Living Income and Child Labour in the Cocoa Sector of Côte d'Ivoire

Rik Habraken, Oumou Diallo, Lisa de Graaf, and Rob Kuijpers[1]

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Summary

- Child labour persists as a human rights violation in the cocoa sector of Côte d'Ivoire, with 790,000 children engaged in child labour in cocoa-producing areas of the country. The international cocoa sector is increasingly supporting cocoa farming households in their pursuit of a living income—the annual net income required for a household to afford a decent standard of living.
- There is a prevailing belief that higher and more diversified incomes can reduce child labour by making children's school attendance more affordable. However, after analysing survey data from 1,949 cocoa farming households in Côte d'Ivoire and 3,519 of their children, our findings reveal that the prevalence of hazardous child labour is highest among households that have achieved a living income.
- Until a household reaches the living income benchmark, our research indicates that higher incomes are associated with an increased use of child labour. It is only when households earn more than the living income that the relationship between income and child labour becomes negative. Our results suggest that the dominant living income strategies, such as intensification of cocoa production and diversification of income sources, may unintentionally contribute to the increased prevalence of hazardous child labour, potentially by raising households' demand for labour.
- A more comprehensive do-no-harm living income strategy is thus required, one that takes into account labour implications of the support offered to cocoa producing households and the household's access to adult labour.
- We recommend the development of a research agenda on this topic and extend an invitation to researchers, company managers, and development practitioners to collaborate in further investigating and discussing the interplay between living income strategies and child labour prevalence.

1. Introduction

Child labour remains a persistent human rights violation in international commodity supply chains, adversely impacting children's physical and mental health and depriving them of educational opportunities (UNICEF, 2020). This holds true for the cocoa sector in Côte d'Ivoire; a country that produces 43% of all cocoa worldwide (ICCO, 2022). A nationwide study conducted by NORC (Sadhu, et al., 2020) showed that during the 2018/19 cocoa-growing season, 790,000 children were engaged in child labour in cocoa producing areas in Côte d'Ivoire.[2] This represents 38% of children living in agricultural households. Of these children, an estimated 770,000 children (37% of children living in agricultural households) were exposed to hazardous work.[3]

The international cocoa sector is increasingly acknowledging the presence of child labour in cocoa-producing regions, which has led to a wide range of sustainability initiatives. The International Cocoa Initiative (ICI) developed the Child Labour Monitoring and Remediation Systems (CLMRS) to better monitor and address child labour in cocoa supply chains. In cocoa importing and processing countries, public-private partnerships have been launched such as the Dutch Initiative on Sustainable Cocoa (DISCO) and the German Initiative on Sustainable Cocoa (GISCO) in which the sector committed to ending all forms of child labour. To achieve these commitments, cocoa brands and cocoa traders have scaled-up their sustainability programmes.

A common strategy of cocoa sustainability programmes is to decrease child labour by increasing households' income towards a *living income*[4]. Living income refers to the net annual income necessary for a household in a specific location to afford a decent standard of living for all its members (The Living Income Community of Practice, 2021).

The assumption is that parents living on a budget below the living income benchmark cannot afford to send their children to school and need them to help with agricultural work and household chores. Increasing household income is thus assumed to lead to lower child labour.

To increase household income of cocoa farming households, most sustainability programmes operate a two-pronged strategy:
1. *intensifying* cocoa production on existing farmland through the adoption of good agricultural practices (GAP); and
2. *diversifying* incomes outside of cocoa through the promotion of alternative crops, rearing of livestock, or initiating additional income-generating activities (IGAs).[5]

These diversification programmes also often target women (Bisseleua et al., 2018), with an assumption that additional income can promote their economic empowerment, intra-household bargaining power and financial independence (Balayar and Mazur, 2021).

The assumed relationship between these living income strategies and child labour remains, however, ambiguous, and the expected mechanisms insufficiently capture the complex interplay between income and labour. More specifically, they ignore how promoting increased farm productivity and additional income sources might directly affect the need for additional labour, increasing the opportunity cost for families not using (more) child labour.

