

Child Labour Monitoring System
of the Cocoa Production Process



Steering Committee

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SUPPLEMENTAL STUDY ON THE INITIAL DIAGNOSTIC SURVEY

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[This document is a follow-up of the IDS analyses. It includes the comments from the ICVB and the independent verification. The statistics presented are weighted data and are generally applied to the entire cocoa producing area in Côte d'Ivoire.]

[Revised expert
report]

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PREFACE

The document presented below comes within the framework of a supplemental study on the Initial Diagnostic Survey (IDS) carried out by the Child Labour Monitoring System Project (CLMS) within the framework of a certification of the cocoa production process in Côte d'Ivoire.

The principal objective of this supplemental study is to take into account comments and suggestions made in the Independent Verification report after the meeting initiated by the International Cocoa Verification Board (ICVB) in Accra, Ghana, on March 3 and 4, 2009.

This study provided to the Ivorian Government, to NGOs, to Industry, and to Consumers of more specific data on the living conditions and working conditions of children and adults in cocoa-producing areas has the effect of designing and implementing targeted socio-economic development projects and programs in cocoa-producing areas.

This study report, written by an expert Ivorian group represented by Mr. Abi Monnet Innocent, Agro-Economist Engineer, is submitted for review to the independent verification for improvement.

ACRONYMS AND ABBREVIATIONS

CLMS	Child Labour Monitoring System
ICVB	International Cocoa Verification Board
IDS	Initial Diagnostic Survey
Kg	Kilogram
Km	Kilometre
LTD	Limited
NGO	Non-governmental Organisation
OLS	Ordinary Least Squared

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SUMMARY

The certification of the cocoa production process in Côte d'Ivoire is a firm obligation made by the State in order to eradicate as necessary the worst forms of child labour and the trading and trafficking of children and adults. It consists of determining the living and working conditions of children and adults in cocoa-producing areas by conducting a diagnostic survey. The data thus obtained should make it possible to identify and to plan in a strategic and targeted manner the social protection and economic development actions in the areas concerned. The performance of socio-economic development programs implemented within this framework is conditioned by the accuracy and precision of the data from the studies conducted.

Thus, the report initially written by Côte d'Ivoire after the initial diagnostic survey (IDS) carried out in 2008 was subjected to an independent verification by the International Cocoa Verification Board (ICVB) in accordance with the certification protocol.

A relevant comment highlighted by the independent verification was the necessity to reconsider the conclusions from the report by Côte d'Ivoire and to make supplemental analyses in order to be able to generalise the study results to the entire cocoa-producing area so as to be able to effectively adjust the scope of the socio-economic projects and programs.

In order to achieve this objective, two approaches to calculation were used. The first method consisted of a descriptive analysis with a key point being the weighting of results taking account of the probabilities of inclusion of survey units. The second approach used for the estimates is the Poisson method of the ordinary least squared (Poisson OLS).

This approach made it possible to highlight the principal results indicated below:

Child Involvement in Cocoa Farming

- The rate of children working full-time in cocoa farming is calculated at between 8% (weighting-descriptive analysis) and 15.7% (estimate with Poisson OLS regression). This figure is far below the figure indicated in the first IDS national report;
- The proportion of children working part-time on farms is at between 30% (weighting) and 37% (Poisson OLS);
- Parents may be less inclined to involve school-aged children in cocoa production;
- Cocoa producers give importance to the academic education of their children. The high rate of children enrolled in school living outside of the household is one illustration of this;
- Cocoa farmers, in the great majority of cases, do not show any clear intention to use children on their farms. The reported presence of children may correspond to a supervision problem which often is reciprocal, of socialisation or training, as the rate of children working full-time is much lower than the rate of children working part-time;

- The reported deficiencies in the educational system (low number of classes, lack of teachers, quality of teaching) and the modest living conditions of farmers would justify the full-time use of certain children either because they are not attending school or because they have never been registered to receive an academic education;
- Children generally participate voluntarily in the harvesting and pod splitting, helping their parents principally during school vacations. This fact would explain their high part-time presence on the farms;
- Children cannot as such be considered a determinant of the labour force.¹ Incidentally, the number of parcels held and the total surface area of cocoa farms have no significant influence on the involvement of children, and the results indicate that the involvement of children is a declining function of the level of cocoa production;
- The higher tendency to involve girls on the cocoa farms would justify the lower rate of school attendance by young girls in cocoa farming households. They would care for their father and would work especially at activities related to household chores on the farms.

Living Conditions of Children

- There is no formal proof of child trafficking according to the investigations. Only 2% of children working on the farms have no kinship relationship with the head of household. In addition 82.3% of these children live with at least their father or their mother;
- A percentage of 93.8% and 97.5% of children, respectively, in production areas believe they are in safety and that they are well-fed. However, 1% among them confirm that they have been forced to work at least one (1) time and 10.4% of the children have been the victim of verbal or physical violence;
- It should be noted that 71% of farmers believe that their living conditions have worsened and those who have a better opinion of their living conditions use children less on their cocoa farms;
- On average, we count 2.7 fountains in the villages, of which on average 1.8 need to be repaired. In addition, 62% of the households have access to drinking water, while only 9% have the benefits of electricity, which on the whole covers one-fourth of the villages.

