease (from 29% to 20%) in the proportion of children involved in agriculture work outside of the cocoa sector between the survey rounds. This indicates that, given the increasing importance of cocoa farming, children shifted away from other agricultural activities to cocoa production.

While looking at the choice between farm and non-farm activities, the data indicate that between the same periods, children involvement in non-agricultural sectors increased by 8 percentage points. In Côte d'Ivoire, there was a 9 percentage-point increase while in Ghana there was a 5 percentage-point increase in the proportion of children working in non-agricultural sectors. This is consistent with the general trend towards the shrinking of the agricultural sector as a whole and expansion of opportunities outside agriculture such as mining, fishing and service sectors.[53] [54]

5.3 Main Findings: Cocoa Growing Households (2013/2014 and 2018/2019)

In this section we explore recent trends in changes in children engagement in cocoa production activities, child labor, and hazardous child labor for the subpopulation of children from cocoa growing households working in cocoa production. For this purpose, we use data from the 2013/14 survey round and compare it with data from the 2018/19 round. While NORC was able to use 2008/09 data for a comparison of all agricultural households as seen in Section 5.2, due to the methodological issues with the 2008/09 data, it was not feasible for NORC to use that data for comparison of cocoa growing households as described in detail in Section 4.3 and Annex

[53] http://www.fao.org/3/a-i4337e.pdf

[54] https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_624872.pdf

10.2. However, based on available documentation about the 2013/14 survey round, NORC concluded that there were no such methodological issues with the data collected from the sub-population of cocoa growing households. Consequently, based on discussions with the stakeholders and given the importance of comparing cocoa growing households across rounds, we use the data from the cocoa growing household of 2013/14 for the comparison of progress made among this sub-population of agricultural households.

It is important to note that cocoa households constitute about 86 percent of the survey sample in 2018/19 and 76 percent of the sample in 2013/14. So while the comparison of 2013/14 data on all agricultural households with the 2018/19 data is not possible, the comparison of data from cocoa households between 2013/14 and 2018/19 still provides the status of progress of most of the agricultural households in the cocoa growing areas of Ghana and Côte d'Ivoire.

However, it is useful to note that the comparison of cocoa and non-cocoa households of 2018/19 survey round reported in Table 55 in Annex 10.4.2 indicates that the proportion of children engaged in child labor and children engaged in hazardous child labor is not different between the non-cocoa households compared to the cocoa households, again indicating the similarity between these two sub-populations.

5.3.1 Cocoa Growing Households: Estimate of Working Children

Table 24 presents estimates of children in cocoa households in cocoa production based on usual and current activity status.

Overall, a higher proportion of children in cocoa growing households were usually active in 2018/19 in cocoa production compared to 2013/14 – a trend similar to the trend found among all agricultural households between 2008/09 and 2018/19. On the other hand, involvement based on current activity status (reference period past 7 days) for children in cocoa households remained stable between 2013/14 and 2018/19.

In Côte d'Ivoire and Ghana individually, there was no change in the proportion of children in cocoa households usually working in cocoa growing areas in the last twelve months. The proportion of children in cocoa households reporting work in cocoa production in the last twelve months was much higher than those working in the last seven days. In Côte d'Ivoire, there was a 14 percentage-point decrease in the proportion of children working in the last seven days, while in Ghana there was a 13 percentage-point increase from 2013/14 to 2018/19.

Table 24: Estimates of Children in Cocoa Households Working in Cocoa Production in the Last 12 Months and in the Last 7 Days, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

	Last 12 Months				Last 7 Days			
	2013/14	2018/19	Diff (pp)*	Sig of diff^	2013/14	2018/19	Diff (pp)*	Sig of diff^
Total Children Working in Cocoa Production								
Percent	47%	53%	6	***	29%	25%	-4	
Côte d'Ivoire Children Working in Cocoa Production								
Percent	41%	45%	5		34%	20%	-14	***
Ghana Children Working in Cocoa Production								
Percent	60%	64%	5		19%	32%	13	***

Source: Child survey 2013/14, and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2013/14 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 56 in Annex 10.4.2 shows the working hours and minimum age for children in cocoa households disaggregated by age group and data in Table 57 in Annex 10.4.2 shows the working hours and minimum age for children in cocoa households disaggregated by sex. These tables show that the proportion of children working more than the allowable number of hours and the number of hours worked for each gender and age group remained stable in Côte d'Ivoire. At the same time, average number of hours worked by male children overall did decreased (from 12.5 hours to 10.5 hours) during this period. In Ghana, there was a decrease in the percent of children in the 12-14 age group working overall (18% to 9%) and within each sex. The total number of hours worked decreased overall in Ghana from 8.8 to 6.4, which was driven by both male and female children in the 12-14 and 15-17 age groups.

Quantitative Insight

A higher proportion of children in cocoa growing households were usually active in 2018/19 in cocoa production compared to 2013/14 – a trend similar to the trend found among all agricultural households between 2008/09 and 2018/19. On the other hand, involvement based on current activity status (reference period past 7 days) for children in cocoa households remained stable between 2013/14 and 2018/19.

5.3.2 Cocoa Growing Households: Estimate of Child Labor and Hazardous Child Labor

Next, we present the prevalence rates of child labor and exposure to hazardous work in cocoa production between 2013/14 and 2018/19 for children in cocoa households in Côte d'Ivoire and Ghana in Table 25.

The data presented in Table 25 indicates that in cocoa growing areas of Côte d'Ivoire and Ghana, between 2013/14 and 2018/19, there was an increase (6 percentage-points in aggregate) in the proportion of children working in cocoa production, children engaged in child labor, and children engaged in hazardous work. When the data was disaggregated by country, it shows there was no statistically significant change in the proportion of children engaged in child labor and in hazardous work in either country. These findings may reflect stakeholders increased interest in reducing child labor and hazardous child labor following the 2013/14 data collection round.

Quantitative Insight

The prevalence rates of hazardous child labor in cocoa production increased between 2013/14 and 2018/19 among the cocoa growing households in aggregate.

Data presented in Table 58 in Annex 10.4.2 shows the changes in children in cocoa households engaged in child labor and in hazardous child labor in Côte d'Ivoire and Ghana, disaggregated by sex and age group. Comparison of data by sex indicates that in Côte d'Ivoire a larger proportion of male children were engaged in child labor, while a smaller proportion of children in the 15-17 age group and a higher proportion in the 5-11 age group were engaged in hazardous child labor. There were no significant changes by sex or age group in Ghana.

Table 25: Estimates of Change in Children in Cocoa Household, 5-17 Years, Working in Cocoa Production, Children Engaged in Child Labor in Cocoa Production, and Children Engaged in Hazardous Work in the Cocoa Sector in the Last 12 Months, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Children in cocoa households		Children Working in Cocoa Production			Children Engaged in Child Labor in Cocoa Production			Children Engaged in Hazardous Work in Cocoa Production		
		Pct	Diff (pp)*	Sig of diff^	Pct	Diff (pp)*	Sig of diff^	Pct	Diff (pp)*	Sig of diff^
Total	2013/14	47%	6	***	44%	6	***	42%	5	***
	2018/19	53%			50%			47%		
Côte d'Ivoire	2013/14	41%	5		37%	5		36%	6	
	2018/19	45%			43%			41%		
Ghana	2013/14	60%	5		57%	2		55%	0	
	2018/19	64%			59%			55%		

Source: Child survey 2013/14, and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2013/14 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

5.3.2.1 Children's Engagement in the Components of Hazardous Work in Cocoa Production

It is important to explore how exposure to different hazards related to cocoa agriculture have changed among children engaged in cocoa production in the cocoa growing households. Similar to our analysis of multiple hazards within agricultural households presented in section 5.2, focusing solely on the rate of exposure to any one hazardous activity provides an incomplete picture of the realities on the ground. Table 26 presents the data on exposure to each of the six different types of hazards related to cocoa agriculture among children in cocoa households in cocoa growing areas of Côte d'Ivoire and Ghana.

Data presented in Table 26 indicates that overall, the most prominent change is in exposure to agro-chemicals which increased by 17 percentage points (from 10% to 27% in 2018/19), followed by an increases in land clearing (by 8 percentage points) and sharp tool use (by 7 percentage points) in the cocoa growing areas of Côte d'Ivoire and Ghana. However, there are some interesting differences at the country level. Following the overall trend, there were significant increases in exposure to agro-chemicals in both countries (by approximately 15 percentage points), while exposure to land clearing increased by larger extent in Ghana (by 14 percentage points against 6 percentage points increase in Côte d'Ivoire). Also, in Ghana, among cocoa growing households, children's exposure to carrying heavy loads fell by 9 percentage points between 2013/14 and 2018/19, and children's exposure to carry loads did not change in Côte d'Ivoire. Additionally, the average number of hazardous activities children were exposed to increased from 0.9 to 1.2 overall, including similar increases at the country level.

Quantitative Insight

The most prominent change in hazardous child labor is in exposure to agro-chemicals which increased by 15 percentage points, followed by marginal increases in land clearing and sharp tool use.

Data presented in Table 59 in Annex 10.4.2 shows the changes in exposure to each of the six different types of hazards related to cocoa agriculture among children in cocoa households disaggregated by age groups and gender in both countries. Prominent changes across age groups were observed in exposure to agro-chemicals, land clearing, sharp tool use, and night work. The largest increase in the proportion of children exposed to agro-chemicals or agro-chemicals between 2013/14 and 2018/19 was among the 12-14 and 15-17 age groups. Exposure to sharp tools in cocoa significantly increased among children in the 5-11 and 12-14 age group. There were also increases across each age group for the number of hazardous work activities children were exposed to.

Table 26: Estimates of Change in Children in Cocoa Households, 5-17 Years, Exposed to Various Types of Hazardous Work Activities in the Cocoa Sector, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19*

Percentage of children in cocoa growing households exposed to:	Total			Côte d'Ivoire			Ghana		
	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
Land clearing in cocoa (V1)	12%	20%	***	18%	24%	***	1%	15%	***
Heavy loads in cocoa (V2)	31%	31%		24%	29%		44%	35%	***
Agro-chemicals in cocoa (V3)	10%	27%	***	5%	21%	***	20%	34%	***
Sharp tools in cocoa (V4)	33%	40%	***	28%	35%	***	42%	46%	
Long working hours in cocoa (V5)	1%	1%		1%	1%		1%	0%	
Night work in cocoa (V6)	1%	3%	***	1%	2%	***	0%	3%	***
Exposed to one or more variables in cocoa	42%	47%	***	36%	41%		55%	55%	
Average number of variables exposed to in cocoa	0.9	1.2	***	0.8	1.1	***	1.1	1.3	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

Sex disaggregation reported in Table 60 in Annex 10.4.2 indicates only marginal differences in the trend in change in exposure between male and female children with the proportion of girls exposed to agro-chemicals, land clearing, and night work being marginally greater than the increases in the proportion of boys exposed to either of these between the survey rounds. Additionally, in both rounds, there was a consistently higher proportion of boys exposed to five of the six hazardous activities compared to girls. There was also an increase for each gender in the number of hazardous work activities children are exposed to. It is important to note that children who are exposed to one hazard are more likely to be exposed to a greater number of hazards.

Table 61 in Annex 10.4.2 shows data on incidence of multiple hazards among children in cocoa households. Between 2013/14 to 2018/19, there were increases in the exposure to four or more hazardous activities and decreases in exposure to either two or one hazardous activity in both Côte d'Ivoire and Ghana. The proportion of children exposed to any hazardous activities increased from 88 percent in 2013/14 to 92 percent in 2018/19 in Côte d'Ivoire and decreased from 92 percent to 86 percent in Ghana during the same period. The average number of hazardous work activities children were exposed to increased from 1.9 to 2.5 in Côte d'Ivoire and from 1.8 to 2.1 in Ghana.

5.3.2.2 Exposure to Various Components of Agro-Chemical Product Use

Table 27 shows that among children in cocoa households working in cocoa production, exposure to agro-chemicals increased significantly in both countries between 2013/14 and 2018/19. Additionally, the table presents the data on exposure to agro-chemicals broken down into different sub-components for children in cocoa households between 2013/14 and 2018/19.

Table 27 indicates that similar to the trend in agricultural households described in Section 5.2.5.3, exposure to each of the sub-components of hazards related to agro-chemical exposure increased for children working in cocoa production in cocoa households. Similar to the case of all agricultural household, among the sub-components, the proportion of children carrying water for spraying increased by largest extent (by around 21 percentage points) in cocoa growing areas of Côte d'Ivoire and Ghana, followed by being present or working in the vicinity of a farm during pesticide spraying and being involved in working with agrochemicals. At the country level, there was a similar trend in changes in exposure to the various sub-components of agro-chemicals exposure in both countries.

Table 27: Disaggregation of Exposure to Agro-Chemicals, Children in Cocoa Households Working Cocoa Production in the Last 12 Months, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Number and percentage of children in cocoa households working in cocoa exposed to V3	Total			Côte d'Ivoire			Ghana		
	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
Children exposed to V3 (agro-chemicals)	22%	50%	***	13%	47%	***	34%	54%	***
Spraying pesticides or insecticides	4%	8%	***	4%	9%	***	3%	7%	***
Present in vicinity of farm during pesticide spraying	7%	23%	***	5%	23%	***	10%	24%	***
Reentering a sprayed farm within 12 hours of spraying	3%	10%	***	3%	10%	***	2%	11%	***
Carrying water for spraying	15%	36%	***	7%	31%	***	26%	40%	***
Involved in working with agrochemicals*	2%	17%	***	3%	17%	***	1%	18%	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Such as purchasing, transport, storage, mixing, loading, spraying/applying, washing of containers and spraying machine, and/or disposal*

*^Significance of Difference *** p<0.01*

While the comparison of trends in exposure to hazardous work indicate that overall exposure to hazardous work in cocoa production did not increase between 2013/14 and 2018/19, disaggregation of exposure to the six sub-components of hazardous work indicate there is increased exposure to some of the sub-components such as exposure to agro-chemical use, land clearing, and sharp tool use. Additionally, further disaggregation of exposure to agro-chemical by sub-components indicates that for children who were exposed to agro-chemicals, incidence of exposure to each of the sub-components increased between 2013/14 and 2018/19. Thus, the findings presented in this section suggest that while there was no increase in the proportion of children engaged in hazardous work, those who were exposed, were more vulnerable to increasing incidence rates of exposure to individual hazards.

5.4 School Attendance among Children in All Agricultural Households

In the following sections, we present findings from changes in school attendance, measures of literacy, and numeracy for children from agricultural households between the two survey periods. Access to education has been a priority for the Governments of Côte d'Ivoire and Ghana, and references to a child's school attendance are included in both countries' hazardous activities frameworks. Therefore, it is important to get a sense of the progress that has been made in this area. Table 28 reports school attendance by sex and age group.

Between 2008/09 and 2018/19, school attendance among children between 5-17 years significantly increased in Côte d'Ivoire and Ghana. Following a 22 percentage-point increase in Côte d'Ivoire, in 2018/19 80 percent of Ivoirian children were attending school in the last twelve months. Additionally, school attendance among Ghanaian children increased from 89 percent to 96 percent between the two survey periods.

Gains in attendance were seen across both boys and girls. School attendance also increased across all age groups between 2008/09 and 2018/19. In Côte d'Ivoire, the greatest gains in school attendance were seen in the 15-17 years age group within which the proportion of children attending school increased from 39 percent to 66 percent. In Ghana, the greatest gains in school attendance were seen in the 5-11 years age group within which the proportion of children attending school increased from 89 percent to 97 percent. The school attendance data indicates that reform in both countries and a greater push for education has led to significant gains in levels of school attendance among children in agricultural households.

Table 28: School Attendance for Children in the Last 12 Months, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children attending school in the last 12 months	Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Children 5-17 years	58%	80%	***	89%	96%	***
Sex						
Boys 5-17 years	61%	83%	***	90%	96%	***
Girls 5-17 years	53%	78%	***	89%	96%	***
Age Group						
Children 5-11 years	60%	81%	***	89%	97%	***
Children 12-14 years	68%	88%	***	93%	98%	***
Children 15-17 years	39%	66%	***	85%	89%	

Source: Child survey 2008/09 and 2018/19, weighted data, strata 1-3

*^Significance of Difference *** p<0.01*

5.5 School Attendance among Children Working in Cocoa Production

Working in agriculture could be an obstacle to school attendance and children's ability to learn. Table 29 presents the trend in school attendance for children working in cocoa production in the cocoa producing areas of Côte d'Ivoire and Ghana.

Consistent with the overall trends in school attendance for children in agricultural households discussed earlier, there were significant increases in school attendance across the board among children working in cocoa production. School attendance among girls increased more than that among boys in Côte d'Ivoire (by 32 percentage points among girls against 21 percentage among boys). In Côte d'Ivoire, the greatest gains in school attendance were seen in the 15-17 age group (21 percentage points increase), and in Ghana in the 5-11 age group (8 percentage points increase).

Table 29: School Attendance for Children Working in Cocoa Production in the Last 12 Months, All Agricultural Households, by Age Group and Gender, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children working in cocoa production attending school in the last 12 months	Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Children 5-17 years	59%	84%	***	91%	96%	***
Sex						
Boys 5-17 years	65%	86%	***	91%	96%	***
Girls 5-17 years	49%	81%	***	91%	97%	***
Age Group						
Children 5-11 years	67%	88%	***	91%	99%	***
Children 12-14 years	67%	89%	***	93%	98%	***
Children 15-17 years	34%	65%	***	88%	89%	

Source: Child survey 2008/09 and 2018/19, weighted data, strata 1-3

*^Significance of Difference *** p<0.01*

5.6 School Attendance among Children in Child Labor and Hazardous Child Labor in Cocoa Production

Next, we explore whether there was any improvement in school attendance among the children engaged in child labor and hazardous child labor in cocoa production. Table 30 presents data on school attendance for children engaged in child labor and hazardous labor in cocoa production by age group.

In aggregate, a higher proportion of children engaged in child labor in cocoa production across all age groups attended school in 2018/19 compared to 2008/09. Overall, among children engaged in child labor in cocoa production in the 5-11 age group, there was a 14 percentage points increase in the proportion attending school between 2008/09 to 2018/19. In Côte d'Ivoire, the proportion of children engaged in child labor and attending school in the 5-11 age group increased from 67 percent to 89 percent between 2008/09 and 2018/19, while in Ghana it increased from 91 percent to 99 percent during the same period.

School attendance among children in the 12-14 age group also experienced an increase of 12 percentage points between 2008/09 and 2018/19 in aggregate. In Côte d'Ivoire, 89 percent of children engaged in child labor attended school in 2018/19 and, 97 percent of Ghanaian children in the 12-14 age group in child labor attended school.

Between the survey periods, school attendance among children engaged in child labor in the 15-17 age group increased 14 percentage points, entirely driven by gains in Côte d'Ivoire. School attendance among Ivoirian children engaged in child labor in the oldest age group almost doubled between 2008/09 and 2018/19. In Ghana, there was no change between the same periods.

Qualitative Insight

Qualitative findings indicate that in many instances, children were engaging in child labor due to their inability to access a nearby school, or their caregivers' inability to manage the costs associated with schooling. Findings indicate that changes in access to schooling have mitigated these barriers and impacted how much time children spend on farms.

The trends in school attendance across age groups (and the magnitude of change) for children engaged in hazardous work were consistent with the trends for children engaged in child labor. There were highly statistically significant increases in school attendance among children engaged in hazardous work attending school across the 5-11 age group (14 percentage points), 12-14 age group (12 percentage points), and 15-17 age group (14 percentage points) between 2008/09 to 2018/19. Changes in the 15-17 age group were primarily driven by improvements in school attendance in Côte d'Ivoire.

Table 30: School Attendance for Children Engaged in Child Labor in Cocoa Production and Children Engaged in Hazardous Work in Cocoa Production, All Agricultural Households, By Age Group, 5-17 Years, in Côte d'Ivoire and Ghana, 2008-09 and 2018-19

Age Group: Attending School	Children Engaged in Child Labor in Cocoa Production											
	Total				Côte d'Ivoire				Ghana			
	2008/ 2009	2018 20/19	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^
5-11 Years	80%	94%	14	***	67%	89%	21	***	91%	99%	8	***
12-14 Years	81%	93%	12	***	67%	89%	22	***	92%	97%	5	***
15-17 Years	63%	77%	14	***	34%	65%	30	***	88%	89%	1	
Children Engaged in Hazardous Work in Cocoa Production												
5-11 Years	80%	93%	14	***	67%	88%	21	***	91%	99%	8	***
12-14 Years	81%	93%	12	***	67%	89%	22	***	92%	97%	5	***
15-17 Years	63%	77%	14	***	34%	65%	30	***	88%	89%	1	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*Significance of Difference *** p<0.01*

Table 63 in Annex 10.4.2 presents data on school attendance for children in cocoa households engaged in child labor and hazardous labor in cocoa production by age group which demonstrated similar trends between 2013/14 and 2018/19 as found in the case of all agricultural households described above.

Next, we look at how basic literacy and numeracy have changed amidst increasing levels of school attendance in both countries.

5.7 Basic Literacy and Numeracy among Children Working in Cocoa Production

In order to explore the benefits of school attendance, we present the data on basic literacy and basic numeracy in Table 31. Measurement of basic literacy involves two dimensions – ability to read a short simple statement and ability to write a short simple statement. Numeracy is measured through the ability to perform simple calculations.

Table 31: Basic Literacy and Numeracy for Children Working in Cocoa Production[55], All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2018/19

Children working in cocoa production, 5-17 years		Côte d'Ivoire			Ghana		
		Cocoa HHs	Non-cocoa HHs	Sig of diff^	Cocoa HHs	Non-cocoa HHs	Sig of diff^
Who can read a short simple statement	Number	652,438	141,566	N/A	726,543	71,763	N/A
	Percent	38%	40%		57%	58%	
Who can write a short simple statement	Number	744,017	174,941	N/A	667,402	69,308	N/A
	Percent	43%	50%		53%	56%	
Who can perform simple calculations	Number	826,858	198,541	N/A	886,787	87,996	N/A
	Percent	48%	56%		70%	71%	

Source: Child survey 2008/09, 2013/14, and 2018/19, weighted data, strata 1-3
*^Significance of Difference *** p<0.01*

Overall, we see that in Ghana and Côte d'Ivoire, there was no statistically significant difference in literacy or numeracy rates between the cocoa and non-cocoa households. There is no statistically significant difference in the ability to read a short simple statement between children working in cocoa production and belonging to cocoa households and those belonging to non-cocoa households across Côte d'Ivoire and Ghana.

[55] Children working in production include all children who work in cocoa production, regardless of whether or not their parents work in cocoa production. Children can live in a household where the household head does not produce cocoa and the child works on someone else's cocoa farm, and still be considered as working in cocoa production.

5.8 Estimate of Children's Work Interfering with Education among Children Working in Cocoa Production

Working in cocoa production could likely interfere with the education of children enrolled in school. For instance, children engaged in this work might be forced to drop out of school during harvest season, sustain injuries that have negative health consequences that prevent them from attending school, or might be too tired to engage in school-related activities due to fatigue from cocoa production activities.

To assess whether involvement in work affected schooling, we report data on whether children's work interfered with their schooling for children working in cocoa production in the cocoa growing areas of Côte d'Ivoire and Ghana. The schooling of a child, 6-14 years, is considered negatively impacted by work performed in cocoa agriculture if he or she worked in cocoa farming during the previous twelve months and reported either having been withdrawn from school during cocoa season to do farm work and/or reporting that schooling has been affected by his/her work.

In aggregate, the proportion of children reporting that cocoa work was interfering with schooling increased significantly from 5 percent in 2008/09 to 13 percent in 2018/19, which may be related to increases in overall school attendance.[56]- In Côte d'Ivoire, the proportion of children reporting that work interfered with schooling increased by 3 percentage points (from 3 percent in 2008/09 to 6 percent in 2018/19), while the proportion of Ghanaian children reporting the same increased by 13 percentage points (from 7 percent to 20 percent between 2008/09 and 2018/19). The percent of children not attending school decreased from 2008/09 to 2018/19, which is consistent with the data in the previous section on school attendance.

[56] This indicates that the interference of cocoa work on education became more prevalent.

Table 32: Estimates of Children Working in Cocoa Production Not Attending School, and Work Interferes with Schooling, 6-14 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children 6-14 years working in cocoa production	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
V7: Percent not attending school	19%	7%	***	33%	11%	***	8%	2%	***
V8: Percent work interfering with schooling	5%	13%	***	3%	6%	***	7%	20%	***
Percent exposed to either V7 or V8	24%	19%		36%	17%	***	14%	21%	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points*

*^Significance of Difference *** p<0.01*

6 Analytic Insights: Role of Production Stratum, Agro-chemical Use & Household Demographics

Comparison of the 2008/09 and 2018/19 survey data presented in the previous sections indicate that in the past ten years, there has been a statistically significant increase in the proportion of children engaged in child labor and in hazardous work in cocoa production. There may be several factors influencing those findings on child labor and hazardous work. In this section, we provide additional insights from survey data to understand the potential interplay of such factors.

Here we consider the role of the following factors[57]:

1. Increased production and geographic expansion of cocoa production into areas with relatively less production and new areas: We explore how the prevalence rate of child labor and exposure to hazardous work changed within different production stratum.
2. Increased usage of agro-chemical products among cocoa growing households
3. Changes in household demographics

6.1 Child Labor and Hazardous Work in Cocoa Production by Production Stratum

Cocoa production is an important part of the agricultural sector of both countries and has increased substantially over the years (by 62% between 2008/09 and 2018/19). As overall production increases, areas with already high cocoa production become saturated and thus cocoa production activities expand to other areas with historically lower production levels. This expansion of production into new areas and areas with low production can potentially lead to increased engagement of children in cocoa production, especially in the early stages when the market is underdeveloped, and related increases in child labor.

In order to explore whether increases in cocoa production and consequent shifts in production to new areas plays a role in affecting child labor and children engaged in hazardous work in cocoa production, we present in Table 33 the prevalence of child labor and children engaged in hazardous work disaggregated by whether the areas are high, medium, or low production strata.

[57] Note that these are not an extant list of possible contributing factors but only the most prominent that came out of the research team's analysis of the data.

Table 33: Estimates of Change in Children Engaged in Child Labor and Exposure to Hazardous Labor of Children Working in Cocoa Production in Areas with High, Medium and Low Cocoa Production, All Agricultural Households, in Côte d'Ivoire and Ghana, in 2008/09 and 2018/19

Country	Strata	Children Engaged in Child Labor in Cocoa Production				Children Engaged in Hazardous Labor in Cocoa Production*			
		2008/09	2018/19	Diff (pp)**	Sig of diff^	2008/09	2018/19	Diff (pp)**	Sig of diff^
Overall	High	43%	47%	4		42%	46%	3	
	Medium	33%	50%	16	***	33%	46%	13	***
	Low	6%	33%	27	***	6%	32%	27	***
	Total	31%	45%	14	***	30%	43%	12	***
Côte d'Ivoire	High	40%	45%	5		39%	44%	5	
	Medium	19%	38%	19	***	19%	36%	17	***
	Low	5%	31%	26	***	5%	30%	26	***
	Total	23%	38%	15	***	23%	37%	14	***
Ghana	High	56%	52%	-5		55%	49%	-7	
	Medium	43%	59%	16	***	42%	55%	12	***
	Low	16%	42%	26	***	16%	41%	25	***
	Total	44%	55%	11	***	43%	51%	8	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report.*

***Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Comparison of data by stratum indicates that among the three strata, between 2008/09 and 2018/19, the prevalence of child labor and exposure to hazardous work in cocoa production did not change in the high cocoa production stratum. On the other hand, there are substantial increases in the prevalence rate within the low and medium production strata. Between the two survey periods, child labor prevalence increased 16 percentage points (from 33% to 50%), and 27 percentage points (from 6% to 33%) in medium and low cocoa production areas respectively. There was a similar trend in the change in prevalence of exposure to hazardous work during the same period.

Quantitative Insight

The prevalence of child labor and the exposure to hazardous work did not see significant increases in the high production strata, while we observe substantial increases in prevalence within the low and medium production strata. There was a similar trend in the change in prevalence of exposure to hazardous work during the same period.

Changes in prevalence of child labor and exposure to hazardous work within different production strata in Côte d'Ivoire were similar to the overall trends. While there was no increase in prevalence rates in high production stratum, the prevalence rate of child labor increased by 19 and 26 percentage points in the medium and low production areas respectively with similar trends found in the prevalence rate of hazardous child labor.

In Ghana, similar to the trend in Côte d'Ivoire the prevalence of child labor increased by 13 percentage points and 27 percentage points in medium and low cocoa production areas respectively between the two survey periods. Children's exposure to hazardous work during the same period also increased by the largest extents in low production areas.

The breakdown of child labor prevalence by production stratum and comparison of prevalence rates clearly indicate that while child labor and exposure to hazardous work prevalence rates were relatively stable in the high production stratum, most of the increase in the prevalence of child labor between the survey rounds took place in the areas that produce relatively less cocoa.

These findings suggest that as high production areas become increasingly saturated with cocoa farms, cocoa production activities permeate other areas where the infrastructure is still weak and awareness related to child labor and hazardous work is limited. Additionally, interventions targeting child labor over the past ten years have likely focused on the high production areas where child labor is more prevalent and the perceived need for such interventions is greatest. Thus, it seems that the expansion of production to less saturated and new areas may have resulted in increased child labor and exposure to hazardous work in cocoa production.

6.2 Expenditure on Agro-Chemical per ton of Cocoa Produced

Comparison of the trends in exposure to various types of hazardous activities in cocoa production reported in Section 5.2.5.1 reveals that exposure to agro-chemical products has

become a prominent source of exposure to hazardous activities in cocoa production, which increased from 5 percent of children in agricultural households in both countries in 2008/09 to 24 percent in 2018/19. Also, data reported in Section 5.3.2.1 shows that a substantially larger proportion of cocoa growing households were using agro-chemical products in agriculture. While a larger proportion of cocoa growing households were using agro-chemical products, the intensity of use can play an important role in influencing exposure to hazardous activities.

In order to explore this relationship we present the data on how average expenditures on agro-chemical products (as a proxy for amount of usage) among cocoa growing household changed during 2013/14 and 2018/19 period in Table 34. The data reported here is the expenditure per ton of cocoa produced for households that reported using respective agro-chemical component and adjusted for inflation (reported in constant dollar value).

Table 34: Estimates of Change in Cocoa Households'[58] Use of Agro-Chemical Products Expenditure Per Ton of Cocoa in USD in the Last 12 Months, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

USD/Ton of Cocoa	Total			Côte d'Ivoire			Ghana		
	2013/ 2014	2018/ 2019	Sig of diff^	2013/ 2014	2018/ 2019	Sig of diff^	2013/ 2014	2018/ 2019	Sig of diff^
Fertilizer(s)	556	1,254	***	530	663		598	2,192	***
Pesticide(s)	267	745	***	199	376	***	383	1,207	***
Herbicide(s)	230	481	***	169	345	***	361	646	***

Source: Head of household survey 2013/14 and 2018/19, weighted data, strata 1-3
*^Significance of Difference *** p<0.01*

The per-ton expenditure on fertilizer, pesticide, and herbicide per ton of cocoa showed an overall increasing trend between 2013/14 and 2018/19. In Côte d'Ivoire, there were statistically significant increases in expenditure on pesticides (from USD 199 to USD 376 per ton of cocoa) and herbicides (from USD 169 to USD 345 per ton of cocoa). In Ghana, there was a statistically significant increase in expenditure on fertilizers (from 598 to 2,192 USD), pesticides (from 383 to 1,207 USD), and herbicides (from USD 361 to USD 646).

The analysis presented here indicates that increases in cocoa farming and production led to both an increased usage and significantly greater intensity of use of agro-chemical products in Côte d'Ivoire and Ghana. Given the large proportion of children engaged in cocoa growing activities, it is likely that this increased usage of agro-chemical products in cocoa production led to increased exposure to agro-chemicals related hazards among children in cocoa growing areas of

[58] *Bottom 10 percentile of households in cocoa production have been removed to no longer have high outliers.*

Côte d'Ivoire and Ghana. Future interventions around reducing child labor may want to have a significant focus on mitigating agro-chemical related hazards.

6.3 Household Composition: Distribution of Children in Household

Table 35 shows that between 2008/09 and 2018/19, average household composition by age shifted in each country as the overall number of children age 5-17 decreased (both overall and across most age categories). In most cases, these differences are highly statistically significant.

The average number of children age 5-17 per household decreased 10 percent from 2.7 to 2.4 per household. Decreases were statistically significant in the aggregate as well as at the country level, though the decrease was slightly larger in Côte d'Ivoire where the total number decreased from 2.8 to 2.5 children per household (11% decrease) than in Ghana where the total decreased from 2.6 to 2.4 children per household (9% decrease).

The group with the largest decrease across rounds were children age 15-17, which saw a 22 percent decrease from 0.5 per household in 2008/09 to just 0.4 in 2018/19, primarily driven by the highly significant 30 percent decrease between rounds in Côte d'Ivoire. The average number of children age 5-11 saw a more muted 10 percent decrease overall, with a highly significant 11 percent drop in Côte d'Ivoire and no change in Ghana. Difference in average number of children 12-14 per household is not significant overall.

Thus, comparison of average number of children in the three age groups clearly indicates there were fewer children in agricultural households and likely indicates the average family size decreased between the 2008/09 and 2018/19 period. This may imply there are fewer children in the agricultural households in cocoa growing areas of Côte d'Ivoire and Ghana in 2018/19. Given the increase in production, and simultaneous reduction in average number of children in cocoa growing areas, it may indicate a greater demand for existing child labor, and thus a greater likelihood of children's engagement in child labor.

Table 35: Estimates of Average Number of Children, 5-17 Years, All Agricultural Households, by Age Group, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Age group	Total				Côte d'Ivoire				Ghana			
	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^
5-11 years	1.7	1.5	-10	***	1.8	1.6	-11	***	1.5	1.4	-6	
12-14 years	0.6	0.5	-1		0.5	0.5	10		0.6	0.6	-14	
15-17 years	0.5	0.4	-22	***	0.5	0.3	-30	***	0.5	0.5	-13	
All years	2.7	2.4	-10	***	2.8	2.5	-11	***	2.6	2.4	-9	***

Source: Household roster survey, 2008/09 and 2018/19, weighted, strata 1-3

**Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

7 Findings Based on Country Specific Definitions of Hazardous Work (2018/19 Survey Round)

In earlier sections of this report, we discuss child labor and hazardous child labor prevalence based on the common definition used to aggregate data between Côte d'Ivoire and Ghana. The Governments of both Côte d'Ivoire and Ghana have made concerted efforts to address child labor and hazardous child labor prevalence, including passing legislation and establishing guidance frameworks that include country-specific definitions of child labor and hazardous child labor. Although aggregate information is helpful for the international community to understand the impact of cocoa agriculture on children, it is less helpful for each individual government when they design country-specific programs to address child labor in cocoa. Below we present findings based on country specific definitions of child labor and hazardous child labor to help local stakeholders better address the issue of child labor.

We first present data on children's exposure to hazardous work activities based on national legislation in Côte d'Ivoire and Ghana. We then present the estimate of the prevalence rate of children's exposure to child labor and exposure to hazardous work based on the national definitions.

7.1 Estimate of Children Engaged in Child Labor, and Hazardous Work in Cocoa Production in Côte d'Ivoire based on Ivoirian Legislation

In Côte d'Ivoire[59], per the national legislation there are seven types of hazardous activities that Ivoirian children could likely be exposed to while working in cocoa production. These include: not getting a full rest day, land clearing, charcoal production, carrying heavy loads, exposure to agro-chemicals, using sharp tools, and night work. .

[59] The Ivoirian country definition of what is considered hazardous work activities is derived from the list of hazardous activities the published by Ministry of Civil Service and Labor in Côte d'Ivoire released a list of dangerous child work in March 2005 and subsequent revisions to the list made in 2012 and the new hazardous work list published on 2nd June 2017 (ARRETE N°2017-017 MEPS/CAB) and a Light Work List (ARRETE N°2017-016 MEPS/CAB du 02 Juin 2017)

Table 36 presents the data on exposure to each of these hazardous activities.

Table 36: Estimates of Children, 5-17 Years, Exposed to Various Types of Hazardous Work Activities by the Côte d'Ivoire Country Definition, in Côte d'Ivoire, 2018/19*

Percentage of children exposed to:	Côte d'Ivoire
	2018/19
Number of children 5-17 years	2,082,507
Hazardous Work Activities	
No rest day (V1)*	3%
Land clearing (V2)	26%
Charcoal production (V3)	11%
Carrying heavy loads (V4)	8%
Agro-chemicals (V5)	9%
Sharp tools (V6)	26%
Night work (V7)	8%
Exposed to one or more variables	42%
Average number of variables exposed to	0.9

Source: NORC Child survey 2018/19, weighted, strata 1-3
**All variables for the 12 month reference period, except no rest day is for the 7 day reference period.*

In 2018/19, 42 percent of children in cocoa growing areas in Côte d'Ivoire were exposed to at least one of the seven hazardous activities. Approximately one in four children were exposed to using sharp tools (26%) such as, machetes, long cutlasses, axes, chainsaws etc., or land clearing activities (26%). One in ten children were working in charcoal production and likely subject to an unsafe working environment (11%). On average children were exposed to 0.9 Côte d'Ivoire definition hazardous work activities in 2018/19 in cocoa growing areas.

7.2 Estimate of Children Engaged in Child Labor, and Hazardous Work in Cocoa Production in Ghana based on Ghanaian Legislation

Ghanaian legislation defines ten types of hazardous activities that Ghanaian children could likely be exposed to while working in cocoa production. These include – not attending school, withdrawing from school, land clearing, carrying heavy loads, exposure to agro-chemicals, using sharp tools, climbing trees, night work, working in isolation, and lack of protective clothing. Table 37 presents the data on exposure to hazardous activities for each of these categories of hazard specified in the Ghanaian legislations.

Table 37: Estimates in Children, 5-17 Years, Exposed to Various Types of Hazardous Work Activities by the Ghana Country Definition, in Ghana, 2018/19*

Percentage of children exposed to:	Ghana 2018/19
Number of children 5-17 years	1,394,016
Hazardous Work Activities	
Not attending school (V1)	0%
Withdrawing from school (V2)	9%
Land clearing (V3)	14%
Carrying heavy loads (V4)	10%
Agro-chemicals (V5)	14%
Sharp tools (V6)	50%
Climbing trees (V7)	6%
Night work (V8)	3%
Work in isolation (V9)	5%
No protective clothing (V10)	16%
Exposed to one or more variables	56%
Average number of variables exposed to	1.3

Source: NORC Child survey 2018/19, weighted, strata 1-3

In 2018/19, more than half of children in Ghana (56%) were exposed to at least one of the ten hazardous activities. The most commonly reported hazardous activity was using sharp tools, 50 percent of Ghanaian children reported using sharp tools in 2018/19. Lack of protective clothing (16%), engaging in land clearing activities (14%), exposure to agro-chemicals (14%), and carrying heavy loads (10%) were other commonly reported hazardous activities. On average children were exposed to 1.3 Ghana definition hazardous work activities in 2018/19.

Using the definitions of hazardous activities as specified by each country described above, we present the estimates of prevalence of child labor and hazardous work as per the national definitions. Table 38 presents the estimate of prevalence of child labor and exposure to hazardous activities for in Côte d'Ivoire and Ghana.

Table 38: Prevalence of Children Engaged in Child Labor and Hazardous Child Labor by Country Definitions, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2018/19

Exposure to:		Child Labor	Hazardous Child Labor
Côte d'Ivoire country definition	Number	1,216,688	865,565
	Percent	58%	42%
Ghana country definition	Number	900,407	775,676
	Percent	65%	56%

Source: NORC Child survey 2018/19, weighted, strata 1-3

Estimates of child labor prevalence based on the country-specific definitions align with the estimates based on the common definition reported in Section 5.2.5. In 2018/19, 58 percent and 42 percent of Ivoirian children, and 65 percent and 56 percent of Ghanaian children were engaged in child labor and hazardous child labor respectively. The rates of child labor and hazardous child labor as higher for the national definitions because the national definitions are usually more restrictive in defining child labor and hazardous child labor than the common definition.

8 Part II: Assessment of the Effects of Interventions on Child Labor

8.1 Objectives

The second main objective of this report is to undertake an assessment of effectiveness of various interventions funded by the members of the CLCCG and other stakeholders. Under this objective, using a mixed-methods approach, we address a set of specific research questions in order to understand how different types of interventions were effective in addressing child labor issues and to examine the impact of multiple child labor interventions on the prevalence of child labor and hazardous child labor. Our assessment looks at overall effectiveness of funded interventions and efforts related to the reduction of child labor, in general, and hazardous child labor, in particular, in the two countries.

It is important to note that our analysis does not assess the effectiveness of individual interventions implemented by a particular partner or organization. Given both the disparate types and overall number of interventions conducted between 2008/09 and 2018/19, it was not methodologically feasible to assess the effectiveness of each individual intervention due to data limitations. Rather we assess the effectiveness of different categories of interventions such as education related interventions, livelihoods programs, and occupational safety and health interventions, to name a few.

8.2 Methodological Approaches

8.2.1 General Quantitative Approach

To address the research questions identified in the previous section, NORC employed a suite of quantitative analyses to generate robust conclusions. The quantitative analyses are based on statistical modelling techniques. Whenever possible, we employ a set of statistical modelling techniques in an effort to understand attribution by contrasting actual outcomes with those that

would have occurred without the intervention (the so called *counterfactual*).[60] These statistical models are discussed in more detail later in the report in Section 8.3 and in Annex 10.8.

It is worth noting that our proposed approach to assessment is not "design-based" (that uses randomized control trials (RCTs)), but "model-based"[61]. Given both the disparate types and overall number of interventions conducted between 2008/09 and 2018/19, it is not practically feasible to conduct RCTs on the entire set of interventions.[62] The goal of the modelling approach used here is to generate findings that can be causally attributed to the interventions being evaluated.

8.2.2 General Qualitative Approach

The qualitative component of the 2018/19 Child Labor Survey provides context for the quantitative results and a deeper understanding of how various key players understand child labor within the cocoa sector in Ghana and Côte d'Ivoire. This component also provides nuanced perspectives on the topics covered in the surveys, including complex concepts such as night work, heavy loads, and sharp tool use. Qualitative data helps identify factors contributing to observed prevalence rates, changes in prevalence rates, and changes in hazardous work trends. The qualitative component was based on focus group discussions (FGDs) with children and caregivers in cocoa growing regions of Ghana and Côte d'Ivoire and key informant interviews (KIIs) with the community leaders, donors, International Chocolate and Cocoa Industry members, government officials, implementers and civil society organizations. The research team interviewed both beneficiary and non-beneficiary children in both countries and information is disaggregated by beneficiary status where possible[63]. A summary of the respondent groups can be found in Annex 10.1.2. The detailed methodological approach is available in Annex 10.1.7.1.

8.3 Research Questions, Analysis and Findings

In this section we present the key research topics (RTs) addressed in this assessment highlighting the effectiveness of various thematic areas of intervention as well as overall effectiveness and sustainability of interventions implemented by various stakeholders aimed at reducing the prevalence of child labor and hazardous child labor in the cocoa sector. We then provide a brief

[60] The attribution analysis explores if the interventions led to a statistically significant decrease in prevalence rates of child labor and hazardous child labor, over and above the influence of other confounding factors.

[61] The model-based approach use theoretical model to specify the relationship between the outcome variables of interest and set of covariates that influence the outcome and estimate the impact of an intervention.

[62] The most commonly used method required either a randomized rollout of interventions into treatment and control location and/or a random assignment of beneficiaries into the treatment and control group.

[63] Beneficiaries are those individuals who live in communities receiving interventions

description of the analyses undertaken to address the RTs and finally presents the assessment findings.

The following figure summarizes the key RTs and methods used to address them.