This paper aims to explore how household income, farm productivity and alternative IGAs are related to child labour prevalence. We base our analysis on household survey data from 1,949 cocoa farming households in Côte d'Ivoire, including interviews with 3,519 children, gathered in July and August 2022.

1 We appreciate contributions from Anne Sonneveld and Esther Smits (KIT Royal Tropical Institute).

2 Not all child work is considered illegal. Light work (from 14 years old) and regular work (from 16 years old) is accepted, depending on the child's age. Hazardous tasks are always forbidden for children, even if the hours this work is undertaken are limited.

3 Examples of hazardous work include carrying heavy loads (like firewood, water or cocoa), working with sharp tools like knifes or machetes, bush burning, hunting, and using motorized farm machinery. Working excessive hours is also considered hazardous.

4 Other important strategies include the promotion of schooling through the building of school facilities, providing school kits, setting up community child labour committees, and installing CLMRS.

5 Income of cocoa farmers is determined by three factors: cocoa price, cocoa yields, and other sources of income (Van Vliet et al., 2021). However, most sustainability programmes ignore price and focus only on yields and other sources of income.

We estimate naïve correlations, without claiming causality between any of our variables of interest. The objective is to raise the profile of this topic, and to invite researchers, company managers, and development practitioners to further disentangle and discuss the interplay between living income strategies and child labour prevalence.

Our results show no significant relationship between the living income gap (i.e., the gap between the living income benchmark and actual household income) and overall child labour prevalence. We do find, however, a strong curvilinear correlation between the living income gap and *hazardous* child labour prevalence rates. This means that hazardous child labour prevalence is *higher* for families with a higher income until the living income benchmark is (more or less) achieved. Only for those households with incomes above the living income benchmark (10% of our sample), do we see a negative relationship between income and child labour. One potential explanation is that both cocoa intensification and income diversification increase household labour demand, putting more pressure on children to contribute to productive and non-productive household activities. For example, we find some evidence that shows a positive relationship between yields and hazardous child labour. We also find that (non-hazardous) child labour prevalence rates are higher for households where women spend more time on IGAs.

Our results are in line with Dumas (2015), André et al. (2021), and Nordman et al. (2022) who show that higher agricultural productivity increases child labour in Tanzania, and India. Tsiboe et al. (2018) also find a positive correlation between child labour and cocoa farm productivity in Ghana and reveal that the amount of revenue generated by child labour is higher than that of hired labour. Our findings on income diversification and child labour are also in line with Shah and Steinberg (2015) who found that a public works programme that enhanced local employment opportunities in India increased child labour, especially for girls in and around the household, and older children who substituted adults for household chores. Similarly, Rosas and Sabarwal (2016) found that an employment support project in Sierra Leone increased school absenteeism, most likely as adult participation in the labour market increased the need for labour in the household.

Our results therefore suggest that sustainability programmes attempting to address child labour in the cocoa sector through promoting increased incomes may inadvertently perpetuate its prevalence due to an increasing demand for labour to intensify production and diversify incomes. These findings do not imply that these programmes are irrelevant – in contrast, they may be essential to alleviating severe poverty – but programme design features are crucial. For example, more attention to household labour configurations and availability is needed. As the descriptive analyses presented in this paper are based on naïve regressions, more profound analyses of causal relationships and the complex interconnections between child labour and poverty reduction strategies are warranted, including labour allocation and income levels.

The remainder of this paper is organised as follows. In the next section, the data and methods used for the analyses are introduced, followed by a section presenting the empirical results. The paper concludes with a discussion and a proposed research agenda.

2. Data and methods

Household survey data were collected among 1,949 cocoa farming households and 3,519 children in Côte d'Ivoire in July and August 2022.[6] Data are representative for cocoa farming households in the Eastern and South-western regions of the country. Households were randomly sampled among 28 cooperatives using a two-stage random sampling design at the village and household level. The cooperatives cover a multitude of traders and are Rainforest Alliance certified. The survey period falls outside of the main cocoa harvesting season and farm labour needs were expected to be lower compared to other periods in the year. In addition, it is important to note that in all villages and communities included in the sample, child labour remediation and monitoring activities are deployed, implying that cocoa supply chain actors are actively trying to reduce child labour prevalence in these areas.