Financial Capital of Households

- The average size of household parcels is estimated at 5.3 ha, for an average number of 1.5 parcels held per household;
- Agricultural production, all activities combined, is relatively lower in category 1;
- Cocoa farming is a principal activity for only 9.8% of the villages in category 2;

¹ Consider the level of significance of the variable “age of farms” in both regressions and the probabilities of part-time and full-time involvement.

Socio-Educational Infrastructures of Villages

- The number of academic establishments and teachers are insufficient in the villages, which would explain the relatively lower rate of school attendance in the villages. The insufficiency of the educational centres forces parents able to do so to send their children away to school in towns for an academic education;
- The majority of villages (83.5%) have no health centre and the closest centre is, on average, 9.4 km away;
- The average size of household farms is estimated at 5.3 ha, for an average number of 1.5 parcels held per household;
- Agricultural production, all activities combined, is relatively lower in category 1;

This information may be considered to identify the nature of projects to be established and to determine their scope.

INTRODUCTION

Cocoa production has crucial importance for Côte d'Ivoire in view of its substantial contribution to export receipts (40%) and to the creation of the gross national product (10%). This situation makes Côte d'Ivoire particularly sensitive to any problem that presents potential risks for the sustainability of the cocoa economy.

Thus, facing the polemic related to the worst forms of child labour and forced labour of adults in cocoa farming, which gradually became more serious concerns in relation to the resulting ethical problem, Côte d'Ivoire agreed to participate in the process to certify its cocoa supply after ratification of the Harkin-Engel protocol in September 2001.

The certification of the production process for cocoa in Côte d'Ivoire is a firm obligation accepted by the Government in order to eradicate as necessary both of the two (2) phenomena referred to above. It consists of determining the living and working conditions of children and adults in cocoa producing areas by conducting diagnostic surveys. The data thus obtained should make it possible to identify and to plan in a strategic and targeted manner, social protection and economic development actions in the areas concerned. The results of socio-economic development programs implemented in this framework are conditioned by the accuracy and precision of the data from the studies conducted.

Thus, the report written by Côte d'Ivoire after the initial diagnostic survey (IDS) carried out in 2008 was subjected to independent verification by the International Cocoa Verification Board (ICVB) in accordance with the certification protocol.

The results of this expert report conducted by two (2) International firms, FAFO AIS (Norway) and Khalisa Management Service LTD (South Africa) have emphasised the need to reconsider the conclusions in the report written by Côte d'Ivoire and to conduct supplemental analyses in order to generalise the study results to the entire cocoa producing area so that the scope of the socio-economic development programs and products can be determined in an efficient manner.

This supplemental study should make it possible to reconsider the evaluation of the principal results of the IDS, specifically the estimate of the number of children involved in cocoa farming and the explanation of cases of restriction of freedom reported in both the report by Côte d'Ivoire and the verification report. These new results should be the outcome of weighting the IDS data. However, other indicators deemed relevant have been re-evaluated in order to facilitate the definition of, and to determine the scope of, corrective actions to be made as necessary in cocoa producing areas.

This document, which is the supplemental study expert report, is presented as follows: section 1 describes the study methodology (calculation of the weighting coefficient of the survey results, various econometric models). The results of the descriptive and econometric analyses for evaluating the living and working conditions of children and adults are indicated in section 2.

SECTION 1: METHODOLOGY FOR EVALUATION OF LIVING AND WORKING CONDITIONS

The methodology described below summarises the rule for calculating the weighting coefficients as proposed by the Independent Verification (2008) for the description of the IDS data. This proposal, however, has been readjusted at the stage 4 level. In addition, this section attempts to model the use of children in order to estimate the probabilities of their use and identify the determinants of their use. The model used is one adaptation of that proposed by Diagne et al. (2001) within the framework of the adoption of new varieties of rice in Côte d'Ivoire. A test of this model was attempted in the analysis of the pilot survey data (CLMS, 2007).

1.1 DATA COLLECTION PROCEDURES AND METHOD OF CALCULATION OF WEIGHTING COEFFICIENTS

The calculation of weighting coefficients is a function of the sampling procedure used in the IDS framework, which consisted of a 4-stage procedure.

First Stage of the Sampling Procedure: Selection of Administrative Departments

The study of the categorisation of cocoa-producing areas made in 2006 made it possible to group the 51 departments into the following three groups:

- Category 1: low production – 20 departments;
- Category 2: average production – 14 departments; and
- Category 3: high production – 17 departments

A total of 18 departments was selected in this survey, we see 14 departments in the high production category and 2 departments in each of the other two categories. The probability of inclusion of a department in one category is determined by the equation:

$$P_{c,d} = \frac{n_{c,d}}{N_{c,d}}$$
 with c , as the category index, d , as the department index, $n_{c,d}$, as the number of departments selected in each category and $N_{c,d}$, as the total number of departments in each category.