Figure 4: Research Questions and Analyses

Research Questions		Type of Analysis	
Interventions/Theme	**Sub-themes**	**Quantitative**	**Qualitative**
Impact of education and vocational training	Impact on children's attitudes towards education		X
	Impact of provision of education material assistance	X	X
	Impact of school construction/infrastructure		X
	Impact of school feeding/school supply programs		X
	Impact of vocational training		X
Impact of livelihood services	Impact of livelihood services on child labor/hazardous child labor	X	X
	Aspects of livelihood services were most important in deterring child labor		X
	Perception of gains of livelihood services		X
Impact of occupational safety and health training	Use of appropriate safety gear	X	X
	Exposure to hazardous work	X	X
Impact of awareness raising campaigns	Influence on awareness of children, parents, community leaders		X
	Influence on their attitude and behavior		X
Overall effectiveness of interventions	Themes emerged in terms of effectiveness of interventions		X
Overall sustainability of interventions	Strategies of promoting sustainability and intervention sustainability		X
Overall Impact of interventions on the prevalence of child labor and hazardous child labor	Impact of multiple interventions on child labor/hazardous child labor	X	

8.3.1 Impact of Education and Vocational Training on Child Labor in the Cocoa Sector

Provision of education and vocational training to children serves as one of the important interventions in reducing CL & HCL. Between 2008/09 and 2018/19, various stakeholders implemented projects focusing on education and vocational training for children in the cocoa

sector in Côte d'Ivoire and Ghana. Thus, assessing effectiveness of education and training interventions on prevalence of CL and HCL in the cocoa sector in Côte d'Ivoire and Ghana becomes an important research question.

8.3.1.1 Children's Attitudes towards Education

To anchor findings on the impact of education programs, this section begins with an analysis of children's attitudes towards education, and their perceptions of the costs and benefits of education.

Children value their education, noting that completing school was a necessary requirement for achieving future aspirations. Children said they enjoyed their lessons as well as the social aspects of attending school, including seeing their friends and playing sports.

However, children reported significant barriers to school attendance. In both Ghana and Côte d'Ivoire, children explain that school absences were due to illness and financial difficulties where parents were unable to provide money for lunch, school supplies, or uniforms. Children also cite lack of transportation as a barrier to school attendance, as some had to travel five or more kilometers to the nearest school. In these instances, inclement weather and long distances between home and school made the journey to class difficult.

Children also said they occasionally miss school to help their parents, particularly during the cocoa harvest season. In some instances, these absences were anticipated and, in other cases, children explained that after going to the farm in the morning, they would return home too late to be able to get to school on time. As a result, they stayed home to avoid punishment from their teachers. Notably, children who were supporting older caregivers in farm activities (such as grandparents) more often attributed their school absences to work.

During interviews, implementers reported similar trends, noting that the aging population of cocoa farmers was a contributing factor to child labor. Implementers and government officials indicated that in many cases older farmers are physically unable to complete certain tasks and therefore rely on children more heavily.

Children reported engaging in a variety of on-farm and off-farm activities, including weeding, bean transportation, drying cocoa, and applying chemicals. Children broadly indicated that they enjoyed knowing they were supporting their parents and working alongside their friends on cocoa farms. Children in Côte d'Ivoire more often reported that working on cocoa farms fulfilled a sense of duty to their families and enabled them to support their caregivers.

Although children enjoyed feeling like they were helping their parents, neither beneficiary nor non-beneficiary children indicated a preference for working on cocoa farms over attending

school[64]. In fact, beneficiary and non-beneficiary children preferred to be at school and felt that supporting their caregivers on cocoa farms would also support their schooling:

> *You can also take out the cocoa seeds and dry it and when they sell the cocoa they can support your education with the proceeds.* Beneficiary child, Côte d'Ivoire, Male

> *When I think about the fact that my mother will give me money she gets from harvesting the cocoa for school it makes me happy.* Beneficiary child, Ghana, Male

> *When I help my mother to pick and gather the cocoa she gives me money for my school fees.* Non-beneficiary child, Ghana, Male

Overall, children in both countries reported similar perspectives on the benefits of education. Children indicated that going to school would enable them to achieve their future goals and allowed them to socialize with their peers.

8.3.1.2 Education Material Assistance and Child Labor in the Cocoa Sector

To help families that lack resources to afford children's education-related materials and supply, stakeholders implemented projects offering material assistance to families in the cocoa-growing areas of Côte d'Ivoire and Ghana. While the interventions were implemented in both Côte d'Ivoire and Ghana, the coverage of this intervention type was more extensive in Côte d'Ivoire. The material assistance provided included uniforms, school bags, and other scholastic materials such as textbooks, pens, and pencils.

The expectation is that material assistance supports families that typically cannot afford those items and thus helps children avoid absenteeism and/or reduces dependence on child labor to pay for supplies. To examine the effectiveness of such interventions, we used quantitative analysis to explore whether the households receiving educational material support (such as school supplies, text books, and uniforms) are less likely to engaged children in child labor and in hazardous child labor in cocoa production than households that did not receive such support.

The quantitative analysis uses a model-based approach to assess how provision of material support affects the likelihood of children's engagement in child labor and hazardous child labor as well as rates of child labor and hazardous child labor in a family, after controlling for other observable influences in a regression framework. Based on a theoretical model of the household decision-making process, we first identify factors that may influence households' decision to

[64] Beneficiaries are those individuals who live in communities receiving interventions

engage children in child labor in cocoa production. We then estimate whether, after controlling for such factors, households receiving material support are less likely to engage children as child labor and in hazardous child labor in cocoa production.

The self-reported data show that in Côte d'Ivoire 605 households (44%) had at least one child who received benefits and in Ghana 164 households (14%) with at least one child that received material assistance related to education.

Please refer to Annex 10.8.1 for a detailed description of the quantitative methodology and data sources used for addressing this research question.

8.3.1.3 Findings from Quantitative Analysis

The detailed statistical model used for testing whether households receiving educational material assistance are less likely to have child labor and children engaged in hazardous child labor in cocoa production is reported in Annex 10.8.1.

The model was estimated for Côte d'Ivoire and Ghana separately and reported in

After the counterfactual was constructed, we used multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Ghana.

Table 74 and Table 76 in Annex 10.8.1. Regression results presented in the second and third columns in

After the counterfactual was constructed, we used multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Ghana.

Table 74 and Table 76 in Annex 10.8.1 indicate that the likelihood of children's engagement in child labor and in hazardous child labor in cocoa production among households receiving educational material support were *not* statistically different from the households that did not receive such benefits in each country.

Similarly, results presented in the last two columns in

After the counterfactual was constructed, we used multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Ghana.

Table 74 and Table 76 in Annex 10.8.1 indicate there was no statistically significant difference in the rate of child labor and hazardous child labor in cocoa production between the beneficiary and the non-beneficiary households in each country.

In sum, our analysis was not able to detect any statistically significant difference in child labor and hazardous child labor among the households receiving educational material support, even at a modest level of significance (10%). This indicates that the educational material support programs were probably not strong enough to generate a large enough difference in child labor and hazardous child labor rates detectable by the given design. A second possibility is that educational support programs are not effective when implemented by themselves. Given the complex nature of child labor it may be the case that no one intervention will lead to significant decreases in child labor and/or hazardous child labor and a system approach, addressing multiple factors within a community, is needed to see significant impacts. Hence, it is important to understand the potential methodological reasons for these observed "null effects". Please refer to Annex 10.10 for a detailed discussion of the quantitative analysis.

8.3.1.4 Impact of School-Based Interventions

Quantitative data indicate a significant increase in children's school attendance in both countries. Qualitative findings indicate improved access to schooling, improved infrastructure, and the provision of school materials contributes to increases in children's school attendance. Children residing in school-based intervention communities reported significant changes, including infrastructural and administrative improvements to their schools, new school building construction, school building rehabilitation, the addition of new classrooms or grade levels, and electricity.

8.3.1.4.1 School Construction and Infrastructure Improvement

In communities where school building construction took place, children said they noticed a significant reduction in the time and effort previously required to get to school. For some children, the nearest school is in a neighboring community several kilometers away. As such, traveling to and from school is arduous, especially during inclement weather. Students also indicate that travel distances to and from school sometimes prohibit their attendance, particularly when they knew they would be late. In other communities that were sites for school construction, children report that before their new schools were built, classes were conducted outdoors, with

makeshift blackboards. Children said that the new school buildings made them more motivated to attend class, and less likely to miss school when it was raining.

Among teachers and caregivers in beneficiary communities, improved physical access to schools for children additionally contributed to positive outcomes in children's school attendance. Prior to school construction initiatives, many children lacked access to nearby schools. Consequently, caregivers could not leave their children at home, and would take them instead to the farm. With the construction of schools more proximate to their homes, children report going to school instead of staying home or going to the farm due to school distances.

Teachers indicate that children who have difficulty accessing nearby schools are at higher risk of engaging in child labor. However, teachers also made specific distinctions between socializing work and accompaniment, reporting that in some cases, children accompanied their parents because they did not have anywhere else to go, but were not necessarily working.

> *Since the parent himself must go to the field. If there is class, the child stays in school, he knows that his child is safe with the masters. But if he leaves him alone in the village, he does not know what his child is doing behind him. So, to be able to have an eye on their child, they prefer to go with them to the field. Like that, they are all together. They have time to watch over them. So, I do not think it's in any other sense that parents do it. The parents would not necessarily want his child to become a farmer tomorrow.* Primary School Teacher, Côte d'Ivoire

Aside from new school building construction, other reported infrastructural improvements include the addition of fences, washrooms, electricity, water pumps, and boreholes. The improvements brought a sense of safety to the children and enhanced their ability to focus during class. New construction also eliminated burdensome school chores. As one student explained:

> *We used to fetch water at a longer distance but now we have water in our school, and we can access water easily.* Beneficiary Child, Ghana, Female

There were gendered differences in perceived benefits from school infrastructure improvements. Only girls reported that latrine construction or improvement made them feel safer. Girls were also more likely to report that prior to the availability of water on school grounds, they, rather than boys, were responsible for fetching water for their schools. These activities caused girls to miss some lessons in school and made it difficult to catch up.

In communities without school rehabilitation programs, caregivers in Ghana and Côte d'Ivoire expressed concern about their children's safety in schools needing infrastructure improvements.

8.3.1.4.2 School Feeding Programs & School Supply Provision

Focus group results also indicate children see significant benefits of school support programs. Among these, children report the most significant gains from school feeding programs and canteens. Prior to the school feeding programs, children would sometimes go without meals during the day as their caregivers could not afford to send them to school with money for food. The lack of money for school lunch also discouraged children from going to school to avoid going hungry and/or watching others eat.

Teachers also found school feeding programs helpful in improving school attendance and changing caregiver and children's attitudes towards schooling. Teachers indicate that school feeding programs improve performance, and enabled children to be more engaged in school:

> *It has really helped the children because before the school feeding started, the class is always bored after 12pm because the children are hungry. The introduction of the school feeding has helped the children to concentrate for the last lesson after they have eaten. It has also encouraged more children to attend school because most of the children were not coming to school due to their parents not giving them pocket money.* Primary School Teacher, Ghana

> *The canteen has helped a lot. It is undeniable that when there is food, it stabilizes the children. So even at noon, when they have eaten here, they don't even find it important to go home. Before, they would go home and did not come back.* Primary School Teacher, Côte d'Ivoire

Teachers who saw a link between school-based interventions and child labor report that children from vulnerable families were most at risk of engaging in child labor, and most at risk of not attending school. These teachers believe that school feeding programs enable these students to access schooling, and therefore, lower their risk of engaging in child labor. These teachers also explain that caregivers who engage their children in child labor do so because they can not afford to send their children to school.

> *Yes, there have been changes in the parents' attitude, because previously, when a parent could not afford to give the child money for school, the parents will rather ask the child to follow the parent to the farm but things have changed. Now, parents allow their children to come to school without money knowing there is school feeding.* Primary School Teacher, Ghana

In addition to school feeding programs, the provision of school supplies and uniforms was helpful when parents could not afford to provide these. Specifically, caregivers noted the

significant impact of uniform provision and school feeding on their children's ability to attend school.

> *Some time ago, the government brought free uniforms for the children here. Some of the children were orphans, and they all had a share of the free school uniforms. The children who were once staying home are back to school because of the free school uniform intervention when their friends shared the good news with them.* Beneficiary caregiver, Ghana, Female

For a small set of students, it was reported that an increase of teachers in schools (hence a reduction in the teacher to student ratio) led to better relationships with their instructors. Children noticed increased dedication in their teachers and reduced incidences of corporal punishment. These improvements ultimately diminished students' fear of teachers and catalyzed excitement in learning.

In communities where such interventions were not in place, caregivers reported that they believed their children would greatly benefit from canteens. As one caregiver reports:

> *There is no canteen at school, where the children can stay there to eat. They have to come back to the house, and their parents are not there to give them food. The distance is very long to go back to school, so sometimes they just stay home.* Non-beneficiary caregiver, Côte d'Ivoire, Male

8.3.1.5 Persisting Challenges

While school-based interventions are improving overall attendance and reducing work-related school absences, teachers report persisting challenges in discouraging caregivers from engaging their children in work. Consistent with children's self-reported absences, teachers disclose that many students are late to school because they spent the morning on cocoa farms. Teachers also indicate a spike in absences during the harvest season and on market days, where children support their families in various tasks and consequently miss school.

Notably, teachers in Ghana and Côte d'Ivoire saw the potential of future collaboration with caregivers as a means of reducing child labor. In communities where school-based interventions took place, teachers noticed improved relationships with caregivers. In some communities, teachers and caregivers were mobilized to raise funds and materials for school infrastructure improvement. This collaboration provided teachers an opportunity to discuss their students wellbeing with caregivers and raise concerns about involvement in child labor. Teachers also felt more comfortable visiting children's homes and discussing absences with caregivers. This was most common in communities where teachers reside in the community, and in locales where teachers' quarters were recently constructed within the community. This proximity to families

was instrumental in building relationships where teachers could encourage caregivers to send their children to school and have one-on-one conversations about how going to farms before school affects students' performance.

> *These initiatives, because for parents, when we meet during PTA meetings; and then they put forward all these things, sometimes we try to educate them and why they should support their wards in education; to go through their education, especially when we were building the KG*[65] *building. We told them the fundamentals are very important, so they should support it. So most of them came around to help, so I think the attitude is changing.* Primary School Teacher, Ghana

> *Here, we specify the worst forms of child labor. We did several training on this subject. With the support of [implementer] we mobilize parents, to make them aware of the fight against child labor and especially the worst forms of child labor*. Primary School Teacher, Côte d'Ivoire

Teachers see an opportunity to build on the strides made by school-based interventions and move conversations on child labor forward within regular school-related meetings with parents.

8.3.1.6 Impact of Vocational Training Programs

Provision of vocational training to children is an important intervention for reducing child labor by helping children gain the skills necessary to secure safer alternative employment. During the assessment period, various stakeholders implemented projects focusing on vocational training for children in the cocoa sector. Here we assess the impact of vocational training interventions on children's engagement in child labor and hazardous child labor in the cocoa sector.

During the research design stage, the research team planned on addressing this question using quantitative analysis. Accordingly, in the 2018/19 child-labor survey, children were asked to report whether they attended vocational or skill training or apprenticeship program outside of their school. The self-reported data show that in Côte d'Ivoire only 24 households (less than 2%) had at least one child who received vocational training and in Ghana only 3 households (less than 1%) had at least one child that received vocational training. [66]

[65] Kindergarten

[66] Intervention data collected from the CLCCG partners corroborated with the self-reported data. The intervention data demonstrated that vocational training was rarely offered: only 8 communities in Côte d'Ivoire (out of the 75 communities covered in the 2018/19 survey round) had any vocational training intervention implemented by the CLCCG partners, while in Ghana, none of the 75 communities covered in the 2018/19 survey round had any vocational training intervention implemented by the CLCCG partners.

Given the small number of children reporting exposure to vocational training, this research question could not be addressed using quantitative methods and was subsequently dropped during analysis due to insufficient data. However, qualitative analysis was used to gauge the effect of vocational training.

Qualitative findings on exposure to, and the impact of, vocational training programs are also limited. Despite best efforts to ensure thorough representation of communities exposed to vocational training interventions, most respondents did not participate in such programs. However, for the communities that did have vocational training, children and caregivers reported significant gains.

For example, children in Ghana and Côte D'Ivoire who participated in vocational training programs received skills training in sewing, soap making, and agricultural practices. Children over fifteen years old in both countries received training in best practices in cocoa pruning and maintaining other agricultural commodities. Children often cited vocational training as most helpful for improving their understanding of the options available to them for their future careers. This was especially pronounced for children who felt it was unlikely that they would go on to tertiary education.

Among beneficiaries, girls reported more benefits from vocational training than boys. Beneficiary girls state that they and other girls in their communities find vocational training a valuable resource for learning skills they can use to take care of themselves after they complete school, or when their parents are no longer able to support their education. One girl shared the experience of another in her community:

> *She said she wanted to go to school but her father told her he won't get the money to fund her education so she should stay home and when she was staying at home her father didn't mind her. Then the opportunity came, now she feels good and it has changed her life.* Beneficiary child, Ghana, Female

Both beneficiary and non-beneficiary children voiced desire for additional training. However, there are gendered differences between the types of trainings preferred. While girls sought additional training around sewing, textiles, and hair dressing, boys opted for training around agricultural practices, automobile repair, and motorcycle repair. There were also notable differences by country – boys in Côte d'Ivoire more often express a desire for vocational training in cocoa production and other agricultural endeavors than boys in Ghana.

> *I would like to learn cocoa culture or how to plant rice or rubber because there is a lot of money in it.* Beneficiary child, Côte d'Ivoire, Male

> *I would like to be an apprentice to a carpenter and learn how to build things so I can sell them.* Beneficiary child, Ghana, Male

Caregivers also see benefits for vocational training programs for their children. Caregivers in both Ghana and Côte d'Ivoire believe that vocational training programs helped their children become more responsible and motivated about school. Caregivers also indicated that vocational training programs enabled youth to explore opportunities within their own communities and reduced the frequency with which children were migrating to larger cities to find work upon finishing their studies. In some communities, parents explained that participation in vocational training programs requires enrollment in school. Therefore, children became more motivated about being in school to meet the qualifications for participation. Similar to children's anecdotes, caregivers report that vocational training programs help children understand the possibilities available to them once they are finished with their schooling:

> *I think that this training can lead to other open-mindedness. That is, when they do after a training, the child may be able to orient himself. To know what activity he wants to lead himself. Since he will see all that this training can teach him as a profession. And help him to take care of himself. And to fit into the social fabric. So he will have the choice now to decide. Given the training he did, if he decides to continue school, ok. But if he decides to settle down, and do the entrepreneurship, ok.* Beneficiary Caregiver, Côte d'Ivoire, Male

In communities where vocational trainings were not present, caregivers felt their children could benefit from participating in such programs. Caregivers' perceived benefits of vocational training participation closely align with reported benefits from communities where they do exist:

> *We want the government to establish vocational training centers because we see lots of them going on in other places. If they vocational training, after completing school, they can have other means of employment. So we are asking the government to provide us with a vocational center.* Beneficiary Caregiver, Ghana, Male

The majority of teachers interviewed did not have firsthand experience with vocational training programs in their communities, thus this evaluation cannot gauge teacher assessments of this intervention.

Overall, children who participated in education and vocational training programs experienced significant benefits. These benefits addressed key barriers to education, including school distances, and material costs of school attendance. Administrative and infrastructural improvements facilitated more consistent attendance, promoted feelings of safety, and improved

teacher-student interactions. Vocational training programs enabled children to explore opportunities for skills acquisition and future income generation.

8.3.2 Impact of Livelihood Services

Provision of livelihood support to vulnerable families can help improve the economic condition of such households and is expected to indirectly affect the prevalence of child labor and hazardous child labor in these families by releasing their resource constraints and, in turn, reducing the need for the household to put children to work. Hence, the theory of change would expect that children's engagement in child labor and in hazardous child labor is lower among the families receiving some livelihood services as compared to the families not receiving such services.

The livelihood assistance offered most commonly included training on good agricultural practices (GAP), microfinance services, and market linkage services. In this section, we use statistical analysis to test whether the households whose members received livelihood assistance were less likely to have child labor and children engaged in hazardous child labor in cocoa production than the households whose members did not receive such assistance.[67]

The self-reported data show that in Côte d'Ivoire 128 households (9%) had at least one member who received livelihood support and in Ghana 70 households (5.8%) with at least one member who received livelihood support.

Please refer to Annex 10.1.7.1 for a detailed description of the quantitative methodology and data sources used for addressing this research question.

8.3.2.1 Findings from Quantitative Analysis

We used a multivariate regression technique to test whether the households that received livelihood services were less likely to have children engaged in child labor and in hazardous child labor in cocoa production.

Given the relatively small sample size of households that received livelihood services in Ghana, the model was estimated only for Côte d'Ivoire and reported in Table 78 in Annex 10.8.2. All proceeding regressions were pre-conditioned by performing entropy-balanced (matched) sample of comparison households. Regression results are shown in Table 78 in Annex 10.8.2, with estimates of the effect of livelihood services on the likelihood of having at least one child

[67] For the evaluation design, we ignore selection bias at the community level assuming that the factors affecting selection of a community will be uncorrelated to the outcomes once the community level infrastructure related indicators are included in the attribution equation.

exposed to child labor in cocoa production in the second column and the effect on the likelihood of children's exposure to hazardous child labor in the third column.

The results in the second column indicate that the likelihood of having at least one child engaged in child labor among households that received livelihood support was *not* statistically different from the likelihood of having at least one child engaged in child labor among the households that did not receive such benefits. Similarly, the results in the third column indicate that there was no statistically significant effect of livelihood support on the likelihood of exposure to hazardous child labor in cocoa production. In other words, the results of both analyses were unable to detect any effect of livelihood service treatment on the likelihood of having at least one child engaged in child labor and in hazardous child labor.

Next, we turn to the effect of intervention themes on rates of exposure to child labor and to hazardous child labor, namely, the proportion of children in agricultural households exposed to child labor and hazardous child labor. The regression results in the fourth column in Table 78 in Annex 10.8.2 indicate that in cocoa production the rate of child labor among the households that received livelihood services was 10-percentage-points lower than the rate of child labor among the set of comparable (matched) households that did not receive such services. Thus, the results imply that provision of livelihood service led to a lower proportion of child labor among agricultural households in the cocoa growing areas of Côte d'Ivoire. However, the results reported in the last column of Table 78 of Annex 10.8.2 show that there was no statistically significant effect of livelihood services on the rates of hazardous child labor.

While our analysis was not able to detect any statistically significant effect (at 10% level of significance) of livelihood services on the likelihood of having at least one child engaged in child labor or in hazardous child labor, our results show that the rate of child labor was lower among the households that received livelihood services compared to the households that did not receive such services; no such impact of livelihood services was detected on children's exposure to hazardous child labor in cocoa production. That said, it is important to note some caveats and methodological limitations related to the above evaluation findings. Please refer to Annex 10.10 for a detailed discussion caveats and limitations of the quantitative analysis and some potential explanations for the lack of effect of this intervention on child exposure to hazardous child labor.

8.3.2.2 Findings from Qualitative Analysis

Focus group findings among Ghana and Côte d'Ivoire caregiver households show varying levels of involvement with livelihoods services. Despite attempts to ensure proper representation of communities that received livelihood services, caregivers indicate limited exposure to such services. Caregivers who did receive livelihoods services, however, reported significant outcomes for their household, ranging from improvements in knowledge, practice, and boosts in

income, each with implications for the frequency and length of time their children supported them on farms.

Among caregivers receiving livelihood services, the majority of their households received assistance in the form of good agricultural practices (GAP) training, material resource provision, support for the creation of savings and loans groups, and training on other agricultural and non-agricultural income-generating activities. Among agricultural income-generating activities, households most often reported receiving training on vegetable production. Within non-agricultural income-generating activities, households reported receiving training on batik-making and soap-making.

Households receiving GAP training felt this training was critical to addressing the challenges of income generation from cocoa. Households most often described challenges related to pests and diseases, yields, and crop quality. Despite persisting challenges in cocoa production, households receiving GAP training report increased yield, and reduced expenditures for pest management. Households also report that GAP training results in time and labor-saving practices that were essential to changing their children's engagement on farms. As one caregiver opined:

> *Yes, with what they taught us concerning how to plant inline, we were able to do these things easier and faster on our own without engaging the children.*
> Beneficiary caregiver, Côte d'Ivoire, Male

According to caregivers, GAP training also results in increased household income from cocoa production, enabling payment for laborers instead of engaging their children. Community leaders also notice that households now have more money to manage expenses for their children.

> *Yes, [my child's] time in the farm reduced because I was able to hire laborers instead of using the kids, so the children were not going to the farm always*.
> Beneficiary caregiver, Ghana, Male

Furthermore, caregiver households found the provision of material support for cocoa production helpful in increasing their overall income and improving cocoa yield. These include support for mass spraying, fertilizer provision, and farm equipment provision. In some cases, the implementers or institutions providing material support also discouraged households from engaging their children as a condition of receiving support.

> *There is this organization called [implementer name]. They helped the men especially by providing them with cutlass, boot etc., so the parent could help himself or herself and stop using the children for farming activities.* Beneficiary caregiver, Ghana, Male

Group savings and loans also supported household income generation and access to credit.

> *Those who got involved in the savings, we started not long ago. Since we started, we are now 3 months into it, but still, people go for loans for their needs. So, I think we will progress as time goes on. We were only 15 when we started, but because those who took the loan testified to others, we are 30 now. So, I know that we will increase as time goes on and many people too will get involved.* Beneficiary caregiver, Ghana, Male

Community leaders, likewise, note that savings and loan groups are instrumental for easing the financial burdens of households because they replace income that may be otherwise generated from child labor. Leaders notice that many in their communities no longer want to engage their children in work but do not feel they have a choice. Savings and loans groups, however, help families address these financial challenges and, consequently, the extent to which their children are engaged in child labor.

> *If you compare to the previous years, we were doing child labor, because our finances were not stable. The children were doing some works that they were not supposed to do. And now, too, things have really changed we are going forward.* Community leader, Côte d'Ivoire

Lastly, households receiving livelihood support find training in income-generating activities impactful for improving financial outcomes. While the majority of focus group respondents did not have income-generating activities outside of cocoa, those who received training noted changes in overall income, especially during the off-season. Households reported similar benefits from both agricultural and non-agricultural trainings. Community leaders concluded that such support was key to tackling child labor within their communities:

> *So, because of that initiative, it helped everyone in the community to get garden eggs and okra. It helped us to get money in our pockets, so when the people get money, they are able to hire people to come and help them with the farm work which means that the children too will be free*. Community leader, Ghana

While households in both Ghana and Côte d'Ivoire see similar benefits from livelihood services, there were variations in gender, and between countries in the types of livelihood services received. Beneficiaries in Ghana more often received material support for cocoa production, including inputs, cocoa pods, and mass spraying. Additionally, women in both Ghana and Côte d'Ivoire more often report receiving training in non-agricultural income-generating activities, including fabric-making, food sale, and soap-making. Male caregivers more often report receiving GAP training and participating in Village Savings groups.

Overall, beneficiaries report receiving livelihood services in the form of GAP training, material support for cocoa production, skills training, and savings and loans groups. These activities facilitated income generation and credit access and supported agricultural expense management. The reduction in financial burden enabled some farmers to hire laborers and reduce children's engagement in farm work.

8.3.3 Impact of Occupational Safety and Health training interventions

Provision of training to understand and address issues of occupational safety and health (OSH) related to cocoa production can lead to a transition of youth of legal working age who are engaged in hazardous labor into safe, acceptable work adhering to the national laws and international labor standards. Thus, OSH interventions play an important role to protect youth workers in the cocoa sector from injuries and other occupational hazards with strong health consequences. Below assess whether OSH interventions influence youth workers to use proper safety equipment or reduce their exposure to hazardous child labor.

We use statistical analysis to investigate whether the youth beneficiaries who received OSH from formal sources[68] were more likely to work with appropriate safety equipment and or more likely to engage with non-hazardous work as compared to their counterparts who did not receive such training.

Children were asked to report whether they received any training on occupational safety and health and/or training on using appropriate safety equipment at work from formal and informal sources. The self-reported data show that in Côte d'Ivoire, 16 youth of age 15-17 (4% of all 15-17 year old children) received formal OSH training and in Ghana, 156 youth of age 15-17 (31% of all 15-17 year old children) received formal OSH training.

In the child survey, children were asked to report whether they used any protective gear while working in agriculture. The types of protective gear considered include protective boots (Wellington boots, Afro Moses), gloves, protective clothing (overalls, long sleeves, trousers), nose mask or gas mask, helmet, goggles, and other protective wear. Based on the responses, an indicator variable was constructed to specify whether the children reported using any one of the above categories of protective gear while working in agriculture in the past 12 months before the survey. The data indicates that in Ghana, 41 percent of youth of age 15-17 were using at least one of the listed protective gear.

[68] Formal OSH training was defined as training provided by an employer, NGO, or other organization and delivered in a planned/structured manner.

Please refer to Annex 10.8.3 for a detailed description of the quantitative methodology and data sources used for addressing this research question.

8.3.3.1 Findings from Quantitative Analysis

As reported above, in Côte d'Ivoire a very small number of youth received OSH training, and thus it was not feasible to conduct statistical analysis with the sample from Côte d'Ivoire. Therefore, the statistical analysis reported below used the data from Ghana only reported by 15-17 year old children.

Comparison of usage of protective gear data between the treatment group (youth who received formal OSH training) and the matched comparison group indicate that 49 percent of the youth in the treatment group reported using at least one of the seven different types of protective gear, while 35 percent of the youth from the comparison group reported using protective gear. The difference between the two groups was statistically significant at 1% level of significance. Thus, the results show that the youth in Ghana who received formal OSH training were more likely to use at least some of the protective gear while working in agriculture.

Finally, we used a multivariate regression technique to test whether the youth who received OSH training were less likely to engage in hazardous child labor in cocoa production. The results from the analysis (shown in Table 80 in Annex 10.8.3) indicate that after controlling for various covariates that affect children's engagement in hazardous child labor, there was no statistically significant effect of OSH training on the youth's likelihood of exposure to hazardous child labor in cocoa production in Ghana. In other words, the analysis was unable to detect any effect of OSH training treatment on the likelihood of exposure to hazardous child labor among youth.

While our analysis indicates that youth's engagement in hazardous child labor was not affected by their participation in formal OSH training, it is important to note that the lack of effect of OSH training on youth's exposure to hazardous child labor could be due to the inability of the regression analysis to detect the effect through quasi-experimental design as explained in Annex 10.8.3.

8.3.3.2 Findings from Qualitative Assessment

In assessing changes in occupational safety habits among beneficiary youth, focus group results in Ghana and Côte d'Ivoire suggest youth acquired at least some level of awareness of measures that may protect them from the hazards of cocoa farm activities. Respondents said they learned about using protective gear when working with chemicals, and how to cover themselves adequately for on-farm activities, including wearing goggles and closed shoes. Importantly, youth express that trainings on safety helped improve their understanding of the importance of safety precautions, and of the potential health consequences of non-adherence to the practices

promoted. When asked about changes in their farm activities or activities they were not allowed to do, youth most often said that they were no longer allowed to handle chemicals and when they did, they were only allowed to do so with the correct protective gear.

Changes in occupational safety practices are more often reported by boys than girls in both countries. This correlates with previously noted differences in girls and boys reported on-farm and off-farm activities, as boys reported more chemical use and sharp tool use as part of their on-farm activities. Additionally, changes in occupational safety practices are most often reported by youth who indicate their caregivers received these training as well. In communities where caregivers received occupational safety training, there were more supporting anecdotes from youth regarding caregiver-led precautions and changes to hazardous labor practices. In cases where caregivers did not receive similar training, youth reported challenges in talking to their caregivers about their desire to implement new occupational safety and health practices.

> *They told us our parents should not to give us heavy loads to carry. When I went home and told my father about it, he told me to go and stay with the man who said that so that when I go to the farm with him he will not give me heavy loads to carry. But I told my father it was an education they gave us on health and how to stay strong. Me for instance I get sick often so if you give me heavy loads to carry it make me sick [more often].* Beneficiary youth, Ghana Female

In both Ghana and Côte d'Ivoire, a portion of beneficiary youth believe that while their knowledge around occupational health and safety practices has improved, their practices remain the same. In these cases, youth want to adopt changes, but are unable to do so due to the unavailability of protective materials such as boots, masks, and gloves. While there were significant reported changes in chemical use and wearing protective gear when conducting other farming activities, youth did not report changes in sharp tool use.

Both beneficiary and non-beneficiary youth reported wanting more training on how to be safer during farming activities.

> *I want to know how to operate the spraying machine so that when my surroundings grow weedy I could spray with weedicides without it coming into contact with my body.* Beneficiary youth, Ghana Male

Overall, occupational safety and health interventions resonated among youth, especially when their caregivers received similar training. Youth report that these interventions have helped them understand the importance of keeping themselves safe, and that when possible, they have modified their practices accordingly.

8.3.4 Awareness-raising efforts on Awareness of Children, Parents, Community leaders and on Attitudes towards Child Labor

Although hazardous labor increased in Ghana and Côte d'Ivoire, qualitative findings among beneficiary caregivers offer more nuanced outcomes and dynamics regarding knowledge, attitudes, and practices. Beneficiaries in both countries show increases in knowledge around child labor, particularly hazardous labor.

8.3.4.1 Exposure to Child Labor Campaigns

Adult caregiver beneficiaries in Ghana and Côte d'Ivoire were exposed to child labor awareness campaigns in the form of posters, visits from NGOs and government-affiliated groups, good agricultural practices trainings, and radio ads. Beneficiaries also reported exposure to child labor sensitization efforts during parent teacher association (PTA) meetings and community gatherings. In both countries, adult beneficiaries indicated that awareness raising efforts were also administered through child protection committees that worked closely with community leaders to integrate child labor sensitization into community meetings, and through one-on-one meetings with community members. Caregivers, as a result, learned about the dangers of child labor, especially within hazardous work. These awareness campaigns emphasized the adverse health effects of child labor, appropriate working ages for children, and the potential legal consequences caregivers could face if they subjected their children to child labor.

> *They taught us everything. They said that a child who is not up to the age of 18, someone from 5 years – 15 years, if you let that child carry a bag full of farm produce the police can arrest you because it is a form of child labor so when we heard that, I for instance I have not been to school so if my child has been to school and she is telling me this and I have also seen the posters outside then it means I have to be serious with it because the police can arrest me. I then decided that I will not do it for the police to arrest me so I adhere to the advice that the child is giving me so for me I know it has helped me.* Caregiver, Ghana, Female

8.3.4.2 Child Labor Attitudes and Practices

Caregiver beneficiaries in both Ghana and Côte d'Ivoire reported changes in their farming practices, particularly around sharp tool use, carrying heavy loads and chemical use. Caregivers indicated that as a result of these campaigns, they no longer allowed their children to use sharp tools or chemicals or carry heavy loads. Some also indicated that as a result of these campaigns, they no longer allow their younger children to do any type of work. In describing these changes, caregivers used key language from awareness campaigns about hazardous activities and proper working ages. Community leaders in Ghana and Côte d'Ivoire also noticed changes in practices related to child labor, most often around carrying heavy loads, and sharp tool use. Community

leaders in some locales say that members of their community no longer engaged their young children in any type of work.

> *Before we had the teachings when the child comes back from school, the parents could tell the child to come to the farm after school, even the child's lunch, the child should come and have his or her lunch on the farm and after that you will see the child carrying firewood and some food stuffs but after the teachings I can see that parents who engage in such acts has all stopped doing that.* Community leader, Ghana

Among children (5 to 17 years of age) in both countries, many engaged in both on and off-farm activities, including weeding, extraction, bean transportation, and drying cocoa, focus groups reveal. Those engaged in these activities used machetes, sickles, and fertilizer. Among older children (13 and up), there was more reported use of fertilizers and spraying machines.

Consistent with assessments among caregivers, hazardous practices have changed for children as well, with beneficiary children reporting a difference in their use of sharp tools, chemicals, and carrying heavy loads. When asked to reflect on how these tasks have changed, children of all age groups report that the use of spraying machines, fertilizers, and other chemicals had changed the most. Caregivers, meanwhile, express favorable views of the campaigns, asserting the information educated them on the harmful effects of chemicals on their children's health. Similarly, children reported that they were no longer allowed to use chemicals, because it could result in compromised health or injury.

To measure children's attitudes about child labor, children were asked what they liked and did not like about helping their parents on farms. Children said that many on-farm and off-farm tasks, such as weeding, or carrying cocoa pods are physically painful. Children also cite incidences of animal bites as a reason they did not enjoy working. When asked about what they do like about working, social benefits appear to shape children's views about work, as respondents point out the importance of parental validation, working alongside friends, in addition to contributing to supporting their families. In this regard, there were differences by country. Children in Ghana more often quoted the social aspect and parental validation as favorable, while children in Côte d'Ivoire tend to enjoy working because they were fulfilling their familial responsibility.

> *We like helping because they suffer for us, and they have to pay for our school. You have to work in the farm to have enough to eat.* Beneficiary child, Côte d'Ivoire, Male

Caregivers report notable differences in their perceptions of child labor campaigns based on the mode of delivery. For instance, caregivers who report receiving awareness training within good agricultural practices training, interactions with community groups, and trainings from NGOs learned more about the health impacts of child labor and were more receptive to these teachings than those who only received awareness training. These caregivers more often attributed changes in their practices to the promotion of good health for their children.

> *Well, these awareness campaigns, first there was a community relay, which was formed against the worst forms of child labor. So we were sensitized, and also in training, when we do training, we are told not to use children, that's it! We change because there are diseases that attack children, because the weight that the child bears is more than his own strength. So the child can get sick. But today, these diseases are no longer attacking children, so we are still evolving, really it's good.* Caregiver, Côte d'Ivoire, Male

Caregivers who report more exposure to other information dissemination modes, such as radio ads and child protection committee presentations, learned more about national anti-child labor laws and punitive consequences for engaging their children in child labor. These caregivers more often explained changing their practices to avoid arrest or facing other consequences from local authorities. Notably, caregivers had less favorable perceptions of campaigns that focused on the punitive aspects of child labor engagement, reporting that these laws did not take their economic circumstances or familial dynamics into account.

Community leaders in Ghana and Côte d'Ivoire also saw changes in their own attitudes towards child labor overall, and credit the shift to increased attention and encouragement from government-affiliated groups. Community leaders in both countries engaged in awareness campaigns through community meetings, collaborations with local government authorities, and collaborations with NGOs. Leaders indicate that their involvement in designing awareness campaigns is critical to creating messaging that resonates with community members:

> *They placed the posters outside so that if there is a child who has carried a lot of cocoa that has made the neck [bent] If they paste the posters and even someone cannot read and the person sees the picture and sees even a child...saw in the picture that the child falls inside a pit or falls down because of what he or she is carrying. So if the parents or the elders see it, then they say if I make my child work very hard like this, this is what will happen to the child.* Community leader, Ghana

Focus group results reveal dramatic differences in caregiver and youth perceptions of child engagement in farm activities. Importantly, caregivers most often report that their children

worked only on weekends and were not allowed to weed or collect cocoa. By contrast, children report working weekends, before and after school, and engaging in the activities their caregivers reported they did not allow them to do. Moreover, though caregivers said only their older children (15 and over) were allowed to work, children of all ages revealed they engaged in on-farm and off-farm activities.

> *We go to the farm on Saturdays but sometimes my father can tell me not to go to school but rather go and help him in the farm so I go to the farm on Saturdays and any day I don't go to school. We go in the morning and come back in the afternoon around 1:00 to 2:00 pm*. Beneficiary child, Ghana, Female

Results suggest that caregivers may underreport child labor, possibly due to several factors. While caregivers were open about the household economic imperatives that necessitate children's work, they were less open about their own children's engagement in child labor. Despite attempts to ensure neutral wording in all questions, caregivers may have opted for more socially favorable responses, or feared punitive consequences. Community leaders also demonstrated similar trends, reporting that there was no child labor in their communities while children in the same communities reported engaging in farm work. Given community leader's roles in awareness campaigns it is possible that community leaders also opted for socially favorable responses that demonstrated progress within their communities. Alternatively, community leaders may have feared consequences for their community's and eligibility for future interventions.

Government officials, implementers, and donors report changes in knowledge and attitudes towards child labor. These stakeholders convey that awareness raising efforts are extremely successful in improving knowledge on child labor. When asked about the most significant recent changes in child labor attitudes, one implementer reports:

> *The biggest change is in knowledge and awareness. There are a lot of awareness raising programs and programs that have increased knowledge around child labor. There is a great improvement in farmers' awareness of child labor, and what they should be doing to prevent it.* Implementer, dual-country program

Despite improvements in attitudes and knowledge around child labor, cocoa sector stakeholders conclude that awareness-raising efforts are insufficient for changing practices around child labor. Government officials, donors, and implementers explain that creating broad change within child labor practices requires the implementation of complementary activities. There is a new opportunity to build on the gains made through awareness raising efforts including continued collaboration between implementers, government stakeholders, and donors to design programs melding awareness raising with other types of interventions.

There was limited evidence that changes in child labor awareness campaigns led to changes in attitudes about education. Both caregiver and child respondents indicate that most school absences were not due to low prioritization of education, but rather, limited resources. However, a few teachers and community leaders in each community report that child protection committees played an important role in monitoring absences in school and discouraging caregivers from having their kids skip school to help on the farm during peak cocoa season.

Overall, awareness-raising campaigns have significantly improved knowledge on child labor for children, caregivers, community leaders, and teachers. Most notably, children and caregivers in Ghana and Côte d'Ivoire report decreases in children's interactions with chemicals. Although most caregivers and community leaders insist that awareness raising campaigns reduce children's engagement in cocoa work, their children still report regularly engaging in on and off-farm activities.

8.3.5 Effectiveness of interventions and Themes emerged relating to Challenges, Good Practices, and Lessons Learned Based on Qualitative Findings

This section combines perspectives from beneficiaries, implementers, donors, and government officials to illustrate findings related to intervention efficacy. Several themes emerge related to intervention efficacy, best practices, and challenges with implementation.

8.3.5.1 Theme 1: Beneficiary and Community Ownership

According to beneficiary respondents and implementers, interventions that promote beneficiary participation in planning and implementation are most effective. This was most evident in school-based interventions, which had the highest levels of success in Ghana and Côte d'Ivoire.

While many school-based interventions received some support from government or NGOs, community leaders, teachers and caregivers were encouraged to mobilize their own funds to make additional contributions to school construction and school rehabilitation. These respondents raised funds for school materials, school furniture, borehole construction, teachers' quarters' construction, and new school construction. Motivated by NGO and government-sponsored improvements to community schools', caregivers and community leaders collaborated with teachers to support their children's schools.

> *That is one thing I like about this community. Anytime we want to embark on a project for the school the parents go all out to help the school*. Teacher, Ghana

Community-funded supplements to sponsored interventions facilitated increased impact and efficacy of school-based interventions. In both Ghana and Côte d'Ivoire, school-based

interventions were critical to addressing key barriers to school attendance, particularly those related to lack of finances and long distances to school.

Implementers, donors, and government officials have similar perspectives on intervention efficacy. Asked to share their views on the types of interventions that were most effective, they most often cited interventions promoting beneficiary ownership and community mobilization. Implementers and government officials mentioned engaging community leaders, especially in child labor awareness efforts, as most effective. This was most pronounced in the implementation of community-level child labor monitoring efforts through child protection committees. As one respondent from an implementing organization reports:

> *The most impactful interventions is the establishment of Community Child Protection Committees in the communities. We have mentioned that the outsider is only a facilitator and you have no power to sanction the farmer. The farmers understand the issues well when the issue is led by their own community members.* Implementer, dual-country program

Community leaders also report that child protection committees worked closely with previously established leadership frameworks within the community, including faith leaders and women leaders. Leaders noted that these committees were key to promoting awareness-raising efforts in language that was accessible to community members.

8.3.5.2 Theme 2: Potential of indirect interventions

Community leaders, implementers, donors, and government officials report that in most cases, factors related to poverty and truancy contribute to high child labor rates. Notably, some of the most effective interventions were those that address the root causes of child labor but were not necessarily designed to support child labor prevention only. These include school construction, good agricultural practices training, and road construction between cocoa communities and larger communities.