Table 1 shows that the households interviewed consist of almost four adults and four children (<18 years) on average. They produce on average 577kg/ha of cocoa and cultivate 4.2 ha of cocoa land (including non-productive land). Seventy two percent of household income comes from cocoa sales, indicating that, on average, households rely largely on cocoa for their income. In terms of income diversification, households are engaged in 3.6 income sources on average, including cocoa; only 19% of households rely solely on cocoa for their income.[7] In those households with at least one IGA outside of cocoa, 75% of women participate in the IGA and, in 87% of the cases, they were responsible of that IGA[8]. On average, women spend 22 hours per week on IGAs. This excludes all non-paid work such as assisting on the farm and family care-taking activities.

Table 1: Descriptive Statistics

Variables	Mean
Household members: adults	3.8
Household members: children	3.9
Cocoa yield (kg/ha)	577
Cocoa land (ha)	4.2
Cocoa sales as proportion of household income (%)	72%
Number of IGAs per household	3.6
Weekly hours spent on paid IGAs by women	22
Household income (US$)	3509
Living income gap (US$)	4241
Households with income above the living income gap (%)	10%
Child is female (%)	49%
Age of child (in years)	10
Child labour (%)	43%
Hazardous child labour (%)	14%

Notes. Sampling weights used.

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6 Household survey data on household characteristics, cocoa production and income, and child labour were collected as a baseline for a programme aimed at reducing child labour in Cote d'Ivoire. Next to the farmer and their spouse, a maximum of two children per household were interviewed. As data are cross-sectional, price is not part of the analyses presented in this paper.

7 Income generating activities can include growing cocoa; sales of non-cocoa crops (two max.), livestock, fish, bush meat, and land; having a business/trade (including food processing); holding a governmental job; or partaking in any other form of formal employment or paid labour

8 The variables on participation in IGAs are limited to female spouses of male farmers only, as female cocoa producers are considered a different group of respondents. Moreover, income from IGAs and time spent on activities are only calculated for female spouses responsible for the IGA.

Annual household income levels amount to US$3,509 on average, which is US$4,241 below the living income benchmark adjusted for household size.[9] Household income is assessed by considering various components. First, we compute the gross income from cocoa using data from cocoa production (for both main and mid-crop seasons), post-harvest losses, prices, the proportion of cocoa sold as certified, and the premium received.

We then deduct production costs (e.g., materials, tools, inputs, labour) incurred at each stage of the production process to compute cocoa profit. We then add profits derived from various income sources (e.g., trades, business activities, other crops, fishing, etc.) to the cocoa profit to determine the overall household income level. That figure is then compared against the living income benchmark, adjusted for household size, to obtain the value of the living income gap for each household.

Figure 1 illustrates the distribution of the living income gap and reveals that only a few households are below zero (10%) which indicates that their income falls above the benchmark.[10]

Children interviewed are on average 10 years old, and half of them are girls. Forty-three percent of the children interviewed take part in child labour, and 14 percent of the children are exposed to hazardous tasks. To assess child labour prevalence, ICI guidelines are followed, based on recommendations from the Côte d'Ivoire Government. In this context, a child is involved in child labour if, during the past seven days, they performed hazardous work or any work for more than the maximum number of hours allowed for their age:

• More than one hour until the age of 12 years old.
• More than 10 hours if aged 13-15 years old.
• More than 40 hours if 16-17 years old.