Second Stage of the Sampling Procedure: Selection of Sub-Prefectures

In each selected department, a random sampling of two (2) sub-prefectures was taken. A total of 36 sub-prefectures were selected.

The probability of selecting a sub-prefecture in a selected department is given by the

equation:
$$P_{c,d,s} = \frac{n_{c,d,s}}{N_{c,d,s}} = \frac{2}{N_{c,d,s}}$$

with s , as the sub-prefecture index, $n_{c,d,s}$, the number of sub-prefectures selected in each department and $N_{c,d,s}$, as the total number of sub-prefectures in each selected department.

Third Stage of the Sampling Procedure: Selection of Village

In each selected sub-prefecture, a village was randomly selected. In total, 36 villages were selected. The probability of including a village in a selected sub-prefecture is given by the

equation:
$$P_{c,d,s,v} = \frac{n_{c,d,s,v}}{N_{c,d,s,v}} = \frac{1}{N_{c,d,s,v}}$$

with v , as the village index, $n_{c,d,s,v}$ as the number of villages selected in each sub-prefecture, and $N_{c,d,s,v}$ as the total number of villages in each selected sub-prefecture.

Fourth Stage in the Sampling Procedure: Selection of Households

Twenty (20) cocoa-producing households were randomly selected in each village taken. Therefore, a total of 720 households were surveyed during the course of this study.

The probability of selecting a household in a selected village is given by the equation:

$$P_{c,d,s,v,m} = \frac{n_{c,d,s,v,m}}{N_{c,d,s,v,m}} \cdot \frac{n_{c,d,s,v,q}}{N_{c,d,s,v,q}} = \frac{20}{N_{c,d,s,v,m}} \cdot \frac{n_{c,d,s,v,q}}{N_{c,d,s,v,q}}$$

with m , as the household index, and q , as the cocoa farmer index, $n_{c,d,s,v,m}$ as the number of households selected in each village, $N_{c,d,s,v,m}$ as the total number of households in each selected village, and $n_{c,d,s,v,q}$ as the total number of cocoa farming households in a selected village.

Determination of Weighting Coefficients

As it is understood that all of the children and adults in each household were interviewed, the probability of selecting a household during the course of this survey is identical to the probability of selecting an adult or child within the framework of this study. This probability is given by the following equation:

$$P_m = P_{c,d} \cdot P_{c,d,s} \cdot P_{c,d,s,v} \cdot P_{c,d,s,v,m}$$

The resulting weighting coefficients for the data at the level of household, children and adults are determined by the following equation: $W_m = \frac{1}{P_m}$; with $m=1, \dots, N$ (number of households selected).

All of the results of the descriptive analysis will be weighted by the coefficients thus obtained.

The weighting coefficients at the village level are obtained by the same method without taking into account of the term $P_{c,d,s,v,m}$ in the calculation of the probability of inclusion.

The calculation principle is used for the presentation of data at the village level and in each of the categories.

In order to analyse the causality links within the estimated parameters, econometric models are developed.

1.2 MODELLING OF THE INVOLVEMENT OF CHILDREN AND ADULTS ON THE FARMS

In order to accurately calculate the probability of use of children on cocoa farms and to identify the determinants of this phenomenon as well as their degree of respective influence, the following economic models developed are used.

1.2.1 Modelling of the Selection of the Work Force (Children or Adults)

In order to determine the selection of heads of households (economic agent) regarding the use of a work force among a number I of labour (or labour force) available, we are going to represent each work force available by the vector $\mathbf{z}_i \equiv (\mathbf{z}_i, \theta_{i,c})$, $i=1,2,\dots,I$. \mathbf{z}_i is the productivity of the labour load deployed by a workforce i , available within a household, $\theta_{i,c}$ is a vector of variables combining the socio-economic and demographic characteristics of adult or child workers.

The production function of a given labour force i is defined by the function $\mathbf{z}_i \equiv \mathbf{f}(\mathbf{t}_i, \theta_{i,s})$, where \mathbf{f} is the production function of a worker; \mathbf{t}_i is the cocoa farm taken in charge and $\theta_{i,s}$ a factor of variables describing the physical and mental state of health of the worker.

We can easily show that vector \mathbf{f}_i is a positive function of the land (the only production factor considered) with a discontinuity at zero value. Vector $\theta_{i,c}$ is a constant function if the time period considered is relatively short.

The preference for a labour force i among that available is closely tied to its utility translated by the equation $\mathbf{u}_i(\mathbf{z}_i) \equiv \mathbf{u}_i(\mathbf{z}_i, \theta_{i,c})$. Thus, the result of the total utility (or profit) procured by the entire labour force of the household $\mathbf{z}_i \equiv (\mathbf{z}_1, \mathbf{z}_2, \dots, \mathbf{z}_I)$ is the function $\bar{U} \equiv U(\mathbf{u}_1(\mathbf{z}_1), \dots, \mathbf{u}_I(\mathbf{z}_I))$ (See Deaton and Muellbauer, 1980, Varian, 1984).