Respondents note that while awareness raising efforts are extremely effective in improving knowledge around child labor, they are less effective in changing actual behaviors. Rather initiatives that address barriers to schooling and income generation are felt to be more effective. Government officials and implementers report a variety of strategies used to improve cocoa production outcomes have indirect effects on child labor. For example, the provision of core inputs, good agricultural practices training, and road construction from remote farms to collection centers had significant effects on farmer incomes from cocoa. Input provision allowed farmers to minimize agricultural expenses, while road construction allowed them to minimize transportation expenses for their cocoa. Further, good agricultural practices training helped farmers prevent pests and diseases, maximize their yield, and minimize expenses related to pest

and disease management. Respondents from implementing organizations and donor institutions report that in most cases, farmers use their extra income to re-invest in their farms, hire labor, or invest in children's education or wellbeing. Beneficiary caregivers also reported using any extra income to hire day laborers for arduous tasks, engaging their children less often in those tasks.

8.3.5.3 Theme 3: Awareness campaigns

As previously noted, findings from focus group discussions indicate that beneficiary caregivers in Ghana and Côte d'Ivoire have improved their knowledge on child labor issues, especially as they relate to hazardous labor. However, these findings also indicate that changes in practices are still lagging. Although caregivers and community leaders report community-wide changes in child labor practices, children in the same communities mostly report changes around hazardous labor, but not around time worked, or ages at which work begins. Caregivers in both countries report that awareness campaigns did not always account for the financial situation within households. When asked about their perceptions of the campaigns, a small set of caregivers note that while they understand the objectives of the campaign, they are not in a position to hire laborers for their farms and do not have any choice in using their children as laborers. Community leaders report similar challenges, indicating that caregivers have difficulty changing their practices due to their financial state:

> *As I said it's about money, if I have money I won't let my child to go to the farm, but if I don't have money for weeding and can't weed then I will tell the child to help me weed. Because you told me you need a new shoe then you will go if I tell you I will buy you a new shoe when we come.* Community leader, Ghana

In addition to situational barriers to changing practices, teachers and community leaders also referenced a few cases where awareness campaigns have not changed caregiver attitudes towards child labor.

> *I do not think the education from [government program] had any impact on the parents. The parents claim they are the ones that feeds their children therefore they could use their children for any work they want.* Primary School Teacher, Ghana

Quantitative Insight

Findings in Ghana and Côte d'Ivoire suggest that awareness campaigns resonate more with caregivers when messaging is focused on the health implications

In some communities, caregivers maintain that since they provide for their children, they can determine how often their children should work. Although these caregivers were more transparent about the work their children did, beneficiary caregivers did report implementing new practices around occupational safety. Findings in Ghana and Côte d'Ivoire also suggest that awareness campaigns resonate more with caregivers when messaging is focused on the health implications of engaging children in child labor, rather than punitive measures for parents who engage their children in child labor. Community leaders believe that community members are much more receptive to messaging that is tailored to them and does not demonize caregivers. Child protection committee members (both caregivers and community leaders) used similar approaches. Committee members maintain that confronting caregivers who were engaging their children in child labor or hazardous labor was challenging when caregivers were afraid that committee members would report them to the police. In these instances, caregivers became hostile, or would avoid conversation with committee members. However, when child protection committee members focused their messaging on the collective wellbeing of children in the community, caregivers were much more receptive.

of engaging children in child labor, rather than punitive measures for parents who engage their children in child labor.

Implementers report similar findings, noting that awareness-raising efforts must be tailored to local audiences and engage community members as champions in order to encourage behavioral change. One implementer explains:

> *The awareness has gone far and in almost all the interventions, but I must say that one of the challenges is that, you know it is attitudinal and behavioral change, one's attitude and beliefs cannot be changed in a day. It requires consistent efforts in engaging the farmers. It should be more of a participatory dialogue to help the farmers understand the issues and address it themselves because if the farmers are not addressing the issues themselves, we cannot address it for them.*

Focus group and interview data suggest that future awareness campaigns messaging from child protection committees should focus more on the health effects of child labor, and less on the legal consequences of engaging children in farm work. This may enable caregivers to be more forthcoming about the situations in which they engage their children in farm work, and the challenges they experience in implementing practices promoted by awareness campaigns. Further, future awareness campaigns should actively engage locals in message formation and distribution in order to promote behavioral change.

8.3.5.4 Theme 4: Timeliness of material support

Material support, including input provision, and schooling kits had significant positive impacts on beneficiaries. However, the timeliness of these materials is key to maximizing positive impact. In Ghana, caregivers reported that while input provision and mass spraying significantly supported their farms, there were instances in which these supports arrived too late to be helpful. Implementers echoed this sentiment, noting that the timeliness of these inputs is key to facilitating real change for farmers:

> *Yes, the government provides some of the inputs, some companies also have their inputs in shops but the question is do they come at the right time for the farmers and are the prices okay for the farmers? They have to start applying fertilizers in May but that is the month most farmers do not have money so they rely on the government subsidized or free fertilizers. There is [also] a mass spraying exercise done by the government, where they spray the farms for free but as to whether the numbers are enough to cover the farmers at the right time because if you are spraying certain chemicals, they should be sprayed at the right time.*

In Côte d'Ivoire, caregivers report that the provision of school supply kits helped ease financial burdens related to schooling, while teachers in Côte d'Ivoire reported that these kits resulted in improved attendance. However, when schooling kits came late, or were incomplete, caregivers noted that it affected their ability to enroll their children, as they did not have all the materials required.

Quantitative Insight

Respondents indicate that NGOs should work more closely with local authorities and one another to mobilize resources, avoid duplication and inefficient deployment of resources, and increase intervention activity reach.

8.3.5.5 Theme 5: Intervention coordination

Community leaders, implementers, and government officials report that in some communities, there are interventions conducting similar activities that can benefit from improved coordination. These respondents indicate that NGOs should work more closely with local authorities and one another to mobilize resources, avoid duplication and inefficient deployment of resources, and increase intervention activity reach. Adult beneficiaries in the same communities also reported having participated in similar interventions, with varying levels of success. These respondents indicate that within some communities, there were multiple livelihood initiatives with similar components.

Quantitative Insight

Overall, interventions that engaged community members in their design and implementation were most effective, while those that took more of a top-down approach were less effective. In both countries, school-based interventions reported the most success, especially when coupled with community mobilization, and deep engagement with caregivers, teachers, and community leaders. Future interventions must engage community members early in their design and roll-out. Qualitative analysis found that future awareness campaign messaging should avoid focus more on the health consequences of engaging children, rather than the legal consequences of engaging in child labor. Community leaders and child protection committees should be deeply engaged in the formation of awareness messaging, and any subsequent monitoring activities.

In both countries, school-based interventions reported the most success, especially when coupled with community mobilization, and deep engagement with caregivers, teachers, and community leaders.

8.3.6 Overall Sustainability of Interventions

The following section combines perspectives from implementers, donors, and government officials to outline strategies for promoting intervention sustainability, challenges to sustainability, and perceptions of future sustainability.

8.3.6.1 Strategies for promoting sustainability

Implementers, donors, and government officials in Ghana and Côte d'Ivoire identified several strategies for promoting the sustainability of their interventions.

First, respondents recommend that engaging community leaders, including representatives for women and youth early in the design of the intervention helped promote sustainability. Implementers explained that during the planning stages for new interventions, they worked closely with key community members to ensure that intervention objectives were realistic, and relevant to each community.

Next, respondents recommended promoting sustainability through integrating interventions within existing community structures. Respondents reported that in many communities, they looked to existing structures for leadership and child protection and conducted extensive capacity building efforts within these structures to implement awareness-raising and child protection committees. Implementers explained that creating open and early relationships with government partners at national and regional levels was key to promoting sustainability and gaining early buy-in. Collaboration with government actors ensured that when the intervention was over, government officials at regional and district levels, would be well-positioned to move intervention activities forward. Implementers also assert this strategy was critical to identifying practical ways to integrate intervention activities into community structures. As one implementer reports:

> *Critical partnerships were from government. Like I mentioned in the community action plan, usually these stakeholders support it and when they support it, they are able to integrate it into the district medium term development plan or the annual development plan. When they integrate this into the district plan, then, the districts are in the position to support the plans that they have integrated into their own plans.*

Lastly, the creation of national action plans and national committees on child labor are key to promoting intervention sustainability. Many implementers argued that such groups enable those working both directly and indirectly on child labor issues to better coordinate efforts, exchange lessons learned, and collaboratively explore improvements to future programming.

8.3.6.2 Intervention Sustainability

Respondents held a range of perspectives on the types of interventions they believed had the most promise for maintaining outcomes beyond external material assistance. Respondents share the view that promoting community and beneficiary ownership of intervention activities promotes sustainability of all types of interventions. Donors and implementers report that some interventions, particularly livelihood services, need more financial investment to realize the full potential of outcomes, thus addressing some of the root causes of child labor. Of all interventions, community leaders, implementers, and government officials agreed that school-based interventions hold the most promise for sustainability, as school-based interventions have rendered consistent and effective community resource mobilization. Stakeholders also believe that schools provide an opportunity for collective conversations and trainings with caregivers on child wellbeing.

Regarding the sustainability of other interventions, implementer assessments are more varied. For example, although awareness campaigns earned praise from caregivers and community leaders, campaigns in and of themselves are unlikely to yield sustainable outcomes, according to implementers as well as government officials. As demonstrated in the previous section, increased awareness on child labor does not readily translate into improved practice. Indeed, habits are slower to change. To facilitate awareness that is more sustainable, awareness efforts should be incorporated into other initiatives, such as GAP training that support farmers.

In some communities, the current and most popular implementer models of livelihood interventions are not sustainable, in the view of local leaders. These community leaders notice that while community members are gaining new skills, their ability to generate income from those skills is limited, as their potential buyers reside in the community.

> *The farmers are still poor because as I was saying the people from [Implementer] taught us to make soap. If all of us are doing the soap who will buy from someone?* Community leader, Ghana

Community members further see challenges in securing the necessary capital to move some livelihood activities forward. In this regard, community leaders suggest more material investment in income-generating activity interventions, and careful consideration of the types of activities that can generate income within the community.

National action plans and steering committees are critical to maintaining and building on the progress made thus far. Donors, implementers, and government officials, alike, assert these committees promote dialogue on effective and ineffective methods of child labor prevention and remediation. Committees also allow implementers to report on innovative approaches to child labor prevention and remediation, and gain buy-in from government stakeholders early.

Implementers report that due to increased investment in child labor remediation from government stakeholders, these committees have resulted in productive dialogue and planning around child labor prevention and remediation, with tangible goals. In both Ghana and Côte d'Ivoire, government stakeholders have drawn from implementer expertise, lessons learned, and monitoring efforts to produce national plans of action for child labor monitoring, prevention, and remediation. In Ghana, Phase II of the National Plan of Action to Eliminate the Worst Forms of Child Labor builds on the insight gained from Phase I, while Côte d'Ivoire the 2018–2020 National Action Plan of the Fight against Trafficking, Exploitation, and Child Labor builds on previous efforts as well.

Implementers and donors indicate that these national plans of action have promising potential for promoting intervention sustainability. Implementers and donors also cited the CLCCG meeting, specifically, as key to sustaining momentum, and international coordination. These platforms provide a unique opportunity for the continued exchange of best practices, collaborative programming, and exploration for new approaches.

Qualitative Insight

Implementers and donors both mentioned the annual CLCCG meetings are key sustaining moments of internal coordination in the fight of child labor and hazardous child labor in cocoa production.

Overall, implementer and stakeholder interviews reveal an array of perspectives on sustainability of interventions. Respondents perceive school-based interventions as most sustainable, while other interventions should aim to address the root causes of child labor to be sustainable. Promoting beneficiary and community ownership of intervention activities is considered a useful method for facilitating sustainability. Working groups, national action plans, and coordinated activities also hold significant potential for facilitating current and future sustainability. Moving forward, international donors believe that more rigorous research is

needed to determine which interventions are most effective and sustainable. Other stakeholders believe additional community-level and supply-chain monitoring efforts are needed to truly understand the breadth and complexity of child labor issues in each community, and to determine which outcomes are most feasible to sustain.

8.3.7 Impact of Funded Interventions[69] on the Prevalence of Child Labor and Hazardous Child Labor in Cocoa Production

Over the past decade, various stakeholders including the CLCCG partners and other international organizations implemented different types of interventions in Côte d'Ivoire and Ghana with the objective of reducing child labor and children's exposure to hazardous child labor in cocoa production. Significant resources have been spent on various interventions during this period and, thus, it is important to assess whether these interventions were effective in fighting children's engagement in child labor and hazardous child labor in cocoa production.

For the CLCCG partnership, the three main sources for funding over the past decade have been USDOL, the Industry partners, and the local governments in Côte d'Ivoire and Ghana. The USDOL have committed $24 million through ILAB toward projects aimed at preventing and reducing child labor since 2010. The Governments of Côte d'Ivoire and Ghana have made significant progress in adopting legislation and implementing programs targeted at reducing child labor in cocoa production. The "National Plan of Action for the Elimination of the Worst Forms of Child Labor (NPA)" in Côte d'Ivoire includes a $52 million budget for interventions targeted at reducing child labor in cocoa production. Additionally, the "Ghana Child Labor Monitoring System (GCLMS)" in Ghana is working to improve women's economic empowerment in cocoa growing areas and increase community awareness. The Industry committed $10 million to reducing child labor between 2010 and 2016 through individual companies implementing their own interventions. The companies have joined together for a larger scale CocoaAction with an estimated value of investment of $400 million by the Industry between 2015 and 2020.[70]

Comparison of data from 2008/09 and 2018/19 survey rounds presented in Section 1.1 indicates that both the rate of child labor and the rate of children's exposure to hazardous child labor increased between 2008/09 and 2018/19. It is also important to note that during this period there was a substantial increase cocoa production. Data presented in Section 1.1 also indicate that cocoa-growing households as a proportion of all agricultural households experienced a large statistically significant change between 2008/09 and 2018/19, increasing from 55 percent to 86 percent. This also suggests that as more agricultural households engaged in cocoa production it is

[69] See Annex 10.8 for the combination of interventions.

[70] Self-reported by the international cocoa industry.

possible there was more (not less) child labor employed. Given the interplay of different forces, it is important to assess whether the interventions funded by the stakeholders to reduce child labor and the hazardous child labor in cocoa-growing areas had a statistically significant impact, even if the use of child labor increased over time.

In order to evaluate whether the interventions implemented by various stakeholders has any impact on child labor and hazardous child labor, it is important to recognize that evaluating the impact of any one type of intervention would most likely to be methodologically challenging as the impact of the particular program being considered needs to be large enough to detect with the given sample size. So it would be better to rather explore whether there was any impact when multiple types of interventions were implemented by the partners. Keeping that in mind, we evaluate the impact of implementing combinations of interventions on the prevalence of child labor and hazardous child labor by undertaking an attribution analysis. Due to methodological limitations, we addressed this research question using the data from 336 households from 18 matched communities from Côte d'Ivoire. Please refer to Annex 10.8.4 for a detailed description of the quantitative methodology and data sources used for addressing this research question.

8.3.7.1 Findings from Quantitative Analysis

We used a multivariate regression technique to test whether implementation of combinations of interventions in communities had any impact on children's engagement in child labor and in hazardous child labor in cocoa production. The results from the analysis are summarized below.

Effect on having at least one child in child labor and hazardous child labor: Regression results in Table 84 in Annex 10.8.4 provide estimates of the effect of being in a treated community (i.e., receiving some combination of interventions) on the likelihood of a household having at least one child exposed to child labor in cocoa production in column two and on the likelihood of children's exposure to hazardous child labor in column three.

The results in the second column indicate that the households from the treated communities were less likely to have at least one child engaged in child labor from the households from comparison communities where no treatment was offered by the stakeholders. Specifically, when we control for the household, community, and school characteristics in regression, households in the treatment communities were 25 percentage points less likely to have at least one child engaged in child labor than the households from comparison communities.

Similarly, the results in the third column in Table 84 indicate that when we control for the community and school characteristics in the regression, implementation of multiple treatment had a statistically significant impact on the likelihood of having at least one child engaged in hazardous child labor in cocoa production. The results indicate that the households living in the communities where multiple treatments were implemented during 2010 and 2018, were, on

average, 28 percentage points less likely to have a child exposed to hazardous child labor in cocoa production than the households from communities that did not receive any intervention from the stakeholders during the period.

Thus, these results indicate that the households in communities receiving multiple interventions were less likely to have children exposed to child labor and hazardous child labor in cocoa production.

Effect on the rate of child labor and hazardous child labor: Next, we turn to the effect of receiving multiple interventions on prevalence of children's exposure to child labor and to hazardous child labor, estimating the effect on the proportion of children in a cocoa-growing household exposed. The regression results presented in Table 85 in Annex 10.8.4 in the second column indicate that the rate of child labor in cocoa production among the households in the communities exposed to some combination of interventions was approximately 17 percentage-points lower than the rate of child labor among the households in the communities that did not receive any intervention. Similarly, results presented in the third column shows that the rate of children's exposure to hazardous child labor was 17 percentage-points lower among the households in treated communities than the rate of hazardous child labor among the households in the comparison communities.

To sum up, the results of our quasi-experimental analysis indicate that after controlling for the covariates that typically influence children's exposure to child labor and hazardous child labor, households in communities that received multiple types of interventions had a lower likelihood and lower rates of child labor and hazardous child labor in cocoa production.

While the analysis presented above demonstrates that the rates of child labor and hazardous child labor were lower in communities that were exposed to multiple intervention, it is important to note that this analysis was based on data from only 18 communities (including the treatment and comparison communities) and the conclusions may not be generalizable for the entire cocoa growing area as a whole. Please refer to Annex 10.10 for a discussion on the caveats and methodological limitations related to the above evaluation findings.

8.4 Caveats and Limitations

The quantitative and qualitative analyses used to address assessment questions and detect and quantify the impact of different interventions on child labor and hazardous child labor, while being rigorous in nature, have some limitations. It is useful to summarize those limitations to help in interpreting the findings of the quantitative results and qualitative findings.

8.4.1 Limitations of Quantitative Analyses

Model-based approach: One of the major factors weakening the ability of any assessment methodology to detect impact is that the interventions being assessed were not implemented (geographically or via roll-out) in a way that facilitates assessment. Ideally, groups of communities would have been randomly assigned to receive the interventions (or various combinations of intervention categories). Such an approach was not feasible in this case due to the number and disparate types of interventions under investigation.

Since the interventions did not permit randomizing which villages received the intervention, a model-based approach was used to construct a comparison group from untreated villages. The model based approach estimates the impact based on "observables" (that is, only on factors that could be and were measurable). Thus, the credibility of the evaluation depends on the degree to which the salient explanatory variables were accounted for by the models' specifications and the modelling of how the implementers selected beneficiaries. In addition, since this assessment has been undertaken retrospectively, there was no pre-intervention data (baseline data) on beneficiaries to construct a strong counterfactual.

Sample-size issues: The observational nature of the assessment sample and the sample sizes of treated and comparison units were entirely dependent on the implementer's earlier choices of which communities to serve and, often, which households within them to treat. As a result, the study sample size was pre-determined rather than being drawn as a dedicated sample with a pre-specified target sample size of the treated and non-treated households leading to a highly unfavorable distribution of sampling units. That led to an evaluation design with a small sample, leading to low-precision and an inability to detect small impacts with satisfactory precision.

8.4.2 Limitations of Qualitative Analyses

Due to the purposive nature of qualitative sampling, qualitative data collection did not reflect the full array of interventions taking place in beneficiary communities. Despite attempts to ensure that beneficiaries of vocational training programs were well-represented, there were limited findings within the communities selected for data collection. Further, the perspectives represented by donors and government officials reflect only those who were available for interview.

9 Conclusions and Recommendations for Future Research

9.1 Overview

This report is the conclusion of five years of research on child labor within the cocoa growing regions of Ghana and Côte d'Ivoire. The study integrates quantitative survey data from three data collection rounds (2008/09, 2014/15, and 2018/19), quantitative implementation data from key stakeholders over a ten year period (2008/09–2018/19), and qualitative data from children, caregivers, school teachers, farmers, and key international and national stakeholders. The quantitative survey data are used to present estimates on the prevalence of child labor and hazardous child labor, while both quantitative and qualitative data are used to assess the effectiveness of different types of interventions on child labor and hazardous child labor in the cocoa growing areas of Côte d'Ivoire and Ghana.

Survey findings indicate that in 2018/19, approximately 1.56 million children (45% of children in agricultural households) were engaged in child labor in cocoa production in cocoa growing areas of Côte d'Ivoire and Ghana. Among them, approximately 1.48 million children (43% of children in agricultural households) were engaged in hazardous child labor in 2018/19.

Over the assessment period (2008/09- 2018/19), the proportion of children engaged in hazardous child labor in agricultural households in the cocoa growing areas of Côte d'Ivoire and Ghana increased 14 percentage points. Thus the target of the *Declaration and Framework* to reduce the worst forms of child labor in the cocoa sector by 70 percent between 2008/09 and 2018/19 was not met. However, it is worthwhile to consider this finding in the context of the growth in cocoa production, which increased 62 percent during the ten-year assessment period.

Interestingly, comparison of data on cocoa growing households (rather than all agricultural households) between the 2013/14 and 2018/19 rounds indicates the prevalence rate of children's exposure to hazardous work in cocoa production remained stable for this group during this time period although production during this period increased 14% in aggregate across Côte d'Ivoire and Ghana.

In addition, comparisons of the prevalence of child labor and hazardous child labor by cocoa production stratum indicates prevalence rates increased substantially in the medium and low production strata (child labor increased by 16 and 27 percentage points respectively in the medium and low strata) with no change within the high production stratum. These findings suggest that as cocoa production increased and cocoa farming expanded in historically lower cocoa growing areas, the use of child labor in those areas also expanded. As one senior

stakeholder mentioned to the research team on seeing these results, summarizing them well **"We've been chasing the cocoa rather than chasing the children."**

At the same time, child labor in high production stratum remained stable even in the face of increased production and a corollary increase in the proportion of agricultural households growing cocoa. Intervention data indicate that the penetration of interventions implemented seemed to be fairly low[71], and that most of the interventions were heavily concentrated in the high production stratum (where the problem of child labor may have been more severe to start with), with some interventions in the medium and almost no interventions in the low production stratum. This may indicate child labor interventions focused on high cocoa producing areas of Côte d'Ivoire and Ghana have been effective to offset the impact of increased cocoa production on child labor.

These findings, in conjunction with the findings from the assessment of the effectiveness of various interventions, paint a fuller picture of the situation around child labor and hazardous child labor in Côte d'Ivoire and Ghana, indicating varying degrees of success. Although the research team found some impacts of livelihood interventions on child labor, it was only when multiple interventions were implemented in one area that we find a significant impact on the rates of child labor and hazardous child labor.

Qualitatively though, children, teachers, and farmers all felt there was a strong impact of interventions on behavior. These respondents consistently described the importance of interventions on reducing child labor and hazardous child labor pointing to school-based reforms as most important.

While the quantitative analyses were only able to detect a limited impact of interventions, it is important to note that lack of detection of impact does not mean lack of an effect, only that the design of the intervention and the amount of data collected did not permit a level of statistical precision sufficient to detect an effect, given its size.

Overall, this report makes a strong case for understanding child labor and hazardous child labor in cocoa production as a complex problem requiring multiple complementary solutions. Such an approach is often called a systems approach in which it is essential to understand the phenomena as being interrelated with, and dependent on, different facets of the system itself. For example, understanding the relationship between child labor prevalence and increased cocoa production

[71] Implementation data provided by major stakeholders indicate that less than 50% of the randomly selected communities (representative of the cocoa growing areas of Côte d'Ivoire and Ghana) received any type of interventions in the past 10 years.

and/or the global demand for cocoa. Layering that understanding on top of the role of production stratum and the power of interventions begins to bring the system as a whole into perspective.

Another important takeaway from this report are the achievements on the ground in confronting child labor and hazardous child labor by both national and international stakeholders. Although the goals of the Harkin-Engle Protocol were not met, we do see an impact on child labor in areas with high production and multiple interventions. While assessment results suggest that sustained efforts to fight child labor are successful, it is important to understand what types and combinations of interventions are more effective in reducing child labor and hazardous child labor and how effectiveness may vary under different local conditions. This points to the necessity for further research on this topic.

In terms of hazardous child labor, data suggests that it is essential to understand each component part of hazardous labor (such as land clearing, agro-chemical use, sharp tool use, and carrying heavy loads) in order to focus efforts on the dimensions of hazardous labor most prevalent in a particular area. There is significant debate around the differences between national and international definitions of child labor. However, the issue of hazardous child labor is less contentious, and the component parts of hazardous child labor can directly impact the physical and psychological development of a child. Thus, looking directly at hazardous child labor and especially at the frequency of exposure to different hazard, rather than a binary categorization of a child as either "in" or "out" of child labor may be a way forward that stakeholders can agree on.

In terms of agro-chemical product usage, agricultural households use of agrochemical products increased steadily, and at the same time, children's exposure to agro-chemical products increased by approximately five times between 2008/09 and 2018/19. Further studies, both quantitative and qualitative, looking specifically at agro-chemical use and its drivers may be warranted.

This, again, points to the importance of a systems approach in which multiple interventions (or single multi-armed interventions) are co-developed to address specific aspects of the system such as raising awareness in conjunction with livelihood services in conjunction with increased access to schools in conjunction with changes in national legislation. These interventions can then be focused on, for example, the component parts of hazardous child labor that are most prevalent within particular areas.

9.2 Lesson Learned and Future Research

Beyond the main findings of this report, there are multiple important topics and takeaways that can help guide future research on child labor and hazardous child labor. Below we present several of these takeaways for future research.

9.2.1 Stakeholder engagement

The research team believes stakeholder engagement can be the single most important factor in a successful child labor data collection project. There is, at times, an atmosphere of distrust among stakeholders when approaching issues such as this one that touch on economies, cultural beliefs, and national legislation. As such, we feel stakeholder engagement, bringing together tripartite partners in a mutual and equal dialogue, is essential to the process.[72] These engagements should take place at the start of a project, during the design of questionnaires and field plans, and at the end of the project to help structure analysis and the final report. Stakeholders are more open to accepting the results of such projects if they feel a sense of ownership over the process. In addition, stakeholder engagement has the added benefit of improving the research design and implementation, streamlining the data collection permission process, IRB process, and oftentimes provides access to national level administrative and census datasets.

In terms of the current project, the research team consulted with the governments of Côte d'Ivoire and Ghana (including cocoa regulatory institutions, national statistics bureaus, and various ministries in each country), the international cocoa industry through the WCF, international organizations such as the ILO and UNICEF, local and international civil society organizations, and the U.S. Department of Labor. These engagements positively impacted the quality of the data used as part of this study.

9.2.2 Common and National Definitions

The research team agrees with the recommendations made in the 20th International Conference of Labour Statisticians Guidelines in reference to using common concepts and definitions in child labor/forced labor data collection projects. Common definitions allow for international benchmarks, and discussions around labor issues can then be outlined within a global framework. However, local definitions are at times equally important to ensure ownership and buy-in from local stakeholders. The cost for including two definitions is oftentimes marginal and allows for comparisons based on both local and international definitions as shown in this report. For example, there is significant debate around the international definition of child labor and the role of what stakeholders in Côte d'Ivoire and Ghana call "socializing work" done by children with oversight of their parents to teach children the necessary skills needed for life on a farm. Although the research team agrees that international definitions are necessary to allow for a global response to child labor issues, future researchers should be aware of this debate and work to address it by including local definitions where possible.

[72] Such engagement activities are also stressed in the current ICLS guidelines

9.2.3 Child Labor, Hazardous Child Labor, and the component parts of Hazardous Child Labor

Based on a deeper understanding of data and issues related to the binary nature of the target outcome of interest, we believe that measuring child labor by itself is insufficient to accurately describe realities on the ground. Child labor and hazardous child labor are dichotomous variables in which children are identified as either in or out of a child labor and/or hazardous child labor situation. For example, an 11-year-old child who works one hour with their parent on the farm is considered identical to an 11-year-old child who spends 40 hours spraying hazardous chemicals. While reducing the exposure to any hazardous work is an important target, it is equally important to consider the implications of children's exposure to specific types of hazard as well as exposure to multiple hazards to identify strategies and programs that can help address them. Nuances such as these are often points of contention between tripartite partners and being able to report on not only child labor but also on the relative impact of the various component parts of child labor and hazardous child labor is essential. Such an analysis also provides policymakers with concrete examples of where exactly interventions need to be targeted to be most effective.

9.2.4 Enumerator Training

Enumerator training is an often under considered aspect of high-quality data collection. The current project had 21 days of training across activities and within each country. This included 5 days of listing training, 5 days of supervisor training, and 10 days of enumerator training and piloting. This extensive training, with a core group of supervisors and enumerators, should not be underestimated and led directly to the high data quality used for our analysis.

9.2.5 Evaluation based on Randomized Control Trials

In conducting an assessment of the effectiveness of various interventions in the cocoa sector, it became evident to the research team that a model based approach to identify the impacts of interventions (and combinations of interventions) is challenging given the multitude of factors that influence the prevalence of child labor and hazardous child labor. In order to produce actionable inputs that stakeholders can use to fight child labor in cocoa production, it is useful to underscore the importance of undertaking randomized control trials to detect impact with greater degree of internal validity that can provide more concrete estimate of impact. Similarly, to understand complementarities of different types of interventions, it is important to design and implement randomized control trial studies to unpack the relative effectiveness of each intervention.

9.2.6 Final Remarks

The research team hopes that information in this report is useful for national and international stakeholders to better understand how child labor and hazardous child labor rates changed

between 2008/09 and 2018/19, areas where more attention is needed, and how future interventions can be designed and implemented to further improve the lives of children in West Africa. In addition, the strength of the 2018/19 data collection round and integration of both local and international definitions allows this study to be used in the future as a new baseline to measure the progress towards eliminating the worst forms of child labor in the cocoa growing areas of Côte d'Ivoire and Ghana.

The evidence of effectiveness of interventions in reducing child labor highlighted in this study, even if limited to only specific areas and to specific conditions, clearly advocates for the continuation and intensification of the efforts undertaken as part of the Harkin-Engel Protocol. The Protocol brought national and international partners together towards a common goal to address the issue of child labor, and it is important to ensure that collaboration and dialogue among stakeholders continues and intensifies to reduce and eliminate hazardous child labor in the cocoa sector in Côte d'Ivoire and Ghana.

10 Report Annexes

10.1 Annex I: Detailed Survey Methodology and Implementation in the 2018/19 Round

10.1.1 Sampling design

The sampling design for the 2018/19 Child Labor Survey in Ghana, and Côte d'Ivoire maximizes the potential for comparability of estimates between the baseline 2008/09 and 2018/19 round to ensure we can make valid inferences of change while also producing current and accurate cross-sectional estimates. In our sampling methodology we try to strike a balance between accuracy in estimation and comparability between rounds.

In order to generate estimates representative of agricultural households in the cocoa producing areas of Ghana and Côte d'Ivoire, NORC collected survey data from 75 clusters from each country in the 2018/19 cocoa harvest season.

10.1.1.1 Sampling Method

Following the method used in the previous rounds of the Child Labor Survey administered by Tulane University and ISSER/ENSEA, NORC employed a multi-stage stratified cluster sampling method to select the Census Enumeration Areas (CEAs/clusters/communities) which are the Primary Sampling Units (PSUs) of the 2018/19 data collection.

The sampling frame consists of three steps where, in the first step, we identified a given number of CEAs (communities) as described below. In the second step, once the CEAs were identified, we undertook a complete enumeration of all households (listing) in those areas. Finally, from the list of the households in each CEA, a given number of households were randomly sampled for the 2018/19 survey.

10.1.1.2 Selection of Census Enumeration Areas

For selecting the CEAs based on a stratified cluster sampling two approaches were considered by the NORC team:

- **Preferred approach:** CEA stratification based on amount of cocoa produced per CEA.
- **Alternative approach:** CEA stratification based on amount of cocoa produced at next available higher level of geographic unit above the CEAs.

The NORC team first explored whether it was feasible to use the preferred approach which required current cocoa production data at the CEA level. However, after several rounds of deliberation with the governments of Ghana and Côte d'Ivoire, we realized that the CEA level

production data was not available due to lack of current agricultural census data. As a result, NORC decided to adopt the alternative approach of CEA stratification noted above and followed a stratification strategy described below:

- In the first stage:
  - Collected data on cocoa production at the district /department level[73] (rather than the CEA level)
  - Classified the districts/departments into high/medium/low cocoa production stratum based on the most recent available cocoa production data.
  - Identified the cocoa growing communities from each of the districts/departments and assigned the identified communities into high/medium/low cocoa production stratum based on the classification of the districts/departments they belong to.
- In the second stage, from the list of all cocoa growing communities classified into high/medium/low cocoa production stratum, used random sampling methods to sample CEAs from each the above three stratum to select a total of 75 CEAs from high, medium and low cocoa production stratum with oversampling of CEAs from the high cocoa production stratum (in this case stratum are districts/departments)
  - Since CEA level data on cocoa production was not available in this approach, GSS in Ghana/INS in Côte d'Ivoire used a simple random sampling method to sample the CEAs within the districts/departments.
  - 40 CEAs from high, 25 CEAs from medium and 10 CEAs from low cocoa production stratum were sampled in each country

Figure 5: Range Used for Stratification of Department/Districts: 2018/19 Survey Round

Stratification	Côte d'Ivoire	Ghana
	Department total cocoa production in ton	**District total cocoa production in ton**
High stratum	More than 40,000 ton	More than 20,000 ton
Medium Stratum	10,000-40,000 ton	8,000-20,000 ton
Low Stratum	Less than10,000 ton	Less than 8,000 ton

10.1.1.3 Selection of Households from Identified CEAs for Survey

Once the clusters were identified, NORC undertook a fresh household listing exercise in each of the selected CEAs to enumerate the households. After the listing exercise, NORC randomly

[73] Most recent data on the quantity of cocoa produced at the district level in Ghana provided by Ghana COCOBOD and at the department level Côte d'Ivoire by the Coffee-Cocoa Council of Côte d'Ivoire.

sampled agricultural households with at least one eligible child aged 5-17 for conducting the main child labor prevalence survey of 2018/19 cocoa harvest season.

The 2018/19 survey was set to collect data from 1,500 households in Côte d'Ivoire and 1,300 households in Ghana resulting in approximately 2,300 children interviewed in each country.[74]

10.1.1.4 Important Considerations

It is important to note that our proposed sampling methodology diverges from the methodology used by Tulane in previous survey rounds. This is mainly due to the fact that the NORC's stratification of CEAs (the PSUs) was based on district/department cocoa production levels, whereas, according to the available documentation, Tulane used the region/district level cocoa production data respectively for Ghana and Côte d'Ivoire[75] to stratify the CEAs. Since our PSU is the CEA, stratifying based on cocoa production at the district/department will lead to improved controls on the sample and more precise estimates. However, our approach of stratification of the PSUs based on district/department cocoa production levels, rather than on region/district levels, would not affect the comparability of national estimates of prevalence rates between the rounds, instead, it will improve precision of national estimates by reducing the potential sampling error related to stratification of PSUs based on production data at a higher level. Please see Annex 10.2 for a complete explanation of this issue.

10.1.2 Survey methodology

10.1.2.1 Quantitative approach

The main source of quantitative data was the three rounds of sectorally representative surveys of child labor (2008/09, 2013/14 and 2018/19) from Côte d'Ivoire and Ghana. In order to address possible seasonality concerns, the surveys were fielded during the main coco harvesting season in both countries and close to the fielding of earlier rounds of the survey as possible.

The 2018/19 survey obtained survey data from 1,507 households in Côte d'Ivoire and 1,317 households in Ghana, resulting in approximately 2,743 child interviews in Côte d'Ivoire and 2,809 in Ghana. We collected survey data from the heads of each sampled household as well as

[74] The calculation of total number of households to be surveyed is based on the target of surveying at least 2300 children and average number of children per household. The data on average number of children per household in each country is available from the Tulane report for 2008/09 and 2013/14 survey rounds. Based on the experience of previous survey rounds, we expect 20% and 15% reduction in average number of children per household in Côte d'Ivoire and Ghana respectively in the 2018 survey round and calculated total number of household required to survey 2300 children.

[75] Note that Ghanaian 'regions' are equivalent to 'districts' in Côte d'Ivoire

community-level data from local community leaders, schools, and cocoa shed operators to provide additional insights.

10.1.2.2 Qualitative approach

Qualitative data collection took the form of focus group discussions (FGDs), key informant interviews (KIIs), and fieldwork observation. All focus groups were led by a trained moderator who followed a pre-determined set of questions articulated in a discussion guide. The participants were chosen or recruited based on criteria in a screening questionnaire or by being clustered in a geographic location.

The qualitative component of the 2018/19 Child Labor Survey provided context for quantitative results, as well as a deeper understanding of how various key players understand child labor within the cocoa sector in Ghana and Côte d'Ivoire. This component provided nuanced perspective into the topics covered by quantitative surveys, including contextual understanding of complex concepts such as night work, heavy loads, sharp tool use, and others.

10.1.2.2.1 Key Informant Interviews

KIIs informed how different key players understand child labor and interventions aimed at reducing child labor. These interviews outlined country-specific complexities that may affect child labor rates, and the efficacy of interventions aimed at reducing child labor and focused on elites, donors, and CSOs/implementers of interventions to reduce child labor. NORC conducted KIIs with the following groups in each country:

- Agricultural extension agents
- Community leaders
- Cocoa growers
- Donors and cocoa industry members
- Government officials
- Implementers (CSOs and NGOs)

For all interviews, NORC engaged cocoa industry members, and implementers in identifying potential respondents. NORC closely collaborated with USDOL and Industry members to ensure that all KII questions were relevant, logical, and coherent. NORC also engaged implementers who receive funding outside of USDOL and the cocoa industry.

NORC took a snowball sampling approach to KIIs, in which respondents were asked to identify other appropriate KII respondents for the study. NORC also leveraged opportunities at workshops and meetings related to child labor in cocoa and approached potential respondents in

this way While KIIs did not have a fixed sample size, NORC ensured that similar numbers of respondents from each respondent group and each country were interviewed. The following figure details the institutions interviewed:

Figure 6: KII Interviews: 2018/19 Survey Round

Institution	Interviewees
Education Information Branch	1
Ghana Education Service	1
Ministry of Employment and Labour Relations	2
Ghana COCOBOD	6
Commission on Human Rights and Administrative Justice	1
MOCA	4
Fairtrade Africa	1
ILO	1
Free the Slaves (Ghana)	1
UNICEF Ghana	1
UNICEF Côte d'Ivoire	1
USDOL Bureau of International Affairs	3
Fairtrade International	1
International Cocoa Initiative	2
World Cocoa Foundation	1
Action Against Child Exploitation	2

Prior to each interview, we outlined the interview procedure, including purpose and expected duration of the interview. Interviewees were informed that their participation is voluntary, all responses are confidential, and they may choose not to have their interview recorded. Any quotes used in subsequent reports removed all personally identifying information, or any details that would make it clear that any quote likely came from a specific person or entity. All interviews were administered by NORC staff and Kantar senior staff with extensive qualitative experience.

10.1.2.2.2 Focus Group Discussions

Focus groups contextualized the quantitative component of the assessment and outlined the on-the-ground realities for cocoa farmers, including common experiences, perceptions of interventions, and perceptions of education. Group discussions primarily focused on beneficiary cocoa communities but included some non-beneficiary communities to allow for comparison between beneficiary and non-beneficiary communities.

Focus groups were disaggregated by sex to allow gendered differences to emerge. Focus groups with children were disaggregated by both gender and age to allow participants to engage in

discussion alongside their peers. Prior to age and gender disaggregation, focus group discussions were broadly separated into the following groups: beneficiary children, non-beneficiary children, beneficiary caregivers, and non-beneficiary caregivers.

In general, FGDs were comprised of roughly 6-10 participants and focus groups with children were on average 45 minutes to an hour in length, while focus groups with adults were one hour to 90 minutes in length.

10.1.2.2.3 Sampling

To select communities for focus groups and community-level KIIs, NORC used quantitative survey responses to generate a comprehensive list detailing average responses for key intervention and hazardous labor data. The team closely analyzed surveyed communities along the following parameters:

- **Training exposure:** % of respondents exposed to occupational safety training, vocational training, awareness training, and livelihood projects
- **Reported activities:** % of respondents reporting land clearing, agrochemical use, night work, working hours
- **Child labor rate:** % of children in EA engaged in child labor.

To maximize variances in perspectives, the team members individually selected EAs with varying rates in training exposure, reported activities, and child labor. The team then narrowed the list of communities by focusing on communities with inverse relationships between training exposure and reported activities/child labor rates, and high training exposure and low child labor rates/reported activities, low training exposure and high reported activities/child labor rates. The team also individually selected communities where training exposure rates were high, but child labor and hazardous activity rates were also high, and communities where training exposure was low, but child labor rates and hazardous activity rates were also low. This was an iterative exercise in which after each pass, team members discussed their reasoning for selecting each community. Finally, the team agreed on 15 communities in each country that represented varying rates of child labor and hazardous child labor, and varying levels of intervention of exposure.

Following this exercise, NORC used GPS data and STATA to generate a map of each country that displayed where each selected community was positioned. The purpose of this exercise was to ensure that selected communities were spread across each country and represented an array of interventions. The team worked closely with our local subcontractor to ensure the accuracy of the maps generated and selected the final communities. The following figures outline the communities for focus groups and community-level KIIs in each country:

Figure 7: Ghana FGD Communities

Region	District	Community Name
Central	Assin South	Dossi
Ashanti	Atwima Mponua	Mmawaninha
Ashanti	Ahafo Ano South	Aponaponso
Ashanti	Ahafo Ano South	Essienkyem
Western	Sefwi Wiawso	Kofikrom
Brong Ahafo	Asunafo North	Akorabuokrom (Duase)
Ashanti	Amansie Central	Fenaso No. 3
Central	Asikuma Odoben Brakwa	Baffokrom (Adandan No. 1)

Figure 8: Côte d'Ivoire FGD Communities

Department	Sub-Prefecture	Community Name
Adzopé	Becedi-Brignan	Becedi-Anon
Gueyo	Gueyo	Lakota Carrefour
Lakota	Zego	Goboue
Oumé	Diégonéfla	Goudi
Tiassalé	Morokro	Koyékro
Tiassalé	N'Douci	Badasso (Abeve)
Yamoussoukro	Kossou	Zatta

10.1.3 Design of survey instruments

Quantitative questionnaires cover a wide array of subjects aimed at addressing the many factors that contribute to child labor and hazardous child labor in the cocoa sector. For each sampled household, all consenting children aged 5-17 were interviewed. In addition, the household head or other knowledgeable household member was interviewed using a household head questionnaire and a household labor roster. Within each sampled CEA, interviews were conducted with all village chiefs, cocoa shed operators, and K-12 public/private school head teachers.

To ensure comparability between data collection rounds, the aforementioned quantitative instruments were modeled upon those used in the 2008/09 and 2013/14 survey rounds. Prior to data collection, all survey instruments were vetted and reviewed through in-country stakeholder workshops which included representatives of host governments as well as industry and NGO partners. In addition, instruments were thoroughly reviewed by our local research teams followed by a field-based pre-test within CEAs that are demographically similar to, but outside of, the sampled communities. Learnings from the workshops, reviews, and pre-test were included to

inform the final instrument design and carefully documented. ILAB was involved and provided input at each step in this process.

10.1.4 Child Questionnaire

The child questionnaire captures data used to construct all child labor indicators and population estimates and is therefore of central importance to the study. To minimize bias and in accordance with ILO best practices, enumerators were trained to administer the child survey in private after obtaining parental consent to do so. Given the complex subject matter of the survey, enumerators conducted a pre-interview developmental assessment to determine the cognitive capacity of the child to comprehend key concepts and definitions covered in the survey. In cases where the developmental assessment suggests a child will not understand the majority of the survey questions, parents were asked to support the child in the interview (in all cases, enumerators are required to record information on the presence of other persons and the extent to which they influenced the child's responses). Where appropriate, cognitive interviewing techniques are employed with younger children to reduce the risk of suggestibility, confabulation, and source-monitoring error. All child interviewing protocols, tools, and techniques were thoroughly covered in the enumerator training and enumerator manuals. The child questionnaire covers the following topics:

Migration and Movement. Respondents are asked questions about migration patterns, which are often a common component of the agricultural sector. These questions address respondents' countries/towns/communities of origin, identify driving factors for migration, and identify decision-makers about migration.