Figure 1: Living income gap (US$)

Living income gap (US$)
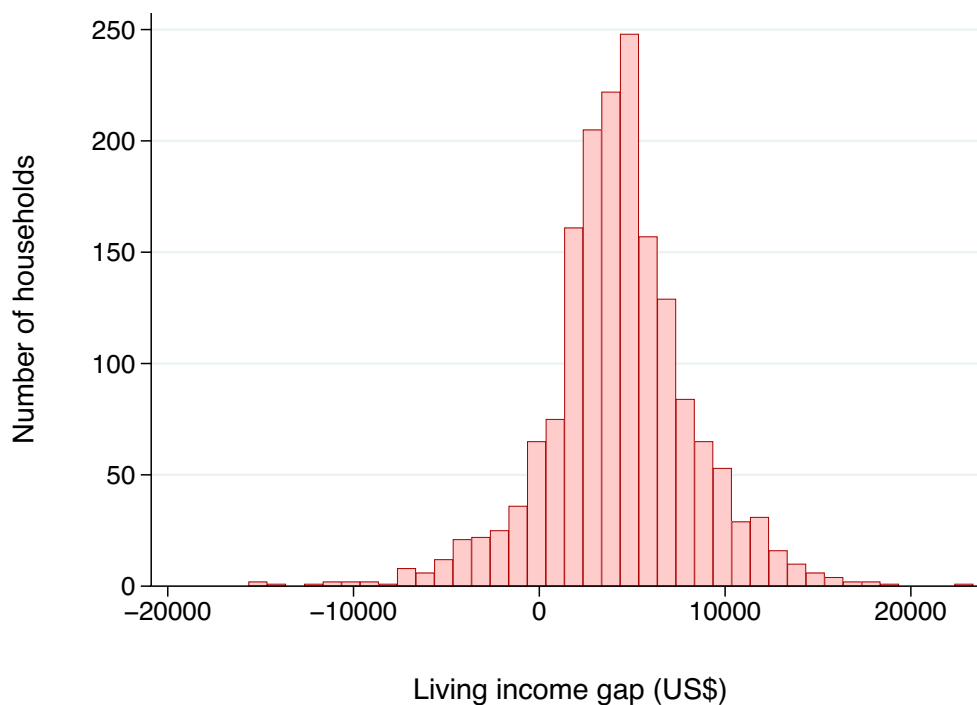
9 The living income benchmark use here is set at FCFA298,983 per month in June 2022. The raw value of the benchmark is adjusted for household size in all calculations using the OECD equivalence scale and corrected for inflation using the Consumer Price Index (CPI). The exchange rate used is CFA 626.047 = US$1.

10 Some households comprise numerous (adult) members, increasing their Living income benchmark. Combined with low income levels, this gives rise to a substantial Living income gap.

Work is considered hazardous under legislation in Côte d'Ivoire if it involves any prohibited task (e.g., manipulating sharp tools, working with fire, carrying heavy loads, using chemicals products, etc.), or if any work is carried out under dangerous circumstances (e.g., for more than 40 hours per week or at night) (International Cocoa Initiative, 2017; International Cocoa Initiative, 2021). For children 13-15 years old, working up to 10 hours per week on non-hazardous tasks is considered light work. The same holds for children aged 16-17, up to the threshold of 40 hours per week. This could include domestic chores, helping a family business, producing or selling various items, or any other IGA. Light work is not considered child labour.

Regarding hazardous tasks, boys are four percentage points more likely to be exposed than girls, as illustrated in the left-hand graph in **Figure 2.**[11] Older children are also more likely to perform hazardous work.[12] It should be noted that data were collected during the months of July and August, which could mean lower hazardous prevalence rates as these months fall outside of the main cocoa harvesting season in Côte d'Ivoire. However, the survey period falls within the school holidays, which could suggest that children perform more tasks in and around the household.

In the next section, we employ a naïve probit regression model to examine the relationship between (hazardous) child labour and household income in cocoa farming households. In addition, we focus on two potentially income-increasing household strategies: cocoa production intensification (measured using cocoa yield (kg/ha)) and income diversification (measured by the number of income sources, and weekly hours spent on IGAs by the interviewed woman in the household). We test for non-linearity by adding the quadratic form of the continuous right-hand side variables in the regression. Child age and gender are included as the only exogenous controls to better isolate the correlation coefficients. Controlling for child age and gender allows us to account for the variations in child labour rates attributed to these exogenous factors (as shown in **Figure 2**). No causal inference is possible from these results due to potential omitted variable bias (e.g., land size and household size, which both potentially influence yield and labour needs) and reverse causality (e.g., child labour contributes to income and vice versa).