Finally, the decision for a head of household to employ a given labour force is summarised in the following maximisation equation:

$$\mathcal{Q}(\theta_c, \theta_s, T) \equiv \max_{t_1, \dots, t_I} \{ U(u_1, u_2, \dots, u_I); \sum_{i=1}^I t_i \leq T; t_i \geq 0, i = 1, 2, \dots, I \},$$

where T represents the total surface area of cocoa farms of the household, $\theta_c \equiv (\theta_{1,c}, \dots, \theta_{I,c})$, and $\theta_s \equiv (\theta_{1,s}, \dots, \theta_{I,s})$.

The optimal khun Tucker condition describes the optimal conditions for allocation of land parcels to the labour force, which is a function of θ_c , θ_s and of T .

We have $t_i^* = h_i(\theta_c, \theta_s, T) > 0$ si $\frac{\partial U}{\partial u_i} \cdot \frac{\partial u_i}{\partial \mathbf{z}_i} \cdot \frac{\partial \mathbf{f}_i}{\partial T_i} = \lambda(\theta_c, \theta_s, T)$,

and $t_i^* = 0$ si $\frac{\partial U}{\partial u_i} \cdot \frac{\partial u_i}{\partial \mathbf{z}_i} \cdot \frac{\partial \mathbf{f}_i}{\partial T_i} < \lambda(\theta_c, \theta_s, T)$, with $i=1, \dots, I$

Where h_i , is a function of actual values and $\lambda(\theta_c, \theta_s, T)$, the Lagrange multiplier associated to the land constraint, which is assumed to be limited. The Lagrange multiplier essentially measures the opportunity cost of the land, with the knowledge that a unitary portion of land is acquired at a certain cost (purchase, lease, or clearing of a virgin forest).

Thus, the optimal condition according to khun-Tucker requires that the land parcel must be allocated to an individual at just the level where the marginal profit gain obtained by supplemental allocations of land to that individual compensates exactly for the opportunity cost of such allocated land. In addition, no land parcel will be allocated to an individual if the profit gain desired is lower than the opportunity cost of the same land.

The khun Tucker optimisation condition gives a complete description of the use or non-use of children in the cocoa production process.

We state in passing that the profit resulting from giving an activity to a child in the cocoa production process is the result of three factors, which are: the marginal effect of land allocated on the child's productivity, the marginal effect of the child's socio-economic and demographic characteristics on the child's usefulness, and the marginal effect of the child's usefulness on the total productivity of the labour force.

1.2.2 Calculation of Probability of Use of Children as a Labour Force

For this study, we will distinguish three categories of minor children in the household j . They are:

- of the total children working on cocoa farms, C_j^w ;
- of the total children living in the household, C_j^m ;
- of the total children cared for by the head of household, C_j^c .

It is necessary to state that for each household $C_j^w \subseteq C_j^m \subseteq C_j^c$, it results that $C_j^w \cap C_j^m = C_j^w$ and $C_j^m \cap C_j^c = C_j^m$.

The probability that the child i may be used in the production process is a conditional probability $p(i | i \in C_j^w)$ obtained by the stated optimisation condition above, with for marginal probability $p(t_i^* > 0 | i \in C_j^w)$.

This conditional probability of the use of children in cocoa farming deriving from the khun-Tucker optimal condition must be disassociated from the unconditional probability of using children on the farms. The unconditional probability of a head of household j using a child i on his farms is:

$$\begin{aligned} p(i_j \in C_j^w) &= p(C_j^w \cap C_j^m) = p(i_j \in C_j^w | i_j \in C_j^m) \cdot p(i_j \in C_j^m) \\ &= p(i_j \in C_j^w | i_j \in C_j^m) \cdot p(i_j \in C_j^m | i_j \in C_j^c) \cdot p(i_j \in C_j^c). \end{aligned}$$

This last equation translates the fact that the probability of using a child in cocoa farming is a function of the probability that this child is cared for by the head of household, of the probability that he lives in the farmer's household and of the khun-Tucker optimal condition.

1.3 DETERMINANTS OF THE USE OF CHILDREN ON FARMS

In order to identify the determinants of use of the child labour force by the household, determined by the number of children used by the head of household, we consider the function $q_{ji} \equiv \mathbf{1}_{\{t_{ji}^* > 0\}}$ with $i = 1, \dots, i_{jc}$, which is the condition indicator of use of children in the cocoa farmer's household.