Work Activities. Respondents are asked general questions about the nature of the work they do. This includes extensive probes on activities that may not be typically perceived as work among respondents, including unpaid household farming or business activities. This module also asks about the types of agricultural tasks performed, such as land clearing, burning, and carrying water for spraying. These questions address the extent to which a given respondent regularly performs these tasks, or only performs them from time to time.

Working Hours. Respondents are asked various questions about the hours they work, including times of day, the length of time in a given day, and the amount of time in a given week. These questions will address the extent to which working hours are typical for that respondent.

Injury and Illness. Respondents are asked to recall the extent to which they have experienced injuries or pain as a result of agricultural work. These may include broken bones, wounds, back pain, muscle pain, and others.

Heavy Loads. Respondents are asked to recall the types of loads they have carried, the circumstances under which they were carried, and the distance they may have carried them. With younger child respondents, NORC will ensure that enumerators ask children to estimate weights or distances using familiar items and locations within the community (versus units of measurement). However, youth aged 14-17 are asked to provide estimations based on distance, weight, and transportation mode. All children are asked to recall the extent to which carrying heavy loads resulted in immediate and/or ongoing physical pain.

Exposure to Environmental Hazards and Other Dangers. Respondents are asked to recall their levels of exposure to environmental hazards and chemicals. This may include the use of pesticides and herbicides, exposure to flames or fumes, and work at dangerous heights. These questions also address whether respondents experienced any health consequences as a result of this exposure, and the severity of any health consequences experienced.

Tools, Equipment, and Machinery. Respondents are asked to recall the types of equipment they normally use when performing agricultural activities. This includes the use of machetes, mist blowers, knives, or animal-drawn tools, and any injuries that may have resulted from the use of such tools. Conversely, respondents are also asked to recall the types of protective equipment they may have used while carrying out these activities. This may include protective boots, masks, and other gear.

Education. This module will assess the extent to which children have received or are receiving education or training. It will include brief a literacy and numeracy assessment as well as capture any reasons for missing school, dropping out, or repeating classes.

Project Activities and Sensitization. As various interventions will be taking place, respondents are asked to recall the extent to which they have benefitted from various project activities and sensitization efforts.

10.1.4.1 Household Roster

The household roster collects basic demographic information on all household members, including sex, age, marital status, education, literacy status, as well as labor status over the past 7 days and 12 months.

10.1.4.2 Household Head Questionnaire

The household head questionnaire is administered to the person(s) determined by the sampled household to be most knowledgeable about household farming practices and income, spending, and borrowing. The household head questionnaire includes modules on household socio-economic status, farming characteristics, migration patterns, use of and opinions on child labor,

access to and use of credit (including input financing), participation in community projects, and future risk of agriculture-related injuries.

10.1.4.3 Community Leader Questionnaire

The community leader questionnaire is administered to all village chief(s) within the CEA. In cases where a traditional leader cannot be interviewed, local assemblymen will be interviewed in their place. The community leader questionnaire collects a broad range of community-level indicators including on migration patterns, infrastructure, socio-economic status, governance, trends in cocoa production, project activities, and the incidence of child and forced labor.

10.1.4.4 School Questionnaire

The school questionnaire is administered to head teachers (or their designated proxies) at all public and private schools serving K-12 pupils within the CEA. The school questionnaire collects general information on the school including trained teachers, enrollment figures, and school fees. In addition, the survey collects information on working children as well as head teacher opinions on the extent to which agricultural work influences educational outcomes in the community.

10.1.4.5 Cocoa Shed Questionnaire

The cocoa shed questionnaire is administered to all cocoa shed operators/managers within the CEA. This brief survey collects information on cocoa shed capacity/volume and purchases as well as the extent to which the shed uses child labor and rates of pay for child workers.

10.1.5 Training

10.1.5.1 Training of Trainers

To help facilitate the main enumerator training, a training of the trainers (TOT) was conducted for supervisors who were tasked to lead breakout sessions in the main training. The training of the supervisors was conducted from November 1st-3rd, 2018 for Ghana and January 10-17th, 2019 for Côte d'Ivoire. A total of 15 supervisors, 2 regional coordinators, 4 managerial team members from Kantar and 3 facilitators from NORC attended each training.

The training lasted for two days and the topics covered were;

- Cognitive Interview Technique (CIT),
- Head of household questionnaire review,
- Child questionnaire review,
- Roster questionnaire review,

- Community leader questionnaire review,
- School questionnaire review,
- Cocoa shed questionnaire review,
- Entry protocols, and
- Role of trainees during main enumerator training.

At the end of training, feedback from supervisors was incorporated into the review of the scripts. Supervisors were better equipped to lead smaller groups during the enumerator training.

10.1.5.2 Enumerator Training

The main training for Ghana was conducted from November 5-14th and was conducted from January 18-28th, 2019 for Côte d'Ivoire. A total of 113 participants were present for the training in Ghana and 98 participants were present for the training in Côte d'Ivoire.

Training was based on the following;

- Understanding the objectives of the research,
- Understanding the questions and its administration requirement,
- To be conversant with the field operations, survey methodology and protocols,
- To state roles, responsibilities and expectations of interviewers and supervisor's involvement in the survey, and
- To carry out effective interview, using CAPI (Nfield).

10.1.5.2.1 Outcomes of Training

By the end of the training, participants were;

- Familiar with all the instrument,
- Able to administer the assigned instruments for survey with confidence and accuracy,
- Able to follow data collection process and plan as expected, and
- Effective handling of field materials.

Training for the household and community teams were run co-currently. The household (head of household, child and the roster tools) were facilitated by NORC while the community questionnaires (school, community leader and cocoa shed) was handled by Kantar.

The topics that were addressed across all teams included;

- Techniques for interviewing young children,

- Guidelines for tablets practice,
- Child questionnaire guide,
- Head of household questionnaire guide,
- Community (Cocoa shed, community leader, school) questionnaire guide,
- Child protection protocol,
- Confidentiality and informed consent,
- Interviewing techniques,
- Stimulus worksheets, and
- Child safety referral.

10.1.5.2.2 Qualitative Training

NORC conducted back to back trainings in Ghana and Côte d'Ivoire. The qualitative training was four days long, including one day of pilot, and one day of post pilot debrief.

Moderators and note-takers were trained in best practices in focus group moderation, including topics around managing group dynamics, minimizing risk for adult and child respondents, maintaining neutrality throughout the discussion, and maintaining intragroup confidentiality. Moderators were also trained on how to manage child disclosures of abuse and forced labor, including response and reporting to appropriate authorities. Moderators were provided with a risk and response protocol outlining the appropriate procedures of bringing attention to disclosure. Focus group moderation teams were also provided with operative definitions for intervention categories, and a comprehensive list of off-farm and off farm activities. Focus group moderation teams were required to be very familiar with both lists in order to probe effectively and recognize local names for various tools.

During training, moderators held extensive practice rounds and discussions to ensure that the proper local words were being used. Moderators also made considerations for regional variations for the names of key terms, and concepts. Following the pilot, data collection teams made the necessary adjustments to the data collection instruments. These changes maintained the meanings of each question, but were reworded to be more direct, and ensure consistent translation to local languages in the field.

Focus groups and community-level KIIs were recorded, translated, and transcribed into English and French. Transcripts were transmitted through NORC's secure file transfer platform.

10.1.6 Pilot

The objective of the pilot was to check the quality of survey material, its consistency and proper interpretation as intended by client and understood by respondents. The pilot was conducted to

provide on-field learning experience for trainees and to ensure scripting instructions were properly implemented as well as skip patterns working accurately. Piloting was conducted in Ghana on November 10th, 2018 and in Côte d'Ivoire on January 26-27th, 2019. The household team screened and scheduled appointments with eligible households and later interviewed household heads and eligible children. The community teams conduct interviews with community leaders, schools' heads, and cocoa shed managers.

10.1.7 Data collection

Data collection for Ghana lasted from November 23rd, 2018 to January 27th, 2019 and for Côte d'Ivoire from February 9th, 2019 to March 7th, 2019. Fifteen teams were deployed to field. Each team comprised a supervisor and four household interviewers, and one community interviewer. Each team was accompanied by one quality control officer. The teams were provided vehicles to facilitate their movement across the different communities as the roads leading to most of the localities were in bad shape. In each locality, our teams met the administrative and village authorities to explain the purpose of the study before starting the data collection.

The team (led by the supervisor) debriefed daily before the start of the field. The supervisor contacted households and assigned them to enumerators to conduct interviews after household heads had consented. For each enumeration area, 20 households were screened for eligibility and surveyed. In the evening after the day's work the supervisor synchronizations all tablets and sends a report for the day.

10.1.7.1 Methodology

A list of 23 agricultural households per EA (of which 5 were for replacement) were sampled and provided for the ILAB survey. The Roster gets to the community, observe all the necessary community entry protocols with or without the supervisor. The roster team visited the EA a day earlier to screen the household for eligibility and recruit the head of household and the children (5 to 17) who were available during the stay of the team in the EA.

10.1.8 Generating the Sampling Weights

The enumeration areas (EAs) were stratified into three strata based on a prior measure of the quantity of cocoa produced as per the data provided by the COCOBOD in Ghana and the Coffee-Cocoa Council in Côte d'Ivoire. A predetermined number of EAs from each stratum were selected for the sample, the distribution of which is presented in

Table **39**.

Table 39: Number of EAs per Stratum

Stratum	Côte d'Ivoire	Ghana
Stratum 1 (High Cocoa Production)	40	40
Stratum 2 (Medium Cocoa Production)	25	23
Stratum 3 (Low Cocoa Production)	10	10
Total	75	73

Household and child-level weights were generated for each EA and calculated for each household head and child respondent, as follows.

- **Household-level EA Weights**

Household-level sample weights were based on two stages of calculations, both of which correspond to a stage of the sampling design. Suppose household i was situated within stratum h and enumeration area (EA) k. The first-level weight was based on the corresponding number of enumeration areas (EAs) within the stratum, and was evaluated as $w_i^{(1)} = \frac{N_h}{n_h}$ where N_h was the number of EAs in stratum h and $n_h$was the number of EAs that were selected at the first stage of the sampling design.

The second-level weight was based on the corresponding number of eligible households (with at least one child age 5-17) for interview within the EA. This was evaluated as $w_i^{(2)} = \frac{M_k}{m_k}$ where M_k was the number of eligible households for interview in EA k and m_k was the number of households that were selected within this EA at the second stage of the sampling design. The final sampling household-level weight for each EA was the product of these values, namely $w_i = w_i^{(1)} \times w_i^{(2)}$. All households within a given EA received the same weight as constructed above.

- **Child-level EA Weights**

In order to generate the child level weights, , a third-level weight was constructed based on the corresponding number of children observed across all selected households within the corresponding EA. Suppose child j resides within household i, as from above. The corresponding third-level weight for this child was evaluated as $w_j^{(3)} = \frac{C_k}{c_k}$ where C_k was the number of children eligible for interview in EA k and c_k was the number of children that were interviewed within EA k and at the third stage of the sampling design. The purpose of basing the third-level weight on the number of children observed within each EA was to mitigate the influence of heterogeneous weights, that may arise due to basing the weighting scheme on the number of children eligible for observation within the corresponding household, on the sampling distribution of the point estimates. The final child-level sampling weight was the product of these three values, namely $w_j = w_i^{(1)} \times w_i^{(2)} \times w_j^{(3)}$.

All child respondent within a given EA received the same weight as constructed above.

The following provides an example of how the household head- and child-level weights were calculated. Suppose EA k is situated within stratum h. The hypothetical number of EAs in stratum h, households in EA k, and children observed within EA k are as presented in Table 40.

Table 40: Illustration of Weight Construction

Weight construction	
Total number of EAs in stratum *h*	1000
Number of EAs selected in stratum *h*	40
EA k	
Total number of eligible HHs (with at least one child age 5-17) listed	100
Total number of eligible HH interviewed	20
Total number of Children in EA k	200
Total number of Children interviewed in EA k	50

For a sampled household i within the enumeration area k, the calculated sampling weight is

$$w_i = w_i^{(1)} \times w_i^{(2)} = \frac{1000}{40} \times \frac{100}{20} = 125.$$

For a sampled child respondent j within the enumeration area k, the calculated sampling weight is

$$w_j = w_i^{(1)} \times w_i^{(2)} \times w_j^{(3)} = \frac{1000}{40} \times \frac{100}{20} \times \frac{200}{50} = 500.$$

10.1.9 Hypothesis Testing

For comparing the changes in data between 2018/19 -2008/09 rounds and between 2018/19 and 2013/14 rounds, hypothesis testing was conducted which was based on the Wald test statistic. The set up for the comparison analysis is as follows. Suppose μ_A is a population quantity corresponding to the study population at the time of one of the 2008/09 or 2013/14 studies, such as a population prevalence. Similarly, let μ_B be the population quantity at the time of the 2018/19 study. The null and alternative hypotheses state that $H_0: \mu_A = \mu_B$ and $H_A: \mu_A \neq \mu_B$ or $H_A: \mu_A < \mu_B$ (depending on the response).

The test statistic is evaluated as $T = (\bar{x}_A - \bar{x}_B)/se(\bar{x}_A - \bar{x}_B)$. Due to 2008/09 and 2013/14 data collection information unavailable to this study team, the standard error of $\bar{x}_A$ is approximated with that from the 2018 calculations so that the actual test statistic used is $T = (\bar{x}_A - \bar{x}_B)/\ (\sqrt{2} \times se(\bar{x}_B))$.

10.2 Annex II: Notes on Comparability of Data and Population Estimates across 2008/09, 2013/2014 and 2018/19 Survey Rounds

As part of the statement of work assigned to NORC at the beginning of project was a data quality review task on the data collected during previous rounds of the child labor survey. We began by examining the documentation and data available on the previous survey rounds provided by the previous contractor. During this exploration stage, we examined the documentation and data with the following objectives:

- Whether appropriate and complete documentation was available for designing the 2018/19 sampling frame that is fully comparable with the sampling frame used in the previous survey rounds in 2008/09 and 2013/14.
- Whether the datasets contained all variables required to generate the child labor and hazardous work related indicators.
- Whether all documentations were available to replicate the construction of child labor and hazardous work related indicators from the raw survey data of previous rounds.
- Whether the formulas and algorithms used to construct the child labor and hazardous work related indicators from the raw survey data were appropriately coded.
- Whether all documentations were available to replicate the sampling weights of previous survey rounds that were necessary to generate population estimates of child labor and hazardous work related indicators of 2018/19 round from the raw survey data.

The explorations undertaken by NORC identified three sets of issues that have bearing on the comparability of data and population estimates across the previous survey rounds (2008/09, 2013/14) and the 2018/19 round undertaken by NORC as described below:

- Incomplete documentations on construction of sampling frame used by the previous contractor for 2008/09, 2013/14 survey rounds
- Missing data to link the child respondents to their respective households for 2008/09 survey round, and
- Errors made in survey administration in Côte d'Ivoire during 2013/14 survey round and the process used for correction of the implementation errors.

10.2.1 Incomplete documentation and implication on comparison of population estimates between the survey rounds

In designing the 2018/19 sampling methodology NORC's mandate was to ensure comparability between rounds as well as design a more robust baseline for future studies. After examining the available documentation on how the sampling frame was constructed in the previous rounds, it became evident that there was not enough information available on the exact methods used in construction of sampling frames in the previous survey rounds. NORC brought this issue to the

notice of USDOL and after repeated discussions with the institutions that were involved in designing the sampling frame of the past survey rounds[76], NORC reached the conclusion that it was not feasible to recover the required information and that essential data needed for an exact replication of the sampling frame used in the earlier rounds was missing.

This lack of information made it challenging at times to design the 2018/19 survey to allow for precise comparisons across rounds. NORC approached this issue by striking a balance between precision and comparability, allowing for comparability on key metrics while improving upon the sampling frame construction with an aim of increasing the precision of the 2018/19 estimates.

The 2008/09 and 2013/14 survey rounds used regions as the stratification level and NORC used districts/departments[77] in 2018/19 (which are geographically smaller and can be assigned to a stratification level more precisely than the larger area). Although this means the population estimates generated from the 2018/19 survey round are more precise than those used previously, it also means the sampling frames were not exactly identical (one started at the regional level and the other at the district/department level) and thus **population total estimates are not fully comparable** as explained below:

Population estimates of the total number of children is computed by multiplying the average population of children in each stratum by the total number of enumeration areas (EAs) in each stratum (which would be the sum of the EAs in the regions for the 2008/09 survey round, while it would be the sum of all EAs in the cocoa producing districts with a coco producing region). It is important to note the not all of the districts in a region would be cocoa producing, and thus, the regional population totals derived from EAs selected to represent regions will naturally be higher than those derived from EAs selected to represent districts/departments since the count of regional total number of EAs will be greater than the district/department total number of EAs. This indicates that the differences in total population of children estimated between survey rounds are not comparable though both are valid estimates for the population frames the samples represent.[78]

However, it is important to note that the difference in sampling frames that led the population estimate of total number of children to be non-comparable, does not affect comparison of the main outcomes of interest (the prevalence rates of children in child labor and children engaged in

[76] Includes Tulane University, Ghana Statistical Service (GSS), the Insitut National de la Statistique de Côte d'Ivoire (INS), École Nationale de Statistique et d'Economie Appliquée (ENSEA) in Côte d'Ivoire and the Institute of Statistical, Social And Economic Research (ISSER) in Ghana.

[77] In Ghana the next stratification level are named "districts" and in Côte d'Ivoire they are labeled "departments".

[78] However based upon our review of both datasets, there is no evidence that the underlying distribution of child labor characteristics are different in the 2018/19 round as compared to the 2008/09 round.

hazardous work). As described in Annex 10.1 EAs in both the 2008/09 sample and the 2018/19 sample were stratified into high, medium and low cocoa production stratum. While there was no documentation available on the exact cutoff range used for stratification of high, medium and low EAs in 2008/09 round, examination of child labor survey data of 2008/09 and 2018/19 rounds and comparison of distributions among high, medium and low EAs substantiates their similarity. Computing prevalence rates, under most circumstance, is not affected by the regional or district stratum totals. This is because the comparison of rates involves, for example, the number of children in hazardous work for the entire population divided by the total number of children in the population. Thus, for rate calculation, both the denominator and numerators include the population projection based on the same weights for each stratum, the rates are not affected by the difference in the stratum totals as involved in generating the population estimate of total number of children and children in child labor and children in hazardous work. As such, the rates of prevalence are comparable across the survey rounds.

A second important consideration is that, while we cannot compare population counts across rounds, we can provide very precise and accurate counts for the 2018/19 round as a single point-in-time estimate.

Although not ideal, this balance allows stakeholders to use 2018/19 data as a strong base with more precise estimates moving forward while also allowing for comparisons across study rounds.

10.2.2 Missing data to link the child respondents to their respective households in 2008/09 survey round and its implication on comparison of prevalence estimates

While exploring the database of 2008/09 survey round, NORC found that although the data from the child survey, the head of the household survey and household roster survey were available, there was no way to map the children from the child labor survey to the data collected from their respective cocoa growing households. After deliberation with the previous contractor, it was realized that the “key” linking individual children to their respective households was missing. This implied that while the estimates of child labor prevalence rate and prevalence rate of hazardous work can be compared between the 2008/09 and 2018/19 survey rounds for the entire sample (including all agricultural households), it was not feasible to compare the estimates broken down by household type (cocoa growing and non-cocoa growing households). As a result, for the report, we are unable to compare the prevalence rate of child labor and prevalence rate of hazardous work for cocoa growing households between 2008/09 and 2018/19 survey rounds.

10.2.3 Errors made in survey administration in Côte d'Ivoire during 2013/14 survey round and implication on comparison of population estimates between the 2013/14 and 2018/19 survey rounds.

The previous contractor selected 60 clusters in both Côte d'Ivoire and Ghana for the 2013/14 round of the child labor survey. The previous contractor conducted a household listing in the 60 selected clusters to create a sampling frame and identify both cocoa and non-cocoa growing agricultural households to be surveyed in 2013/14. They then undertook data collection in both countries and completed data collection activities in Ghana as per the survey design. However, while administering the 2013/14 survey in Côte d'Ivoire, due to error in survey implementation, field teams collected data only from the cocoa growing households and did not survey the sample of non-cocoa growing households. So, the data collected from Côte d'Ivoire included only cocoa growing households. This error was discovered after data collection was complete, and, in an attempt to correct the error, the study team went back to the field one year later (in early 2015). However, for the supplemental survey, the study team adopted a different sampling method for selecting the non-cocoa growing households who were supposed to be surveyed as part of the main sample of the 2013/14 survey round. Ideally, it would have been appropriate to follow the original survey design and to survey non-cocoa growing households from each of the 60 clusters sampled in the 2013/14 round. However, instead of sampling non-cocoa households from each of the 60 clusters, the study team sampled non-cocoa households from only 15 clusters (out of 60) based on a combination of random and systematic sampling methods.[79]

In this process, the team systematically selected 11 clusters and randomly selected 4 clusters. Then approximately 14-16 non-cocoa growing households were surveyed in each cluster in early 2015.

Given that only a small number of clusters were selected to survey the non-cocoa growing households, most of which were "systematically sampled" instead of being randomly sampled, it was important to check the reliability of such sampling method and potential bias involved in generating population estimates. Since there was no information about the process adopted to "systematically sample" these clusters, NORC decided to examine whether these systematically selected clusters were similar to the randomly selected clusters.

NORC compared the unweighted and weighted estimates (using sampling weights provided by the previous contractor) between the systematically and randomly selected clusters which generated separate estimates for the full sample (including both cocoa and non-cocoa growing households) and for the non-cocoa growing households. The findings from NORC's analysis

[79] Tulane University, Final Report, 2013/14 Survey Research on Child Labor in West African Cocoa Growing Areas.

indicated that the prevalence rate of child labor working in cocoa production in the systematically chosen clusters was higher than the prevalence rate of the randomly selected cluster. This raised serious concerns that the method of sampling of non-cocoa growing households and weighting schema used for the clusters selected for the supplemental sample potentially introduced bias in the population estimates of child labor for all agricultural households in the cocoa growing areas of Côte d'Ivoire. In addition, since the supplemental sample surveyed only 14 -16 households from a small number of clusters (15), the estimates generated from these clusters might be associated with larger sampling error, producing unreliable estimates of the population. Finally, it is important to note that the difference in timing of the survey of non-cocoa households (conducted one year after the main survey was done in 2013/14 cocoa harvest season), also raised significant concerns regarding the comparability of data from the cocoa growing and non-cocoa growing households. These findings indicated that the population estimate of child labor generated by the previous contractor for the 2013/14 survey round was probably not a true representation of the population estimate of child labor in cocoa production in agricultural households in the cocoa growing areas of Côte d'Ivoire, and hence produced a biased estimate for the aggregate population estimate of child labor in the cocoa growing areas of Côte d'Ivoire and Ghana. To err on the side of caution, NORC has not utilized the data collected on non-cocoa growing households from 2013/14 and avoided making any direct comparisons between 2013/14 and 2018/19 as well as between 2008/09 and 2013/14, in terms of all agricultural households as well as the non-cocoa growing households. This indicates that the prevalence rates of child labor for all agricultural households in 2013/14 and 2018/19 rounds and 2008/09 and 2013/14 rounds are not statistically comparable.

However, it is important to note that since the survey was administered as per the survey design among the cocoa growing households in Côte d'Ivoire in 2013/14 round, these issues did not affect the population estimates of prevalence rates of child labor and rate of exposure to hazardous work in cocoa growing households in 2013/14 round. As a result, is still feasible to make a statistically valid comparison of population estimate of prevalence rates of child labor and rate of children's exposure to hazardous work in cocoa growing households between 2013/14 and 2018/19 survey rounds.

10.3 Annex III: Common Definition and Local Definitions of Child Labor & Hazardous Child Labor

This section first provides a description of the different components used to form the common definitions used to measure aggregate (between Côte d'Ivoire and Ghana) progress against the goals of the Harkin-Engel Protocol and then describes the local definitions of hazardous child labor. It is important to note that in many cases the local definitions are more proscriptive than the common definition and using local definitions leads to higher rates of child labor and hazardous child labor.

10.3.1 Common definition

Unacceptable working hour conditions for the common definition is defined as a child under 12 years old engaging in at least one hour of work, a child between 12 and 14 engaging in 14 or more hours of work, or a child between 15 and 17 engaging in 43 or more hours of work within a 12 month reference period.

The common definition of hazardous child labor consists of six sub-categories;

1. Land clearing,
2. Carrying heavy loads,
3. Spraying and agro-chemicals,
4. Sharp tools,
5. Long working hours, and
6. Night work.

A child has been exposed to hazardous work during the reference period if they were exposed to at least one subcategory during the reference period.

Land clearing (1) is defined as a child engaging in land clearing, felling and chopping, or burning within the reference period. Heavy loads (2) is defined as a child carrying a heavy load of wood and other things during land clearing, loads of water for spraying, loads of fermented cocoa beans, loads of dry cocoa bean to the shed, or other loads within the reference period. The child's own definition of "heavy" is used.

Agro-chemicals (3) is defined as spraying, carrying water for spraying, or working with agro-chemicals during the reference period. Spraying includes a child spraying of pesticides or insecticides, being present or working in the vicinity of farm during pesticide spraying, or reentering a sprayed farm within less than 12 hours of spraying. Working with agro-chemicals includes a child having been involved in working with agro-chemical products.

Use of sharp tools (4) includes using machetes/long cutlasses for weeding, handling motorized equipment or machines, knapsack sprayer and/or chainsaw, harvesting with a machete or sickle, harvesting overhead cocoa pods with harvesting hook, or breaking cocoa pods with knife or a sharp object/tool during the reference period. Long working hours (5) is defined as a child working 43 hours or more during the reference period. Night work (6) is defined as a child going to or returning from the farm alone, or working on the farm between 6.00 p.m. and 6.00 a.m.

10.3.2 Côte d'Ivoire

For Côte d'Ivoire local legislative definitions, the definition of the unacceptable working hours condition for children between 5 and 11 is defined as working at least one hour a day. For 12 and 16 year olds unacceptable working hours is defined as engaging in more than two hours of work a day or 10 hours a week on school days or four of more hours a day or 14 or more hours of work during non-school days. For children 17 years old unacceptable working hours is defined as working more than 40 hours a week. The hours are on school days cannot be evaluated for the twelve month reference period.

The Côte d'Ivoire definition of hazardous child labor consists of seven sub-categories

1. Adequate rest,
2. Land clearing,
3. Charcoal production,
4. Carrying heavy loads,
5. Agrochemicals,
6. Sharp tools, and
7. Night work.

A child has been exposed to hazardous work during the reference period if they were exposed to at least one subcategory during the reference period. The Côte d'Ivoire definition is different than the other definitions because if a child is 16 or 17 and has received any training in the field they are not considered to have been exposed to hazardous work.

Adequate rest (1) is defined as less than one full day of rest per week for children between 13 and 16 years old. This subcategory can only be evaluated for the seven day reference period. Land clearing (2) includes land clearing, tree felling and chopping, bush burning, tree stump removal, or working with animal-drawn cultivation for children 12 to 15. For children 16 and 17 only those who participated in any land clearing activities without receiving training on land cleaning are considered to be exposed to hazardous work.

Charcoal production (3) includes working in charcoal production, working as a lumberjack, or hunting with a weapon. Additionally, any child that is between 12 and 15 years old that dug a hole or was involved in holing/planting of seedlings, and any child between 16 and 17 that was involved in the same activities but did not receive a training on either is considered to be exposed to hazardous labor.

Carrying heavy loads (4) varies by age, gender, and type of transportation used. A complete breakdown of the heavy load definition can be found in Annex 10.3, and there is no heavy load training that would make this permissible.

Agrochemical (5) use includes children between 12 and 15 years old and who report having participated in the sale, transportation, handling and application of agro-pharmaceutical products. Additionally, children between 16 and 17 years old who have not received any training on applying pesticides, insecticides and fertilizers, and reports having been involved in the sale, transport, or handling of agro- chemical products is considered to be in agrochemical hazardous work. Finally, children between 16 and 17 years old who have not received any training on occupational safety and health, and report having been involved in washing containers of agro-chemical products and spraying machine, and/or disposal of agro-chemical products are also considered to be in agrochemical hazardous work.

Sharp tool (6) use is defined as children between 12 and 15 years old who report having harvesting with a machete or sickle, handled motorized equipment/machines, or broke cocoa pods with knife or a sharp object/tool. Additionally, children between 16 and 17 years old who report harvesting with a machete or sickle without receiving training on harvesting, handling motorized equipment/machines without training on driving motorized vehicles, and breaking cocoa pods with a knife or a sharp object/tool with training on cocoa pod breaking are considered to be in sharp tool hazardous work.

Night work (7) is defined as going to or returning from the farm alone or working on the farm between 7pm and 7am, and there is no night work training that would make this permissible.

10.3.3 Ghana

For the Ghanaian definition of unacceptable working hour conditions for children between 5 and 11 is defined as working at least one hour a day. For 12 and 14 years old is unacceptable working hours is defined as engaging in more than two hours of work a day on a school day or three of more hours a day or 18 or more hours a week during non-school days. For children between 15 and 17 years old unacceptable working hours is defined as working more than three hours a day or more than 18 hours a week. The hours are on school days cannot be evaluated for the twelve month reference period.

The Ghanaian definition of hazardous child labor consists of ten sub-categories;

1. Working full time and not attending school,
2. Withdrawing from school during cocoa season to do farm work,
3. Land clearing,

4. Carrying heavy loads,
5. Spraying and agrochemicals,
6. Sharp tools,
7. Climbing trees,
8. Night work,
9. Working in isolation, and
10. Working without protective clothing.

A child has been exposed to hazardous work during the reference period if they were exposed to at least one subcategory during the reference period.

Working full time and not attending school (1) is defined as a child working 43 hours or more on a farm and not attending formal or non-formal school during the reference period. Withdrawing from school during cocoa season to do farm work (2) can only be evaluated on a 12 month reference period.

Land clearing (3) includes a child engaging in land clearing, felling of trees, or bush burning during the reference period. Carrying heavy loads (4) beyond permissible carrying weight is defined as a child carrying a load over one third of the child's body weight.

Agro-chemicals (5) is defined as spraying or working with agro-chemicals during the reference period. Spraying includes a child spraying of pesticides or insecticides, being present or working in the vicinity of farm during pesticide spraying, or reentering a sprayed farm within less than 12 hours of spraying. Working with agro-chemicals includes a child having been involved in working with agro-chemical products.

Use of sharp tools (6) is defined as; using machetes or long cutlasses for weeding, handling motorized equipment or machines, harvesting with a machete or sickle, harvesting overhead cocoa pods with harvesting hook or sickle, or breaking cocoa pods with knife or sharp object or tool. Climbing trees (7) is defined as climbing a tree that is three meters or higher to cut mistletoe with a cutlass.

Night work (8) is defined as going to or returning from the farm alone or working on the farm between 6pm and 6am. Working in isolation (9) is defined as working alone on the farm beyond the visible or audible range of the nearest adult. Working without protective clothing (10) is defined as working without adequate basic foot wear (protective boots) and protective clothing (overalls, long sleeves, and trousers).

10.4 Annex IV: Supplementary Tables I

10.4.1 Survey respondents

Table 41: Types and Numbers of Interviews Completed, by Region, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

	Child	Household Head
Total	5,543	2,809
Ghana	2,809	1,314
Ashanti	995	468
Brong Ahafo	324	144
Central	459	181
Eastern	190	108
Volta	89	54
Western	752	359
Côte d'Ivoire	2,734	1,495
Agnebytiassa	211	102
Bas Sassandra	174	120
Belier	103	40
Cavaly	64	41
Gbokle	203	100
Goh	270	157
Guemon	317	192
Haut Sassandra	458	242
Indeniedjouabke	93	61
Lac	81	40
Lame	104	60
Loh Djiboua	306	160
Marahoue	173	80
Tonkpi	107	60
Worodougou	70	40

Source: NORC sample 2018/2019, strata 1-3

Table 42: Household Head and Child Survey Response Rates, Côte d'Ivoire and Ghana, All Agricultural Households, 2018/19

Percent of households with:	Total		Côte d'Ivoire		Ghana	
Total household rosters	2,821	N/A	1,504	N/A	1,317	N/A
Household head survey	2,809	99%	1,495	99%	1,314	100%
At least one child survey	2,586	92%	1,384	92%	1,202	91%
Correct number of child surveys*	2,324	82%	1,140	76%	1,184	90%
No eligible children	166	6%	82	5%	84	6%
Data collection complete*	2,321	82%	1,139	76%	1,182	90%

Source: NORC household roster, household head, and child surveys 2018/2019, strata 1-3

**The number of children listed in the household roster is equal to the number of children surveyed in that household.*

***Percentage of households with a roster survey, a HH Head survey, and child surveys for all eligible children.*

Table 43: Place of Birth and Nationality of Survey Respondents: Children, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2018/19

	Côte d'Ivoire		Ghana	
Place of Birth				
Côte d'Ivoire	2,610	95%	3	0%
Ghana	4	0%	2,794	100%
Burkina Faso	98	4%	1	0%
Mali	15	1%	0	0%
Other	1	0%	1	0%
No response	1	0%	0	0%
Nationality				
Ivorian nationality	2,043	75%	1	0%
Ghanaian nationality	2	0%	2,796	100%
Burkinabe nationality	582	21%	3	0%
Malian nationality	65	2%	0	0%
Other	15	1%	1	0%
No response	6	0%	0	0%

Source: NORC roster survey 2018/2019, strata 1-3

Table 44: Household Land Under Cultivation and Under Cocoa Cultivation, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

	Côte d'Ivoire	Ghana
Land under cultivation by households involved in agriculture (in acres)	20.5	8.4
Land under cocoa cultivation by cocoa-producing households (in acres)	8.6	6.4

Source: NORC head of household survey 2018/19, weighted, strata 1-3

10.4.2 Descriptive analysis

Table 45: Selected Characteristics (Age Group, Gender) of Children Engaged in Child Labor in Agriculture, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children engaged in child labor in agriculture	Total		Côte d'Ivoire		Ghana	
	2008/09	2018/19	2008/09	2018/19	2008/09	2018/19
Sex						
Male	57%	57%	56%	58%	57%	57%
Female	43%	43%	44%	42%	43%	43%
Age group						
5-11 Years	47%	50%	49%	52%	44%	48%
12-14 Years	28%	30%	26%	30%	31%	30%
15-17 Years	25%	20%	25%	17%	25%	22%

Source: Child survey 2008/09, 2013/14, and 2018/19, weighted, strata 1-3

**Includes children who worked in both cocoa production and other agricultural and non-agricultural economic sectors.*

Table 46: Selected Characteristics (Age Group, School Attendance) of Children Engaged in Child Labor in Agriculture, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Children engaged in child labor in agriculture		Total		Côte d'Ivoire		Ghana	
		2008/09	2018/19	2008/09	2018/19	2008/09	2018/19
5-11 Years	Attending School	77%	92%	66%	88%	92%	99%
	Not attending school	23%	7%	34%	11%	8%	2%
12-14 Years	Attending School	79%	93%	66%	89%	92%	98%
	Not attending school	21%	7%	34%	11%	8%	2%
15-17 Years	Attending School	55%	77%	31%	66%	85%	89%
	Not attending school	45%	22%	69%	32%	15%	12%

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

Table 47: Prevalence of Child Labor By School Attendance, All Agricultural Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2018/19

Prevalence of Child Labor	Attending school	Not attending school	Diff. (pp)*	Sig of diff^
All	65%	50%	16%	***
5-11 Years	56%	32%	24%	***
12-14 Years	81%	73%	8%	
15-17 Years	84%	80%	4%	

Source: NORC child survey 2018/19, weighted, strata 1-3

**Calculated as the difference between attending and not attending school rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 48: Working Hours and Minimum Age, Children Working in Cocoa Production, By Sex, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Number and percentage of children working in cocoa in agricultural households		Côte d'Ivoire			Ghana		
		2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Sex: Male							
5-11 years	% Working 1+ hour per week	13%	24%	***	31%	34%	
	Average # of hours worked	9.0	7.3		7.1	5.1	***
12-14 years	% Working 14+ hours per week	15%	26%	***	14%	11%	
	Average # of hours worked	14.4	12.4		8.4	7.0	
15-17 years	% Working 43+ hours per week	4%	4%		1%	2%	
	Average # of hours worked	21.5	15.2	***	10.2	10.4	
All years	% Working more than allowable hours per week	12%	22%	***	20%	23%	
	Average # of hours worked	13.9	10.7	***	8.3	6.9	
Sex: Female							
5-11 years	% Working 1+ hour per week	12%	17%		21%	32%	***
	Average # of hours worked	13.1	7.6	***	6.5	5.2	
12-14 years	% Working 14+ hours per week	11%	13%		12%	7%	
	Average # of hours worked	12.3	10.2		7.1	6.0	
15-17 years	% Working 43+ hours per week	2%	2%		1%	1%	
	Average # of hours worked	16.9	11.5		9.1	7.3	
All years	% Working more than allowable hours per week	11%	14%		15%	21%	
	Average # of hours worked	13.8	9.0	***	7.3	5.9	***

Source: NORC child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

Table 49: Estimates of Change Children, 12-17, Engaged in Light Work and Regular Work in the Cocoa Production, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

		Children 12-14 years engaged in non-hazardous light work* in cocoa production			Children age 15-17 years engaged in regular work** in cocoa production		
		Pct	Diff (pp)***	Sig of diff^	Pct	Diff (pp)***	Sig of diff^
Total	2008/09	1%	2	***	1%	0	
	2018/19	3%			1%		
Côte d'Ivoire	2008/09	0%	1		0%	1	
	2018/19	2%			1%		
Ghana	2008/09	2%	3		2%	-1	
	2018/19	6%			1%		

Source: NORC child survey 2008/09 and 2018/19, weighted, strata 1-3

**Children aged 12-14 who work less than 14 hours per week in non-hazardous work*

***Children aged 15-17 who work less than 43 hours per week in non-hazardous work*

****Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 50: Child Work Involved in Cocoa Production, All Children 5-17 Years, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008-09 and 2018-19

Percentage of children	Total			Côte d'Ivoire			Ghana		
	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^
Land preparation activities in cocoa production									
Land clearing	12%	16%		15%	20%		7%	9%	
Felling and chopping	1%	9%	***	1%	11%	***	2%	6%	***
Burning	1%	5%	***	1%	5%	***	2%	6%	***
Stumping	0%	6%	***	1%	6%	***	0%	5%	***
Planting activities in cocoa production									
Preparing seedlings	3%	9%	***	3%	8%	***	2%	10%	***
Planting seedlings	2%	9%	***	2%	7%	***	3%	11%	***
Sowing at stake	3%	7%	***	4%	5%		1%	11%	***
Farm maintenance activities in cocoa production									
Weeding	17%	21%	***	10%	17%	***	29%	28%	
Spraying insecticides	0%	4%	***	0%	4%	***	0%	3%	***
Applying fertilizer	0%	4%	***	0%	4%	***	0%	3%	***
Applying fungicides/herbicides/other chemicals	0%	3%	***	0%	3%	***	0%	3%	***
Carrying water for spraying	4%	17%	***	3%	12%	***	5%	24%	***
Doing sanitation and pruning	1%	4%	***	1%	4%	***	0%	5%	***
Doing mistletoe control	2%	4%	***	2%	4%	***	1%	3%	***
Harvest activities in cocoa production									
Plucking cocoa pods	11%	17%	***	9%	17%	***	14%	16%	
Gathering and heaping cocoa pods	22%	43%	***	16%	36%	***	33%	53%	***
Breaking cocoa pods and fermentation	16%	26%	***	13%	26%	***	21%	27%	***

Percentage of children	Total			Côte d'Ivoire			Ghana		
	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^	2008/ 2009	2018/ 2019	Sig of diff^
Post-harvest activities in cocoa production									
Carting fermented cocoa beans	11%	21%	***	9%	19%	***	14%	25%	***
Drying cocoa beans	10%	23%	***	9%	23%	***	13%	24%	***
Carting dry cocoa beans to shed	6%	13%	***	5%	13%	***	8%	12%	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

Table 51: Children Engaged in Child Labor and Hazardous Work in Cocoa Production, All Agricultural Households, 5-17 Years, by Sex and Age Group in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

	Children Engaged in Child Labor in Cocoa Production								
	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Sex									
Male	61%	61%		61%	64%		60%	58%	
Female	39%	39%		39%	36%		40%	42%	
Age group									
5-11 years	45%	47%		47%	47%		43%	47%	
12-14 years	30%	32%		28%	33%		32%	30%	
15-17 years	25%	22%	***	26%	20%	***	25%	23%	
Children Engaged in Hazardous Work* in the Cocoa Production									
Sex									
Male	60%	62%		61%	65%		60%	59%	
Female	40%	38%		39%	35%		40%	41%	
Age group									
5-11 years	44%	44%		46%	45%		42%	43%	
12-14 years	30%	33%		28%	34%		32%	32%	
15-17 years	26%	23%		26%	21%	***	25%	25%	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

***Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points*

*^Significance of Difference *** p<0.01*

Table 52: Estimates of Percentages of Children Exposed to Hazardous Work* Activities in the Cocoa Sector, 5-17 Years, All Agricultural Households, by Age Group in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Percentage of children in agricultural households:	Total				Côte d'Ivoire				Ghana			
	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^
Age group: 5-11 years working in cocoa												
V1: Land clearing	7%	10%	2		9%	12%	3		4%	6%	2	
V2: Heavy loads	17%	19%	2		13%	17%	4		24%	22%	-2	
V3: Agro-chemicals	4%	14%	11	***	3%	11%	8	***	5%	20%	15	***
V4: Sharp tools	19%	23%	4	***	14%	20%	6	***	27%	27%	0	
V5: Long working hours	1%	0%	0	***	1%	0%	-1	***	0%	0%	0	***
V6: Night work	0%	1%	1	***	0%	1%	1		0%	1%	1	
Exposed to multiple hazards	22%	30%	8	***	16%	26%	10	***	33%	37%	4	
Average number of hazards	0.5	0.7	41%	***	0.4	0.6	51%	***	0.6	0.8	26%	
Age group: 12-14 years working in cocoa												
V1: Land clearing	17%	33%	16	***	23%	40%	17	***	9%	22%	13	***
V2: Heavy loads	34%	42%	8	***	28%	41%	12	***	42%	45%	3	
V3: Agro-chemicals	6%	36%	30	***	4%	30%	26	***	9%	45%	36	***
V4: Sharp tools	42%	55%	13	***	32%	50%	18	***	55%	64%	9	
V5: Long working hours	1%	1%	0		1%	2%	0		0%	0%	0	
V6: Night work	1%	4%	3	***	1%	3%	2		0%	5%	5	***
Exposed to multiple hazards	45%	62%	17	***	35%	56%	21	***	57%	71%	14	***
Average number of hazards	1.0	1.7	70%	***	0.9	1.7	84%	***	1.1	1.8	57%	***

Percentage of children in agricultural households:	Total				Côte d'Ivoire				Ghana			
	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^
Age group: 15-17 years working in cocoa												
V1: Land clearing	23%	36%	14	***	28%	41%	13	***	16%	31%	15	***
V2: Heavy loads	34%	48%	14	***	29%	46%	17	***	40%	50%	10	
V3: Agro-chemicals	7%	47%	41	***	5%	39%	34	***	9%	57%	48	***
V4: Sharp tools	42%	61%	20	***	34%	52%	19	***	53%	72%	19	***
V5: Long working hours	2%	2%	0		3%	3%	0		1%	2%	1	
V6: Night work	1%	7%	5	***	2%	7%	5		1%	6%	6	***
Exposed to multiple hazards	44%	67%	23	***	35%	59%	23	***	56%	77%	21	***
Average number of hazards	1.1	2.0	86%	***	1.0	1.9	87%	***	1.2	2.2	82%	***

Source: Child survey 2008/09, 2013/14, and 2018/19, weighted, strata 1-3

** Measured based on Variables 1-6, as described in Chapter 3.3 of this report.*

***Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 53: Estimates of Percentages of Children Exposed to Hazardous Work* Activities in the Cocoa Sector, 5-17 Years, By Sex, All Agricultural Households, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Percentage of children in agricultural households	Total				Côte d'Ivoire				Ghana			
	2008/ 2009	2018/2 019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^	2008/ 2009	2018/ 2019	Diff (pp)*	Sig of diff^
Sex: Boys work in cocoa												
V1: Land clearing	15%	27%	11	***	20%	32%	11	***	8%	19%	11	***
V2: Heavy loads	27%	33%	6	***	21%	31%	10	***	36%	34%	-2	
V3: Agro-chemicals	5%	29%	24	***	4%	24%	21	***	7%	36%	29	***
V4: Sharp tools	32%	45%	13	***	24%	42%	18	***	44%	50%	6	
V5: Long working hours	1%	1%	0		1%	1%	0		0%	1%	0	
V6: Night work	1%	3%	3	***	1%	3%	2	***	0%	4%	3	***
Exposed to multiple hazards	34%	50%	16	***	26%	46%	20	***	48%	57%	9	***
Average number of hazards	0.8	1.4	70%	***	0.7	1.3	87%	***	1.0	1.4	49%	***
Sex: Girls work in cocoa												
V1: Land clearing	8%	10%	2		9%	11%	3		7%	8%	1	
V2: Heavy loads	19%	24%	4		15%	20%	5		26%	30%	4	
V3: Agro-chemicals	4%	19%	14	***	3%	13%	10	***	6%	27%	21	***
V4: Sharp tools	23%	25%	2		17%	19%	2		32%	35%	2	
V5: Long working hours	1%	0%	0	***	1%	0%	-1		0%	0%	0	
V6: Night work	0%	1%	1		0%	1%	1		0%	2%	2	
Exposed to multiple hazards	26%	34%	8	***	19%	27%	8	***	37%	45%	8	
Average number of hazards	0.6	0.8	43%	***	0.5	0.6	43%	***	0.7	1.0	41%	***

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

***Calculated as the difference between the 2008/09 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 54: Exposure to Agro-Chemicals, Children Working in Cocoa Production in the Last 12 Months, All Agricultural Households, by Age Group and by Sex, in Côte d'Ivoire and Ghana, 2008/09 and 2018/19

Exposed to Agro-Chemicals	Total			Côte d'Ivoire			Ghana		
	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^	2008/09	2018/19	Sig of diff^
Sex									
5-11 years	47%	37%	***	54%	37%	***	40%	37%	
12-14 years	28%	34%	***	22%	36%	***	33%	33%	
15-17 years	25%	28%		23%	27%		27%	30%	
Age group									
Male	58%	64%		56%	67%	***	60%	61%	
Female	42%	36%		44%	33%	***	40%	39%	

Source: Child survey 2008/09 and 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

Table 55: Prevalence of Children Engaged Child Labor and Hazardous Child Labor in Cocoa and Non-Cocoa Households, 5-17 Years, in Côte d'Ivoire and Ghana, 2018/19

		Côte d'Ivoire				Ghana			
		Cocoa Households	Non-cocoa Households	Diff (pp)*	Sig of diff^	Cocoa Households	Non-cocoa Households	Diff (pp)*	Sig of diff^
Child labor	Number	1,059,218	204,853	N/A	N/A	859,355	76,257	N/A	N/A
	Percent	61%	58%	-3		68%	62%	-6	
Hazardous child labor	Number	970,493	167,828	N/A	N/A	764,278	68,798	N/A	N/A
	Percent	56%	48%	-9		60%	56%	-5	

Source: Child survey 2008/09, 2013/14, and 2018/19, weighted, strata 1-3

**Calculated as the difference between the cocoa and non-cocoa households rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 56: Working Hours in Any Economic Activity and Minimum Age, Children in Cocoa Households Working in Cocoa Production, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Number and percentage of children in cocoa production in cocoa households		Côte d'Ivoire			Ghana		
		2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
5-11 years	% Working 1+ hour per week	20%	24%		37%	35%	
	Average # of hours worked	7.2	7.3		6.5	5.1	***
12-14 years	% Working 14+ hours per week	19%	20%		18%	9%	***
	Average # of hours worked	12.5	11.3		9.1	6.5	***
15-17 years	% Working 43+ hours per week	5%	3%		2%	2%	
	Average # of hours worked	17.9	14.3		12.4	9.2	***
All years	% Working more than allowable hours per week	18%	20%		26%	24%	
	Average # of hours worked	11.5	9.9		8.8	6.4	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3.

