# Modeling the Determinants of Farmers' Decision on Exclusive Schooling and Child Labor in the Cocoa Sector of Ghana

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*Abstract -* The use of children on cocoa farms in West Africa has received extensive attention over the last few decades due to media coverage in the international press and growing pressure from international organizations such as the International Labor Organization. Based on 2007 cocoa sector survey, the paper used a logistic regression model to determine the factors that significantly affect the decision to let a child attend school exclusively or do some work on the cocoa farm. To enable them develop, children who are in the school-going age are expected to devote their full time to education (and some recreation) and not engage in any type of work. The factors that were found to positively and significantly influence farmer`s decision to let the child attend school exclusively in cocoa communities of Ghana were: main source of drinking water being borehole, sex of a child, age of a child, and household heads living in the Ashanti cocoa region. The results of the study also showed that sex of household head and household head staying in the Western South cocoa region, had negative and significant effect on the household`s decision to let the child attend school exclusively. Some of the children who undertook farm work got involved in hazardous work such as the use of cutlass which often harmed them and could further put them away from school; if they were enrolled. Children should not be made to compromise their education in any way by assisting with farm work which should be undertaken by adult household members and hired labor.

*Keywords :* *child labor, cocoa, development, school, model, ghana.*

## I. Introduction

### a) Background

Increasing numbers of children in developing countries are involved in agriculture and other commercial activities at the expense of their education. Some of these children are engaged in hazardous activities, situations, and conditions, such as working in mines, Working with chemicals and pesticides in agriculture or working with dangerous machinery. UNICEF (2008) estimates that 158 million children in the world (that is, one in six children) aged 5-14 are engaged in child labor. In Sub-Saharan Africa, around one in three children, representing 69 million children are engaged in child labor.

Agriculture is the dominant sector of most developing countries. Agriculture also serves as the major source of income and employment for the rural people. Because of the intensity of labor use in agriculture and the inability of many farmers to engage hired labor due to low incomes, the use of child labor in agriculture is rampant in developing countries. According to the International Cocoa Initiative (ICI) (2009), nine out of ten working children in rural areas are engaged in agricultural activities. The children usually work on their parents` or relatives farms often on regular basis, dramatically affecting their schooling (ICI, 2009). Studies in Ghana by the International Institute of Tropical Agriculture (IITA) and Ghana`s Ministry of Manpower, Youth and Employment (MMYE) revealed that majority of the children employed on cocoa farms were members of farm households (IITA report, 2002a; MMYE, 2008 and MMYE, 2007).

Using children in economic activities tends to interfere with their education, and the attainment of the Millennium Development Goals (Rena, 2009), especially the achievement of universal primary education (Goal 2). Although net primary enrollment has increased in all countries and the majority of African countries are likely to achieve this goal by 2015, this achievement has not been matched by a commensurate increase in the primary school completion rate (UNECA, AUC, AfDB and UNDP, 2010). One reason for dropping out of school is to work for a parent or seek wage employment.

There have been various conventions and measures aimed at helping to solve or provide the benchmark or standards for the involvement of children in any form of work (Nkamleu and Kielland, 2006; Nkamleu, 2009 and IITA, 2002b). For example, ILO Convention No. 182 on the worst forms of child labor, 1999, helped to focus the international spotlight on the need for urgent action to eliminate as a priority, worst forms of child labor without losing the long term goal of

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the effective elimination of all child labor. ILO Convention No. 138 on the minimum age for admission to employment and work is one of the most effective methods of ensuring that children do not start working when they are too young. ILO Convention No. 184 addresses the need for safety and health in agriculture, and Convention 29 addresses the need to actively prohibit forced labor (ILO-IPEC, 2009; ICI, 2009; Nkamleu and Kielland, 2006).

MMYE-NPECLC (2008) reported that in 2001, there were strong agitations on the international media front, especially in the United States of America (USA) and United Kingdom (UK) about child exploitation in the cocoa industry in Cote d`Ivoire and, by association and proximity, Ghana. There were threats by some consumers to boycott chocolates because of the presumption that production of the cocoa beans involved the use of child labor. The governments of these countries (USA and UK) also threatened to discontinue purchasing cocoa beans from West Africa.