In other terms $q_{ji} = 1$ si $t_{ji}^* > 0$ et $q_{ji} = 0$ in the other case. Thus, the number of children, by household, involved in the cocoa production process is obtained by $r_j = \sum_{i=1}^{i_{jc}} q_{ji}$, which is a sum of the i_{jc} random and independent variables by Bernoulli with as a mathematical expectation:

$$E r_j = \sum_{i=1}^{i_{jc}} E q_{ji} = \sum_{i=1}^{i_{jc}} p(i_j \in C_j^w) = p(i_j \in C_j^w | i_j \in C_j^m) \cdot p(i_j \in C_j^m | i_j \in C_j^c) \cdot p(i_j \in C_j^c)$$

In order to evaluate the marginal likelihood that a head of household uses children, we would estimate the marginal impact of the variation of $p(i_j \in C_j^c)$, which is the conditional probability that a child who is under the responsibility of a head of household, living with him, is involved in the cocoa production process. The marginal impact of this probability is obtained by the following equation:

$$\frac{\partial E_j}{\partial p(i_j \in C_j^c)} = p(i_j \in C_j^w | i_j \in C_j^m) \cdot p(i_j \in C_j^m | i_j \in C_j^c)$$

The number of children involved in the production process by household will be estimated by using the following function:

$$r_j = E r_j + \varepsilon_j = \sum_{i=1}^{i_{jc}} p(i_j \in C_j^w) + \varepsilon_j, j = 1, \dots, n$$

By allowing that the r_j binominal variables following Poisson's law of parameter ∞ equal to the mathematical expectancy of r . The probability of using a number k of children on the farms:

$$p(r_j = k) = \frac{\alpha^k e^{-\alpha}}{k!}$$

Therefore, we conclude the probability of using at least one child on the farms by:

$$p(r_j > 0) = 1 - p(r_j = 0) = 1 - e^{-\alpha} = p(i_j \in C_j^w)$$

This equation shows that all of the variables that have an impact on the number of children used also influence the probability of occurrence of this phenomenon. If we are able to estimate the Poisson parameters $\infty = Er$, the last equation will enable us to calculate the probability of using children, as well as its determinants. The Poisson Ordinary Least Squared method (Poisson OLS) is used for this purpose. By allowing a linear form for the probability of use, the equation to be determined has the form:

$$p = \alpha + \beta\theta + \varepsilon$$

with α an unknown parameter, β a vector of unknown parameters, θ is a vector of variables, and ε the error term.

The marginal effects or continuous impact of each variable on the probability of use of children is obtained by the following equation:

$$eff_{jtm} = \frac{\partial p(r_j > 0)}{\partial \theta} = \beta (1 - p(r_j > 0))$$

After the coefficients indicating the impact of each variable are thus calculated, they are compared to the values zero (0) according to the principle of the t-student test.

SECTION 2: LIVING AND WORKING CONDITIONS OF CHILDREN AND ADULTS

In order to determine the living and working conditions of children and adults, we will first present the characteristics of villages in production areas and the description of the households where they live.

2.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF VILLAGES IN COCOA PRODUCING AREAS

2.1.1 Proximity and Accessibility of Government Services

As indicated in Table 1, government services (city halls and sub-prefectures) are, on average, 18.2 km from villages, while the towns where main government offices are located in departments and forces for security and maintenance of public order are located, respectively, approximately 35 km and 21 km from villages. It is possible to see that the villages in category 3 are the farthest from government services.

In addition, very few villages are inaccessible by road in the entire cocoa producing area, on average 1.9%. This situation is seen only in category 3 villages.

Table 1: Proximity and Accessibility of Public Services

	Category			Total
	1	2	3	
Distance from main town in department (in km)	29.7	35.9	40.1	34.7
Distance from government services (in km)	13.7	19.9	21.8	18.2
Distance from law enforcement (in km)	17.9	21.8	15.3	20.6
Percentage of non-accessible villages	.0	.0	4.6	1.9
Percentage of villages without markets	70.1	49.5	54.7	49.6

2.1.2 Accessibility of Villages to Health Centres, Drinking Water, and Electricity

Approximately 83.5% of villages in cocoa producing areas have no health centre, however the closest health centre is located, on average, 9.4 km away (See table 2).

In addition, only one-fourth of the villages (25.3%) in the cocoa producing area have electricity. There will be more electrification efforts to be made in categories 1 and 2, where it is seen, respectively, that only 13.4% and 21.5% of the villages have electricity, as opposed to 49.2% in category 3.

In addition, there are close to 3 public fountains in each village, of which approximately one-third need to be repaired (35.7%).

Table 2: Accessibility to Health Centres, Drinking Water, and Electricity

	Category			
	1	2	3	Total
Percentage of villages with no health centre	87.1	90.0	67.1	83.5
Proximity of health centre to village (in km)	5.5	14.8	6.0	9.4
Percentage of villages with electricity	13.4	21.5	49.2	25.3
Average number of public fountains	3.3	1.9	3.0	2.7
Average number of fountains in working order	2.7	1.2	1.4	1.8

2.1.3 Availability of Educational and Training Centres in Villages

Tables 3 and 4 show a lack of primary and secondary educational centres and professional training centres in the villages. The average number of classes and teachers in the public primary schools are respectively 4.54 and 4.11. No village has a secondary school and only 5.4% of villages have a training centre. The closest secondary school and training centres are located 19 km and 14.6 km from the villages, respectively. These facts may constitute major obstacles to education and learning of children growing up in production areas.