*^Significance of Difference *** p<0.01*

Table 57: Working Hours in Any Economic Activity and Minimum Age, Children in Cocoa Households, Working in Cocoa Production, By Sex, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Number and percentage of children in cocoa production in cocoa households		Côte d'Ivoire			Ghana		
		2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
Sex: Male							
5-11 years	% Working 1+ hour per week	25%	28%		39%	36%	
	Average # of hours worked	7.8	7.2		6.9	5.0	***
12-14 years	% Working 14+ hours per week	21%	27%		20%	11%	***
	Average # of hours worked	13.1	12.0		8.5	6.8	
15-17 years	% Working 43+ hours per week	7%	4%		3%	3%	
	Average # of hours worked	19.6	15.6		12.4	10.5	
All years	% Working more than allowable hours per week	21%	24%		27%	24%	
	Average # of hours worked	12.5	10.5	***	8.8	6.8	***
Sex: Female							
5-11 years	% Working 1+ hour per week	14%	20%		34%	34%	
	Average # of hours worked	6.1	7.6		6.0	5.3	
12-14 years	% Working 14+ hours per week	17%	13%		16%	7%	***
	Average # of hours worked	11.3	10.0		10.2	6.1	***
15-17 years	% Working 43+ hours per week	4%	2%		2%	1%	
	Average # of hours worked	13.2	11.5		12.4	7.4	***
All years	% Working more than allowable hours per week	13%	16%		24%	23%	
	Average # of hours worked	9.4	8.9		8.8	5.9	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3.

*^Significance of Difference *** p<0.01*

Table 58: Children in Cocoa Households, Engaged in Child Labor and Hazardous Child Labor* in Cocoa Production, 5-17 Years, by Sex and Age group in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

	Children Engaged in Child Labor in Cocoa Production											
	Total				Côte d'Ivoire				Ghana			
	2013/14	2018/19	Diff (pp)**	Sig of diff^	2013/14	2018/19	Diff (pp)**	Sig of diff^	2013/14	2018/19	Diff (pp)**	Sig of diff^
Sex												
Male	64%	61%	-3		70%	64%	-6	***	57%	58%	1	
Female	36%	39%	3		30%	36%	6	***	43%	42%	-1	
Age group												
5-11 years	43%	47%	5	***	42%	48%	5		43%	47%	4	
12-14 years	32%	31%	-1		33%	32%	-1		31%	30%	-1	
15-17 years	26%	22%	-4	***	25%	21%	-4		26%	23%	-3	
Children Engaged in Hazardous Work* in the Cocoa Production												
Sex												
Male	65%	62%	-2		70%	65%	-5		57%	59%	2	
Female	35%	38%	2		30%	35%	5		43%	41%	-2	
Age group												
5-11 years	40%	44%	4		40%	46%	6	***	40%	43%	3	
12-14 years	33%	32%	-1		34%	33%	-1		32%	32%	0	
15-17 years	27%	23%	-4		26%	21%	-5	***	28%	25%	-3	

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

***Calculated as the difference between the 2013/14 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 59: Estimates of Percentages of all Children in Cocoa Households, 5-17 Years, By Age Group, Exposed to Hazardous Work* Activities in the Cocoa Sector, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Percentage of children in cocoa households exposed to:	Total				Côte d'Ivoire				Ghana			
	2013/ 2014	2018/2019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^
Age group: 5-11 years in cocoa work												
V1: Land clearing	6%	10%	4	***	9%	13%	4		0%	6%	6	***
V2: Heavy loads	20%	21%	1		15%	19%	5		33%	24%	-9	***
V3: Agro-chemicals	4%	16%	12	***	2%	13%	11	***	10%	22%	12	***
V4: Sharp tools	20%	26%	6	***	18%	24%	6	***	25%	29%	4	
V5: Long working hours	0%	0%	0		0%	0%	0		0%	0%	0	***
V6: Night work	0%	1%	1		0%	1%	1		0%	1%	1	
Exposed to multiple hazards	28%	34%	6	***	23%	30%	7	***	39%	39%	1	
Average number of hazards	0.5	0.7	46%	***	0.4	0.7	59%	***	0.7	0.8	21%	
Age group: 12-14 years in cocoa work												
V1: Land clearing	18%	34%	17%	***	26%	43%	17%	***	2%	23%	21	***
V2: Heavy loads	41%	44%	3%		33%	42%	9%		57%	47%	-10	
V3: Agro-chemicals	15%	39%	24%	***	8%	32%	24%	***	28%	48%	20	***
V4: Sharp tools	45%	60%	15%	***	39%	54%	15%	***	57%	67%	10	***
V5: Long working hours	1%	1%	0%		2%	2%	0%		0%	0%	0	
V6: Night work	1%	4%	3%	***	2%	3%	2%		1%	5%	4	***
Exposed to multiple hazards	58%	66%	8%	***	51%	60%	9%		72%	75%	3	
Average number of hazards	1.2	1.8	51%	***	1.1	1.8	62%	***	1.4	1.9	31	***

Percentage of children in cocoa households exposed to:	Total				Côte d'Ivoire				Ghana			
	2013/ 2014	2018/2 019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^
Age group: 15-17 years in cocoa work												
V1: Land clearing	27%	39%	13%	***	42%	45%	3%		4%	33%	29%	***
V2: Heavy loads	55%	53%	-2%		51%	51%	0%		60%	54%	-6%	
V3: Agro-chemicals	27%	52%	25%	***	16%	43%	27%	***	43%	61%	19%	***
V4: Sharp tools	65%	67%	2%		60%	58%	-2%		73%	78%	5%	
V5: Long working hours	4%	3%	-1%		5%	3%	-2%		2%	2%	0%	
V6: Night work	3%	7%	5%	***	4%	8%	4%		1%	7%	6%	***
Exposed to multiple hazards	73%	73%	0%		68%	65%	-4%		80%	82%	3%	
Average number of hazards	1.8	2.2	23%	***	1.8	2.1	17%		1.8	2.4	29%	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

***Calculated as the difference between the 2013/14 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 60: Estimates of Percentages of all Children in Cocoa Households, 5-17 Years, By Sex, Exposed to Hazardous Work* Activities in the Cocoa Sector, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19*

Percentage of children in cocoa households exposed to:	Total				Côte d'Ivoire				Ghana			
	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^	2013/ 2014	2018/ 2019	Diff (pp)**	Sig of diff^
Sex: Boys in cocoa work												
V1: Land clearing	19%	29%	10	***	27%	35%	8		2%	20%	18	***
V2: Heavy loads	34%	35%	1		29%	35%	6		46%	36%	-9	
V3: Agro-chemicals	14%	32%	18	***	8%	27%	19	***	26%	39%	13	***
V4: Sharp tools	42%	50%	8	***	38%	47%	9	***	49%	53%	4	
V5: Long working hours	1%	1%	0		2%	1%	0		1%	1%	0	
V6: Night work	1%	4%	2	***	1%	4%	2	***	1%	3%	3	***
Exposed to multiple hazards	49%	55%	6	***	45%	52%	7		58%	60%	2	
Average number of hazards	1.1	1.5	35%	***	1.1	1.5	42%	***	1.2	1.5	23%	***
Sex: Girls in cocoa work												
V1: Land clearing	4%	11%	7	***	6%	13%	7	***	0%	8%	8	***
V2: Heavy loads	26%	27%	1		18%	23%	4		42%	33%	-10	
V3: Agro-chemicals	6%	21%	15	***	2%	15%	13	***	14%	29%	15	***
V4: Sharp tools	22%	28%	6	***	16%	21%	5	***	33%	37%	4	
V5: Long working hours	1%	0%	0		1%	1%	0		0%	0%	0	
V6: Night work	0%	1%	1		0%	1%	1		0%	2%	2	
Exposed to multiple hazards	33%	38%	5		24%	30%	6		50%	49%	-1	
Average number of hazards	0.6	0.9	50%	***	0.4	0.7	69%	***	0.9	1.1	23%	

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

***Calculated as the difference between the 2013/14 and 2018/19 rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 61: Estimates of Exposure of Children Working in Cocoa Production in Cocoa Households, 5-17 Years, to Hazardous Work, by Count, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Percentage of children exposed to hazardous work (V1-V6)	Côte d'Ivoire			Ghana		
	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
6 Variables	0%	0%		0%	0%	
5 Variables	1%	4%		0%	2%	***
4 Variables	6%	24%	***	2%	13%	***
3 Variables	24%	24%		23%	22%	
2 Variables	33%	23%	***	38%	28%	***
1 Variable	24%	17%	***	29%	20%	***
Not exposed to any hazard	12%	8%	***	8%	14%	***
Average number of hazards exposed	1.9	2.5	***	1.8	2.1	***

Source: Child survey 2013/14, and 2018/19, weighted, strata 1-3
*^Significance of Difference *** p<0.01*

Table 62: Disaggregation of Exposure to Agro-Chemicals, Children in Cocoa Households Working in Cocoa Production in the Last 12 Months, by Age Group and Gender, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

	Total			Côte d'Ivoire			Ghana		
	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
Spraying pesticides or insecticides									
Age group									
5-11 years	3%	16%		0%	13%		7%	20%	
12-14 years	24%	31%		26%	37%		20%	24%	
15-17 years	73%	53%	***	74%	50%	***	72%	57%	
Sex									
Male	98%	82%	***	98%	83%	***	97%	80%	***
Female	2%	18%	***	2%	17%	***	3%	20%	***
Being present or working in the vicinity of farm during pesticide spraying									
Age group									
5-11 years	18%	37%	***	18%	36%	***	17%	39%	***
12-14 years	31%	35%		31%	35%		31%	35%	
15-17 years	51%	27%	***	51%	29%	***	51%	26%	***
Sex									
Male	75%	66%	***	85%	68%	***	69%	64%	
Female	25%	34%	***	15%	32%	***	31%	36%	
Reentering a sprayed farm within less than 12 hours of spraying									
Age group									
5-11 years	14%	27%	***	14%	34%	***	15%	20%	
12-14 years	47%	40%		46%	34%		49%	45%	
15-17 years	39%	34%		40%	31%		36%	36%	

	Total			Côte d'Ivoire			Ghana		
	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^	2013/14	2018/19	Sig of diff^
Sex									
Male	80%	66%	***	88%	65%	***	59%	68%	
Female	20%	34%	***	12%	35%	***	41%	32%	
Carrying water for spraying									
Age group									
5-11 years	29%	34%		32%	33%		27%	35%	29%
12-14 years	34%	33%		30%	34%		35%	33%	34%
15-17 years	38%	33%		37%	33%		38%	32%	38%
Sex									
Male	72%	63%	***	84%	68%	***	67%	59%	
Female	28%	37%	***	16%	32%	***	33%	41%	
Having been involved in working with agrochemicals*									
Age group									
5-11 years	8%	22%	***	9%	26%	***	7%	19%	***
12-14 years	34%	40%		39%	38%		21%	41%	***
15-17 years	58%	38%	***	52%	36%	***	72%	40%	***
Sex									
Male	91%	74%	***	90%	76%	***	93%	72%	***
Female	9%	26%	***	10%	24%	***	7%	28%	***

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Such as purchasing, transport, storage, mixing, loading, spraying/applying, washing of containers and spraying machine, and/or disposal*

*^Significance of Difference *** p<0.01*

Table 63: Children in Cocoa Households, Children Engaged in Child Labor and Hazardous Work in Cocoa Production, by School Attendance, 5-17 Years, in Côte d'Ivoire and Ghana, 2013/14 and 2018/19

Age group		Total		Côte d'Ivoire		Ghana	
		2013/14	2018/19	2013/14	2018/19	2013/14	2018/19
Children Engaged in Child Labor in Cocoa Production							
5-11 Years	Attending school	35%	41%	29%	36%	44%	47%
	Not attending school	16%	18%	16%	18%	26%	20%
12-14 Years	Attending school	59%	67%	51%	61%	72%	74%
	Not attending school	55%	56%	54%	52%	79%	85%
15-17 Years	Attending school	73%	74%	65%	63%	79%	82%
	Not attending school	74%	71%	72%	68%	89%	83%
Children Engaged in Hazardous Work in Cocoa Production							
5-11 Years	Attending school	31%	36%	26%	33%	39%	40%
	Not attending school	15%	17%	15%	17%	19%	18%
12-14 Years	Attending school	59%	67%	51%	61%	72%	74%
	Not attending school	54%	56%	53%	52%	79%	85%
15-17 Years	Attending school	73%	74%	65%	63%	79%	82%
	Not attending school	74%	71%	72%	68%	89%	83%

Source: Child survey 2013/14 and 2018/19, weighted, strata 1-3

**Measured based on Variables 1-6, as described in section 3.3 of this report*

10.5 Annex V: Supplementary tables II

10.5.1 Comparison of exposure to Hazardous Work indicators using 7 days vs. 12 months reference periods for 2018/19

The following section investigates the difference between using a 7-day (**current activity status**) versus a 12-month (**usual activity status**) reference period for understanding child labor and grew from debates among various stakeholders on the pros and cons of each approach. Using a 7-day reference period is thought to be cognitively easier for children to answer and situates a child directly within a particular growing season. However, a 7-day reference period ignores seasonality concerns (you may grow cocoa in one season but prepare the fields in another season) and temporal bias (if a study is conducted during the school year or when less work is being conducted) which can impact the estimates of child labor through undercounting. The current activity status would be expected to be lower than the usual activity status since all activities that were performed in the past seven days are, by definition, also performed in the past year. Hence the 12-moth reference period includes the 7-day reference period as well as capturing children who may not have worked in just the last seven days.

To better understand this issue we compare the estimates of child engagement based on **usual activity status** (reference period of last twelve months) and **current activity status** (reference period last seven days).

Table 64 shows significant increases in the percent of children working in agriculture, engaged in child labor, and engaged in hazardous child labor between the seven day and twelve month reference periods for both Côte d'Ivoire and Ghana. The increases in Ghana were slightly higher for working (27 percentage points compared to 24 percentage points), engaged in child labor (24 percentage points compared to 21 percentage points), and engaged in hazardous work (25 percentage points to 23 percentage points). In aggregate, there were 2.35 million children working in agriculture in the past twelve months (68%) compared to 1.49 million in past seven days (43%). Additionally, there were 2.10 million children engaged in child labor in the last year (60%) compared to 1.32 million in the last week (38%) and 1.94 million engaged in hazardous work (56%) compared to 1.10 million (32%).

There were 2.10 million children engaged in child labor in the last year (60%) compared to 1.32 million in the last week (38%) and 1.94 million engaged in hazardous work (56%) compared to 1.10 million (32%).

The large increases across the board between the usual activity status and current activity status show that many children do not work year round and are only involved in seasonal work. The fact that there are similar percentage point increases across the different categories even though the overall number of children engaged in activities declines from working to child labor to hazardous work may imply that the hazardous work activities are more driven by the seasonality of the activities. Some activities (land clearing, heavy loads, agro-chemicals, and sharp tools) are more seasonal than others (long working hours and night work) and seasonal activities that take place more often in the harvest season would be expected to see the largest differences. To further explore the increase in children exposed to hazardous work activities, Table 65 compares the changes in the different hazardous work activities to see which particular activities are driving the changes seen above.

Table 64: Estimates of Change in Children Engaged in Child Labor and Exposure to Hazardous Labor of Children Working in Agriculture By the 7 Day and 12 Month Definitions, in Côte d'Ivoire and Ghana, in 2018/19

Children in all agricultural households		All children	Children Working in Agriculture				Children Engaged in Child Labor in Agriculture				Children Engaged in Hazardous Work in Agriculture			
		Number	Number	Pct	Diff (pp)*	Sig of diff^	Number	Pct	Diff (pp)*	Sig of diff^	Number	Pct	Diff (pp)*	Sig of diff^
Total	7 Day	3,476,523	1,482,065	43%	25%	***	1,316,185	38%	22%	***	1,102,854	32%	24%	***
	12 Month		2,348,567	68%			2,097,212	60%			1,936,326	56%		
Côte d'Ivoire	7 Day	2,082,507	845,182	41%	24%	***	752,571	36%	21%	***	626,335	30%	23%	***
	12 Month		1,336,435	64%			1,194,033	57%			1,106,329	53%		
Ghana	7 Day	1,394,016	636,882	46%	27%	***	563,614	40%	24%	***	476,519	34%	25%	***
	12 Month		1,012,132	73%			903,180	65%			829,997	60%		

Source: NORC Child survey 2018/19, weighted, strata 1-3

**Calculated as the difference between the 7 day and 12 month rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 65: Prevalence of Children, 5-17 Years, Exposed to Various Types of Hazardous Work Activities by the 7 Day and 12 Month Definitions, in Côte d'Ivoire and Ghana, 2018/19*

Percentage of children in agricultural households exposed to:	Total				Côte d'Ivoire				Ghana			
	7 Day	12 Month	Diff (pp)*	Sig of diff^	7 Day	12 Month	Diff (pp)*	Sig of diff^	7 Day	12 Month	Diff (pp)*	Sig of diff^
Number of children 5-17 years in agricultural households	3,476,523		N/A	N/A	2,082,507		N/A	N/A	1,394,016		N/A	N/A
Hazardous Work Activities												
V1: Land clearing	8%	19%	12%	***	10%	23%	13%	***	5%	14%	9%	***
V2: Heavy loads	17%	36%	19%	***	17%	37%	20%	***	18%	36%	18%	***
V3: Agro-chemicals	11%	29%	18%	***	11%	25%	14%	***	11%	34%	24%	***
V4: Sharp tools	25%	46%	21%	***	24%	44%	20%	***	27%	50%	22%	***
V5: Long working hours	1%	1%	0%		2%	2%	0%		1%	1%	0%	
V6: Night work	1%	3%	1%	***	1%	2%	1%	***	1%	3%	2%	
Exposed to multiple hazards	33%	57%	24%	***	32%	55%	23%	***	35%	60%	24%	***
Average number of hazards	0.6	1.3	111%	***	0.6	1.3	106%	***	0.6	1.4	120%	***

Source: NORC Child survey 2018/19, weighted, strata 1-3

**Calculated as the difference between the 7 day and 12 month rates in percentage points, includes rounding*

*^Significance of Difference *** p<0.01*

Table 65 shows for children's exposure to hazard in agriculture in general, there were significantly higher levels of engagement in each activity for both Côte d'Ivoire and Ghana for all activities except long working hours (stayed constant at 1%) and night work (only significant for Côte d'Ivoire). The largest overall increases were found in work that was seasonal; sharp tool use (20 percentage points in Côte d'Ivoire and 22 percentage points in Ghana), followed by agro-chemicals (14 percentage points in Côte d'Ivoire and 24 percentage points in Ghana), heavy loads (20 percentage points in Côte d'Ivoire and 18 percentage points in Ghana), and land clearing (13 percentage points in Côte d'Ivoire and 9 percentage points in Ghana). There was a much smaller increase in night work (1 percentage points in both Côte d'Ivoire and remained stable in Ghana at 1%), which along with long working hours are activities that are less likely to be seasonal in nature.

The large increases in the seasonal activities (V1-V4) show that much of the increase in children involved in hazardous labor is driven by the increases in seasonal activities in agriculture instead of just an overall increase in the number of children working. If the increase was only due to increase in children working then there would be expected to be a large and consistent change across all six categories. It is important to note that the overall incidence of hazardous labor is lower in non-seasonal activities (1 percent for long working hours and night work in the seven day reference period), so the large increase in absolute terms would not be expected. However, the fact that these numbers are low and stay low show that much of driving force behind the level of children involved in hazardous work in agriculture is driven by the more seasonal activities.

Between the two countries, of the four seasonal activities, the trend in increase in exposure to hazardous work is generally similar.

10.5.2 Frequency of exposure to Hazardous Work in Cocoa Production in 2018/19 over the 12 months reference periods[80]

The frequency that children engaged in hazardous work in cocoa production is also important in determining the prevalence and impact/intensity of child labor and hazardous labor. Merely looking at the binary of whether or not a child was exposed to any activities does not paint the full picture, and knowing how often these activities occur is an important step in determining how wide spread the issue is. Additionally, breaking the different activities of cocoa production into components shows how different aspects of the activities play into the narrative. Tables 66-69 show the frequency of which components of hazardous work children were exposed to.

Table 66 shows that of the children who were exposed to land clearing (V1) in cocoa production, the most common overall subcomponent to be exposed to was land clearing (32%), followed by

[80] Note that frequencies of components can only be calculated for V1-V4, as the survey data does not include frequencies of V5 (long working hours) and V6 (night work).

felling and chopping (18%), and burning (10%). The general trend for land clearing and felling and chopping was that highest frequency level of six or more times saw the largest percent of those engaged in that activity (16% for land clearing and 8% for felling and chopping for Côte d'Ivoire and Ghana). The opposite trend was suggested for burning with only 2 percent reporting six or more times in Côte d'Ivoire and Ghana. These frequencies suggest that the biggest drivers of V1 were also the activities that happened the most frequently, and that the incidence of land clearing was high.

The types and frequency of heavy loads carried in cocoa production is shown in Table 67 for those children that carried a heavy load. The most common types of loads carried overall were gathering/heaping cocoa pods (35%) and loads during land clearing (26%). Each of these types of loads saw the general trend that the higher frequency levels saw a higher percentage of children engaged in that activity in both Côte d'Ivoire and Ghana (16% and 13% for gathering and 14% and 13% for loads during land clearing for Côte d'Ivoire and Ghana in the highest frequency level).

The next most common types of loads were fermented cocoa beans (24%), other loads (15%), and water for spraying (18%), and the least common was dry cocoa beans to shed (11%). For all the loads (except other) the level of engagement by children stayed constant across the different frequency levels. This indicates that the most common types of loads carried were also the loads that were the most frequently carried, and that the overall incidence of carrying heavy loads was high.

The different types of exposure to agro-chemicals in cocoa production and the frequency of this exposure for children who were exposed can be found in Table 68. The two most common types of exposure were carrying water for spraying (35%) and being present during pesticide spraying (23%). Carrying water for spraying was more common for higher frequencies of exposure (12% for Côte d'Ivoire and 16% for Ghana for the highest frequency level), this is inconsistent with carrying a heavy load of water for spraying, which stayed constant across frequency levels. Conversely being present during spraying decreased in percentage of children exposed as the frequencies increased.

Table 66: Prevalence of Children, 5-17 Years, Exposed to Land Clearing Components in Cocoa by Frequency, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children in agricultural households exposed to:	Total				Côte d'Ivoire				Ghana			
	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times
Number of children working in cocoa	1,667,575				831,937				835,638			
Land Clearing (V1) in cocoa												
Land clearing in cocoa	68%	8%	8%	16%	52%	11%	12%	25%	84%	4%	4%	7%
Felling and chopping in cocoa	82%	5%	5%	8%	74%	7%	7%	12%	90%	3%	2%	5%
Burning in cocoa	90%	5%	3%	2%	89%	6%	3%	2%	91%	5%	3%	2%

Source: NORC Child survey 2018/19, weighted, strata 1-3

Table 67: Prevalence of Children, 5-17 Years, Exposed to Heavy Loads Components in Cocoa by Frequency, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children in agricultural households carrying different loads:	Total				Côte d'Ivoire				Ghana			
	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times
Number of children working in cocoa	1,667,575				831,937				835,638			
Heavy loads (V2) in cocoa												
Loads of wood and other loads during land clearing in cocoa	74%	5%	7%	14%	73%	5%	7%	14%	74%	5%	8%	13%
Loads of water for spraying in cocoa	82%	5%	7%	7%	80%	5%	7%	8%	85%	4%	6%	5%
Loads while gathering and heaping cocoa pods in cocoa	65%	10%	11%	14%	64%	9%	11%	16%	66%	10%	11%	13%
Loads of fermented cocoa beans in cocoa	76%	7%	8%	9%	77%	9%	6%	9%	75%	6%	10%	9%
Loads of dry cocoa beans to shed in cocoa	89%	4%	4%	4%	87%	5%	4%	5%	91%	3%	3%	3%
Other heavy loads in cocoa	85%	3%	4%	7%	79%	5%	6%	11%	91%	2%	3%	4%

Source: NORC Child survey 2018/19, weighted, strata 1-3

Table 68: Prevalence of Children, 5-17 Years, Exposed to Agrochemicals Components in Cocoa by Frequency, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children in agricultural households exposed to:	Total				Côte d'Ivoire				Ghana			
	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times
Number of children working in cocoa	1,667,575				831,937				835,638			
Agro-chemicals (V3) in cocoa												
Spraying of pesticides, insecticides in cocoa	92%	4%	3%	2%	91%	4%	3%	2%	93%	3%	3%	1%
Being present or working in the vicinity of farm during pesticide spraying in cocoa	77%	11%	7%	5%	77%	11%	6%	6%	76%	11%	8%	4%
(Re)entering a sprayed farm within less than 12 hours of spraying in cocoa	90%	5%	3%	2%	89%	6%	2%	2%	90%	5%	4%	2%
Carrying water for spraying in cocoa	65%	11%	10%	14%	70%	9%	9%	12%	61%	12%	12%	15%
The sale, transport, or handling of agro-chemical products in cocoa	88%	5%	5%	3%	88%	4%	4%	3%	87%	5%	5%	3%
Washing containers of agro-chemical products and spraying machine, and/or disposal of agro-chemical products in cocoa	90%	4%	4%	2%	89%	4%	5%	2%	91%	4%	3%	2%

Source: NORC Child survey 2018/19, weighted, strata 1-3

Table 69: Prevalence of Children, 5-17 Years, Exposed to Sharp Tools Components in Cocoa by Frequency, in Côte d'Ivoire and Ghana, 2018/19

Percentage of children in agricultural households exposed to:	Total				Côte d'Ivoire				Ghana			
	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times	0 times	1-2 times	3-5 times	6+ times
Number of children working in cocoa	1,667,575				831,937				835,638			
Sharp tools (V4) in cocoa												
Using machetes or long cutlasses for weeding in cocoa	35%	13%	16%	37%	35%	15%	14%	36%	35%	10%	17%	38%
Handling motorized equipment or machines in cocoa	96%	1%	1%	1%	97%	1%	1%	1%	96%	1%	1%	2%
Harvesting with a machete or sickle in cocoa	69%	8%	9%	14%	65%	11%	9%	15%	72%	6%	8%	14%
Harvesting overhead cocoa pods with harvesting hook or sickle in cocoa	81%	5%	6%	8%	80%	5%	5%	9%	82%	4%	6%	8%
Breaking cocoa pods with knife or a sharp object/tool in cocoa	57%	11%	13%	19%	52%	14%	13%	21%	62%	9%	12%	17%

Source: NORC Child survey 2018/19, weighted, strata 1-3

The next most common types of exposure were the sale/transport/handling of agrochemicals (12%), re-entering a sprayed farm (10%), washing/disposal of agrochemicals (10%), and spraying of pesticides (8%). Each of these types of exposure also decreased in percentage of children exposed as the frequencies increased like being present during spraying. The fact that for all types of exposure (except carrying water for spraying) has lower frequencies of exposure shows that the intensity of exposure to agro-chemicals is less prominent than for land clearing and carrying heavy loads.

Table 69 shows the frequency levels for different types of sharp tool use in cocoa agriculture for children who used sharp tools. The most common use of sharp tools by far was using machetes/long cutlasses (65%), and this was more common at higher frequencies of exposure (36% for Côte d'Ivoire and 35% for Ghana in the highest frequency level). The next most common uses of sharp tools were breaking cocoa pods (43%), harvesting with a machete/sickle (31%), and harvesting cocoa pod with a harvesting hook/sickle (19%). Each of these types of sharp tool use were also more common at higher frequencies, which shows that the incidence of sharp tool use is also very high overall.

Across the four hazardous work activities in cocoa production, there were generally high intensity of exposure for land clearing, heavy loads, and sharp tools as measured by frequency of activity levels. The only hazardous work activity with lower intensity was use of agro-chemicals. In section 4.2 the largest increase in exposure to a hazardous work activity from 2008/09 to 2018/19 came from use of agro-chemicals, however since the intensity of agro-chemical use is overall not very high this makes that result less troubling as the overall impact of agro-chemical use is not as high relatively.

10.6 Annex VI: Additional Insights from 2018/19 Survey Round

In this section we explore how different household, community, and school characteristics are related to children's exposure to child labor in agriculture and to hazardous work within a household. Each of the variables analyzed below most likely play some role in determining child labor rates and lend further evidence to the necessity of taking an ecosystem approach to the complex issue of child labor. To do this we present the proportion of households having children in child labor in agriculture and children exposed to hazardous work within a household disaggregated by the given demographic, economic characteristics of households, by community characteristics and by school characteristics in the neighborhood of cocoa producing areas in Côte d'Ivoire and Ghana. **It is important to note that these comparisons do not imply attribution/causality**, rather indicates potential correlation only. Tables 70-72 present the values of proportion of children in child labor in agriculture and children exposed to hazardous work by parent and household characteristics, by community and school characteristics.

Data presented in Tables 70-72 indicate that mother education level and household head's awareness of child labor are negatively correlated with the prevalence of child labor.

Proximity to schools may influence child labor and hazardous child labor prevalence, where a higher rate of child labor and hazardous child labor would be expected in areas without schools because sending children to school would be more costly than sending them to work.

Among community infrastructure, in Côte d'Ivoire and Ghana no correlation between improved roads or microfinance institutions was found.

In addition to proximity to schools, it is also likely that school quality might affect attendance and hence child labor and hazardous child labor. As a proxy of school quality, we test whether prevalence of child labor and hazardous child labor were lower in communities where greater proportion of schools had toilets, piped drinking water and canteens.

In Côte d'Ivoire and Ghana no changes in child labor or hazardous child labor were found to be correlated with the school characteristics.

Data presented in Table 70 explore maternal and paternal education, household income, area under cocoa cultivation, head-of-household migration status and awareness of child labor. These issues likely have an influence on children's exposure to child labor and hazardous work. In Ghana a higher proportion of children whose mother have below secondary level education were exposed to child labor and hazardous child labor compared to children whose parents have at least secondary level education (65% versus 48% for child labor and 62% versus 44% for hazardous child labor). However, in Ghana there was no statistically significant difference in child labor and hazardous child labor for children whose father had at least a secondary education (around 58% child labor and 54% hazardous child labor). In Côte d'Ivoire there was no statistically significant difference in child labor & hazardous child labor by either parents' education level (around 38% child labor and 36% hazardous child labor for mother's education level and 40% and 39% for father's education level).

Higher education levels may imply greater awareness on the issue of child labor, which might, in turn, lead to lower child labor and hazardous child labor rates. While the differences in the likelihoods were not present in Côte d'Ivoire, they were more prominent Ghana, as exposure to child labor and hazardous child labor was much larger when mothers had below secondary education versus when mothers had at least secondary education.

Table 70: Estimate of Proportion of Children Engaged in Child Labor and Exposure to Hazardous Child Labor in Cocoa by Parent and Household Characteristics, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

Parent and Household Characteristics	Côte d'Ivoire		Ghana	
	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa
Education of Mother				
Below secondary	40%	38%	65%	62%
Secondary or above	36%	34%	48%	44%
Significance			***	***
Education of Father				
Below secondary	42%	41%	62%	58%
Secondary or above	38%	36%	55%	50%
Significance				
Income Group				
Low income*	37%	36%	56%	53%
High income**	38%	36%	55%	50%
Significance				
Area under Cocoa Cultivation				
Less than 5 acres	43%	42%	56%	53%
Greater than 5 acres	43%	42%	62%	57%
Significance				
Household Heads' Awareness of Child Labor				
Head not aware	39%	38%	59%	55%
Head aware	37%	35%	53%	49%
Significance				
Migration: Head ever migrated to and from another village				
Not migrated	35%	34%	56%	52%
Migrated	42%	41%	55%	50%
Significance				

Source: NORC Household Head survey 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

** Low income: with income within the lower 60% of income distribution*

**High income: with income within the upper 40% of income distribution*

Household income is often considered as one of the most important factors that influences the prevalence of child labor and hazardous child labor. In low-income households, it is likely that more children are working in agriculture to support their parents and as a result, potentially have greater proportion exposed to child labor or hazardous child labor. However, the data reported in Table 70 indicates that there was no statistically significant difference in child labor and hazardous child labor rates between low income families (with income in the lower 60% of income distribution) and high income families (incomes quintiles 4-5). An important caveat is that the NORC research program did not include a detailed household income module but rather asked a few, self-reported measures of household income. Future studies, with a household economy focus, should continue this investigation into the relationship between household income and child labor. However, taking an ecosystem approach is essential, and household income is most likely only one variable among others to consider when attributing changes in child labor.

The comparison of child labor and hazardous child labor rates by household's area under cocoa cultivation indicates that there was no statistically significant difference in child labor and hazardous child labor prevalence between households with small cocoa farms (less than 5 acres) and households with large are under cocoa (more than 5 acres) in both countries.

Household head's awareness of child labor and the effects of it on children did not lead to fewer children from these households being exposed to child labor in both countries and hazardous child labor in Côte d'Ivoire. There was also however no statistically significant difference in hazardous child labor in Ghana by head's awareness.

Household migration could also affect child labor with households that migrated being more in need of money and therefore have higher levels of child labor. This was not found in the data where there was no statistically significant difference in child labor or hazardous child labor in Côte d'Ivoire and Ghana between the households with head migrated at least once versus the household where head did not migrate.

The next section will discuss the potential effects of community characteristics on child labor and hazardous work.

Table 71 shows how community and infrastructure characteristics such as ease of access to JHS and SHS schools (based on distance to the nearest school), access to improved roads, access to grid electricity, and presence of microfinance institutions could influence prevalence of child labor and hazardous child labor in Côte d'Ivoire and Ghana.

Table 71: Estimate of Proportion of Child Labor and Exposure to Hazardous Child Labor in Cocoa by Community Characteristics, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

Community Characteristics	Côte d'Ivoire		Ghana	
	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa
Primary School Location				
Closet primary less than 1 KM away	42%	39%	68%	62%
Closet primary more than 1 KM away	38%	37%	52%	48%
Significance			***	
Junior High School (JHS) Location				
Closet JHS less than 2 KM away	39%	37%	62%	57%
Closet JHS more than 2 KM away	36%	35%	52%	49%
Significance				
Senior High School (SHS) Location				
Closet SHS less than 5 KM away	38%	36%	59%	55%
Closet SHS more than 5 KM away	40%	38%	49%	46%
Significance				
Improved Road				
Community has improved road	43%	43%	53%	50%
Community does not have improved road	37%	36%	56%	51%
Significance				
Grid Electricity Available				
Has access to grid electricity	38%	36%	52%	49%
Does not have access to grid electricity	38%	37%	67%	60%
Significance				
Microfinance Institution				
Community has institution	55%	55%	56%	52%
Community does not have institution	37%	35%	54%	51%
Significance				

Source: NORC Community survey 2018/19, weighted, strata 1-3

*^Significance of Difference *** p<0.01*

Quantitative Insight

In Ghana communities where the closest primary school was within 1 km saw lower rates of child labor.

Proximity to schools may influence child labor and hazardous child labor prevalence, where a higher rate of child labor and hazardous child labor would be expected in areas without schools because sending children to school would be more costly than sending them to work. In Côte

d'Ivoire, exposure to child labor and hazardous child labor was not significantly different in communities where the closest JHS was less than 2 km away and where the closest SHS was less than 5 km away, and there was no statistically significant difference with the closest primary school being within 1 km. In Ghana communities where the closest primary school was within 1 km saw lower rates of child labor (68% versus 52%), but no statistically significant difference was found on the distance to the nearest JHS and SHS.

Community infrastructure in terms of improved roads and availability of grid electricity are also factors potentially influencing the extent to which children are exposed to child labor or hazardous child labor. Côte d'Ivoire In Côte d'Ivoire and Ghana no statistically significant difference in child labor and hazardous child labor rates was found in communities with improved roads. Similarly, having access to grid electricity had no statistically significant difference on exposure to child labor or hazardous child labor.

Microfinance institutions provide financial services to individuals in communities in the form of loans that can be used to expand agricultural activities. Access to credit is considered as one of the factors that can influence households' ability to hire labor from the market. Lack of smooth access to finance can make a household vulnerable to liquidity constraints and thus influence them to use children from own household to substitute hired labor. However, in Côte d'Ivoire and Ghana, there was no statistically significant difference in child labor and hazardous child labor rate by the access to a microfinance institute.

Next, we explore whether exposure to child labor and hazardous vary among communities with different school infrastructure.

As school attendance has increased in Côte d'Ivoire and Ghana, it is likely that school infrastructure related factors such as –toilets, piped drinking water and canteens – also influence the prevalence of child labor and hazardous child labor in these countries. However, no such effect was found in Côte d'Ivoire or Ghana.

Some of the household level factors such as parental education seemed to be correlated to children's exposure to child labor and hazardous child labor. Overall, child labor and hazardous child labor rates may be lower in areas with better access to schools. In Côte d'Ivoire and Ghana, child labor and hazardous child labor rates did not seem to differ by community level infrastructure considered here.

Table 72: Estimate of Proportion of Child Labor and Exposure to Hazardous Child Labor in Cocoa by Child, School Characteristics, All Agricultural Households, in Côte d'Ivoire and Ghana, 2018/19

School Characteristics	Côte d'Ivoire		Ghana	
	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa	Exposure to Child Labor in Cocoa	Exposure to Hazardous Child Labor in Cocoa
Toilet in School				
School does not have toilet	38%	37%	56%	52%
School has toilet	38%	37%	52%	48%
Significance				
Piped Drinking Water in School				
School does not have piped drinking water	39%	38%	55%	51%
School has piped drinking water	34%	32%	55%	52%
Significance				
School has Canteen/Kitchen				
School does not have kitchen	37%	36%	55%	51%
School has kitchen	40%	38%	53%	50%
Significance				

Source: NORC School survey 2018/19, weighted, strata 1-3
*^Significance of Difference *** p<0.01*

10.7 Annex VII: Supplement I: Quantitative Analysis of Assessment of Effectiveness of Interventions

10.7.1 Literature review

In order to assess the effectiveness of interventions, we first need to identify the various channels through which interventions influence child labor. Through a literature review, we identified the following factors that typically affect child labor and, correspondingly, the major channels through which these factors affect and moderate child-labor outcomes: poverty, opportunity costs of child labor, household composition, access to capital markets, regulatory factors and production-related factors.

Poverty, especially in the form of adult household members' wages, has been shown to have an important influence on child labor. Blunch, in an evaluation of the 1997 Core Welfare Indicators Survey in Ghana, finds that "Poverty affects the likelihood of engaging in harmful child labor positively." Edmonds's 2001 study (as cited in Basu and Tzannatos 2003), found that increased household income can explain 94 percent of the decline in child labor for households at the poverty line, illustrating the key role that income plays with regards to the level of child labor.

This is also documented by Levy (1985), Rosenzweig (1981), Sakellariou and Lall (1998), and Cartwright (1998) who find that increases in women's wages significantly decrease female child labor (as cited in Canagarajah and Nielsen 2001). In fact, the first two of these studies find that "that a 10 percent increase in women's wage rates would decrease the female child's labor force participation by as much as 10 percent", while the last two "reach a similar conclusion." Together, these studies highlight the important influence of poverty, and especially of wages, on child labor rates.

Opportunity costs, in the form of the expected returns to labor and its clearest substitute — education, also play an important role in affecting child labor. The daily wage earned through child labor, for example has a significant positive impact on the hours of work for children, according to Bhalotra and Heady (1998), as cited in Canagarajah and Nielsen (2001). The returns on child labor are also variable based on farm size, such that larger farms, which require more labor but which do not have the ability to mechanize, see increased child labor.