Figure 2: Child labour prevalence rates by child gender and age

Prevalence of child labour by age of child

Prevalence of child labour by gender child
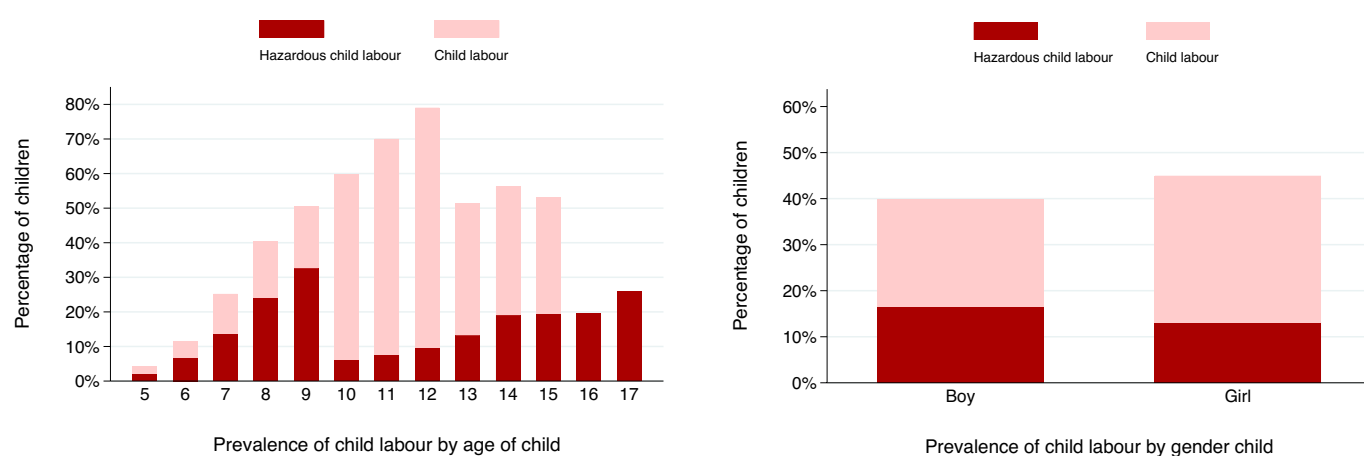
11 Pearson chi-squared test: $\chi2 = 16.376$, p-value = 0.005

12 Children involved in hazardous child labour tasks are on average 0.9 years older compared to those who are not (adjusted Wald test with p-value = 0.000). For child labour, the risk is highest around the age of 12, as shown in Figure 2.
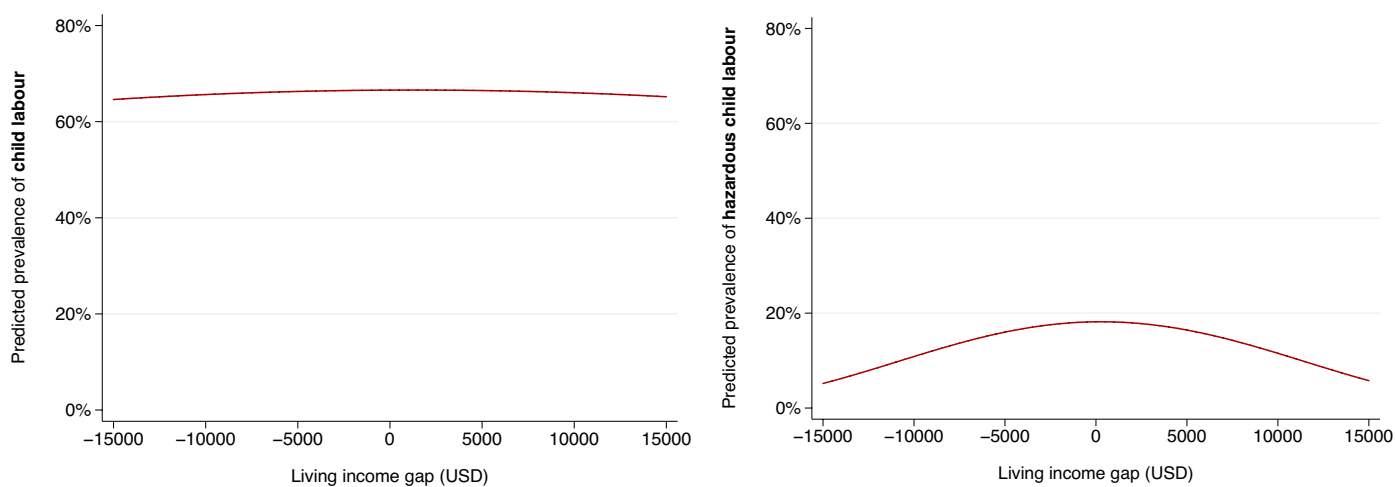
3. Results