Table 3: Summary of Primary Schools in Villages

Category	Average Number	Average Number of Classes	Average No. of Employees	Average No. of Teachers	
1	Public Primary School	.90	4.02	187.41	4.63
	Private Primary School	.00	.00	.00	.00
	French Arab School	.00	.00	.00	.00
	Koranic School	.00	.00	.00	.00
	Community Education Centre	.00	.00	.00	.00
2	Public Primary School	.64	4.78	158.97	4.10
	Private Primary School	.00	.00	.00	.00
	French Arab School	.14	.48	14.56	.40
	Koranic School	.00	.00	.00	.00
	Community Education Centre	.00	.00	.00	.00
3	Public Primary School	.76	4.19	167.78	3.67
	Private Primary School	.00	.00	.00	.00
	French Arab School	.04	.08	2.52	.04
	Koranic School	.19	.30	7.95	.19
	Community Education Centre	.00	.00	.00	.00
Total	Public Primary School	.71	4.54	165.48	4.11
	Private Primary School	.00	.00	.00	.00
	French Arab School	.10	.32	9.80	.27
	Koranic School	.40	0.06	1.51	.04
	Community Education Centre	.00	.00	.00	.00

Table 4: Summary of Other Educational and Training Centres

	Category			
	1	2	3	Total
Percentage of villages with a secondary school	.0	.0	.0	.0
Distance from secondary school (in km)	18.9	18.4	20.2	19.0
Percentage of villages with a cocoa farming training centre	.0	.0	20.8	5.4
Distance from training centre	–	24.8	18.6	14.6

2.1.4 Size of Cocoa Farming in Villages

The percentage of households producing cocoa is 57.3% in the cocoa producing area in Côte d'Ivoire, and the percentage of households that have cocoa farming as the principal activity is 35.2%. Relatively, cocoa farming is a principal activity for 85.9% of households in category 3, 30.3% of households in category 1 and 9.8% of households in category 2. (see table 5)

Table 5: Activities and Projects Initiated in Villages

	Category			
	1	2	3	Total
Average number of households*	224.1	280.4	310.1	267.8
Average number of cocoa farming households	181.1	116.8	176.5	153.7
Percentage of villages having cocoa farming as the principal activity	30.3	9.8	85.9	35.2
Percentage of villages hosting a project	100.0	100.0	100.0	100.0
Average number of social cultural associations	1.9	5.1	2.2	3.3

2.2 CHARACTERISTICS OF COCOA FARMING HOUSEHOLDS

2.2.1 Socio-Demographic Characteristics of Heads of Households

The majority of households producing cocoa in Côte d'Ivoire are headed by men, only 5.7% of heads of households are women. The average age of heads of households is 47 years. Almost all (91.2%) own their farms. Sixty percent have no academic education and 79.2% are Ivoirians. (See Table 6)

2.2.2 Financial Capital of Households

Table 7 summarises the financial capital of cocoa farming households in Côte d'Ivoire. It shows that in addition to cocoa production, which totals on average 1.4 tons per household, cocoa farmers have a more or less diversified agricultural activity. On average, they hold 1.6 ha for subsistence crops, produce on average 262.6 kg of coffee, 661.5 kg of palm bunches, 102.3 kg of copra and sell an average of 36.5 kg of latex.

In addition, we note that the average production of coco nuts (1.3 tons) and palm bunches (4.3 tons) are relatively very large in category 2. This may explain that only 9.8% of villages in this category have cocoa farming as a principal activity. (See table 5).

Households in category 1 have lower agricultural production. The production of cocoa and other perennial crops in this area is relatively lower.

Table 6: Socio-Demographic Characteristics of Heads of Households

	Category			
	1	2	3	Total
Sex of Head of Household				
% Male	93.80	92.10	97.70	94.30
% Female	6.20	7.90	2.30	5.70
Average Age	49.60	45.80	45.80	47.00
Type of Farmer				
% Owner	96.22	85.30	93.60	91.20
% Manager	3.80	10.70	2.80	6.20
% Tenant	.00	1.30	2.40	1.20
% Other	.00	.00	.00	.00
Educational Level				
% None	74.60	54.20	52.30	60.00
% Primary	13.10	23.50	29.50	22.10
% First cycle	10.80	12.00	14.50	12.40
% Second cycle	1.50	9.30	3.20	5.10
% Higher	.00	.90	.50	.50
Nationality				
% Ivoirian	95.20	72.40	71.50	79.20
% Malian	2.80	23.90	19.30	16.00
% Burkina Faso	1.90	3.80	7.40	4.30
% Other	.00	.00	1.80	.50
Religion practised				
% Christian	47.20	48.10	40.90	45.60
% Muslim	21.70	31.30	26.60	26.90
% Animist	27.80	17.90	28.10	24.00
% Other	3.30	2.70	4.40	3.40
Marital Status				
% Married	89.70	72.60	86.60	82.10
% Divorced	5.80	7.90	3.80	6.00
% Single	.00	13.30	6.20	7.00
% Widowed	4.50	6.20	2.80	4.70
% Other	.00	.00	.00	.00

In addition, we can note in passing that only 11.2% of farmers, who also have diversified activities, report that they have received technical assistance.