Households also weigh the potential returns to education and its costs when determining the level of child labor. In an analysis of child labor in Zambia, Nielsen (1998), using the school's roofing as a proxy for school quality, found that in some cases, a school roof's poor condition increases the probability of working by 15 percentage points (as cited in Canagarajah and Nielsen (2001)). Accessibility to a primary school is likewise a determinant of child labor, as shown by Nielsen (1998) who found that presence of a primary school increases school attendance by 10 percentage points in some cases, whereas the availability of a passable road decreases child labor by more than 10 percentage points and also increases school attendance significantly. As children lack the agency to make these decisions themselves, their guardians will weigh these factors, the demand for labor and its expected returns, against the supply, quality and returns to education when determining levels of child labor.

Also at play within these decisions is the household's composition, which includes household size and education levels, and shows intra-household variance for child labor based on age. This latter condition is summarized in the idea of "sibling complementarity," described by Basu and Tzannatos (2003) as the condition "where one child's labor makes it possible for another child to go to school." Citing DeGraff, Bilsborrow, and Herriman (1993), Canagarajah and Nielsen (2001) noted that the incidence of child labor is higher for the older children than for the younger children. Complementary to this, Nielsen (1998) finds that the higher the number of older siblings, the lower the probability of working and the higher the probability of attending school. Younger children, therefore, should be less likely to engage in child labor than their older siblings.

The relationship between age and child labor, however, is more complicated when considering the ages of older household members and the age of the household head. Grootaert (1998) and

Nielsen (1998), for example, find that the higher the age of the household head the lower the probability of working. This is presumably influenced by the household head's own increased wealth over time. Older household members, on the other hand, who may themselves affect the dependency ratio in the household, have a negative impact on school attendance. Canagarajah and Coulombe (1998), for example, "find that the presence of household members older than 60 increases the probability of working and decreases the probability of attending school. In Ghana, the effect varies from 1 to 4 percentage points (Canagarajah and Nielsen, (2001). These impacts highlight the differential effects of household distributions within and across generations on child labor.

Capital markets are likewise a determinant of child labor, especially as it relates to the ability of a household to manage shocks. Households that lack access to credit and assets to shed see the greatest increase in child labor from such shocks. Nielsen (1998) finds that an indicator for whether or not a household owns an asset has a significant effect on both the probability of working and the probability of attending school by as much as 10-percentage-points.

However, regulatory factors can also include informal mechanisms such as culture, which dictate the cultural norms around child labor. Coulombe evaluates the differences of child labor as they related to religion and finds that Christians are more likely to attend school, and in rural areas they are also less likely to work than Muslims and those who practice traditional religion (Coulombe, 1998). He further finds that traditions and attitudes have a significant impact on child labor and can increase the probability of child labor by 30 percentage points. Similar to this, Webbink (2013) finds that culture context have a significant effect and that these factors affect child labor generally and may also have differential effects based on the gender of the child.

Production-related factors also serve an important role in determining child labor and are influenced by the sector, mode of production, and pricing for products. Perhaps most fundamental to production-related factors are the differential labor demands for across products and the ability for children to supply the required labor for these goods. In a rural setting, for example, the labor demands for different agricultural crops may vary significantly as will the demands for child labor for irrigation or application of pesticides. Regulatory factors also overlap with production-related factors in such cases where production is gender-based, creating differential labor demands across children. For example, Cogneau (2012) finds that cocoa bean harvesting is more a male task, whereas plantains are more a female crop. Production-related factors can further differential child labor based on age, as Cogneau argues that young kids are probably too young to be put to work significantly in cocoa bean harvesting.

As illustrated above, the factors which influence child labor may interact with one another. There are also variations in the relative importance of these factors depending on the context and

market under consideration. However, as the literature demonstrates, these factors are key mechanisms in determining the supply and demand for child labor. As such, these same factors of poverty, opportunity costs of child labor, household composition, access to capital markets, regulatory factors and production-related factors are the key avenues for affecting child-labor outcomes.

10.7.1.1 References

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10.7.2 Modelling Child Labor and Hazardous Child Labor

One of the main objectives of this study is to assess how different interventions, either independently or in conjunction with other interventions, affect the main outcome variables of interest - children's engagement in child labor and hazardous work as well as their prevalence rates within a household.

For addressing research questions relating to the effect of interventions, it is important to develop a model-based approach which will be able to empirically test whether, after controlling for observable influences of different factors, interventions affect the outcome variables of interest. For this purpose, we apply a regression framework using a two-step approach. First we used a theoretical model of the household's decision-making process to identify factors that might influence children's exposure to child labor and hazardous work in cocoa production. Then we estimate whether, after controlling for such factors, the interventions affect children's exposure to child labor and hazardous work in cocoa production.

In this section we develop a generic model that examines the relationship between children's exposure to child labor and hazardous work in cocoa production and their determinants using a theoretical model of the household's decision-making process. This generic model will serve as the base of the empirical analysis to be undertaken for addressing the research questions on the influence of different interventions on children's exposure to child labor and hazardous work in cocoa production.

There are several factors that might affect the trade-offs that a family faces between sending children to school and engaging them in child labor in production activities. Using guidance from the literature review of previous research studies (see Annex 10.7.1), we developed a theoretical model that examines for community *c* the household's decision to subject its children

to child labor. The approach accounts for the head of household i's concern for their children's welfare ($W_{c,i}$), opportunity cost of child (hazardous) labor ($O_{c,i}$), and the relevant household characteristics. Toward that end consider the following model:

$$L_{c,i}^{\mathrm{CL}} = f\{(W_{c,i}); (O_{c,i}); (Z_{c,i}); \varepsilon_{\ i}\}$$

where $L_{c,i}^{\mathrm{CL}}$ is the observed child labor function, and $Z_{c,i}$are household characteristics and $\varepsilon_{\ i}$ is Normal deviate. Consider each of the explanatory variables in turn.

Child welfare might be proxied by the number of children in household, $(C_{c,i})$ (more children implies less concern), level of household member's education, $(E_{c,i})$ (the higher it is the more a child might be valued) and head's perception about child work and benefit of education ($M_{c,i}$). These result in the following sub-model:

$$W_{c,i} = f\{(C_{c,i}); (E_{c,i}); (M_{c,i})\}$$

Child labor has two opportunity costs, one financial and immediate, the other investment-related and delayed. The financial component comprises wages foregone (or the child works) and wages paid out to a labor substitute. A potential proxy variable for these would be the average product of labor for a household ($AP_{c,i}$, which is a function of farm and household characteristics) and average wage in the community (w_C). The investment component might be captured by school quality and infrastructure (SC_C). These result in the following sub-model:

$$O_{c,i} = f\{(AP_{c,i})\ (w_C); (SC_C)\}$$

Household characteristics might comprise the demographic influence ($D_{c,i}$) includes religion, number of household members, head age, proportion of children in different age groups, proportion of female children in the household, whether household migrated, presence of non-relative children in household, household wealth and liquidity ($HW_{c,i}$) and farming characteristics ($F_{c,i}$).

$$Z_{c,i} = f\{(D_{c,i}); (HW_{c,i}); (F_{c,i})\}$$

Finally, these sub-models are substituted into the model for $L_{c,i}^{\mathrm{CL}}$ and the combination is estimated this using a reduced form specification:

$$L_{c,i}^{\mathrm{CL}} = \beta_C C_{c,i} + \beta_E E_{c,i} + \beta_M M_{c,i} + \beta_{SC} SC_c + \beta'_D D_{c,i} + \beta'_H HW_{c,i} + \beta_H F_{c,i} + \beta_V V_c + u_{c,i}$$

where V_c is a set of village/community characteristics that influence opportunity cost and average wage (through labor demand) in the community[81] and $u_{c,i}$ is the normal error term assumed to be independently and identically distributed.

This equation will be used as the fundamental model of child and hazardous labor while we estimate program impact of different interventions as specified in Section 8.3. Based on this expression of the child labor function above, the following sets of variables are included in the regressions:

- **Children number:** Number of children (total).
- **Household demographic characteristics:** Head age, gender, total adult members, total member with secondary/above education, proportion in different age groups (5-11, 12-14 & 15-17), proportion of female children in the household, religion, whether family migrated and whether non-relative children live in household.
- **Household Head's perception**: Value for education of children, perception about whether children should be working for pay below age 18.
- **Farming characteristics**: Type of crop produced by the household.
- **Household wealth and liquidity**: Asset (indicator of home quality and household asset/wealth) liquidity (whether can borrow to meet needs)
- **Community characteristics**: Importance of cocoa (most important source of income), having improved road, having access to senior high school (less than 5 KM), remoteness (distance from district capital).
- **School quality/infrastructure**: Indicator variable for concrete building, toilet inside school, having access to improved water source.

10.8 Annex VIII: Supplement II: Quantitative Analysis of Assessment of Effectiveness of Interventions

This annex presents the methodology used for conducting statistical analyses as a part of quantitative assessment of effectiveness of different interventions.

10.8.1 Education Material Assistance and Child Labor in the Cocoa Sector

Here we present the quantitative analysis undertaken to address the following research question:

[81] We hypothesized that wages are highly correlated with the average product of labor (APL) and then introduced an additional model in which the average product of labor is a function of farm and household characteristics which are included in the model.

Are children in households that received materials assistance related to education of children (such as school supplies, text books, uniform, etc.) less likely to be involved in child labor in the cocoa sector than their peers who did not receive such assistance?

10.8.1.1 Methodology

Given that provision of material support would be limited by the amount of resources available to the implementers, it is likely that beneficiary selection criteria were used to select the households who would most benefit from it. Thus, comparison of outcome differences between the recipients and non-recipients necessitates first identifying potential differences in these two groups that might have influenced the beneficiary selection process. Such differences on their own could have led to the observed differences in outcomes rather than the effectiveness of the assistance. If not controlled for, these differences can lead to selection bias in estimation. In order to address the potential selection bias which might influence the estimated effect of treatment (educational material assistance) on outcome variables (child labor and hazardous child labor), we used a quasi-experimental design. The quasi-experimental design was based on a two-step approach:

1. **Generate counterfactual**: To address selection bias where a group of household were selected by the implementers for disbursement of benefits, we identify a set of characteristics that may influence selection of beneficiaries such as number of children in different age groups, households' demographic characteristics and economic profile, among others. We then use entropy balancing,[82] a multivariate reweighting technique that generates a synthetic comparison group in such a way that the treated (beneficiary) households and the non-treated (comparison) households become statistically very similar (balanced) in observable characteristics that are likely to influence beneficiary selection process.

[82] Hainmueller, J. (2012). Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies. *Political Analysis*, 20(1): 25-46).

2. **Use regression model to estimate the impact**: Next, we estimate an attribution model to test whether the households that received educational material support were less likely to have child labor and children engaged in hazardous child labor in cocoa production. We estimate two models: one model defines the outcome variable as the likelihood (probability) of having at least one child in child labor/hazardous child labor; the other model defines the outcome variable as the percent of children in the household exposed to child labor/hazardous child labor. The models specify the outcome variables (child labor/hazardous child labor) as a function of household, community, and school characteristics. Finally, the model tests whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor.[83]

10.8.1.2 Data Source

The data sources we used for examining the research question is the sectorally representative child-labor and head-of -household surveys conducted by NORC during the 2018/19 main cocoa harvesting season. The 2018/19 child-labor survey captured data on children's exposure to child labor and hazardous child labor, and the head-of-household surveys captured whether there was any child in the household who benefited from material support related to education. In addition, we used data collected from a survey of community leaders and schools to control for community and school infrastructure related influences on the outcome variable of interest. Examples of these include the presence of improved roads, distance to the schools from the community, school building construction material, availability of toilets inside school, source of drinking water, etc.

The self-reported data show that in Côte d'Ivoire 605 households (44%) had at least one child who received benefits and in Ghana 164 households (14%) with at least one child that received material assistance related to education.

10.8.1.3 Analysis and Results

For generating the comparison group, the first step of the analysis was to use entropy balancing on the sample of households leading to a synthetically designed group of comparison households that were very similar to the treatment group (the *counterfactual*). Table 73 and

After the counterfactual was constructed, we used multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after

[83] Other influencing factors not of specific interest to research are often referred to as "covariates".

controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Ghana.

Table 74 present the result of entropy balancing showing the difference in variables with influence on selection process before balancing and after balancing for Côte d'Ivoire and Ghana.

Table 73: Ghana Entropy Balancing: Differences in Covariates Affecting Selection Before and After Balancing

	Comparison				Treatment	
	Before		After		Before	
	Mean	Variance	Mean	Variance	Mean	Variance
Total number of children age 5-11	1.37	0.99	1.48	0.99	1.48	0.99
Total number of children age 12-14	0.55	0.47	0.65	0.46	0.65	0.46
Dummy: Household head with secondary education	0.33	0.22	0.41	0.24	0.41	0.24
Dummy: Head believe that children should receive at least senior secondary education	0.98	0.02	1	0	1	0
Dummy: Household paid for school fees	0.51	0.25	0.37	0.23	0.37	0.24
Dummy: Household performs food crop farming	0.87	0.11	0.91	0.08	0.91	0.08
Dummy: Land cultivated is above median	0.54	0.25	0.58	0.24	0.59	0.24
Dummy: Agricultural labor main income source	0.15	0.13	0.21	0.16	0.21	0.17
Dummy: Petty trade main income source	0.32	0.22	0.31	0.21	0.31	0.22
Asset Index: Home quality[84]	0.24	1.56	0.06	1.12	0.06	1.12
Asset Index: Non-agricultural assets[85]	0.00	2.01	-0.05	1.90	-0.05	1.90
Dummy: High income household	0.36	0.23	0.41	0.24	0.41	0.24

After the counterfactual was constructed, we used multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child

[84] First Principal Component based index of home quality (having house made of stone/burnt brick/cement/concrete and having toilet inside house).

[85] First Principal Component based index of ownership of household non-agricultural assets such as radio, TV, refrigerator, bicycle, motor bike, cell phone, computer, sewing machine, and car.

labor and in hazardous child labor. The following table presents the regression results[86] for Ghana.

Table 74: Ghana, Probit Regression and Generalized Linear Regression: Education Material Assistance and Child Labor and Hazardous Child Labor

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	**Hazardous Child Labor**	**Child Labor**	**Hazardous Child Labor**
Estimated treatment effect	0.026 (0.031)	0.025 (0.032)	0.032 (0.030)	0.025 (0.027)
	Regression output: Probit model:		**Regression output: Generalized Linear Model[87]:**	
Treatment dummy: Members received educational material assistance	0.124 (0.149)	0.112 (0.145)	0.167 (0.157)	0.133 (0.141)
Total number of children	0.359*** (0.0616)	0.343*** (0.0657)	-0.0116 (0.0449)	-0.00285 (0.0486)
% of 12-14 children	1.281*** (0.294)	1.556*** (0.287)	1.613*** (0.351)	2.029*** (0.357)
% of 15-17 children	1.253*** (0.320)	1.567*** (0.328)	1.813*** (0.358)	2.250*** (0.369)
% of girl children 5-17	-0.382** (0.162)	-0.474*** (0.163)	-0.412** (0.179)	-0.507*** (0.196)
Head age	-0.00286 (0.00773)	-0.000627 (0.00707)	0.00158 (0.00725)	0.00409 (0.00727)
Head age-squared	2.91e-06 (7.36e-06)	7.85e-07 (6.74e-06)	-1.19e-06 (6.89e-06)	-3.48e-06 (6.92e-06)
Head Gender: Male	0.229 (0.187)	0.268 (0.183)	0.0728 (0.199)	0.128 (0.198)
Total number of adults	-0.0320 (0.0887)	0.00235 (0.0841)	0.00848 (0.0930)	-0.00139 (0.0880)
Number of adults with secondary/above education	0.0675 (0.0890)	-0.00150 (0.0847)	-0.0484 (0.0908)	-0.0757 (0.0824)
Dummy: Christian	0.00436 (0.169)	-0.131 (0.170)	0.0646 (0.218)	-0.0739 (0.213)
Dummy: Cocoa household	1.204*** (0.273)	1.170*** (0.276)	1.224*** (0.376)	1.198*** (0.402)
	-0.191	-0.143	-0.255	-0.128

[86] Included controls for missing observations and whether anyone other than the child was present during interview (not reported).

[87] Generalized non-linear least square regression with binomial family and logit link function, estimated using maximum likelihood estimation.

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Child Labor	Child Labor	Hazardous Child Labor
Dummy: Household produce commercial crop	(0.197)	(0.189)	(0.197)	(0.193)
Dummy: Household produce food crop	-0.117 (0.189)	-0.0551 (0.204)	0.0482 (0.152)	0.117 (0.171)
Dummy: Household has livestock farm	0.390*** (0.134)	0.320** (0.129)	0.378*** (0.146)	0.289** (0.141)
Amount of cocoa sold in 2017/18 harvest	5.73e-05 (0.000105)	-4.54e-05 (9.37e-05)	-7.55e-06 (0.000116)	-9.18e-05 (0.000112)
Asset Index: Home quality[88]	-0.0368 (0.0743)	0.0114 (0.0730)	-0.0194 (0.0852)	-0.000292 (0.0848)
Asset Index: Non-agricultural assets[89]	-0.126*** (0.0425)	-0.147*** (0.0462)	-0.100* (0.0530)	-0.119** (0.0588)
Dummy: Land holding above median	0.0693 (0.131)	0.0506 (0.140)	0.230* (0.132)	0.214 (0.148)
Dummy: Head can sufficiently borrow	0.428*** (0.143)	0.310** (0.146)	0.330* (0.176)	0.317* (0.180)
Dummy: Children's family migrated	0.0136 (0.127)	0.149 (0.128)	0.0355 (0.124)	0.141 (0.130)
Dummy: Non-relative children staying	-0.408 (0.275)	-0.231 (0.286)	-0.216 (0.406)	-0.0166 (0.392)
Dummy: Household head believe children start work for pay below 18	0.459*** (0.177)	0.404** (0.164)	0.416** (0.199)	0.248 (0.194)
Dummy: Cocoa is the most important source of income in community	1.008** (0.405)	1.148*** (0.388)	1.193*** (0.460)	1.062** (0.463)
Dummy: Community has improved road	-0.373 (0.229)	-0.148 (0.248)	-0.413 (0.305)	-0.335 (0.338)
Dummy: District capital more than 50 KM	-0.567 (0.380)	-0.277 (0.332)	-0.600 (0.426)	-0.533 (0.410)
Dummy: Secondary school within 5 KM	-0.179 (0.164)	-0.178 (0.153)	-0.121 (0.209)	-0.118 (0.204)
Dummy: Community has mobile connectivity	-0.885 (0.786)	-0.594 (0.753)	-1.448 (1.090)	-1.406 (1.105)
Dummy: School has concrete building	0.246 (0.291)	0.128 (0.267)	0.238 (0.340)	0.219 (0.332)
Dummy: Toilet inside school	0.309 (0.291)	0.223 (0.298)	0.318 (0.402)	0.106 (0.417)
Dummy: School has improved water	1.478	0.962	1.809	0.743

[88] First Principal Component based index of home quality (having house made of stone/burnt brick/cement/concrete and having toilet inside house).

[89] First Principal Component based index of ownership of household non-agricultural assets such as radio, TV, refrigerator, bicycle, motor bike, cell phone, computer, sewing machine, and car.

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Child Labor	Child Labor	Hazardous Child Labor
	(1.357)	(1.198)	(1.490)	(1.408)
Dummy: Strata1 (High cocoa production)	0.625 (0.594)	0.520 (0.570)	1.130 (0.821)	0.850 (0.810)
Dummy: Strata2 (Medium cocoa production)	-0.596 (0.531)	-0.106 (0.519)	-0.709 (0.673)	-0.576 (0.714)
Constant	-2.818*** (0.925)	-3.170*** (0.923)	-3.316*** (1.263)	-3.198** (1.333)
Observations	1,173	1,173	1,179	1,179
Pseudo R2	0.365	0.368	N/A	N/A

^ Dependent variables: Likelihood of having at least one child engaged in Child Labor and Hazardous Child Labor

^^ Dependent variables: Rate of Child Labor and Hazardous Child Labor in the Household

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

Similar to Ghana, we used entropy balancing to generate counterfactual for Côte d'Ivoire. The results of the entropy balancing is presented below for Côte d'Ivoire.

Table 75: Côte d'Ivoire Entropy Balancing: Differences in Covariates Affecting Selection Before and After Balancing

	Comparison				Treatment	
	Before		After		Before	
	Mean	Variance	Mean	Variance	Mean	Variance
Total number of children age 5-11	1.20	0.81	1.35	0.97	1.35	0.97
Total number of children age 12-14	0.39	0.38	0.49	0.43	0.49	0.43
Dummy: Household head with secondary education	0.13	0.12	0.21	0.16	0.21	0.16
Dummy: Head believe that children should receive at least senior secondary education	0.65	0.23	0.70	0.21	0.70	0.21
Dummy: Household paid for school fees	0.84	0.13	0.95	0.05	0.95	0.05
Dummy: Household performs food crop farming	0.74	0.19	0.85	0.12	0.85	0.12
Dummy: Land cultivated is above median	0.52	0.25	0.60	0.24	0.60	0.24
Dummy: Agricultural labor main income source	0.11	0.10	0.08	0.08	0.08	0.08
Dummy: Petty trade main income source	0.39	0.24	0.42	0.24	0.42	0.24
Asset Index: Home quality	-0.19	0.97	-0.40	1.26	-0.04	1.26
Asset Index: Non-agricultural assets	-0.12	1.73	0.01	1.82	0.01	1.82

Dummy: High income household	0.34	0.22	0.33	0.22	0.33	0.22

After the counterfactual was constructed, we used a multivariate regression model to estimate whether provision of material support related to education had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Côte d'Ivoire. [90]

Table 76: Côte d'Ivoire, Probit Regression and Generalized Linear Regression: Education Material Assistance and Child Labor and Hazardous Child Labor

	Probit Regression^		**Generalized Linear Regression^^**	
	Child Labor	**Hazardous Child Labor**	**Child Labor**	**Hazardous Child Labor**
Estimated treatment effect	-0.004 (0.027)	0.001 (0.027)	-0.015 (0.030)	-0.005 (0.025)
	Regression output: Probit model:		**Regression output: Generalized Linear Model[91]:**	
Treatment Dummy: Members received educational material assistance	-0.0138 (0.0891)	0.00365 (0.0898)	-0.0766 (0.127)	-0.0270 (0.123)
Total number of children	0.152*** (0.0331)	0.155*** (0.0337)	0.0514 (0.0403)	0.0517 (0.0407)
% of 12-14 children	0.904*** (0.150)	0.941*** (0.147)	1.370*** (0.210)	1.463*** (0.208)
% of 15-17 children	0.914*** (0.173)	0.932*** (0.171)	1.486*** (0.220)	1.551*** (0.215)
% of girl children 5-17	-0.273*** (0.0868)	-0.318*** (0.0908)	-0.418*** (0.127)	-0.484*** (0.136)
Head age	0.0407* (0.0217)	0.0483** (0.0216)	0.00883 (0.0297)	0.0119 (0.0294)
Head age-squared	-0.000403* (0.000208)	-0.000462** (0.000208)	-8.47e-05 (0.000281)	-0.000102 (0.000280)
Head Gender: Male	-0.0333 (0.115)	-0.0524 (0.114)	-0.0690 (0.176)	-0.116 (0.176)
Total number of adults	-0.0521* (0.0286)	-0.0538* (0.0300)	-0.0658 (0.0414)	-0.0588 (0.0425)
	0.0693	0.0818	0.112	0.104

[90] Included controls for missing observations and whether anyone other than the child was present during interview (not reported).

[91] Generalized non-linear least square regression with binomial family and logit link function, estimated using maximum likelihood estimation.

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Child Labor	Child Labor	Hazardous Child Labor
Number of adults with secondary/above education	(0.0572)	(0.0566)	(0.0797)	(0.0754)
Dummy: Christian	-0.0146 (0.0875)	-0.0103 (0.0866)	0.0449 (0.120)	0.0318 (0.122)
Dummy: Cocoa Household	0.822*** (0.135)	0.871*** (0.131)	1.347*** (0.210)	1.411*** (0.209)
Dummy: Household produce commercial crop	-0.111 (0.0996)	-0.0933 (0.0926)	-0.203 (0.144)	-0.161 (0.139)
Dummy: Household produce food crop	0.181 (0.115)	0.182 (0.117)	0.166 (0.159)	0.163 (0.165)
Dummy: Household has livestock farm	-0.0661 (0.0963)	-0.0673 (0.102)	0.0102 (0.123)	0.0209 (0.127)
Dummy: Amount of cocoa sold in 2017/18 harvest	3.87e-05 (2.95e-05)	3.96e-05 (3.15e-05)	5.34e-05 (4.39e-05)	5.68e-05 (4.51e-05)
Asset index: Home quality	-0.00701 (0.0410)	0.00370 (0.0421)	-0.0147 (0.0553)	-0.00303 (0.0553)
Asset index: Non-agricultural assets	-0.110*** (0.0364)	-0.0986*** (0.0365)	-0.137*** (0.0477)	-0.121*** (0.0460)
Dummy: Land holding above median	0.0165 (0.0939)	-0.0335 (0.0941)	0.00662 (0.129)	-0.0613 (0.129)
Dummy: Head can sufficiently borrow	-0.201** (0.0874)	-0.238*** (0.0835)	-0.320*** (0.116)	-0.338*** (0.115)
Dummy: Children's family migrated	0.158* (0.0847)	0.161* (0.0849)	0.125 (0.114)	0.156 (0.113)
Dummy: Non-relative children staying	0.0283 (0.174)	0.0508 (0.179)	0.0458 (0.214)	0.0224 (0.202)
Dummy: Household head believe children start work for pay below 18	0.193** (0.0930)	0.198** (0.0918)	0.288** (0.125)	0.270** (0.127)
Dummy: Cocoa most important source of income in community	0.0358 (0.136)	0.0210 (0.138)	0.0931 (0.178)	0.00476 (0.172)
Dummy: Community has improved road	-0.0458 (0.141)	-0.0854 (0.139)	0.0195 (0.183)	0.0278 (0.175)
Dummy: District capital more than 50 KM	-0.340** (0.169)	-0.451*** (0.165)	-0.429* (0.220)	-0.562*** (0.210)
Dummy: Secondary school within 5 KM	-0.360*** (0.129)	-0.361*** (0.134)	-0.449*** (0.161)	-0.470*** (0.163)
Dummy: Community has mobile connectivity	0.373* (0.191)	0.411** (0.180)	0.460* (0.262)	0.483* (0.260)
Dummy: School has concrete building	-0.496*** (0.187)	-0.558*** (0.190)	-0.602** (0.239)	-0.699*** (0.247)
Dummy: Toilet inside school	-0.0124 (0.148)	0.0424 (0.139)	0.168 (0.211)	0.272 (0.205)

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Child Labor	Child Labor	Hazardous Child Labor
Dummy: School has improved water	-0.255 (0.508)	-0.505 (0.484)	-0.568 (0.666)	-0.876 (0.650)
Dummy: Strata1 (High cocoa production)	0.175 (0.362)	0.154 (0.366)	0.867** (0.439)	0.754* (0.428)
Dummy: Strata2 (Medium cocoa production)	-0.692* (0.369)	-0.983** (0.402)	-1.061** (0.508)	-1.398*** (0.487)
Constant	-1.379** (0.679)	-1.433** (0.667)	-1.365 (1.024)	-1.307 (1.035)
Observations	1,357	1,357	1,374	1,374
Pseudo R2	0.211	0.222	N/A	N/A

^ Dependent variables: Likelihood of having at least one child engaged in Child Labor and Hazardous Child Labor
^^ Dependent variables: Rate of Child Labor and Hazardous Child Labor in the Household
Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

10.8.2 Livelihood Support and Child Labor in the Cocoa Sector

Here we present the quantitative analysis undertaken to address the following research question:

Are children in households where members received livelihood services (such as agricultural training, microfinance, and market access) less likely to be engaged in child labor in the cocoa sector than are children from households that did not receive such services?

10.8.2.1 Methodology

We use a model-based regression approach to assess whether households that received livelihood services (GAP training, microfinance services, and market linkage) were less likely to engage children in child labor and hazardous child labor or had lower rates of child labor and hazardous child labor compared to households that did not receive livelihood services, after controlling for other observable influences. For that, we follow the approach described in Annex 10.8.1. We first express the outcome variables (exposure to child labor and hazardous child labor) as a function of household, community, and school characteristics. Then, we estimate a regression equation to test whether, after controlling for such factors, the households where at least one member received livelihood services were less likely to engage children in child labor and in hazardous child labor in cocoa production and had lower rates of child labor and hazardous child labor in cocoa production than households that did not receive livelihood services.

It is important to note that when implementing partners offer livelihood services to a community not all the households participate. Only a subgroup of households in the community would either be eligible or self-select to participate in such programs. It is possible that the households that

were eligible or self-selected to participate in such programs were fundamentally different from the households that did not participate in such program, leading to the problem of selection bias. This could have occurred, for example, if some of the characteristics of the household that influenced its program eligibility or uptake also influenced the household's response ("performance") as a result of the intervention. One such example would be if entrepreneurial farmers were not only more likely to participate in a microfinance program but also more likely to put their children into school. Likewise, a farmer that accepts GAP training may be more likely to reduce the number of children in child labor and hazardous child labor than those who don't participate in GAP training.

In order to address the potential selection bias which might influence the estimated effect of treatment (livelihood services) on outcome variables (child labor and hazardous child labor), we used a quasi-experimental design. The quasi-experimental design is based on a two-step approach described below:

a. **Generate counterfactual**: To address selection bias where households self-select to participate in livelihood-support initiatives, we identify a set of variables that are expected to influence households' decision to participate in livelihood services offered in a community. We identify factors by examining the differences between the households that received/participated in such activities and the households that did not in the communities where the services were offered. These factors include household demographic characteristics (such as head's gender and age, and number of adults with secondary or above education), farming characteristics (such as engage in cocoa, plant other commercial crops, size of landholding), economic profile (such as having income from agricultural labor, petty trade, other self-employment etc., plus an indicator of wealth), variable on whether household recently migrated to the village, etc. In order to select the comparison group that could serve as the counterfactual, we decided to select households from the communities where the livelihood services were not offered (based on self-reported data by the head of the households). This was done to avoid the possibility of spillover effect influencing the results in the treatment communities. We then use entropy balancing on the sample of households from the non-treated communities, to generate a synthetically designed group of comparison households in such a way that the synthetic comparison group, on average, looks like the treatment group (that received livelihood services) in observable characteristics that might have influence on selection of beneficiaries.

b. **Use regression model to estimate the impact**: Next, we estimate whether the households that received livelihood services were less likely to engage children in child labor and in hazardous child labor in cocoa production. As described in Section 10.8.1.1, we estimated two models: one where the outcome variable was the probability of having at least one child engaged in child labor & hazardous child labor; and the other with the outcome variable as

the rate of exposure to child labor & hazardous child labor among the children in the households. The models specified the outcome variables (exposure to child labor/hazardous child labor) as a function of household, community, and school characteristics. Finally, the model tested whether, receiving livelihood services had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production controlling for other covariates.

10.8.2.2 Data Source

The data source to examine this research question is the child labor, head of the household, community and school surveys conducted by NORC during the 2018/19 main cocoa harvesting season in Côte d'Ivoire and Ghana.

The self-reported data show that in Côte d'Ivoire 128 households (9%) had at least one member who received livelihood support and in Ghana 70 households (5.8%) had at least one member who received livelihood support.

Given the relatively small sample size of households that received livelihood services in Ghana, the model was estimated only for Côte d'Ivoire.

10.8.2.3 Analysis and Results

The first step of the analysis was to use entropy balancing on the sample of households from the non-treated communities, to generate a synthetically designed group of comparison households. Table 77 presents the result of entropy balancing for Côte d'Ivoire showing the difference in variables with influence on selection process before balancing and after balancing which generated the synthetic comparison group.

Table 77: Côte d'Ivoire Entropy Balancing: Differences in Covariates Affecting Selection Before and After Balancing

	Comparison				Treatment	
	Before		After		Before	
	Mean	Variance	Mean	Variance	Mean	Variance
Land cultivated is above median	0.854	0.25	0.64	0.23	0.64	0.23
Household performs cocoa farming	0.86	0.12	0.86	0.12	0.91	0.08
Household performs commercial farming	0.47	0.25	0.54	0.25	0.54	0.25
Agricultural labor main income source	0.12	0.11	0.12	0.11	0.12	0.11
Self-employment main income source	0.10	0.09	0. 09	0.09	0.09	0.09
Asset Index: home quality	-0.11	1.16	-0.23	0.78	-0.23	0.78
Asset Index: non-agricultural assets	-0.11	1.64	-0.29	2.24	0.29	2.24

	Comparison				Treatment	
	Before		After		Before	
	Mean	Variance	Mean	Variance	Mean	Variance
Household head gender	0.88	0.10	0.97	0.02	0.98	0.02
Number of adults in household	3.03	2.56	3. 93	2.83	3.39	2.83
Head's perception: Girls should start working before 18	0.41	0.24	0.38	0.24	0.38	0.24

After the counterfactual was constructed, we used a multivariate regression model to estimate whether provision of livelihood services had any statistically significant effect on children's engagement in child labor and in hazardous child labor in cocoa production after controlling for other factors that influence a household's decision to engage children in child labor and in hazardous child labor. The following table presents the regression results for Côte d'Ivoire.

Table 78: Côte d'Ivoire, Probit regression and Generalized Linear Regression: Livelihood Service Support and Child Labor and Hazardous Child Labor

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Labor	Child Labor	Hazardous Labor
Treatment effect	-0.091 (0.081)	-0.068 (0.080)	-0.105* (0.062)	-0.090 (0.061)
	Regression output: Probit model:		Regression output: Generalized Linear Model[92]:	
Treatment Dummy: Members received livelihood support	-0.332 (0.299)	-0.252 (0.294)	-0.612* (0.366)	-0.529 (0.365)
Total number of children	0.243*** (0.0601)	0.239*** (0.0605)	0.0892 (0.0678)	0.0966 (0.0663)
% of 12-14 children	0.771*** (0.253)	0.797*** (0.257)	1.194*** (0.387)	1.240*** (0.397)
% of 15-17 children	1.220*** (0.284)	1.232*** (0.281)	1.996*** (0.414)	2.064*** (0.417)
% of girl children 5-17	-0.240 (0.184)	-0.310 (0.193)	-0.639** (0.266)	-0.719** (0.283)
Head age	0.121*** (0.0428)	0.125*** (0.0427)	0.128** (0.0652)	0.129** (0.0647)
Head age-squared	-0.00114*** (0.000409)	-0.00117*** (0.000408)	-0.00108* (0.000648)	-0.00108* (0.000640)
Head Gender: Male	-1.050**	-1.110**	-1.482*	-1.638**

[92] Generalized non-linear least square regression with binomial family and logit link function, estimated using maximum likelihood estimation.

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Labor	Child Labor	Hazardous Labor
	(0.489)	(0.472)	(0.826)	(0.793)
Total number of adults	-0.0490 (0.0545)	-0.0530 (0.0560)	-0.113 (0.0893)	-0.109 (0.0907)
Number of adults with secondary/above education	-0.0687 (0.104)	-0.0569 (0.107)	0.00154 (0.144)	-8.34e-05 (0.147)
Dummy: Christian	0.188 (0.174)	0.140 (0.169)	0.0823 (0.232)	-0.0189 (0.238)
Dummy: Cocoa Household	1.877*** (0.284)	1.841*** (0.300)	2.706*** (0.406)	2.634*** (0.438)
Dummy: Household produce commercial crop	-0.0515 (0.188)	-0.0598 (0.181)	-0.175 (0.249)	-0.146 (0.246)
Dummy: Household produce food crop	-0.0433 (0.185)	-0.00342 (0.192)	0.0212 (0.286)	0.0824 (0.283)
Dummy: Household has livestock farm	0.233 (0.165)	0.237 (0.174)	0.265 (0.226)	0.337 (0.237)
Dummy: Amount of cocoa sold in 2017/18 harvest	1.96e-05 (5.54e-05)	4.69e-05 (5.45e-05)	0.000102 (7.57e-05)	0.000120* (7.25e-05)
Asset Index: Home quality	0.155* (0.0912)	0.170* (0.0919)	0.156 (0.129)	0.125 (0.122)
Asset Index: Non-agricultural assets	-0.0748 (0.0636)	-0.0739 (0.0631)	-0.0755 (0.0782)	-0.0868 (0.0778)
Dummy: Land holding above median	-0.215 (0.219)	-0.278 (0.215)	-0.480* (0.283)	-0.558** (0.277)
Dummy: Children's family migrated	0.176 (0.188)	0.179 (0.191)	0.310 (0.266)	0.341 (0.263)
Dummy: Non-relative children staying with the family	1.438*** (0.316)	1.446*** (0.314)	1.233*** (0.387)	1.167*** (0.367)
Dummy: Household head value education[93]	-0.498** (0.208)	-0.501** (0.211)	-0.625** (0.275)	-0.682** (0.280)
Dummy: Household head believe children start work for pay below 18	0.201 (0.151)	0.166 (0.150)	0.320 (0.204)	0.218 (0.197)
Dummy: Cocoa most important source of income in community	0.327 (0.347)	0.213 (0.351)	0.979*** (0.370)	0.794** (0.383)
Dummy: Community has improved road	0.103 (0.272)	0.125 (0.277)	-0.164 (0.355)	-0.0107 (0.375)
Dummy: District capital more than 50 KM	-0.752*** (0.236)	-0.797*** (0.234)	-0.992*** (0.287)	-0.959*** (0.311)
Dummy: Secondary school within 5 KM	0.114 (0.256)	0.0896 (0.257)	0.150 (0.274)	0.108 (0.273)
	1.406***	1.383***	1.164**	1.125**

[93] Household Head value education: head believes children should complete at least secondary education.

	Probit Regression^		Generalized Linear Regression^^	
	Child Labor	Hazardous Labor	Child Labor	Hazardous Labor
Dummy: Community has mobile connectivity	(0.503)	(0.489)	(0.485)	(0.455)
Dummy: School has concrete building	-1.053*** (0.334)	-1.128*** (0.335)	-1.035** (0.435)	-1.255*** (0.438)
Dummy: Toilet inside school	-0.330 (0.277)	-0.318 (0.279)	0.443 (0.341)	0.450 (0.347)
Dummy: School has improved water	-1.921** (0.761)	-2.027*** (0.771)	-2.677*** (0.846)	-2.715*** (0.888)
Dummy: Strata1 (High cocoa production)	1.467** (0.673)	1.434** (0.655)	15.58*** (1.502)	15.19*** (1.577)
Dummy: Strata2 (Medium cocoa production)	-0.402 (0.709)	-0.358 (0.699)	11.58*** (1.499)	11.21*** (1.679)
Constant	-4.746*** (1.457)	-4.582*** (1.456)	-18.34*** (2.226)	-17.36*** (2.234)
Observations	569	569	579	579
Pseudo R2	0.307	0.314	N/A	N/A

^ Dependent variables: Likelihood of having at least one child engaged in Child Labor and Hazardous Child Labor

^^ Dependent variables: Rate of Child Labor and Hazardous Child Labor in the Household

Robust standard errors in parentheses[94]

**** p<0.01, ** p<0.05, * p<0.1*

10.8.3 Occupational Safety and Health Training and Hazardous Child Labor in the Cocoa Sector

Here we present the quantitative analysis undertaken to address the following research questions:

Do youth beneficiaries of occupational safety and health (OSH) interventions report working with appropriate safety equipment? Is the exposure to hazardous work lower among the beneficiaries?

10.8.3.1 Methodology

In order to examine whether beneficiary youth report more frequent use of safety equipment and less involvement in hazardous child labor than the non-beneficiary youth, it is important to note that among all the youth only a subgroup would either be eligible or self-select to participate in OSH programs. It is possible that the youth that were eligible or self-selected to participate in such programs were fundamentally different from the youth that did not participate in such

[94] Regression included controls for missing observations, whether anyone other than the child was present during interview and department dummies (not reported).

program leading to the problem of selection bias which can generate misleading conclusions. As an example, youth from high income families might be more likely to participate in such training, and might report more frequent use of safety equipment and less involvement in hazardous child labor than the non-beneficiary youth. This result could lead to a misleading conclusion about true program impact since the youth from high income families might have better access to safety gear, and thus use them more frequently. As a result, just a simple comparison of difference in usage between those who received training and those who did not could lead to incorrect conclusions about the usefulness of OSH training.

In order to address the potential selection bias, we used a quasi-experimental design. The quasi-experimental design is based on a multi-step approach described below:

a. **Generate counterfactual**: To address selection bias where youth self-select to participate in OSH programs, we use statistical matching technique. We identify a set of variables that are expected to influence youth's participation in OSH program. These factors include youth's age and gender, household demographic characteristics (such as head's gender and education), type of farming done in household (such as cocoa, other commercial crops, food crop), indicator of household assets (housing quality and non-farm assets), and whether head values education of children . We then use entropy balancing on the sample of youth who did not participate in OSH to generate a synthetically designed comparison youth group in such a way that the synthetic comparison group, on average, looks like the group that participated in OSH program in observable characteristics that might influence participation in the program.

b. **Use statistical test of significance to detect difference in usage of safety equipment**: After identifying the comparison group of youth, we use a statistical test of significance to test the difference in usage of safety gear between the youth who received OSH training and the matched comparison group of youth.

c. **Use regression model to estimate the correlation between participation in OSH and likelihood of undertaking hazardous child labor**: We use a model-based regression approach to assess whether youth who participated in OSH training program were less likely to engage in hazardous child labor compared to youth who did not receive such training, after controlling for other observable influences. For that, we follow a two-step approach. We first express the likelihood of exposure to hazardous child labor as a function of youth characteristics, household, community, and school characteristics. Then, we estimate a regression equation to test whether, after controlling for such factors, the youth who received OSH training were less likely to engage in hazardous child labor in cocoa production than those who did not receive OSH training.

10.8.3.2 Data Source

The data source to examine this research question is the child labor, head of the household, community and school surveys conducted by NORC during the 2018/19 main cocoa harvesting season in Côte d'Ivoire and Ghana. However, the data indicates very few youth in Côte d'Ivoire received OSH. So the analysis below uses data from Ghana only.

In the child survey, children were asked to report whether they used any protective gear while working in agriculture. The types of protective gears considered include protective boots (Wellington boots, Afro Moses), gloves, protective clothing (overalls, long sleeves, trousers), nose mask or gas mask, helmet, goggles, and other protective gear. Based on the responses, an indicator variable was constructed to specify whether the children reported using any one of the above categories of protective wear while working in agriculture in the past 12 months before the survey. The data indicates that in Ghana, 48% of youth of age 15-17 were using at least one of the protective gears listed above.

10.8.3.3 Analysis and Results

In the first step of our analysis, we performed entropy balancing to generate a synthetic group of comparison youth using the data from Ghana to generate the counterfactual (the comparison group of youth which on average, looks like the group that participated in Occupational Safety and Health training program in observable characteristics that might influence participation in the program). The entropy balancing result reported in Table 79.

Table 79: Ghana Entropy Balancing: Differences in Covariates Affecting Selection Before and After Balancing

	Control				Treatment	
	Before		After		Before	
	Mean	Variance	Mean	Variance	Mean	Variance
Child age	15.87	0.70	15.81	0.60	15.81	0.60
Child sex (male=1)	0.56	0.25	0.49	0.25	0.49	0.25
Household head age	78	24955	57	6184	57	6183
Number of adults with secondary education	0.86	.94	0.94	1.25	0.94	0.94
Dummy: Household performs cocoa farming	0.93	0.06	0.88	0.11	0.88	0.11
Dummy: Household produces commercial farming	0.14	0.11	0.16	0.14	0.16	0.14

Dummy: Household produces food crop farming	0. 91	0.08	0.92	0.07	0.92	0.07
Household's cocoa output	596	959948	510	571,489	510	571,674
Asset Index: home quality	-0.01	1.02	0.49	1.74	0.49	1.74
Asset Index: agricultural assets	0.0	1.47	-0.03	1.51	-0.03	1.51
Dummy: Household head believes children start work for pay below 18	0.26	0.19	0.27	0.20	0.27	0.20

After identification of the comparison youth group, we ran multivariate regression technique to test whether the youth who received OSH training were less likely to engage in hazardous child labor in cocoa production. The following table presents the regression results for Ghana. [95]

Table 80: Ghana Participation in Occupational Safety and Health Training and Likelihood of Exposure to Hazardous Child Labor

	Probit Regression^
	Hazardous Labor
Estimated treatment effect	-0.009 (0.050)
Probit Regression output	
Treatment Dummy: Members received formal OSH training	-0.0299 (0.174)
Child age	-0.0330 (0.0801)
Dummy: Male child	0.290** (0.132)
Total number of children	-0.321*** (0.0772)
% of 12-14 children	-0.0345 (0.141)
% of 15-17 children	0.343** (0.169)
Head age	0.0126* (0.00700)
Head age-squared	-1.07e-05 (6.72e-06)
Head Gender: Male	-0.0919 (0.238)

[95] Included controls for missing observations and whether anyone other than the child was present during interview (not reported).