It has been argued that African rural societies do not consider child labor as a serious issue, and consider that the productive activity of a child living in a rural and traditional environment is a means of social integration and should be regarded as teaching the child survival skills (Nkamleu and Kielland, 2006; Hagan, 1992). According to IITA (2002a), in West Africa, children in rural areas have traditionally worked in agriculture as part of the family unit. This means that in the traditional environment, child labor is not viewed as a problem but it is considered as a form of `on-the-job' training for the child. However, many households also see the importance of education for the development of their children. They are therefore often torn in between allowing the child to pursue education exclusively and involving the child in economic enterprise of the household. Knowledge about factors affecting this decision would be useful in the design of effective education and labor policies that would lead to the development of human resources for, national development (Nkamleu and Kielland, 2006). This paper seeks to bring out these factors in households that are engaged in cocoa farming in Ghana.

The rest of the paper is organized as follows. Section 2 (methodology) is subdivided into five sub-sections. Section 2.1 presents the data (MMYE pilot survey data), section 2.2 describes the socio-economic conditions of child labor, section 2.3 presents the theoretical framework for the study, and section 2.4 presents the model specification and descriptive statistics of variables, and with section 2.5 presenting the discussion and justification of the independent variables included in the logistic regression model. Section 3 is subdivided into two sub-sections. Section 3.1 discusses the logistic regression results and section 3.2 presents the marginal effects of the logistic regression model. Section 4.1 presents conclusions from the study.

### b) Cocoa in the Ghanaian Economy

According to IITA (2002a), West Africa accounts for approximately 70% of the world's cocoa production; with an estimated 15% produced by Ghana which is the second largest producer after Cote d'Ivoire (43%). Cocoa is the most important agricultural enterprise in Ghana contributing over $ 1 billion in 2004 and $1.9 billion in 2009 to foreign exchange earnings (SGER, 2010).The crop occupies about 25% of the cultivated land area and employs about 800,000 small holder farm families (Breisinger et al. 2008; MMYE, 2007).Bøås and Huser (2006) reported that cocoa farms in Ghana are usually small and family-run. The average size of a farm is about five hectares. Currently, the Western region along the coast and towards the border to Cote d`Ivoire produces the largest volume of cocoa per year. The Ashanti region is second and Brong-Ahafo region is third. In the Western and Brong-Ahafo regions, farms tend to be bigger than in other parts of the country, while in the Central region many farms are between one and two hectares.

### c) The Problem of child Labor in the Cocoa Sector of Ghana

Cocoa production, particularly, under the smallholder system as occurs in Ghana is highly labor intensive. Farmers use a combination of family, hired and communal (nnoboa) labor in the production activities. In general, the farmer's household is the main source of labor for the farm, contributing almost 60% of the total labor requirement. The children of the farm household provide above 14% of the labor on the farm (MMYE, 2007).

The issue of unacceptable labor practices has become a growing concern within cocoa producing countries, cocoa-consuming countries, and international organizations. To address it, in 2006 the Republic of Ghana established the National Program for the Elimination of Worst Forms of Child Labor in Cocoa (NPECLC), which sought to reduce the worst forms of child labor to the barest minimum in the cocoa sector by 2011. The Pilot Study in 2007 on labor practices in cocoa production in Ghana and the 2007 cocoa labor study in Ghana are significant steps in this process. These two surveys provided empirical evidence needed for the "standards of public certification" for the cocoa sector of Ghana and also devised steps towards addressing child labor in the cocoa sector.

## II. Methodology

### a) Data

The data used for the analysis was obtained from Ghana`s 2007 cocoa sector survey which provided information on the number of Ghanaian children aged 6-

15[1]years working in the cocoa sector, their characteristics, and those of members of their households. The survey comprised a national random sample of 590 households from six cocoa districts in four cocoa regions of Ghana. The head of the households and519 children aged 6-15 from the households were interviewed.

The survey collected data on sex, age, religion migration status, education, among others for each individual in the household. Information was also obtained on households' access to drinking water and sanitation facilities, housing characteristics and ownership of assets such as spraying machine, and sewing machine, and health and occupational characteristics. For the children, the survey collected data on what they do on day-to-day basis, for example, working on the cocoa farm (and at what time and for what type of activity), attending school or combining working on the cocoa farm with attending school, doing housekeeping chores and/or doing nothing.

b) *Socio-Economic Conditions of Child Labor*

The socio-economic and demographic characteristics of children and their families were summarized by the use of descriptive statistics. Majority (60.1%) of the children between the ages of 6-15 years were males.

About 62.2% of children attended school and did not work on cocoa farms; and 37.8% either worked on the cocoa farms as their sole activity or combined both school and work on the farm. It is presumed that the best way to let a child develop is for the child to devote all his/her time to education during the school-going age. Therefore combining pursuit of education with working on a farm should still be regarded as child labor.