Table 2 provides a summary of the results. The probit regressions do not reveal a linear correlation between (hazardous) child labour prevalence and the living income gap. Further exploration reveals a concave relationship as shown in **Figure 3**, where the quadratic form of the living income gap is statistically significantly correlated with hazardous child labour.[13] Hazardous child labour is the highest among households with a gap of US$214 to the living income benchmark for rural Côte d'Ivoire: children in these households that earn almost the equivalent of the living income benchmark are thirteen percentage points more likely to perform hazardous work compared to children from extremely poor or very wealthy households (e.g., US$15,000 above or below the living income benchmark).[14]

When using cocoa yield (kg/ha) as a proxy for cocoa production intensification, no statistical correlation is found with child labour. However, the graph on the right-hand side of **Figure 4** shows a positive correlation between hazardous work and the production of a metric ton of cocoa (or more) per hectare.[15]

The risk of being exposed to hazardous work is six percentage points higher for children in households that produce a metric ton of cocoa or more per hectare, compared to children in households that produce less. Work labelled as hazardous relates primarily to tasks that are essential to cocoa farming (e.g., carrying a knife or machete for pruning, spraying phytosanitary products, bush burning), explaining at least partly why yield levels correlate significantly with hazardous work. The number of IGAs a household operates and the hours that women work on IGAs are used as proxies for income diversification levels. The latter is selected as sustainability programmes typically target the (female) spouse of the main farmer.

Figure 5 plots the marginal effects of the income diversification regressions. The graph on the left shows that increasing numbers of income sources correlates negatively with child labour, but the slope of the coefficient turns positive after the fourth IGA.

Figure 3: (Hazardous) child labour by living income gap (predicted values)


13 When using income as a proportion of the living income benchmark to test the robustness of our findings, we find similar results. Statistically significant correlations are also found when using household income and its quadratic form. Hazardous child labour prevalence is the highest for households earning slightly over US$6,048 per year.

14 In all regression plots presented in this paper, covariates in the regression models are kept at their mean.

15 This result remains statistically significant when adding cocoa land (ha) as a control. When using cocoa revenue (US$ per hectare) to test robustness, we also find a statistical positive correlation (at the 10% significance level).