	Probit Regression^
	Hazardous Labor
Total number of adults	-0.0274 (0.0967)
Number of adults with secondary/above education	-0.0959 (0.0996)
Dummy: Christian	-0.302 (0.214)
Dummy: Cocoa Household	0.749** (0.323)
Dummy: Household produce commercial crop	0.00964 (0.297)
Dummy: Household produce food crop	0.150 (0.239)
Dummy: Household has livestock farm	0.355** (0.168)
Dummy: Amount of cocoa sold in 2017/18 harvest	0.000141 (0.000122)
Asset Index: Home quality	-0.124 (0.0816)
Asset Index: Non-agricultural assets	-0.0750 (0.0604)
Dummy: Land holding above median	0.252 (0.170)
Dummy: Head can sufficiently borrow	0.302 (0.186)
Dummy: Children's family migrated	0.293* (0.153)
Dummy: Non-relative children staying	0.713** (0.356)
Dummy: Household head value education	-0.637 (0.913)
Dummy: Household head believe children start work for pay below 18	-0.0239 (0.178)
Dummy: Cocoa most important source of income in community	0.851*** (0.286)
Dummy: Community has improved road	0.158 (0.163)
Dummy: District capital more than 50 KM	0.953** (0.453)

	Probit Regression^
	Hazardous Labor
Dummy: Secondary school within 5 KM	-0.146 (0.173)
Dummy: Community has mobile connectivity	-0.823** (0.334)
Dummy: School has concrete building	0.480*** (0.185)
Dummy: Toilet inside school	-0.824*** (0.245)
Dummy: School has improved water	-2.545*** (0.695)
Dummy: Strata1 (High cocoa production)	-0.192 (0.245)
Dummy: Strata2 (Medium cocoa production)	-0.696** (0.279)
Constant	0.821 (1.696)
Observations	465

^ Dependent variable: Likelihood of having at least one child engaged in Hazardous Child Labor
Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

10.8.4 Impact of Multiple Interventions and Child Labor in the Cocoa Sector

Here we present the quantitative analysis undertaken to address the following research question:

Did interventions funded by the stakeholders (including the CLCCG members and other organizations) to reduce the prevalence of child labor and children's exposure to hazardous child labor in cocoa production have any impact?

10.8.4.1 Methodology

In order to evaluate whether interventions funded by the stakeholders were effective, we evaluate the impact of implementing combinations of interventions on the prevalence of child labor and hazardous child labor by undertaking an attribution analysis. The challenge in the present case of conducting attribution analysis is that there was no control group or even explicit counterfactual group identified at the start of the interventions. Another significant concern is that communities exposed to multiple types of interventions appear to have been selected purposively, not randomly by the implementer. Lack of random assignment of a community to an intervention means that it is hard to disentangle the effect of the intervention from the effect of the selection criteria. Thus, the evaluation design is constrained to make the most of the pattern of intervention

assignments that resulted from the site selection decisions of the various Implementing Partners (IPs). A consequence of this is that in what follows there are analyses constrained by the limited sample size and, therefore, whose power to detect the expected effect sizes (impacts) is low. This does not imply that there was no impact, only that the size of the impact was not large enough to have been able to detect it, given the available sample size.[96]

In order to address the methodological challenges associated with the unfavorable intervention assignment of communities, we adopted a two-step approach. In the first step, we address the potential site selection issue related to the IPs' choice of communities to strategically implement multiple interventions. In the second step, once the community selection issue has been addressed, we estimate an attribution equation to test whether, after controlling for other influences of children's engagement in child labor and in hazardous child labor, the rate of child labor and in hazardous child labor were lower among households in communities where combinations of interventions were implemented.

10.8.4.2 Data Source

The stakeholders funded and implemented more than 15 different categories of interventions in the cocoa-growing areas of Côte d'Ivoire and Ghana since 2010 (see Annex 10.11 for a description of the different intervention categories). Ideally, an evaluation would aim to assess which intervention categories (or combination of categories) have the greatest impact, so that implementers can better target their resources and efforts. However, the ability of an evaluation to scientifically detect the impact of interventions and their relative effectiveness critically depends on the availability of data and on feasibility of constructing a valid counterfactual.

In order to assess the effectiveness of interventions in fighting child labor, we collected intervention data from the CLCCG partners and other institutions such as the ILO, UNICEF and Fairtrade focusing on interventions they implemented in communities during 2010-2018 in the cocoa-growing areas of Côte d'Ivoire and Ghana. Combining the data shared by the CLCCG partners and other institutions, we constructed an intervention database that contains information on different types of projects funded by the partners, as well as on the projects' coverage at the national, regional, and district level. We then used information provided by the stakeholders on whether they implemented interventions in each of the communities covered by the 2018/19 survey round and overlaid them with the implementation data (also from the 2018/19 survey). The objective was to link the interventions implemented by the stakeholders with the prevalence of child labor and hazardous child labor as captured by the 2018/19 survey rounds.

[96] Recall that these tests are "opportunistic" in the sense that the sample could only be identified after data collection; the evaluation had no control over where the IPs conducted their interventions nor were the combinations of interventions at each site known in advance.

The majority of these interventions covered here were either implemented or supported by the CLCCG partners. Table 81 and Table 82 present a summary of the data on the exposure of communities surveyed in the 2018/19 round to different interventions based on the intervention database.

Table 81: Distribution of communities in Côte d'Ivoire by treatment combination

Combination	Total EAs	Categories of Interventions*														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	41															
B	16			x	x	x	x									
C	7	x		x	x	x	x	x	x	x	x	x	x	x	x	
D	3		x	x	x	x	x	x			x	x	x	x		
E	2			x	x	x	x					x		x		
F	2		x	x	x	x	x				x	x		x		
G	1	x	x	x	x	x	x						x			
H	1	x	x	x	x	x	x									
I	1	x	x		x	x	x	x			x		x			x

**1: Education, 2: Vocational training, 3: Sensitization/awareness raising program, 4: OSH program, 5: Capacity building, 6: Child labor monitoring and remediation systems, 7: Community action/development plans, 8: Promotion of sustainable livelihood, 9: labor saving practices, 10: Improving access to public services, 11: Women's empowerment, 12: Research, 13: Material assistance, 14: Enforcement of anti-child labor regulations, 15: Compliance initiatives*

Table 82: Distribution of communities in Ghana by treatment combination

Combination	Total EAs	Categories of Interventions*														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	41															
B	13				x		x									
C	9			x	x		x									
D	3	x		x	x	x	x						x			
E	3	x		x	x	x	x			x			x			
F	1	x		x	x	x	x		x	x	x	x	x	x		
G	1	x		x	x	x	x	x	x	x	x	x	x	x		
H	1			x	x	x	x						x			
I	1	x		x	x	x	x		x	x	x	x	x			

**1: Education, 2: Vocational training, 3: Sensitization/awareness raising program, 4: OSH program, 5: Capacity building, 6: Child labor monitoring and remediation systems, 7: Community action/development plans, 8: Promotion of sustainable livelihood, 9: labor saving practices, 10: Improving access to public services, 11: Women's empowerment, 12: Research, 13: Material assistance, 14: Enforcement of anti-child labor regulations, 15: Compliance initiatives*

Table 81 and Table 82 show the combinations of intervention categories implemented in these communities/Enumeration Areas (EAs) and the total number of EAs that were exposed to a given combination. For example, the first row indicates a total of 41 EAs included in the 2018/19 survey round received Combination A (corresponding to value zero for each of the 15 treatment categories, indicating no treatment being reported by the stakeholders for any those 41 EAs). Similarly, the second row (Combination B) indicates total of 16 EAs included in the 2018/19 survey round received intervention Categories 3, 4, 5, and 6. In examining the tables the reader should observe, in particular,

- which combinations have enough observations for analysis (number of EAs times 15 households per EA sampled); and
- which combinations comprise intervention categories that are subsets of other combinations so that in comparing them the non-overlapping categories can be evaluated.

Table 81 and Table 82 suggest that one analysis strategy would be to test whether exposure to *some* – one or more – categories of intervention has an impact when compared no exposure at all. This would compare the 33 EAs in Table 81 that received some set of interventions against the 41 EAs that were not exposed to any intervention. However, this approach is not likely to be successful since many of the exposed combinations contain intent-to-treat interventions – that is, interventions at the community level who probable impact would be very diffuse and therefore undetectable at any financially affordable sample size (not to mention the often highly inadequate sizes to which the evaluation was constrained). A more successful approach – which we describe, below – is to limit the evaluation of impact to just those EAs that received the most significant, or highest "dosage" of treatment. For Côte d'Ivoire, we do this by comparing the 11 EAs belonging to Combinations C, D and I to the 41 EAs remaining unexposed. However, for Ghana, we had only 3 villages with similar dosages of interventions (Combinations F, G and I), we were not able to do any analysis of effectiveness due to small sample size issue.[97] Table 81 and Table 82 also makes clear the limits of the potential analyses that can be undertaken. Although they permit examining the impact for aforementioned combinations, these tables illustrate that our ability to evaluate the effectiveness of the vast majority of intervention category combinations – not to mention individual categories of intervention – is severely limited. First, they reveal the unfavorable distribution of intervention categories across the sampled communities, so combinations generally have too few EAs or more than necessary in order to compare combinations. Thus, even for the data we do have, with two or three exceptions in each country, the small number of communities receiving a given combination of intervention

[97] It was by design that both countries had 41 EAs untreated.

categories means there are too few observations for detecting all but the biggest impacts – and bigger than those anticipated for the interventions.

With the objective of assessing effectiveness of funded interventions, this research question explores whether the interventions, when implemented together, were successful in reducing the prevalence of child labor and hazardous child labor in the cocoa sector. We do this by testing whether community exposure to a given combination of intervention categories (as reported by the IPs) had any detectable impact on the exposed communities. Given that for Ghana there were only 3 communities with multiple interventions, it was only feasible to assess the impact of multiple interventions in Côte d'Ivoire.

10.8.4.3 Analysis and Results

10.8.4.3.1 Construction of Counterfactual

It is likely that the IPs' choice of which enumeration areas (EAs) received a given intervention combination was not random. This means that in order to isolate intervention impact the potential effects of purposive selection must be disentangled from the effect of the intervention itself. Otherwise, a "selection bias" may exist, leading the evaluator to risk misattributing impact or lack thereof. This is especially likely in the present case where only an endline and no baseline is available. For example, if IPs selected communities (possibly unwittingly) based on proximity to major roads (ease of access to the community) and major roads facilitated business, then testing the effectiveness of multiple interventions by comparing treated communities to untreated communities might simply be picking up the effect of proximity to a major road, not the effectiveness of multiple interventions.

To mitigate the potential for community selection bias we statistically match communities that received intervention combinations to the communities that did not receive any intervention (comparison communities). The statistical matching method is used to identify a set of comparison communities that are very similar to the treatment communities with respect to observable characteristics that are correlated to selection of sites by the implementers.

Based on our discussion with the stakeholder who implement multiple interventions and our understanding of the selection process of communities by IPs, we identified the community characteristics that likely played an important role in the selection process. In our matching process, we first used the survey data (from the community leaders' survey) to explore if there were some particular characteristics that differentiate the multiply treated communities from those that received no intervention (comparison communities). The survey data showed that for all communities selected for multiple interventions by IPs, cocoa production was the most important source of income, and these communities were all close to market (distance to the market less than 10 km). Thus, we started the matching exercise by narrowing down the set of

comparison communities to only those in which cocoa production was the most important source of income and which were less than 10 km to the market. This left us with 11 treated communities to be matched with 32 comparison communities in Côte d'Ivoire.

We then used one to one matching based on Mahalanobis metric matching (distance matching). The matching based on the Mahalanobis distance measures is a non-parametric method and is considered to have superior performance than other popular alternative matching methods such as the Propensity Score Matching (PSM). We used matching with replacement (so one comparison community was allowed to serve as a match for more than one treatment community if it was more similar to a given treatment community than other potential comparison communities based on its similarity of characteristics to the treatment community in consideration). Here it is important to remember that the objective was to identify a set of treatment and comparison communities that are very similar with respect to community characteristics that influence community selection by the implementers and also outcomes. These characteristics can be classified as community infrastructure indicators (having access to grid electricity) remoteness indicator (community less than 20 km away from the district capital); and socio-economic indicators (whether migrant live in the community).

The Mahalanobis metric matching was then applied to the 11 treatment and 32 comparison communities in Côte d'Ivoire in order to create two groups of communities such that the average value on an array of variables was the same for both groups (i.e., the groups of communities were statistically "balanced"). The matching method generated a group of 9 treated communities (those that received multiple interventions) and 9 comparison communities that were most similar to the treated communities with respect to the variables identified above. This led to a dataset that we used to assess the impact of intervention combinations on the likelihood and rate of children's engagement in child labor and in hazardous child labor.

10.8.4.3.2 Use of attribution model to estimate the impact of multiple interventions

Next, we used an attribution model to test whether the households in the communities where multiple interventions were implemented had a lower rate of child labor and children's exposure to hazardous child labor than the communities that were similar but did not receive such interventions.

We estimate two regression models: one where the outcome variable was the probability of a household having at least one child in child labor and in hazardous child labor; and the other with the outcome variable as the rate of exposure to child labor and in hazardous child labor among the children in the households. The models specified the outcome variables as a function of household, community, and school characteristics. Finally, the model tested whether, controlling for other covariates, there was any statistically significant difference in children's

engagement in child labor and in hazardous child labor in cocoa production among the households in the treatment communities compared to the households in the matched comparison communities.

For this research question, in the first step of analysis, we used Mahalanobis metric matching technique to identify a set of treatment and comparison communities (from total 11 treatment and 32 comparison communities in Côte d'Ivoire) that are most similar with respect to observed characteristics that were expected to influence IP's community selection process. The following table presents the results of balance check before and after Mahalanobis metric matching was applied.

Table 83: Matching Balance Check: Covariates Balance Before and After Mahalanobis Matric Matching in Côte d'Ivoire

Used in Matching	Comp	Treat	Comp	Treat	Diff	P-value
	Before Matching		After Matching			
Dummy: Community has electricity grid	63%	82%	78%	78%	0%	1.00
Dummy: Migrants live in the community	95%	73%	89%	89%	0%	1.00
Dummy: District capital more than 20km	43%	73%	67%	67%	0%	1.00
Other Community Characteristics						
Dummy: Community has primary school within 1km	98%	91%	100%	100%	0%	1.00
Dummy: Community has cell phone coverage	88%	91%	89%	100%	11%	0.33
Dummy: Community has improved roads	38%	55%	33%	67%	34%	0.18
Dummy: Low income EA*	33%	18%	22%	22%	0%	1.00

**EA where at least 50% of households are low income.*

Using Mahalanobis metric matching technique, we matched nine treatment communities with nine comparison communities that were very similar with respect to the community important characteristics that are expected affect community selection. This led to a total of 18 matched communities which serves as the sample for running the attribution analysis.

Next, we present the results of estimation of the attribution model which tested whether the households in the communities where multiple interventions were implemented had a lower rate of child labor and children's exposure to hazardous child labor than the communities that were similar but did not receive such interventions. Table 84 presents the results where the outcome variable was the likelihood of children's exposure to child labor and hazardous child labor, while

Table 85 presents the results where the outcome variable was the rate of children's exposure to child labor and hazardous child labor. [98]

[98] Included controls for missing observations and whether anyone other than the child was present during interview (not reported).

Table 84: Impact of Multiple Treatment on Likelihood of having Child Labor and Hazardous Child Labor in Côte d'Ivoire: Probit Regression

	Probit Regression^	
	Child Labor	**Hazardous Labor**
Estimated treatment effect: Household living in community exposed to multiple interventions	-0.254* (0.139)	-0.276* (0.151)
Total number of children	0.112*** (0.0279)	0.0968*** (0.0272)
% of 12-14 children	0.276** (0.107)	0.306*** (0.110)
% of 15-17 children	0.531*** (0.116)	0.503*** (0.0933)
% of girl children 5-17	-0.139 (0.0855)	-0.189** (0.0892)
Head age	0.0167 (0.0207)	0.0176 (0.0206)
Head age-squared	-0.000156 (0.000217)	-0.000154 (0.000213)
Head Gender: Male	-0.140 (0.137)	-0.133 (0.122)
Total number of adults	0.00218 (0.0265)	0.00535 (0.0299)
Number of adults with secondary/above education	-0.0101 (0.0625)	0.00378 (0.0641)
Dummy: Religion Christian	-0.102** (0.0483)	-0.0863** (0.0366)
Dummy: Cocoa Household	0.423*** (0.0890)	0.416*** (0.0782)
Dummy: Household produce commercial crop	0.0116 (0.116)	-0.00908 (0.113)
Dummy: Household produce food crop	0.0718 (0.0559)	0.0821 (0.0559)
Dummy: Household has livestock farm	-0.0542 (0.0790)	-0.0245 (0.0928)
Amount of cocoa sold in 2017/18 harvest season	-3.14e-07 (2.14e-05)	1.03e-05 (2.11e-05)
Asset Index: Home quality	-0.0310 (0.0569)	-0.00619 (0.0556)
Asset Index: Non-agricultural assets	-0.0225 (0.0274)	-0.0143 (0.0265)
Dummy: Children's family migrated	0.00179 (0.0970)	0.0490 (0.0900)
Dummy: Non-relative children staying in the household	0.201 (0.203)	0.212 (0.203)

	Probit Regression^	
	Child Labor	**Hazardous Labor**
Dummy: Household Head value education[99]	0.0595 (0.0773)	0.0324 (0.0779)
Dummy: Household Head believe children start work for pay below 18	0.0173 (0.0780)	-0.00274 (0.0833)
Dummy: Cocoa is the most important source of income in community	-0.145 (0.548)	0.180 (0.468)
Dummy: Community has improved road	0.296 (0.236)	0.113 (0.238)
Dummy: District capital more than 50 KM	-0.487** (0.203)	-0.379* (0.219)
Dummy: Secondary school within 5 KM	0.300 (0.399)	-0.132 (0.429)
Dummy: Toilet inside school	-0.221** (0.0924)	-0.215** (0.0889)
Dummy: Low income Community	-0.285 (0.252)	-0.148 (0.274)
Amount of cocoa sold in 2017/18 harvest season (from cocoa shed)	5.96e-08 (6.37e-08)	2.97e-08 (6.11e-08)
Dummy: Cocoa farming relatively new in the community	0.120 (0.302)	-0.0842 (0.278)
Observations	336	336
Pseudo R2	0.233	0.240

^ Dependent variables: Likelihood of Child Labor and Hazardous Child Labor

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

[99] Household head value education: head believes children should complete at least secondary education.

Table 85: Impact of Multiple Treatment on the Household-level rate of Child Labor and Hazardous Child Labor in cocoa production: Average treatment effects estimates based on GLM in Côte d'Ivoire

	Generalized Linear Regression^^	
	Child Labor	**Hazardous Labor**
Estimated treatment effect	-0.172*** (0.062)	-0.174*** (0.065)
	Regression output: Generalized Linear Model[100]:	
Treatment Dummy: Community exposed to multiple interventions	-0.928** (0.382)	-0.973** (0.415)
Total number of children	0.159** (0.0771)	0.119 (0.0749)
% of 12-14 children	1.064*** (0.391)	1.157*** (0.400)
% of 15-17 children	1.733*** (0.475)	1.748*** (0.440)
% of girl children 5-17	-0.645** (0.252)	-0.766*** (0.282)
Head age	-0.0300 (0.0730)	-0.0126 (0.0748)
Head age-squared	0.000450 (0.000734)	0.000302 (0.000749)
Head Gender: Male	-0.149 (0.545)	-0.0744 (0.489)
Total number of adults	-0.0331 (0.125)	-0.0118 (0.135)
Number of adults with secondary/above education	0.0567 (0.253)	0.0564 (0.247)
Dummy: Religion Christian	-0.187 (0.193)	-0.192 (0.163)
Dummy: Cocoa Household	1.508** (0.751)	1.597** (0.779)
Dummy: Household produce commercial crop	0.105 (0.387)	0.0827 (0.391)
Dummy: Household produce food crop	0.296* (0.177)	0.342* (0.189)

[100] Generalized non-linear least square regression with binomial family and logit link function, estimated using maximum likelihood estimation.

	Generalized Linear Regression^^	
	Child Labor	**Hazardous Labor**
Dummy: Household has livestock farm	-0.00360 (0.323)	0.0965 (0.343)
Amount of cocoa sold in 2017/18 harvest season	-2.27e-06 (6.69e-05)	9.75e-06 (6.44e-05)
Asset Index: Home quality	-0.118 (0.207)	-0.0376 (0.207)
Asser Index: Non-agricultural assets	-0.174* (0.0953)	-0.155 (0.0970)
Dummy: Children's family migrated	-0.120 (0.320)	0.00383 (0.296)
Dummy: Non-relative children staying in the household	0.0354 (0.361)	-0.0186 (0.311)
Dummy: Household head believe children should have at least secondary education	0.131 (0.234)	0.0522 (0.261)
Dummy: Household head believe children start work for pay below 18	-0.00734 (0.288)	-0.0447 (0.307)
Dummy: Cocoa is the most important source of income in community	-1.421 (2.478)	-0.446 (2.366)
Dummy: Community has improved road	1.636 (1.071)	1.077 (1.027)
Dummy: District capital more than 50 KM	-1.781 (1.137)	-1.400 (1.139)
Dummy: Secondary school within 5 KM	2.227 (2.205)	0.858 (2.147)
Dummy: Toilet inside school	-0.469* (0.282)	-0.454* (0.260)
Dummy: Low income Community	-1.618 (1.161)	-1.135 (1.145)
Amount of cocoa sold in 2017/18 harvest season (from cocoa shed)	2.39e-07 (2.56e-07)	1.42e-07 (2.53e-07)
Dummy: Cocoa farming relatively new in the community	0.935 (1.346)	0.349 (1.301)
Constant	-2.111 (2.132)	-2.925 (2.187)
Observations	336	336

^^Dependent variables: Rate of Child Labor and Hazardous Child Labor in the Household.

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

10.9 Annex IX: Qualitative Methodology and Supplemental Analysis

10.9.1 General Qualitative Approach

The qualitative component of the 2018/19 Child Labor Survey provides context for the quantitative results, and a deeper understanding of how various key players understand child labor within the cocoa sector in Ghana and Côte d'Ivoire. This component also provides nuanced perspectives on the topics covered in the surveys, including complex concepts such as night work, heavy loads, and sharp tool use. These helped to identify factors contributing to observed prevalence rates, changes in prevalence rates, and changes in hazardous work trends. A summary of each of the research questions and corresponding respondent groups are in Annex 10.1.

10.9.1.1 Key Informant Interviews

NORC conducted KIIs at the community, national, and international level with the following groups: community leaders, donors, cocoa industry members at different points in the value chain, government officials, and implementers. At the community level, NORC conducted 25 KIIs with teachers and community leaders in seven communities in Côte d'Ivoire with, and 28 KIIs with teachers and community leaders in eight communities in Ghana. These interviews provided key stakeholder perspectives on child labor, and interventions aimed at reducing child labor.

10.9.1.2 Focus Group Discussions

NORC conducted focus group discussions with children and caregivers in cocoa growing regions of Ghana and Côte d'Ivoire. Focus groups were disaggregated by sex and beneficiary status (project beneficiary communities vs. non-beneficiary communities). For the purposes of this analysis, we use the term "caregivers" instead of parents, as we found that in many communities, children lived with aunts, uncles, grandparents, or other family members. Respondents were not asked about their familiarity with specific interventions, but rather, types of interventions. For focus groups with children, groups were separated into two age groups: children 5-11 years old and children 12-17.

10.9.1.3 Sampling

For national and international level KIIs, we used a snowball sampling approach, in which respondents were asked to identify other appropriate KII respondents for the study. NORC also leveraged opportunities at workshops and meetings related to child labor in cocoa and approached potential respondents in this way. We also conducted community-level KIIs with community leaders and teachers. These respondents were identified after the team completed the sampling approach below.

To select communities for focus groups and community-level KIIs, NORC used quantitative survey responses[101] to generate a comprehensive list detailing average responses for key intervention and hazardous labor data. The team closely analyzed surveyed communities along the following parameters:

- Training exposure: percent of respondents exposed to occupational safety training, vocational training, awareness training, and livelihood projects
- Reported activities: percent of respondents reporting land clearing, agrochemical use, night work, working hours
- Child labor rate: percent of children in EA engaged in child labor.

To maximize variance in perspectives, we purposively selected EAs with varying rates of training exposure, reported activities, and child labor. The team then narrowed the list of communities by focusing on communities with inverse relationships between training exposure and reported activities/child labor rates, high training exposure and low child labor rates/reported activities, and low training exposure and high reported activities/child labor rates. The team also individually selected communities where training exposure rates were high, but child labor and hazardous activity rates were also high, and communities where training exposure was low, but child labor rates and hazardous activity rates were also low. This was an iterative exercise in which after each pass, team members discussed their reasoning for selecting each community. Finally, the team agreed on 15 communities in each country representing varying rates of child labor and hazardous child labor and varying levels of intervention of exposure.

Following this exercise, NORC used GPS data and STATA to generate a map of each country displaying where each selected community was located. The purpose of this exercise was to ensure that selected communities were spread across each country and represented an array of interventions. The team worked closely with our local subcontractor to ensure the accuracy of the maps generated and selected the final communities. Final communities for FGDs and community-level KIIs are listed in Annex 10.1.2.2.

It is important to note that this sampling approach was purposive and intended to obtain a wide array of perspectives on beneficiary experiences with interventions. Therefore, the sample selected is not representative of all cocoa growing communities in Côte d'Ivoire and Ghana.

[101] Survey responses (from Part 1) included community leader responses about the types of interventions in the area, as well as calculated rates for sharp tool use, night work, and other forms of hazardous labor

10.9.1.4 Training

NORC's qualitative expert conducted trainings in Ghana and Côte d'Ivoire. Our local subcontractor recruited experienced focus group moderators for this exercise. The qualitative training was four days long, including one day of pilot, and one day of post pilot debrief. In Ghana, the training took place April 23rd to 26th, 2019, and April 29th to May 3rd, 2019 in Côte d'Ivoire. Moderators and note-takers were trained in best practices in focus group moderation, including topics around managing group dynamics, minimizing risk for adult and child respondents, maintaining neutrality throughout the discussion, and maintaining intragroup confidentiality. Moderators were also trained on how to manage child disclosures of abuse and forced labor, including response and reporting to appropriate authorities. Moderators were provided with a risk and response protocol outlining the appropriate procedures of bringing attention to disclosure. Focus group moderation teams were also provided with operative definitions for intervention categories, and a list of common off-farm and off farm activities in cocoa. Focus group moderation teams were required to be very familiar with both lists in order to probe effectively and recognize local names for various tools.

During training, moderators held extensive practice rounds and discussions to ensure that the proper local words were being used. Moderators also made considerations for regional variations for the names of key terms, and concepts. Following the pilot, data collection teams made the necessary adjustments to the data collection instruments. These changes maintained the meanings of each question, but were reworded to be more direct, and ensure consistent translation to local languages in the field.

Following the pilot, the data collection team held a debrief session in which moderators outlined the questions and key concepts that were harder to convey in the field. Following this, the made minor edits to focus group and community-level KII instruments. Data collection teams deployed immediately after instrument modification. Fieldwork in Ghana began the week of April 29th, 2019, while fieldwork in Côte d'Ivoire began the week of May 6th, 2019. Focus groups and community-level KIIs were recorded, translated, and transcribed into English and French. Transcriptions were transmitted through NORC's secure file transfer platform

10.9.2 Analysis

Qualitative analysis took a multistep approach. NORC received a total of 96 transcripts, 48 from each country. Following receipt, NORC's qualitative expert conducted phenomenological analysis by reviewing two transcripts in each respondent group in each country and developed a list of key emerging themes. These key themes served as preliminary codes and aligned with research questions. Next, the qualitative expert used preliminary findings from the quantitative data to identify trends for further investigation. These themes were used to develop a preliminary coding framework to be tested. Next, the qualitative expert coded one transcript from each

respondent group to identify gaps in the exiting coding framework. This framework was amended with additional codes to produce a final codebook. All transcripts were then coded in NVivo. Following coding, the qualitative expert conducted in-depth analysis of each code, identified patterns between codes, patterns and variances across respondent groups, and patterns and variances across countries.

10.9.2.1 Education and Vocational Training

To gather perceptions and impact of education and vocational training programs, NORC asked community leaders, teachers, caregivers and children about their exposure to and perspectives on education and vocational training interventions

Older children who received vocational training were asked to reflect on the skills they learned, how these skills affected their future aspirations, and any additional skills they would have liked to learn. Community leaders and teachers were asked about their perspectives on vocational training programs, particularly how vocational training programs affected children's propensity to engage in child labor, and children's prioritization of education. Caregivers (parents, guardians and those who are responsible for the care children) were also asked their opinions on vocational training programs, but specifically focused on how their children benefitted from these initiatives.

Measurement of perceptions and the impact of education interventions followed the same approach. Additionally, NORC asked caregivers, teachers, and community leaders to reflect on how education interventions affected children's school attendance. Caregivers and teachers were asked about the instances where children missed school and the extent to which school-based interventions had any impact on attendance. These responses were then triangulated with data from children's focus groups. Children were asked to reflect on the ways their schools had changed in recent years, and how they benefitted from these changes. NORC then compared responses from children, caregivers, teachers, and communities where school-based interventions were taking place, and where they were not. To assess differences in child labor engagement between beneficiaries and non-beneficiaries of school-based interventions, NORC compared child-reported responses related to on-farm activities, off-farm activities, days and times worked, and the ages of working children. NORC also compared beneficiary and non-beneficiary children's responses regarding perceptions on education, and the situations in which they typically missed school.

To assess children's reported gains in education or training interventions, children were first asked to discuss their schools, and any recent changes they'd observed in their schools. Children were asked about how these changes affected them or changed what they liked about school. Only focus groups with older children (aged 12 to 17) included discussion of vocational training

programs. In these discussions, children were asked to discuss their involvement in vocational training programs, how they benefitted from vocational training programs, and any additional skills they would like to learn. Those who had no involvement in vocational training programs were asked to consider the types of skills training they would like to receive if training were to become available in their communities.

To assess caregiver's perspectives on their children's gains, caregivers were asked to reflect on infrastructural and administrative issues at their children's schools, and how various initiatives have addressed these issues. Caregivers were also asked to report on any changes in their children's opinions of their schools, and how these changes affected their attitudes towards school. For vocational training programs, caregivers were asked about their familiarity with such programs, whether their children were participating, and whether this participation affected their children's aspirations.

To measure teachers' perceptions of education and training interventions, teachers were asked about their familiarity with school-based interventions and vocational training programs in the area. Teachers who were familiar with these programs were then asked to report on the impacts of these programs on student and caregiver attitudes towards learning. Teachers were also asked to provide definitions of child labor in their own words, and report on the prevalence of child labor in the communities in which they resided. Teachers were asked directly about whether these interventions changed the likelihood that a child would be engaged in child labor. Teachers' responses to questions about beneficiary children's likelihood to engage in child labor were compared to their responses about familiarity with these interventions, and the detail with which they could describe the education and training interventions to which they were exposed. Teacher anecdotes concerning their interactions with caregivers, particularly to discuss children's wellbeing were also included in this analysis.

10.9.2.2 Impact of Livelihood Services

To assess the impact of livelihood services, community leaders and caregivers were provided with operative definitions of livelihood services, including examples. They were then asked to report on their level of exposure to such services, and their impact, including whether their involvement in livelihood services changed the frequency, or nature of their children's assistance with cocoa. To measure the impact of livelihood services, community leaders and caregivers were provided with operative definitions of livelihood services, including examples. They were then asked to report on their level of exposure to such services, and their impact, including whether their involvement in livelihood services changed the frequency, or nature of their children's assistance with cocoa. Caregivers were also asked to describe other income-generating activities in which they were involved outside of cocoa. These responses were triangulated with reported increases in income, changes in yield, and capacity to hire laborers. In each community,

caregiver responses to these questions were triangulated with child responses regarding changes in on-farm and off-farm activities. This produced a broader picture of the impact of livelihood services on child activities.

10.9.2.3 Occupational Safety & Health (OSH) Training

To assess exposure to occupational safety and health interventions, older children (aged 12-17, hereafter referred to as youth) were asked whether they have received any training on messaging on how to be safer on farms, and from whom this messaging came. To measure the extent to which these youth were less likely to be exposed to hazardous work, NORC analyzed responses related to on-farm and off-farm activities, particularly the activities youth reported had changed, or they were not allowed to do. These responses were then compared to reported past and ongoing injuries, and reported changes in methods of self-protection.

10.9.2.4 Awareness-Raising Campaigns

Community leaders, teachers, and caregivers were asked about their exposure to awareness campaigns, their perceptions of these campaigns, and the impact of campaigns of these campaigns on child labor practices in their communities. Community leaders were asked to report on the types of awareness campaigns, their involvement in the promotion of awareness campaigns, and any changes in prevalence of child labor in their communities. Teachers were asked about the types of awareness campaigns they were exposed to, their involvement in the promotion of any campaigns, Caregivers were asked about their exposure to campaigns, their perceptions of campaigns, and whether these campaigns affected their practices. Donors, government officials, and implementers were also asked about their involvement with and perceptions of awareness campaigns, including their efficacy, and challenges in changing knowledge and practices around child labor.

Children were not asked directly about child labor, or their exposure to child labor awareness campaigns. To measure children's attitudes towards child labor, children were asked questions about what they liked about helping their caregivers, and what they did not enjoy. Children in both age groups were asked the same questions about their activities, including the day and times they worked. To ensure age appropriateness of all questions related to child labor, children were separated into age groups, five to eleven years old, and then twelve to seventeen years old. Older children were asked to report how long they had engaged in on and off-farm activities, and if there were any changes in levels of responsibility in their tasks.

To measure the on-the-ground impact of awareness campaigns on reported practices, analysis compared caregiver and child responses to questions about the types of activities children engaged in, and the types of activities they were not allowed to do. These comparisons took place between caregivers and children from the same communities, and then compared to

responses from community leaders with these communities. To measure the broader impacts of awareness-raising campaigns, government officials, donors, and implementers were asked to reflect on recent changes in attitudes and practices around child labor and provided anecdotes on key successes and challenges in implementing awareness campaigns.

10.9.2.5 Relative Effectiveness of Interventions

To assess the efficacy of interventions, beneficiary respondents were asked to report on changes they experienced as a result of intervention activities. Child respondents were only asked about school-based interventions, vocational training programs, and occupational safety interventions, while adult beneficiaries and community leaders were asked about all interventions. Each beneficiary reported on the impact of interventions, and any challenges they had participating in intervention activities. These responses were compared with teacher and community leader perceptions of the specific interventions in their communities to inspect emerging themes related to efficacy, challenges with interventions, and recommendations.

Implementers, donors, and government officials were asked directly about which interventions were most effective, and the strategies they put in place to promote the efficacy of these interventions. These respondents were also asked about which interventions were more challenging to implement or did not meet expectations of expected impact. These responses were triangulated with beneficiary, community leader, and teacher responses to reveal several lessons learned, and considerations for future interventions.

10.9.2.6 Sustainability

To measure the overall sustainability of interventions, community leaders, implementers, donors, and government officials were asked to reflect on strategies used to promote the sustainability of interventions, and to report on which intervention outcomes were most likely to be sustained outside of external material assistance. Beneficiary anecdotes revealing common challenge to intervention participation or efficacy were also analyzed to generate findings on which types of interventions were most sustainable.

10.10 Annex X: Caveats and limitations of Quantitative Analysis

While an extensive effort was undertaken to address the research questions posed by this study using appropriate statistical methods, it is important to point out some caveats and limitations of the methods adopted. Understanding the caveats and context of some of the results indicating there were few impacts from interventions as well as interpreting the findings where we found statistically significant impact.

Model-based approach and sample-size issues: One of the major factors weakening the ability of any evaluation methodology to detect impact in the context of the present intervention is the

that the interventions being evaluated were not implemented (geographically or via roll-out) in a way that facilitated evaluation or addressing the study's research questions. Ideally, group of communities would have been randomly assigned to receive the interventions (or various combinations of intervention categories). Such randomization could have been spatial or over time. Instead, the lack of random assignment was made even more challenging by the retrospective nature of the study, and a lack of baseline data on beneficiaries with the present one. This limited the evaluation to a single cross-section, preventing the conditioning of performance on baseline levels and reducing further the scope for identifying pre-treatment variables with which to construct a strong counterfactual.

Facing such unfavorable constraints, we addressed the research questions using available data by retro-fitting a model-based approach onto a quasi-experimental design. There were two main consequences of this approach. First, a model-based approach is based on "observables", that is, only on factors that could be and were measurable. Thus, the credibility of the evaluation depends on the degree to which the salient explanatory variables (e.g., household skills, perceived opportunity costs of own-children) were not omitted from the attribution models' specifications and the modelling of how the implementers selected beneficiaries. While our approach modeled sources of selection very carefully and checked for relationships that were robust to specification perturbations, it is still not perfect and may be vulnerable to unknown inaccuracies and biases.

Second, the observational nature of the evaluation sample and the sample sizes of treated and comparison units were entirely dependent on the implementer's earlier choices of which communities to expose and, often, which households within them to treat (e.g., give material support). NORC's 2018/19 round of survey, rather than being drawn as a dedicated sample with a pre-specified target sample size of the treated and non-treated households, had to make do with a highly unfavorable distribution of sampling units. To wit, among the 1,495 household surveyed in the 2018/19 round in CDI, 605 households (44% of the sample) had at least one child benefiting from the material-support programs, while only 120 household (14% of the sample) surveyed in Ghana had at least one child benefiting. Thus, this design has restricted and unbalanced treatment and comparison sample sizes, which led to an evaluation design with *per se* low statistical power and, in spite of NORC's extensive efforts to consider every possible causal channel and influence, resulted in the model's inability to detect an effect of anticipated size, had there been one, with satisfactory precision.

"All-or-nothing" outcome indicator ("dependent" variable). It would be very unlikely for a dichotomous ("dummy") outcome variable to detect an effect since the only way to register a positive outcome would have been for the household to withdraw children in child labor and hazardous labor entirely, rather than simply to respond to treatment by reducing its occurrence. Given how hard it is for a family to end the practice of child labor it would be extremely unlikely

to see a household's total withdrawal from CL or HCL. To do so would have required a much larger dataset (ideally with a baseline) or a design-based evaluation (i.e., a randomized control trial). For the purposes of policy and of evaluation, therefore, where the former is not feasible and the latter is not affordable, it would be more useful to take as the outcome variables the child's number of hours worked and number of hazards exposed to.

Lack of a baseline. While an evaluation can be rigorously conducted with just an endline (i.e., one cross-section), such an empirical strategy is not advisable when observational units have very different initial (pre-treatment) levels on characteristics thought to influence performance on the outcomes of interest. For example, with a single cross-section it is not possible to know whether a household that acknowledges engaging in two types of hazardous labor after treatment previously had engaged in four types or no types. The former suggests effective treatment and the latter ineffective treatment. The present evaluation was hobbled by the existence of just an endline when much greater precision was called for given all the other empirical challenges of the study.

Lack of direct link between treatment and outcome. According to the theory of change, many of the individual interventions were meant to have their effect operate indirectly. For example, the education related material-support intervention does not affect CL directly, but only through its effect on school attendance. In other words, this theory of change posits that (i) the household decides not to send the child to school due to lack of appropriate material support and (ii) with the child not in school would be more likely to engage in work and potentially exposed to CL and HCL. Thus, in order to influence the rates of CL or HCL exposure, the intervention focused on reducing absenteeism, such as by providing material support.[102] An analogous theory of change exists for livelihood support, which does not directly lower CL but seeks to increase household income so as to reduce the need for an extra set of hands to generate income. The indirect nature of these interventions again had the result of lowering the precision of the statistical analysis. Finally, most of the interventions were indirect in another way. Rather than offering a good or service directly to the household, interventions targeted communities. Here the theory of change posited that there would be follow-on exposure to the treated communities' households. For example, awareness campaigns that are typically implemented at the community level. From an evaluation perspective, these types of "intent-to-treat" effects are always harder to detect and, *ceteris paribus* require more data to achieve a desired level of precision.

Strategic targeting of communities for administering intervention and limited sample size. Due to the inauspicious choice (from the evaluation point of view) of communities to be treated

[102] We note that one could test this theory of change by examining whether the exposure rate among children who do not attend school is much larger than those who attend school, and whether provision of material support leads to a significant fall in school absenteeism.

and not treated, the evaluators were often faced with a paucity of primary statistical units with which to conducting match (in an effort to confront potential selection bias). For example, for measuring the impact of multiple interventions as reported in 10.8.4**,** since we have a very small number of treatment communities (only 10) available for analysis, the efficiency of matching method used for generating the counterfactual[103] in producing acceptable range of bias reduction through matching was not great. In other words, while matching resulted in there being no *statistically* significant difference between the treatment and matched comparison communities the precision of such tests was poor (see above for a discussion of precision).

10.11 Annex XI: Definitions of the Child Labor Intervention Categories

10.11.1 Education

Any intervention that seeks to improve and expand education opportunities to children (excluding vocational training interventions). To be classified in this category, an intervention does not need to specifically or explicitly target child labor reduction.

Please note: Any intervention that offers or facilitates access to formal and non-formal education (e.g. kindergartens) should be included.

The interventions in this category can include:

- Construction of schools/classrooms, improvement of infrastructure (classroom/canteen/ water/toilet/energy such as provision of benches, tables etc., the drilling of a bore hole, provision of a water pump on school premises, toilet facility, construction of teacher housing, the installation of solar panels for the school etc.)
- Mobile schools, provision of birth certificates
- School feeding (provision of meals/food/canteens/equipment)
- School nutrition programs (school gardens, nutrition awareness-raising, supplementary feeding)
- School uniform/book, provision of scholastic materials (study material)
- Improvement of the school environment (playgrounds, etc.)
- Support services to school: capacity of school management committees and teachers, and reinforcing child protection in schools
- Provision of teachers training
- Actions related to violence in schools
- Conditional cash transfer to families (conditional on sending their children to school)

[103] The "comparison communities" that are very similar to the treatment communities with respect to the factors that influenced the selection of the treatment communities

- Non-formal education (to those who are not enrolled/dropped out such as bridging classes)
- Parent engagement programs (e.g., to convince parents to send their children to school and to improve child protection etc.)
- Literacy and numeracy activities

10.11.2 Vocational Training

Any intervention that provides or facilitates access to vocational training to children. To be classified in this category, an intervention does not need to specifically or explicitly target child labor reduction.

The interventions in this category can include:

- Training related to participation in formal jobs, improvement of skills, life-skills training, and linking with formal employment
- Apprenticeships

10.11.3 Sensitization/awareness raising program

Any intervention that seeks to raise awareness of child labor practices (such as what differentiates permissible child work from child labor, what constitutes child labor and hazardous work for children), and awareness of legislation against use of child labor. This includes interventions raising awareness of importance of education (but not the actual provision of education, which is covered in Category 1), awareness of the laws and legislation around child labor, the risk of child labor, common child labor practices to avoid, and awareness of the measures and resources communities can use to prevent child labor practices (such as where to report violations and seek remediation).

The interventions can be implemented at the community, school, or household level and be targeted at children, adults, or both.

10.11.4 Occupational Safety and Health program for youth of legal working age

Interventions that provide occupational safety or health-related services or training to promote safe working conditions for youth of legal working age. Such interventions do not need to explicitly or directly target the reduction of exploitative child labor or hazardous work, but would contribute to the reduction of hazardous child labor.