Based on ILO definition, out of the 26 tasks performed by children, 12 of them were classified as hazardous work. The proportions of children aged 6-15 years who were involved in hazardous tasks such as weeding, spraying insecticides, application of fertilizer, application of fungicide/other chemicals and control of mistletoe were 55.4%,4.3%, 6.0%, 6.6% and 12.2%, respectively. However, the task most of the children who worked on cocoa farms performed was gathering and heaping of cocoa pods. These results conform partly to what Nkamleu, (2009) found in the cocoa sector of Côte d'Ivoire. It was also revealed that about 23.9% of the children used protective equipment and clothing for work and 24.5% of them obtained them from the farm owner or caretaker farmer.

c) *Theoretical Framework*

The theoretical framework adopted for the paper is a household production model introduced by Becker (1965) and further developed by De Tray (1973) and Rosenzweig and Evensong (1977) and further explained and adopted by Khanam (2006). Following from Khanam (2006) the paper uses a general utility maximizing framework to model a household`s choice between a child attending school exclusively; and working on a cocoa farm or combining attending school with working on a cocoa farm (that is, doing some farm work with or without attending school) as a reduced-form function of individual, household, parental and community characteristics. The household is assumed to maximize utility in terms of the quantity and quality of children and also the consumption of other household produced goods and services, and leisure. The household demand for the $ith$ child attending school exclusively or doing some farm work ($Wi$) can be specified as;

$$Wi = w\ (Xi,\ Xh,\ Xc, vi) \qquad (1)$$

Where $Xi$, is a vector of child's characteristics such as the child's age, sex ;$X$ is a vector of household characteristics such as the parent`s education and occupation, family size; $X$ cis a vector of community characteristics, and $vi$ is a vector of any individual, household or community specific unobservable characteristics that may affect child's working and schooling activities. The equation (1) can be considered as reduced form equation, which contains only exogenous explanatory variables.

In empirically estimating factors influencing a household`s decision on a child attending school exclusively, and doing some farm work in the cocoa sector of Ghana, the study uses a logistic regression formulation. Previous attempts in this regard used a single equation standard binomial logic and probit models to analyze child labor and child schooling participation (see, for example, Ray, 2003; Canagarajah and Coulomb, 1997).

The logistic regression formulation adopted for this study has a binary dependent variable(Yi) which takes a value of 1 when a child in the household attends school exclusively and 0 for a child who provides some labor on a cocoa farm (with or without attending school). In the logic model, Yi* can be written as:

$$Pi = E(Y^* = 1 \mid Xi) = \frac{1}{1+e^{-(\beta_1 + \beta_2 X_i)}} \qquad (2)$$

Equation (2) can be re-written as:

$$Pi = \frac{1}{1+e^{-Zi}} = \frac{e^{Zi}}{1+e^{Zi}} \qquad (3)$$

Where $\qquad Z_i = \beta_1 + \beta_2 X_i$

Equation (3) represents (cumulative) logistic distribution function. If $Pi$, the probability of a household`s decision on a child attending school exclusively, is given by (3), then$(1 - Pi)$, the probability of household`s decision on a child working only on the cocoa farm or combining both school and work is:

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[1]The focus on children aged 6-15 years is to capture the basic school going age in Ghana which starts at age 6 at primary class one and ends at age 15 at junior high school form three.

$$1 - Pi = \frac{1}{1+e^{Zi}} \qquad (4)$$

Therefore, write,

$$\frac{Pi}{1-Pi} = \frac{1+e^{Zi}}{1+e^{-Zi}} = e^{Zi} \qquad (5)$$

Since $\quad \dfrac{Pi}{1-Pi} = \dfrac{\frac{e^{Zi}}{1+e^{Zi}}}{\frac{1}{1+e^{Zi}}} = e^{Zi} \qquad (6)$

Now $Pi/1 - Pi$ is the odd ratio in favour of a household deciding to let the child attend school exclusively- the ratio of the probability that a household decides that a child will attend school only to the probability that a household decides that a child will do some work on the cocoa farm (with or without attending school). Now taking the natural log of equation (5) yields,

$$In\left(\frac{Pi}{1-Pi}\right) = Z_i = \beta_1 + \beta_2 X_i \qquad (7)$$

That is, the log of the odds ratio, is not only linear in $X$, but also (from the estimation viewpoint) linear in the parameters, (Gujarati, 2004).