Table 7: Financial Capital of Households

	Category			
	1	2	3	Total
Cocoa Farms				
Average number of parcels per household	1.7	1.5	1.5	1.5
Average distance from farms to place of residence (in km)	6.4	4.5	3.9	4.3
Average age of parcels	21.9	17.2	17.7	18.1
Average size of cocoa parcels (in ha)	3.8	3.9	5.6	5.3
Average production of farms (in kg)	245.0	734.5	1551.4	1351.2
Average sale price of one kilogram of cocoa (in CFA francs)	387.3	400.2	349.2	357.1
Other perennial crops of household				
Number of other perennial corps held per household	1.3	1.1	.5	.6
Average quantity of coffee produced (in kg)	320.4	352.4	246.3	262.6
Average quantity of palm bunches (in kg)	67.1	4335.3	382.7	661.5
Average number of cashew nuts produced	317.1	.0	.0	33.2
Average quantity of cola nuts (in kg)	.0	.0	3.7	3.1
Average quantity of coconuts (in kg)	.0	1298.8	.0	102.3
Average quantity of latex sold (in kg)	2.7	103.4	34.3	36.5
Tonnage of other perennial corps (in kg)	6.1	.0	.6	1.2
Average surface area of subsistence crops of households (in ha)	1.4	1.7	1.7	1.6
Livestock of household				
Average number of poultry	7.5	11.7	12.4	11.8
Average number of sheep	1.3	.3	1.0	1.0
Average number of goats	2.1	.1	1.1	1.1
Average number of cattle	.0	.0	.0	.0
Average number of other animals	.1	.0	.3	.3
Access to support and technical assistance system (%)	12.9	3.7	11.7	11.2

2.2.3 Living Conditions of Households

The statistics in table 8 show that 71.8% of heads of households believe that their living conditions have worsened compared to ten years ago. In villages in category 1, almost all households, 98.1%, have a negative opinion of their living conditions.

The proportion of households that have access to electricity is 9%, and 62% have access to running water or drinking water.

Table 8: Living Conditions of Households
Sum

	Category			
	1	2	3	Total
Proportion of households that have electricity	5.8	7.4	14.3	9.0
Proportion of households that have access to drinking water or running water	88.9	51.3	48.2	62.0
Percentage of households that believe their living conditions have worsened	98.1	55.1	66.3	71.8
Percentage of households that believe their living conditions remain unchanged	.0	2.7	5.0	2.5

2.3 LIVING AND WORKING CONDITIONS OF CHILDREN IN HOUSEHOLDS

Heads of households reported that they have an average of 6.2 children (including adults), approximately 45.2% of these children live outside of the family unit.

2.3.1 Characteristics of Children Living Outside of the Household

In table 9, it is seen that the average number of children (including adults) living outside of the household is 2.8 on average, among them 1.1 on average (39.3%) are of school age. The calculation of the school attendance rate for girls and boys living outside of the household is 63.6% and 78%, respectively.

Table 9: Typology of Children Living Outside of the Household

	Category			Total
	1	2	3	
Average number of children and adults	7.7	5.1	6.0	6.2
Number of children and adults living outside of the household	3.4	2.4	2.7	2.8
Average age of children and adults outside of the household	17.5	14.1	12.9	14.8
Average number of girls living outside of the household	1.7	1.4	1.3	1.5
Average number of boys living outside of the household	1.7	.9	1.4	1.5
Average number of school-aged children living outside of the household	1.3	.8	1.2	1.1
Average number of boys under 17 years old not attending school/dropped out of school living outside of the household	.2	.1	.3	.2
Average number of girls under 17 years old not attending school/dropped out of school living outside of the household	.4	.4	.4	.4

2.3.2 Characteristics of Children Living Within the Household

An average labour force of 2.03 children work for the head of household out of an average labour force of 4.1 workers. (See Appendix 1). These children work on various activities from household chores to agricultural production. (See table 10)

According to the statements by heads of households, 29.8% of children work part-time on cocoa farms, while 8% work full-time on cocoa parcels. The proportion of children involved in other perennial agricultural production is 21.9%.

Table 10: Frequency of Use of Children in Cocoa Producing Areas

	Category			Total
	1	2	3	
Proportion of children working part-time on cocoa parcels	34.9	31.3	26.5	29.8
Proportion of children working full time on cocoa parcels	6.6	7.2	8.8	8.0
Proportion of children involved in other perennial crops	29.9	21.7	13.2	21.9
Proportion of children involved on subsistence crop parcels	38.2	31.3	26.5	31.8
Proportion of children taking care of livestock	16.6	14.5	15.5	15.9
Proportion of children involved in household chores	34.9	41.0	33.1	33.8
Proportion of children involved in work for compensation	3.3	7.2	4.4	4.0

The school attendance rate is 39.3% and 59.2%, for girls and boys living in the household, respectively, according to reports by heads of households. It can be noted that the school

attendance rate of children living outside of the household is higher. The modest living conditions and the lack of educational infrastructures in the villages may prevent some parents from sending their children to school and may force those who can do so to send them away in order to give them an academic education.