10.11.5 Capacity building including community, regional, and national level initiatives

Interventions that build the capacity of community leaders and members of community committees, cooperative staff, or members of other types of farmers organizations, law

enforcement staff, or other public officials (e.g. teachers, school inspectors, social services staff, extension agents) to reduce the risks and incidences of child labor in their communities. This includes provision of training (but not actual implementation of monitoring/remediation which is covered in Category 6) to improve stakeholders' ability to identify child labor practices and employers exploiting child labor, and sensitizing families to child labor prevention. Regional- and national-level initiatives may also be counted in this category.

This category **does not include the implementation of the follow-up activities** at which the greater capacity was targeted to better deliver, and will be captured under other categories (such as community action plan covered under Category 7 & enforcement covered under Category 14). This intervention also excludes any capacity building that accompanies the setting-up of community-based monitoring systems (see Category 6).

10.11.6 National, Community-based and/or supply-chain based monitoring and remediation systems/Child Protection and Child Labor Monitoring and Remediation Systems

Interventions that set-up or strengthen national, community-level or supply-chain based systems that seek to assess, identify and monitor instances of child labor. This type of intervention also includes any local capacity building that accompanies the setting-up of the monitoring system (but excludes any capacity building that is covered in Category 5). This category can include interventions effective at national level as well as both, community-based and supply-chain based models (implemented through the cocoa supply chain, and the community). This can include remediation activities that are not covered in other categories.

10.11.7 Community Action Plans and Community Development Plans

Interventions that develop participatory tools used to build the capacity of community members in taking action in accordance with the problems, needs, and potential of the community, as well as the implementation of those plans when this is not covered into one of the other categories. This category should include community action plans that are explicitly driving child protection/child-centered community development.

10.11.8 Promotion of sustainable livelihood for vulnerable households

Interventions that seek to strengthen the economic situation of households that are vulnerable to engaging in child labor practices. This includes, but is not limited to, interventions to improve agricultural income or productivity (not directly related to labor savings such as use of fertilizer and pesticides), and interventions that seek to strengthen other economic opportunities for households.

Please note that for inclusion into this category, the interventions need to target promotion of livelihood for households that are vulnerable to the use/engagement of child labor. Interventions that are targeted to improve livelihood and income generation of low income HHs with children should be captured here.

Other economic opportunities may include, for example:

- Linking households to mobile money providers or other financial services (e.g. micro-credit, formal banking systems)
- Supporting income generation activities and employment services aim to increase employment opportunities, and job retention: These may include:
  - Provision or linkage to employment assistance programs, micro-finance programs, job placement, apprenticeships and public works programs.
  - Skill training services aim to provide participants with the basic skills and knowledge necessary to benefit from social services, provision of business or leadership training, financial education, and literacy and numeracy programs.
- Supporting the implementation of VSLAs or other savings and/or loan activities

10.11.9 Labor saving practices

Interventions that provide services, training, or materials that specifically target reduction in the need for labor-intensive practices including child labor. This could include, for example:

- Provision of improved forms of transport for materials related to agriculture, including the basic wheelbarrow (which helps prevent the carrying of heavy loads for long distances)
- Provision of materials that may, for example, reduce the need for manual pulling of weeds (such as herbicides), so children do not need to be used as a cheap labor source for weeding

10.11.10 Improving access to existing public services for families vulnerable to child labor

Interventions that aim to link families to existing social and public services provided by the state, such as health services, social services, cash transfers, and other infrastructure (e.g. water and sanitation activities) and help them to avail the benefits offered by such infrastructure and services. This will include only services focusing on child protection or prevention of child labor.

10.11.11 Gender and Women's Empowerment

Interventions with a defined gender and empowerment component. These interventions are expected to improve women's decision making power relating to various households decisions including education of children and engagement of children in work.

10.11.12 Research

Interventions that support research into the prevalence and nature of child labor, the risk factors for child labor, or any other child labor-related area.

10.11.13 Material Assistance

Interventions that provide material assistance to at-risk children or children engaged in child labor including provision of food (excluding school supplies and School Feeding program included in Category 1), other goods and services (medical/health services), family stipend/monetary assistance (not related to school that are covered under Category 1), housing/shelter etc.

10.11.14 Enforcement of anti-child labor regulations

Interventions that facilitate enforcement of laws and regulations in preventing child labor and hazardous child labor through local, state, and national enforcement agencies. This can include preparing documents and harmonized tools to promote an adequate and holistic care of children victims and prevent abuse, violence and exploitation; setting up of call center for assisting children victims; and strengthening the operational capacity of legislative units including additional staff, and provisioning of resources (such as vehicle and fuel, and other supply) to labor inspectors, police and other departments in charge of implementation of anti-child-labor regulations.

10.11.15 Compliance initiatives (Code of conduct/certification)

Interventions that facilitate establishing/incorporating code of conduct for cocoa cooperatives/cocoa farms (or other members of the cocoa supply chain) and certification of cocoa farms that prohibits use of child labor/engaging children to hazardous labor.

10.12 ANNEX XII: EXPERT GROUP FINDINGS

10.12.1 Background

The United States Department of Labor (USDOL) Bureau of International Labor Affairs (ILAB) awarded a cooperative agreement to NORC at the University of Chicago to conduct a child labour survey of cocoa-growing areas of Côte d'Ivoire and Ghana during the 2018/19 cocoa harvesting season. The main objective of this study was to assess and measure changes in the prevalence of working children, children in child labour, and children in hazardous work in the cocoa growing areas of Côte d'Ivoire and Ghana between 2008/09 and 2018/19. In order to develop prevalence estimates and use those estimates to measure changes in child labour prevalence between 2008/09 and 2018/19, NORC undertook a survey during the 2018/19 cocoa harvest season.

The governments of Côte d'Ivoire and Ghana have raised methodological concerns at different points in the process, most recently since NORC shared the preliminary survey results in July 2019. Nevertheless, for transparency, USDOL agreed to put together an external and independent group of experts to review and assess specific methodological issues raised by the two governments. This Expert Group is charged with answering the question of whether the methodologies utilised by NORC for this study were technically sound to meet mandates stipulated in NORC's cooperative agreement with USDOL.

10.12.2 Composition of the Expert Group

The expert Group is composed of three persons:

Pierre Lavallée, Ph.D. (Survey sampling theory) (*Team Leader*), Gatineau (Québec), CANADA. Former Assistant Director in Methodologist Branch at Statistics Canada

Debi Prasad Mondal, M.Sc. (Statistics, with specialization in Applied Statistics and data Analysis), New Delhi, INDIA. Former Director General of National Sample Survey Office of India

James Byiringiro, M.Sc. (Applied labour economics for development), Kigali, RWANDA. Survey Program Manager at the National Institute of Statistics of Rwanda

10.12.3 III. Mandate

The Expert Group has been asked to assess the following two areas:

Validity of the 2018/19 Prevalence Estimates

The 2018/19 survey results (ratios) are representative of cocoa-growing areas of Côte d'Ivoire and Ghana. Is this statement technical sound?

Were the procedures and bases that NORC followed scientifically sound and able to generate reliable population counts for 2018/19 within cocoa growing areas of Côte d'Ivoire and Ghana?

Comparability of 2018/19 survey round with prior surveys.

Sampling Frames:

There were changes made to the sampling design from the surveys in 2008/09 and 2013/14 to the one in 2018/19 concerning how stratification by the level of cocoa production was done. Given the adjustments, is it technically sound for this study to make the following comparisons?

Given the changes in the sampling procedure (i.e., stratification and definition of cocoa producing areas), the 2018/2019 **population counts** are not comparable with prior rounds of survey results. Is this an accurate description?

The prevalence estimates (ratios) with **agricultural households** are comparable between 2008/2009 and 2018/2019. Is this an accurate description?

The prevalence estimates (ratios) with **cocoa-growing households** are comparable between 2013/14 and 2018/2019. Is this an accurate description?

Weighting Scheme:

Was the weighting method used by NORC to generate sampling weights (that replicated the weighting method used in previous rounds to address comparability of weighted estimates across the rounds) technically sound and capable of generating reliable population estimates (with acceptable margin of error at a 5%)?

10.12.4 Preliminary Remarks

To review the methodology used for the 2018/19 surveys on child labour in Côte d'Ivoire and Ghana in cocoa production, the Expert Group read carefully the 2018/19 Draft Cocoa Report produced by NORC at the University of Chicago, concentrating on chapter 3 and 9. These chapters are the ones directly related to the mandate of the Expert Group above. The Expert Group also had access to the reports of the previous 2008/09 and 2013/14 surveys. NORC kindly answered the questions raised by the Expert Group while reading the reports.

It should be noted that despite the yes/no type of questions asked in the mandate, none of the answers of the Expert Group are given as simply yes or no. Although this type of definite answer is asked for, it is felt that a straight yes or no would not provide the nuances that the answers need. For example, for a simple question such as "Are the estimates comparable?", answering yes or no requires, in addition, to what extent these estimates are comparable or not. In the present report, the Expert Group hopes that the answers provided to the mandate's questions will be sufficiently precise to satisfy all parties.

10.12.5 Assessment Results on the Validity of the 2018/19 Prevalence Estimates

10.12.5.1 The 2018/19 survey results (ratios) are representative of cocoa-growing areas of Côte d'Ivoire and Ghana. Is this statement technical sound?

In survey sampling theory, there is no formal definition of representativeness. For instance, Kruskal and Mosteller (1979) provide not less than nine different definitions of a representative sample. A definition frequently encountered is the one where we say that a sample is

representative if it is unbiased and is containing enough observations (or units). This definition translates into two statistical conditions for representativeness. First, for the sample to be unbiased (or, in other words, to be able to produce unbiased estimates), each unit of interest must have a non-zero chance of being selected in the sample. That is, the sampling frame must contain all units of the target population and each of them must have a selection probability greater than zero. Second, if the sample contains enough units, we should be able to produce estimates of sufficient precision. Hence, the variances should be at a sufficiently low level for the estimates to be usable by the stakeholders. Note that the sample size is still a condition for sample representativeness: since the variances need to be estimated from the sample, a minimum sample size is required for these estimates of precision to be themselves precise. Hence, in addition to sample unbiasedness and sufficient precision, we must have for representativeness a minimal sample size.

As we just mentioned, the 2018/19 survey results are representative of cocoa growing areas if the ultimate unit in Cocoa growing area were selected following a probability sampling design. That is, each household in the target population has a known positive probability of being sampled. Now, according to the Draft Cocoa Report, the surveyed population for the child questionnaire was drawn from household with at least one child (5-17 years old) within rural areas of cocoa growing districts. Thus, some areas negligibly involved in cocoa producing, non-agricultural households and households without child were excluded from the sample while they are part of cocoa growing areas. Consequently, estimated ratios do not represent, *per se*, the population in cocoa growing areas. They represent instead the population living in agricultural households having at least one 5-17 child within rural cocoa growing areas. Therefore, if we consider the definition of the population being the one of agricultural households having at least one child aged 5-17 within rural cocoa growing areas, we have that the sample used for the 2018/19 surveys is not biased.

Recalling that the second condition for the sample to be representative is to be able to produce precise estimates, presently, this condition cannot be assessed based on the results presented in Draft Cocoa Report. Unfortunately, the Draft Cocoa Report does not provide any measures of precision (variances, standard errors, coefficients of variation, confidence intervals, etc.). From a request from the Expert Group, NORC computed some estimates together with their precision expressed in terms of standard errors (SE) and confidence intervals (CI). The results are provided in **Table 86** below.

In looking at Table 86, we should for now concentrate only on results related to Method 1, which have been computed using the weighting scheme presently used in the Draft Cocoa Report. Looking at the confidence intervals, we can see that they are quite wide. For instance, looking at the rate for "Total Number of Children in Child Labour" in Ghana, the confidence interval ranges from 49% to 58%. The estimated rate is then about 54% ± 5%, and the margin of error

represents about 9% (5÷54). This largely exceeds the acceptable margin of 5% (see the end of Section 10.12.6.2 below), the same comment applies to the rate for "Total Number of Children in Hazardous Labour". Similar results are also found for Côte d'Ivoire. Thus, the Expert Group cannot consider the estimates produced by the 2018/19 surveys as being precise. Now, the results presented in **Table 86** are for the whole population of interest (i.e., the whole population of agricultural households having at least one child aged 5-17 within rural cocoa growing areas), and any estimates produced for sub-populations (for example, the population of *male children* leaving in agricultural households having at least one child aged 5-17 within rural cocoa growing areas) are likely to be even less precise. Thus, because they exceed the acceptable margin of 5%, the 2018/19 surveys results cannot really be considered as representative of the population of agricultural households having at least one child aged 5-17 within rural cocoa growing areas.

It should be noted that the variances used to derive the standard errors and confidence intervals of **Table 86** have been computed using a linearisation method. To compute the variances in the present context of a multi-stage sampling design, other methods can also have been used by NORC. For instance, in addition to the classical analytical formulas, NORC can use resampling methods (bootstrap or jackknife). For more details on variance estimation, see Wolter (2007).

RECOMMENDATIONS:

Attach to each estimate, or at least to the major ones (e.g., number of working children, number of children in child labour, number of children in hazardous work, child labour rate, hazardous work rate) a precision measure such as variance, standard error, confidence interval or coefficient of variation.

We again stress the fact that the results of the 2018/19 surveys (i.e., estimates of populations and of prevalence rates) presented in the Draft Cocoa Report are representing the population living in agricultural households having at least one 5-17 child within rural Cocoa growing areas, rather than the cocoa growing areas as a whole. Given that this definition of the population of interest corresponds to sub-population of the 2008/09 population, we could consider this sub-population as a domain of interest and re-compute estimates for this domain using 2008/09 data. That is, using the survey data of 2008/09 (or 2013/14), it would be of interest to compute 2008/09 (or 2013/14) estimates for the sub-population of agricultural households having at least one child within rural cocoa growing areas (i.e., the one used to define the 2018/19 population). This would create comparable estimates between years. However, NORC does not have access to the 2008/09 (or 2013/14) raw survey data collected by Tulane in the previous rounds. Unfortunately, the reverse is also not possible using the 2018/19 survey data of NORC: because the 2008/09 and 2013/14 populations are larger, 2018/19 survey data cannot be used to produce estimates for the population of households having eligible children *or not* within cocoa growing areas.

10.12.5.2 Were the procedures and bases that NORC followed scientifically sound and able to generate reliable population counts for 2018/19 within cocoa growing areas of Côte d'Ivoire and Ghana?

As mentioned in (a), the sampling frame used by NORC allows to produce estimates for the population living in agricultural households having at least one 5-17 child within rural cocoa growing areas, not the cocoa growing areas as a whole. Now, the sample selection methodology used by NORC for the 2018/19 surveys is relatively standard. If the sampling design described in the Draft Cocoa Report has been correctly followed on the field, it can produce reliable estimates of the population counts for 2018/19 for the population living in agricultural households having at least one 5-17 child within rural cocoa growing areas of Côte d'Ivoire and Ghana. However, two problems have been identified that could potentially create problems: the use of replacement units and the computation of the weights.

"Replacement EAs" (enumeration areas) and "replacement households" were used to compensate for nonresponse. This type of treatment of nonresponse can be quite hazardous, especially if the resulting dataset is treated as if no nonresponse occurred. However, NORC certified the Expert Group that they provided the replacement list to the enumeration teams and no in-field household replacements were allowed outside of the households NORC provided and in the order NORC provided them. No random walks were used, and all primary households and replacements were chosen by NORC before data collection began. EA replacements had stricter guidelines and the data collection team had to notify NORC personnel before any EA replacements were allowed. At which point NORC would provide the new EA from randomly drawn replacements. Note that one sample EA in Ghana was dropped as there were only five households. Statistically, it was not to be dropped as the replacement would contribute to some overestimation of counts (which, of course, may not be significant). NORC added that household sampling included 18 selected households and 5 replacement households per EA. The replacement households were used for 246 households in Ghana and 86 for Côte d'Ivoire. The most common reason for replacements was that no eligible respondent was at home at time of the interview and that sampled household was not available. The pattern of household characteristics of the households requiring replacement was likely to be different from the rest. However, the Expert Group feels that in the end, sample replacement probably had little impact.

The weighting method used by NORC is questionable. For instance, the estimates presented in the Draft Cocoa Report might be biased. See section 10.12.6.2 below for a deeper discussion on the weighting issue.

To have a more definite answer to this question, the samples of the 2018/19 surveys should first be reweighted according to the inverse of the selection probabilities (see section 10.12.6.2 below) and estimates should be recomputed together with their corresponding variances.

10.12.6 Assessment of the Comparability of 2018/19 Survey Round with Prior Surveys

10.12.6.1 Sampling Frames:

There were changes made to the sampling design from the surveys in 2008/09 and 2013/14 to the one in 2018/19 concerning how stratification by the level of cocoa production was done. Given the adjustments, is it technically sound for this study to make the following comparisons?

First, we need to clarify the issue of stratification. According to sampling theory, a change in stratification does not create bias, but can affect, positively or negatively, the precision of the estimates. That is, for a given sampling frame (a list frame or an area frame), dividing (or stratifying) this frame using different criteria will only affect the precision of the estimates, and no bias will be introduced due to the stratification. As mentioned in the Draft Cocoa Report, "the 2008/09 and 2013/14 rounds used regions as the primary stratification level and the 2018/19 round used districts/departments (which are geographically smaller and could be assigned to a stratification level more precisely than the larger area)." Therefore, assuming only a change of stratification, in theory, comparisons between 2008/09, 2013/14 and 2018/19 estimates can be made without problems.

10.12.6.1.1 Given the changes in the sampling procedure (i.e., stratification and definition of cocoa producing areas), the 2018/2019 population counts are not comparable with prior rounds of survey results. Is this an accurate description?

As mentioned above, the change in stratification does not affect the comparability of estimates of population counts.

As mentioned earlier, the 2018/19 surveys produced results for the population of agricultural households having at least one child aged 5-17 within rural cocoa growing areas. It should be noted that the last population definition does not correspond exactly to the definition of the population of the 2008/09 surveys. In Tulane's report for 2013/14 (page 24, paragraph 5.2), it is mentioned that in 2008/09 and 2013/14 agricultural households having no eligible child were also considered. Therefore, the definition of the population for 2018/19 is not consistent with the previous surveys. This clearly decreases the comparability of results between 2008/09, 2013/14 and 2018/19.

In the Draft Cocoa Report, it is mentioned that "although this means the 2018/19 population estimates are more precise than those used previously, it also means the sampling frames were not exactly identical (one started at the regional level and the other at the district/department level) and thus population total estimates are not fully comparable." Actually, for Ghana, this led to a reduced number of districts in the sampling frame of 2018/19 compared to 2008/09. NORC

explained that as per the documentation they received from Tulane, the 2008/09 sampling frame included EAs from cocoa producing areas only. However, Tulane used the higher geographical area of "regions" as their initial frame whereas NORC used a lower geographical unit (district/department). Given the lack of information, NORC operated under the assumption that Tulane sampled correctly to include only cocoa producing EAs in 2008/09. Although restricting sampling to EAs from cocoa producing areas only was the right thing to do by NORC, there seems to be some problems since we should expect for Ghana (and Côte d'Ivoire) to have a similar number of districts in the 2018/19 sample. Because cocoa producing is an expanding sector, we could even find a larger number of districts, which has not been the case. One possible explanation can be the source of data used to construct the sampling frames.

The sampling frames of 2018/19 were coming from different sources than the ones of 2008/09. For 2018/19, cocoa production areas were provided by COCOBOD in Ghana104 and the Coffee Cocoa Council (CCC) in Côte d'Ivoire105 based on the cocoa production data they collected throughout their respective countries. Using these data, NORC defined cocoa producing areas consisting of the districts/departments that produced cocoa as per the data shared by COCOBOD and CCC. For 2008/09, Tulane had access to government census data for constructing the sampling frames. The last available census data in Côte d'Ivoire were from 1998 while in Ghana a census was implemented in 2000 as well as 2010. In both countries and both years of data collection, Tulane mentions that both rural and semi-urban areas were included in the sampling frame, while NORC mentions that only rural areas were included. This difference in the data sources for constructing the sampling frames might be another reason why Ghana noticed a reduced number of districts in the sampling frame of 2018/19 compared to 2008/09.

At the end, the reduced number of districts in Ghana is likely to have created a difference in the coverage of the population over years, which can affect the capacity of comparing the population estimates between 2008/09, 2013/14 and 2018/19. Despite NORC's efforts to mimic what Tulane did (i.e., include EAs from cocoa producing areas only), it is not clear that the sampling frames are comparable over the years. Hence, the capacity of comparing the population estimates between 2008/09, 2013/14 and 2018/19 is questionable.

The Draft Cocoa Report mentions that "it is important to note the not all of the districts in a region would be cocoa producing, and thus, the regional population totals derived from EAs selected to represent regions will naturally be higher than those derived from EAs selected to represent districts since the count of regional total number of EAs will be greater than the district total number of EAs." Given that the districts/departments are contained in the regions, we could

[104] https://www.cocobod.gh/

[105] http://www.conseilcafecacao.ci/

consider the population of districts/departments as a domain of interest (or a sub-population) and produce estimates for this domain. That is, using the survey data of 2008/09 (or 2013/14), it would be of interest to compute 2008/09 (or 2013/14) estimates for the sub-population of the same districts/departments used to define the 2018/19 population. This would create comparable estimates between years. However, this requires the availability of the 2008/09 (or 2013/14) survey data, which are not available, according to NORC. Unfortunately, the reverse is not possible using the 2018/19 survey data of NORC: because the regions are larger than the districts/departments, 2018/19 survey data cannot be used to produce population estimates at the region level.

10.12.6.1.2 The prevalence estimates (ratios) with agricultural households are comparable between 2008/2009 and 2018/2019. Is this an accurate description?

In the Draft Cocoa Report, NORC claims that "computing prevalence rates does not involve use of regional or district stratum totals. Comparison of rates involves, for example, the number of children in hazardous work for the entire population divided by the total number of children in the population. Thus, since the rates are not affected by the difference in the stratum totals as involved in generating the population estimate of total number of children and children in child labor and children in hazardous work, rates of prevalence are comparable across the survey rounds." This is not exactly true since both numerator and denominator of a prevalence rate (or ratio) require estimates of population counts. We could imagine that a change in the population coverage would influence both numerator and denominator in the same direction, but the amount of change between the two can be different. Returning to the above example, by defining the 2018/19 sampling frames based on districts/departments, rather than regions, NORC probably removed some districts/departments not involved (or negligibly involved) in cocoa producing. Considering the fact that estimates of Child Work, Child Labour and Children in Hazardous Work may normally be lower in the omitted areas, those omitted areas in 2018/19 have an incremental effect on produced estimates in 2018/19 while they have a decremental effect on estimates of 2008/09 because they were included. Thus, the estimated prevalence rates (ratios) with agricultural households are not directly comparable between 2008/2009 and 2018/2019 because they are emanated from two different household populations.

10.12.6.1.3 The prevalence estimates (ratios) with cocoa-growing households are comparable between 2013/14 and 2018/2019. Is this an accurate description?

The same answer as (ii) applies here.

10.12.6.2 Weighting Scheme:

Was the weighting method used by NORC to generate sampling weights (that replicated the weighting method used in previous rounds to address comparability of weighted estimates across the rounds) technically sound and capable of generating reliable population estimates (with acceptable margin of error at a 5%)?

NORC computed stratum-level weights for both selected households and selected children, considering that the EAs were stratified based on the amount of cocoa produced and that a number of EAs were selected for the sample from each stratum. Now, according to sampling theory, the weighting scheme should be based on the selection probabilities of sampled units. That is, in the present context of a multi-stage sampling design, the weights should be computed based together on the selection probabilities of the primary sampling units (the EAs) and the selection probabilities of the secondary sampling units (the households). See Appendix A for technical details.

While conducting their review in response to the questions of the Expert Group, NORC discovered an error in the formulae Tulane used (and NORC copied). This error is beyond the concern of using stratum level weights instead of EA level weights that duly accounts for sampled households' inclusion probability from EAs of different size. In the Tulane weighting method, NORC discovered:

The average number of children per agricultural household was estimated as the total number of children in the roster of sampled households with at least one eligible child in the age group 5-17 years divided by the total number of households with at least one eligible child (so it is the average number of children in households with at least one eligible child).

However, the count of total number of children in the stratum was obtained by multiplying the average number of children per agricultural household, as derived in step (i), by all agricultural households (instead of the total number of agricultural households with at least one eligible child).

As a result, the count of total children, children in child labour and children in hazardous child labour are all overestimated (since it inherently and incorrectly assumed that all agricultural households, even the households with no eligible child, had children equal to the average number of children per agricultural households with at least one eligible child).

To demonstrate how the use of all agricultural households inflated the population counts, NORC constructed sampling weights with four alternative methods of generating sampling weights:

Method 1: Stratum level weights, all agricultural households (following Tulane's method as presently available in the NORC Draft Report)

Method 2: Stratum level weights, eligible households (following Tulane's method using only households with at least one eligible child aged 5-17)

Method 3: EA level weights, all agricultural households (following Expert Group proposed method with all agricultural households, instead of all eligible households)

Method 4: EA level weights, using only households with at least one eligible child aged 5-17 (following Expert Group proposed method).

By looking at **Table 86**, we can see that resulting population count estimates clearly demonstrate that following the same Tulane's method but replacing all agricultural households with at least one eligible child (Method 2), generates much lower estimates of population counts. These are fairly close to the population counts that NORC generated following the Expert Group proposed method that is based on the use of selection probabilities. NORC believe that these findings demonstrate that the main reason behind the large difference in population counts between the Tulane's method and the Expert Group proposed method is due to using the count of all agricultural households in the weighting method rather than using the count of households with at least one eligible child.

Now, using the prevalence rate estimates derived from the four different methods (Method 1 to Method 4) as presented in **Table 86**, we find out that the estimates of prevalence rates are barely affected. Actually, when stratum level weights are used instead of the use of EA level weights (as proposed by the Expert Group), we can see that prevalence rates derived from Method 1 and Method 3 or derived from Method 2 and Method 4 are very close (approximately 1 percentage point difference). As well, when all agricultural households are used instead of using the households with at least one eligible child for generating EA level weights, the prevalence rates derived from Method 3 and Method 4 are also very close (approximately 0.2 percentage point difference).

Therefore, based on the findings from this empirical illustration presented **Table 86**, NORC believe that even though they were able to replace the sampling weights of the 2008/09 round to replicate the Expert Group method based on the use of selection probabilities, the estimates of 2008/09 prevalence rates would not vary so much compared to their current estimates (based on Tulane's method). The Expert Group agrees on the above conclusion.

Now, the results presented in **Table 86** are for the whole population of interest (i.e., the whole population of agricultural households having at least one child aged 5-17 within rural cocoa growing areas), and many estimates are also produced for sub-populations (for example, the

population of male children leaving in agricultural households having at least one child aged 5-17 within rural cocoa growing areas). Therefore, it is not clear that similar results will be obtained from sub-population estimates. Because of this, the Expert Group recommends that weights based on selection probabilities be used (Method 4) for producing the estimates of both population counts and prevalence rates of the Draft Cocoa Report.

Indeed, the weighting scheme currently used by NORC (Method 1) or its corrected version (Method 2) can lead to reduced sampling variances, but it can also introduce serious biases in the estimates. NORC chose this weighting scheme because it was the one used for the 2008/09 surveys, expecting the survey results to be more comparable between 2008/09 and 2018/19. Despite this reason, because of potential bias, the Expert Group does not feel that the present weighting scheme (Method 1 or 2) should be one to be used for the 2018/19 surveys.

Table 86: Comparison of Population Counts, Prevalence Rates with Different Sampling Weights

			Total Number of Children	Total Number of Children in Child Labor		Total Number of Children in Hazardous Labor	
Ghana	2008	**Method 1:** Stratum level weights, all agricultural households (following Tulane method as presently available in the NORC Report)	2,159,456	947,076		930,315	
			Rate	44%		43%	
			SE	0.013		0.013	
			CI	41%	46%	40%	46%
	2018	**Method 1**: Stratum level weights, all agricultural households (following Tulane method as presently available in the NORC Report)	1,997,780	1,071,221		1,002,406	
			Rate	54%		50%	
			SE	0.0236		0.0225	
			CI	49%	58%	46%	55%
		Method 2: Stratum level weights, all eligible households (following Tulane method with only HHs with at least one eligible child)	1,331,556	713,979		668,115	
			Rate	54%		50%	
			SE	0.0236		0.0224	
			CI	49%	58%	46%	55%
		Method 3: CEA level weights, all agricultural households (following EG proposed method with all agricultural households instead of all eligible households).	2,092,111	1,141,059		1,060,168	
			Rate	55%		51%	
			SE	0.0246		0.0237	
			CI	50%	59%	46%	55%
		Method 4: CEA level weights, all eligible households (EG proposed method).	1,394,016	765,754		713,419	
			Rate	55%		51%	
			SE	0.0257		0.0233	
			CI	50%	60%	47%	56%

			Total Number of Children	Total Number of Children in Child Labor		Total Number of Children in Hazardous Labor	
CDI	2008	**Method 1:** Stratum level weights, all agricultural households (following Tulane method as presently available in the NORC Report)	3,550,449	817,079		805,482	
			Rate	23%		23%	
			SE	0.0085		0.0084	
			CI	21%	25%	21%	24%
	2018	**Method 1:** Stratum level weights, all agricultural households (following Tulane method as presently available in the NORC Report)	2,813,249	1,029,256		991,870	
			Rate	37%		35%	
			SE	0.0208		0.0204	
			CI	32%	41%	31%	39%
		Method 2: Stratum level weights, eligible households (following Tulane method with only HHs with at least one eligible child)	2,031,861	743,338		716,336	
			Rate	37%		35%	
			SE	0.0208		0.0204	
			CI	32%	41%	31%	39%
		Method 3: CEA level weights, all agricultural households (following EG proposed method with all agricultural households instead of all eligible households).	2,838,357	1,029,918		992,767	
			Rate	36%		35%	
			SE	0.0202		0.0199	
			CI	32%	40%	31%	39%
		Method 4: CEA level weights, all eligible households (EG proposed method).	2,082,507	790,647		765,233	
			Rate	38%		37%	
			SE	0.0227		0.0219	
			CI	34%	42%	32%	41%

RECOMMENDATIONS:

Recompute the weights using selection probabilities for the 2018/19 surveys (Method 4).

Recompute the estimates of population counts and prevalence rates for 2018/19 using the weights based on the selection probabilities (Method 4).

Recompute the variance estimates of population counts and prevalence rates for 2018/19 using the weights based on the selection probabilities (Method 4).

In the present question on the weighting scheme, we have the sub-question: Was the weighting method used by NORC to generate sampling weights […] capable of generating reliable population estimates (with acceptable margin of error at a 5%)?

Looking at **Table 86** above, the acceptable margin of error of 5% has not been attained. For instance, considering the "Total Number of Children in Child Labour" in Ghana, the estimated

rate is about 54% ± 5%, and thus, the margin of error represents about 9%. As mentioned earlier, the results presented in **Table 86** are for the whole population of agricultural households having at least one child aged 5-17 within rural cocoa growing areas, and any estimates produced for sub-populations (for example, the population of *male children* leaving in agricultural households having at least one child aged 5-17 within rural cocoa growing areas) are likely to be even less precise. Thus, because the acceptable level of precision of 5% has not been attained at the global level, we can say that the acceptable margin of error of 5% will also not be attained for other estimates of subpopulations.

10.12.7 Expert Group Appendix

The sample design used is a multi-stage stratified cluster sampling method. Assuming that simple random sample (SRS) has been used at each stage, at the first-stage, a stratified SRS of EAs is selected, and at the second stage, within each selected EA, a SRS of agricultural households containing at least one child aged 5-17 is selected. All children aged 5-17 are interviewed within the selected households. According to sampling theory (see, for instance, Särndal, Swensson and Wretman, 1992), the sampling weight to be attached to agricultural household j of EA i of stratum h should be:

$w_{hij} = \frac{N_h M_{hi}}{n_h m_{hi}}$ for j ∈ i ∈ h

where N_h : number of EAs in stratum *h*, *h*=1, 2, 3;

n_h : number of selected EAs in stratum *h*;

M_{hi}: number of agricultural households with at least one child aged 5-17 in EA *i* of stratum *h*;

m_{hi} : number of selected agricultural households with at least one child aged 5-17 in EA *i* of stratum *h*.

Since all children of a selected agricultural household are interviewed, the sampling weight of child *k* of agricultural household *j* of EA *i* of stratum *h* should simply be given by

$w_{hijk} = w_{hij}$ for k ∈ j ∈ i ∈ h

To account for child nonresponse, the above weight can be adjusted as

$\widetilde{w}_{hijk} = w_{hijk} \frac{K_{hij}}{K^R_{hij}}$ for k ∈ j ∈ i ∈ h

where K_{hij} is the number of children aged 5-17 in agricultural household j of EA i of stratum h, and K^R_{hij} is the corresponding number of responding children aged 5-17. The two sets of weights $\{w_{hij}\}$ and $\{\widetilde{w}_{hijk}\}$ provide unbiased (or nearly unbiased estimates).

Rather than individual weights as above, NORC has computed stratum-level weights for both selected households and selected children. The NORC weight to be attached to agricultural household j of EA i of stratum h is computed using the following formula:

$$w^{NORC}_{hij} = \frac{\sum_h \sum_{i=1}^{n_n} M_{hi}}{\sum_h n_h} \; x \; \frac{N_h}{\sum_{i=1}^{n_h} m_{hi}} \text{ for j } \in \text{ i} \in \text{h}$$

Now, as mentioned by NORC, an error was discovered in the formulae Tulane used (and NORC copied). In the Tulane weighting method, NORC discovered that the count of total number of children in the stratum was obtained by multiplying the average number of children per agricultural household by all agricultural households (instead of the total number of agricultural households with at least one eligible child). Using the above notation, the total number of agricultural households with at least one eligible child aged 5-17 is given by $\sum_{i=1}^{n_n} M_{hi}$. On the other hand, the total number of agricultural households is given by $\sum_{i=1}^{n_n} M^*_{hi}$ where M^*_{hi} is the number of agricultural households in EA i of stratum h. Of course, $\sum_{i=1}^{n_n} M_{hi} \leq \sum_{i=1}^{n_n} M^*_{hi}$.

Using the total number of agricultural households given by $\sum_{i=1}^{n_n} M^*_{hi}$, Tulane's weights (also referred to as Method 1) are defined as

$$\widetilde{w^{NORC}_{hij}} = \frac{\sum_{i=1}^{n_n} \sum_{j=1}^{m_{hi}} K_{hij}}{\sum_{i=1}^{n_h} M_{hi}} \; x \; \frac{\sum_{i=1}^{N_h} M^*_{hi}}{\sum_{i=1}^{n_n} \sum_{j=1}^{m_{hi}} K^R_{kij}} \text{ for k } \in \text{ j } \in \text{ i} \in \text{h}$$

Using the total number of agricultural households with at least one eligible child aged 5-17 given by $\sum_{i=1}^{N_h} M_{hi}$, NORC's constructed weights (also referred to as Method 2) are defined as

$$\widetilde{w^{NORC}_{hij}} = \frac{\sum_{i=1}^{n_n} \sum_{j=1}^{m_{hi}} K_{hij}}{\sum_{i=1}^{n_h} M_{hi}} \; x \; \frac{\sum_{i=1}^{N_h} M_{hi}}{\sum_{i=1}^{n_n} \sum_{j=1}^{m_{hi}} K^R_{kij}} \text{ for k } \in \text{ j } \in \text{ i} \in \text{h}$$

10.12.8 References

Kruskal, W., Mosteller, F. (1979). Representative Sample III: The Current Statistical Literature. International Statistical Review, Vol. 47, pp. 245-265.

Särndal, C-E-, Swensson, B., Wretman, J. (1992). Model Assisted Survey Sampling. Springer-Verlag, New York, 694 pages.

Wolter, K. (2007). Introduction to Variance Estimation, Second Edition. Springer, New York, 447 pages.

10.13 Answers from the Chair of the Expert Group on NORCs Response

NORC would like to thank the Expert Group (EG) for their thorough review and feedback on the draft cocoa report. Given the ambiguity on certain points in the EG report, we respectfully put together a series of discussions and questions relating to these points. Given this is a highly publicized project covering a 10 year timespan and over five years of NORC effort, it is essential for the international community that the findings and reporting are based on defendable and robust inference procedures, and further offer insights that, in spite of certain methodological limitations, can be used by policymakers to assess trends related to child labor and hazardous child labor in cocoa production.

To begin, NORC is currently finalizing the report using the Method 4 weighting scheme for generating unbiased estimates for the 2018/19 round. Moving forward, it can be assumed that the updated estimates will be in the final report.

Topic 1: The EG has expressed concern over the ability to perform hypothesis testing and comparison analyses between the 2008/09 and 2018/19 studies, primarily because of the difference in the sampling frames used for the two studies. Given the ambiguity around the comparability of the sampling frames, we feel it is important to first clarify the relationship between the NORC and Tulane sampling methods. Essentially, our observation is that both methods were identical. Below we describe two parts related to the issue of the sampling frames and then provide related inquiries for the EG.

Source of Data used for generating the sampling frame:

Based on our understanding, it seems the EG believes the data sources used for the sampling frames between 2008/09 and 2018/19 were different, which may have resulted in sampling from two populations that are not fully comparable. The EG report indicates that they believe Tulane based their sampling frame on census data (page 7, paragraph 2), whereas NORC based their sampling frame on secondary data sources. To the best of our knowledge, both frames started with identification of non-urban cocoa growing areas; these were defined as regions for the 2008/09 study and districts/departments for 2018/19 study. Next, based on available secondary data sources on cocoa production, study areas were stratified into cocoa production strata; for 2018/19, production data was provided by COCOBOD in Ghana and the Cocoa Council in CDI. Non-urban and cocoa producing census enumeration areas (CEAs) were then allocated by GSS in Ghana and INS in Côte d'Ivoire into production strata based on the most recent census data

available to construct the sampling frame. Finally, a given number of CEAs were drawn from each stratum to construct the sample.[106]

Types of areas included in the sampling frame:

In Ghana there was a change in the census classification system between 2008/09 and 2018/19, in which "semi-urban" was removed as a census classification. However, in both the 2008/09 round and the 2018/19 round **non-urban EAs** were sampled in both countries. The EG seems to believe that both this and the resulting sampling design at the district level, as implemented by NORC in the 2018/19 survey, had a significant impact on the study in Ghana since, as per the EG's observation, these differences led to decreased number of districts in the sampling frame in 2018/19 relative to 2008/09 (although, NORC does not have access to any documentation on which districts were included in the sampling frame in 2008/09).

However, the area of interest between the two studies remains the same -the **non-urban cocoa growing areas**. In both rounds the best possible available secondary sources were used to aid in constructing the sampling frame. As a result, NORC believes comparability of the prevalence rates derived from the two independent samples (that are representative of the respective rounds) is possible using the EG proposed method of conducting the hypothesis test of significance of difference between the estimates of two population proportions.[107]

Given this additional information on the sample frames in each round, we would like to inquire as to:

Does the EG still feel that, while being clear with the limitations in the final report, the frames do not sufficiently intersect to allow for comparability of the estimates?

Without numbers and a clear list of areas contained in each frame, this sentence is difficult to answer. However, it is mentioned above that "To the best of our knowledge, both frames started with identification of non-urban cocoa growing areas". Now, was this identification exhaustive for each frame? Was there undercoverage or overcoverage? What criteria were used to define a cocoa growing area? Was the same definition used for both frames? In which category were put the semi-urban areas? Urban or rural (non-urban)? If discrepancies occurred in the creation of

[106] One of Tulane's shared documents, entitled "Sample Allocation by Region – Ghana", on sampling notes "In order to arrive at the final sampling frame, using the listing of enumeration areas (EAs) from the most recent census, urban areas and areas without cocoa production were excluded. ……..While some information on the EAs was available from census records, exact production statistics on EA-level were not."

[107] The EG suggested basing standard error calculations on the Rao-Wu Bootstrap method, and standard errors corresponding to the 2018/19 study calculations should be used for the unknown standard errors for the estimates corresponding to the 2008/09 study.

both frames, they might not be totally comparable, i.e., they might not cover the same population over time.

NORC intends to add a section clearly describing the limitations of such comparisons, along with the proper confidence intervals of the 2018/19 point estimates and results of hypothesis testing based on the EG proposed method. Therefore,

Can we present the results from such comparison analyses for the purpose of assessing the change in the prevalence rates over time, which will facilitate assessing the progress made towards a reduction in child labor and hazardous child labor?

EG Response on Topic 1

Yes, if limitations are clearly mentioned. Yet, the national results that the EG saw are showing clear statistically significant differences between 2008/09 and 2018/19. That is, even if some biases are present in the computed estimates of prevalence rates and their standard errors, it is likely that the biases might not affect the national conclusions. Note that the estimates that were sent to the EG are national ones: for sub-national estimates (e.g., results by sex, age or region), the differences might not be as significant**. This means that some caution should be used before stating that a given difference of prevalence rates is statistically significant or not. For instance, the p-value should be much lower than simply 0.05 before concluding that the difference of two estimates is statistically significant.**

Topic 2: In terms of precision, NORC and Tulane targeted an absolute margin of error of 5%. Correspondingly, NORC's sample size calculations were based on a target of achieving an "absolute margin of error" of 5%. With the absolute margin of error, one can see that the 5% criterion has been met in 2018/19 round. However, the EG's criteria for commenting on the precision is based on the "relative margin of error" rather than the absolute margin of error. We have determined that, based on randomly removing subsets of the sample and basing inference on the remaining subsets, even doubling the sample size of the study would not allow us to reach a 5% level of precision with respect to the relative margin of error; such a level of precision appears to be a higher standard than that seen in most studies.

Since NORC's sample size calculations were not designed to achieve a precision of 5% according to the relative margin of error, if NORC also includes the confidence intervals based on the EG proposed SE calculation in the report then would this alleviate the EGs concerns regarding precision of the estimators?

EG Response on Topic 2

The answer is yes. The EG does not really have the mandate of choosing the acceptable level of error. Producing the confidence intervals will throw some light to the users on whether or not the produced statistics are precise enough to be used for their purpose**. The width of the confidence intervals is a good way to display the precision of estimates, especially for differences, proportions or rates.**

Topic 3: The EG concluded that the 2018/19 round estimates are representative of AG-HHs with at least one eligible child, rather than being representative of all AG-HHs. Based on a statistical review of the methodology and inference procedure, we have determined that the current estimates can be deemed to be representative of all AG-HHs. Our rationale is provided below.

Our study sought to determine the prevalence and size of the population of children aged 5-17 exposed to child labor and hazardous labor conditions. We therefore defined the population units to be the children in agricultural households in the cocoa growing areas. Sample selection consisted of selecting solely from the agricultural households with at least one eligible child since the agricultural households without any eligible children do not contain any population units; observations from such households would make an inexistent contribution to estimation (note that there are no individuals/responses of which to make record for inference purposes).

An alternative argument is based on the use of a household-level weighting approach where the responses attached to each household are based on the count of children within the household and which possess the response of interest. In the context of this study, it can be seen that this approach leads to estimates and standard error calculations that coincide with an individual-level weighting approach. Since all responses among the strata comprising the ineligible households are zero, they therefore do not affect the resulting point or standard error calculations.

Based on the aforementioned observation, our conclusion is that the current estimates based on method 4 (of the EG suggestions) related to children level outcomes (such as population estimate of children, working children, children in child labor and hazardous child labor and prevalence rates of child labor and hazardous child labor) generated from the revised weighting method proposed by the EG (Method 4), are not just representative of the eligible agricultural households, but in fact all agricultural households.

If we indicate in the report that while the actual sampling design is representative of AG-HHs with at least one eligible child, by construction, our estimates are also valid population estimate for all AG- HHs. Would the EG agree?

EG Response on Topic 3

No. The targeted population is clearly the population of children aged 5-17 in rural cocoa growing areas. The statement "all agricultural households" implies that agricultural households without eligible children are also present in the target population, which is not the case. By construction, these households have no chance of being selected in the sample (i.e., their probabilities of selection are equal to zero). We realize that households without eligible children are not entering into the computed statistics, but this does not allow to claim that the target population includes theses households.