### d) Model specification and descriptive statistics of variables

Three models have been specified to explain the factors that significantly influence household`s decision on child labor and schooling in the cocoa sector of Ghana. For instance, the actual model specification for model 1 is:

$$In\left(\frac{Pi}{1-Pi}\right) = Yi^* = \beta_0 + \beta_1(Sex) + \beta_2 Age +$$
$$\beta_3(Disckm) + \beta_4(Sexh) + \beta_5(Ageh) + \beta_6(HH0) +$$
$$\beta_7(HH1) + \beta_8(HH2) + \beta_9(Migrant) + \beta_{10}(Farming) +$$
$$\beta_{11}(Married) + \beta_{12}(Watersou) + \beta_{13}(Coarea) \qquad (8)$$

The dependent variable for the logistic regressions of the household`s decision on child labor and schooling in the cocoa sector of Ghana is measured as a dummy, 1 for a child who attends school exclusively and 0 for a child who provides some labor on a cocoa farm (a child works only on the cocoa farm or combines school and work on the cocoa farm). Two other models (models 2 and 3) have been specified to test the robustness of the regression results of model 1. Definition of the variables used in the models, frequency, mean and standard deviation are presented in Table 1.

*Table 1 :* Definition and descriptive statistics for exogenous variables used in the model

| Variable | Description | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|
| Child characteristics | | | | | | |
| SEX | Sex of child: 1= male; 0= female | 501 | 0.60 | 0.49 | 0 | 1 |
| AGE | Age of child in years | 501 | 11.59 | 2.40 | 6 | 15 |
| Parent and Household characteristics | | | | | | |
| SEXH | Sex of household head; 1= male, 0= otherwise | 590 | 0.85 | 0.36 | 0 | 1 |
| AGEH | Age of household head/ farm caretaker in years | 589 | 46.84 | 13.81 | 18 | 87 |
| HH0 | 1= if the household head had no formal education, 0= otherwise | 588 | 0.28 | 0.45 | 0 | 1 |
| HH1 | 1= if the household head had primary education, 0= otherwise | 588 | 0.18 | 0.38 | 0 | 1 |
| HH2 | 1= if the household head had JSS/Middle school education, 0= otherwise | 588 | 0.44 | 0.50 | 0 | 1 |
| MIGRANT | 1= if the household head is a migrant, 0= otherwise | 590 | 0.24 | 0.43 | 0 | 1 |
| FARMING | 1= if major occupation of household head is farming, 0= otherwise | 589 | 0.93 | 0.25 | 0 | 1 |
| MARRIED | 1= if household head is married, 0= otherwise | 589 | 0.87 | 0.34 | 0 | 1 |
| WSOUTH | 1= if the household head resides in Western South cocoa region, 0= otherwise | 590 | 0.16 | 0.37 | 0 | 1 |
| ASH | 1= if the household head resides in Ashanti cocoa region, 0= otherwise | 590 | 0.33 | 0.47 | 0 | 1 |
| HHCAPITAGHS | Household cocoa per capita income in GHS | 589 | 156.23 | 252.58 | 0 | 2810 |
| COAREA | Cocoa farm size of household head in hectares | 528 | 10.11 | 21.58 | 0 | 4 |
| Community characteristics | | | | | | |
| DISCKM | Distance from household to nearby school in kilometers | 601 | 1.85 | 1.01 | 1 | 10 |
| WATERSOU | 1= if the main source of water for the household is borehole, 0= otherwise | 587 | 0.47 | 0.50 | 0 | 1 |

*Source : Authors computations from MMYE Survey Data, 2007*

*e) Discussion and justification for the independent variables included in the model*

i. *Age of child (AGE)*

According to Canagarajah and Coulombs (1997), combining working on a farm and schooling increase with the age of the child. The decision to let a child work on the cocoa farms not independent of the decision to let him/her attend school exclusively. According to Nkamleu and Kiel land (2006), most activities on cocoa farms are heavy tasks that are not appropriate for children with inadequately developed muscles. It is therefore, more likely that older children will be more involved in work on cocoa farms. Maitra and Ray (2000) reported that older children in Ghana, Peru and Pakistan are more likely to combine schooling with employment than younger children.

ii. *Distance to school in the community (DISCKM)*

This is variable used to capture the availability of school in the community. It is measured as the distance from the household to nearby school in kilometers. Distance from the household to the school has considerable effects on transportation costs to school and also means of transport used during school attendance. Availability and proximity of school sore factors that could positively influence school enrolment. Therefore, it is expected that closeness of school to the household would have positive effect on the household`s decision to allow the child to attend school exclusively and not to engage him or her in farm work.