Figure 4: Hazardous child labour by cocoa yield (predicted values)
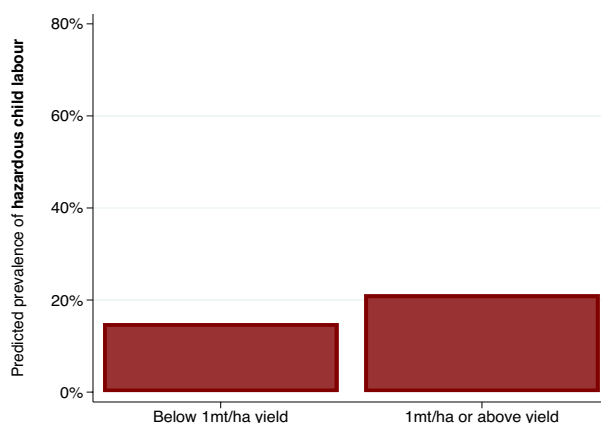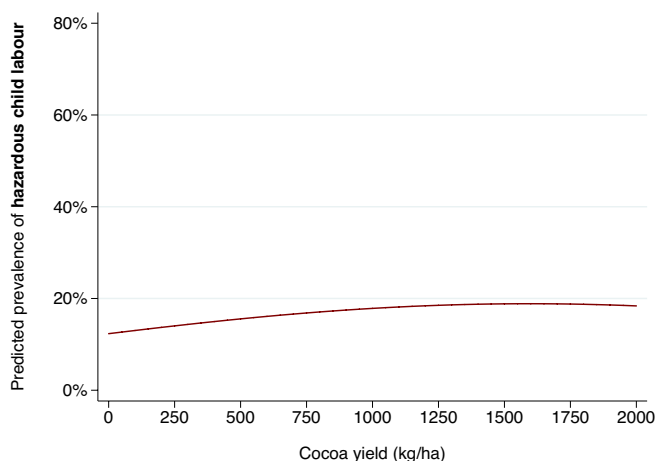
This convex relationship indicates that children in households with only cocoa as income source, and children in households with many income sources, are eight to eleven percentage points more likely to be at risk of child labour. We also find that the number of IGAs correlates negatively with hazardous child labour.[16] Children in households with six income sources are twelve percentage points less likely to be at risk of performing hazardous tasks compared to households that only have cocoa as the sole income source (10% vs. 22%).[17] A potential explanation could be that household with high levels of income diversification have lower cocoa productivity levels and use less labour to perform hazardous tasks on their farm. This is supported by a univariate linear regression that shows that each additional income source is correlated with a statically significant decline of 27kg/ha in cocoa yield levels.

The right graph in **Figure 5** plots the marginal child labour prevalence rates against the weekly hours that a woman worked on IGAs and reveals a concave relationship between the two. Households where women spend more hours on IGAs have a significantly higher likelihood of using child labour. This "effect" decreases with each additional hour worked. No statistically significant correlation is found between the hours worked and hazardous child labour. These results could be explained by children substituting women in non-hazardous tasks (most likely household chores) when women spend more time on income generation.

Figure 5: Child labour by number of household income sources and weekly hours worked by woman on paid IGAs (predicted values)
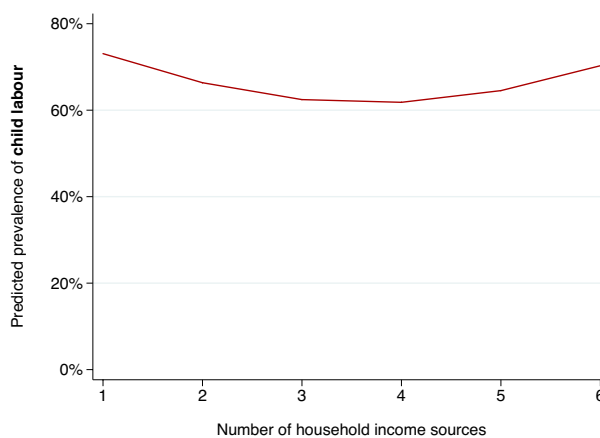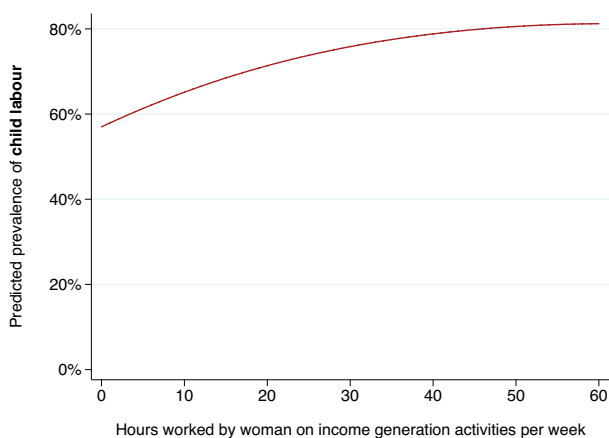
16 When regressing (hazardous) child labour on the relative importance of cocoa sales to household income, we find a statistically significant, positive correlation.