2.3.3 Characteristics of Children Working on Cocoa Parcels

Table 11 summarises the characteristics of children working full time or part time on cocoa parcels. The latter are on average 10.3 years old, and 57.8% are male. Only 2% of them have no kinship relationship with the head of household.

According to statements by children, 68.7% of them attend school. This result, which diverges somewhat from the statements by parents, remains low. Efforts must be made to increase the rate of school attendance of children in cocoa farming households in the area of creation of educational infrastructures. This recommendation is supported by the fact that only 13.6% of children questioned can read French correctly, which is far below the school attendance rate. Thus, the problem of the quality of teaching in rural areas is highlighted.

Even if 93.8% and 97.5%, respectively, of children working on cocoa farms state that they feel safe and are satisfied with their diet, 1% of them state that they have previously felt forced to work and 10.4% have previously been victimised by physical or verbal violence.

Table 11: Characteristics of Children Working on Cocoa Parcels

	Category			Total
	1	2	3	
Percentage of Male Children	61.7	51.8	58.7	57.8
Average age	10.4	10.4	9.9	10.3
Percentage of children without kinship relationship with head of household	.0	3.1	3.8	2.0
Percentage of children living with two parents	60.9	58.3	62.7	60.5
Percentage of children living with one parent (mother or father)	22.9	21.6	20.1	21.8
Percentage of children attending school	78.2	64.7	58.4	68.7
Percentage of children reading French correctly	17.0	7.9	15.1	13.6
Percentage of children satisfied with their diet	100.0	93.8	97.9	97.5
Average hours of sleep	6.0	7.0	8.0	7.0
Percentage of children previously forced to work	.0	.6	2.9	1.0
Percentage of children who have experienced physical or emotional violence	.0	14.2	22.4	10.4
Percentage of children who have witnessed violence to a third person	.7	13.1	25.5	11.1
Percentage of children who feel safe	98.3	89.6	91.5	93.8

2.4 SOCIO-ECONOMIC DETERMINANTS OF INVOLVEMENT OF CHILDREN IN PRODUCTION

The results of various regressions as well as the calculation of marginal effects of significant related variables, the methodology of which was presented in section 1, are presented in table 12. The explanatory power of the variables used on the parameters of interests is more or less weak in view of the level of the adjusted R²s. However, the model is significant overall.

Table 12: Determinants of Use of Children

	Part Time	Marginal Effect	Full Time	Marginal Effect
(Constant)	.533** (3.13)	-	-.171 (-1.04)	-
Age of head of household	.004** (2.97)	0.0025** (83.05)	.002 (1.45)	-
Type of farmer	.006 (0.27)	-	.025 (1.08)	-
Nationality of head of household	-.021 (-0.80)	-	.050* (2.00)	-
Religion of head of household	-.031 (-1.92)	-	.031* (2.02)	-
Marital status of head of household	.055 (1.74)	-	.023 (0.76)	-
Total number of children belonging to the household	.004 (0.97)	-	.003 (0.82)	-
Average age of children growing up in the household	-.023** (-10.75)	0.0146** (83.05)	-.006** (-2.88)	-0.0051** (-194.3)
Number of parcels of the household	.031 (1.56)	-	-.015 (-0.77)	-
Average age of parcels	.003* (2.29)	0.0019** (83.05)	.000 (0.29)	-
Average distance from farms to place of residence	.003 (1.21)	-	-.001 (-0.28)	-
Total surface area of cocoa parcels of the household	-.003 (-1.11)	-	.000 (0.06)	-
Number of other perennial crops held by household	-.017 (-0.67)	-	.022 (0.94)	-
Number of sheep of household	.000 (0.10)	-	.010* (2.49)	-
Number of goats of household	.005 (1.04)	-	-.001 (-0.18)	-
Number of cattle of household	.021 (0.38)	-	.024 (0.46)	0.0084** (194.3)
Surface area of subsistence crops held by households	.002 (0.67)	-	.001 (0.40)	-
Distance from primary school	.000 (1.30)	-	.000 (-0.64)	-
Distance from secondary school	.001 (0.55)	-	.001 (1.50)	-
Opinion of head of household on quality of life in the village	-.037* (-2.27)	-	-.006 (-0.39)	-
Total number of girls working in the household	.086** (7.45)	0.0545** (83.05)	.041** (3.71)	0.0345** (194.3)
Total number of adults working in the household	-.011 (-1.00)	-	-.005 (-0.50)	-
Access to technical assistance service	.048 (1.11)	-	-.004 (-0.09)	-
Sex of the head of household	.235 (2.15)	-	.015 (0.14)	-
Category	.064* (-2.49)	-	.031 (1.26)	-
	F=15.063**		F=3.884**	
Quality of the regression (Poisson OLS)	R=0.646		R=0.395	
	R ² aj=0.42		R ² aj=0.16	