17 All regression results remain robust when adding the number of adults and children in the household as covariates.

Table 2: Probit regression results

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
					Child labour									Hazardous child labour				
Living income gap (US$)	-0.000 (0.000)	0.000 (0.000)								-0.000** (0.000)	0.000 (0.000)							
Living income gap (US$) sq.		-0.000 (0.000)									-0.000*** (0.000)							
Yield (kg/ha)			0.000 (0.000)	-0.000 (0.000)								0.000 (0.000)	0.000 (0.000)					
Yield (kg/ha) sq.				0.000 (0.000)									-0.000 (0.000)					
Yield (mt/ha, 1=yes)					0.185* (0.111)									0.238** (0.121)				
Number of IGAs						-0.014 (0.018)	-0.325*** (0.077)								-0.099*** (0.021)	-0.177** (0.084)		
Number of IGAs sq.							0.044*** (0.010)									0.011 (0.012)		
Woman hours IGA[a]								0.008*** (0.002)	0.023*** (0.005)								0.003 (0.002)	0.009 (0.006)
Woman hours IGA sq.[a]									-0.000*** (0.000)									-0.000 (0.000)
Observations	3077	3077	3136	3136	3136	3519	3519	1436	1436	3077	3077	3136	3136	3136	3519	3519	1436	1436

Notes. *** p<0.01, ** p<0.05, * p<0.10. Probit regression results with robust standard errors in parentheses. Sampling weights used. Child age, child age squared, and child gender included as controls. [a] Sample limited to children from households where the woman interviewed spent time on an IGA.

4. Discussion

Increasingly, sustainability programmes in the cocoa sector aim to increase households' income levels through intensification (e.g., higher yield levels) and diversification (engaging in non-cocoa income sources), while simultaneously trying to reduce child labour prevalence. This paper aims to illustrate how these programmes can risk contributing to (hazardous) child labour instead. This is also the case in areas where households are part of certification programmes and child labour monitoring and remediation activities are operational.

Overall, our results highlight that current living income strategies may be unintentionally increasing (hazardous) child labour prevalence. Cocoa intensification and income diversification typically require more labour, putting pressure on women and children to contribute. Even if children are not directly involved in income generation, there is a risk that children will substitute adults (women) in household chores.

Reducing child labour while simultaneously increasing income levels thus requires a more comprehensive strategy that considers the labour requirements and arrangements within a household. Programme components of such an integrated strategy could include the promotion of labour-saving technologies in the household and non-cocoa IGAs, and the integration of improved child labour awareness campaigns. Introducing labour-saving technologies on the farm can also drive down labour intensity (e.g., drip irrigation, mechanized cocoa pod splitting). Certification could also play a role by paying more attention to labour standards to discourage child labour on farms. A final suggestion is to support local labour markets, making hired labour more accessible. This could be done, for example, by organising, subsidizing, and training communal labour groups.

As this paper only presents cross-sectional correlations, a clear research agenda is needed where more robust econometric analyses adequately address causality and further investigate complexities and the interplay between diversification and intensification strategies, household labour allocation and child labour. There could particularly be more research exploring how labour allocation and child labour decisions by parents are informed and how these relate to efforts to improve their economic situation, with specific attention to psycho-social characteristics like risk aversion and time preferences. There is also room for more rigorous impact evaluations assessing the effect of cocoa sustainability programmes on child labour. It would be particularly interesting to know the effects of (un)conditional cash transfers—which are relatively incentive-neutral compared to cocoa price premiums—on household labour allocation decisions. This would allow us to isolate the effect of increased household income on child labour.

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