iii. *Educational level of the household head (HH0/HH1/HH2)*

Fathers with relatively high level of education have a significant negative influence on the likelihood of the child working (Canagarajah and Coulombs, 1997). Therefore, it is expected that, household heads who have had formal education would have positive effect on the household`s decision to allow the child to attend school exclusively and not to engage him or her in farm work.

iv. *Sex of Child (SEX)*

Canagarajah and Coulombs (1997) pointed out that, boys and girls tend to do different types of work. Girls do more household chores while boys work more in economic enterprises. IITA (2002a) found that about 59% of children working on cocoa farms were boys while girls accounted for 41%.

v. *Household per capita cocoa income (HHCAPITAGHS)*

Poverty has been linked with child labor, with some studies supporting the general idea that poverty is the main cause of child labor. According to Cockburn (2001), child labor is closely and commonly linked with poverty. However, the empirical evidence on this link is weak. According to Canagarajah and Nielsen (2001), there is the belief of poverty as a determinant of child labor; however, other determinants are of similar importance. Furthermore, IITA (2002a) report shows that although cocoa farming is the main source of income, the quantity of cocoa production is relatively low making it difficult for families to have sufficient income to meet their needs which include payment of school fees, payment of hospital bills, among.

vi. *Source of Water (WATERSOU)*

This is variable which captures the main source of drinking water for the household. It is measured as a dummy; 1 if the main source of drinking water for the household is borehole and 0 otherwise. In the traditional African settings children usually performs household chores such as fetching water, cooking, among others before going to school in the morning and also after returning from school. Therefore having direct access to water reduces the time spent on these chores before going to school. There is an opportunity cost of schooling and doing housework for both boys and girls. There is the need for the provision of basic services and facilities like boreholes to decrease the opportunity cost of schooling. Cockburn (2001) study using multinomial logit analysis of data from rural Ethiopian households observed that proximity to a source of water also decreases the involvement of children in labor.

vii. *Age of household head (AGEH)*

Studies in Cote d'Ivoire, have found that, the older the head of the household, the more likely it is that a child will be attending school and not indulge in work (Nkamleu and Kielland, 2006). Based on that finding, age of household head is expected to be positively related to the decision of the household to let the child attend school exclusively.

viii. *Sex of household head (SEXH)*

Cockburn (2001) found that children are more likely to attend school in female-headed households. According to Maitra and Ray (2000), sex of the household head matters in making decisions to send the child to school and/or work in Ghana. Their results found that, being a female household head has a significant positive effect on the decision for a child to attend school only in Ghana. Also being a female household head in Ghana has a significant negative influence on the probability that the household would allow the child to engage in work.

ix. *Cocoa farm size (COAREA)*

According Bhalotra and Heady (2003), farm size has positive effects on child labor. As cocoa farm size (measured in hectares) increases as result of expansion of farms for cocoa production farmers need more labor inputs for planting, weeding and spraying of chemicals. Therefore, as cocoa farm size increases, it is likely to increase the use of child labor and decrease schooling. It is expected that cocoa farm size is negatively related to the decision of household to let the child attend school exclusively.

x. *Occupation of household head (FARMING)*

According to Canagarajah and Coulombs (1997), households who earn a larger share of their income from family enterprises, farming or otherwise, are likely to have a greater demand for labor and have a higher probability of obtaining them within the household as it is cheaper and flexible. This results in high child labor participation in rural farming and urban informal sector. It is expected that farming being the main occupation of the household head would have negative effect on household`s decision to let children in the household devote their time to education only and not help on the farm.

xi. *Marital status of household head (MARRIED)*

It is expected that a married household head would want children of the household to obtain higher educational achievements and so would allow the children to pursue education exclusively.

xii. *Location of household head for cocoa farming (ASH/WSOUTH)*

Nkamleu (2009) included regional dummies in his model; the dummy variables took the value of 1 for farmers in the corresponding area and 0 otherwise. He explained that regions are not homogeneous in terms of agricultural opportunities, potential for employment in farming and non-farming activities, or the quantity, quality and distribution of school infrastructure. The regional factor would normally have an impact on the pattern and intensity of child labor and school attendance, see also Nkamleu and Kielland (2006). Regional dummies in relation to Ashanti and Western cocoa regions have been included to take care of the demand patterns of labor markets, schooling distance and the level of cocoa production as supply variables. The regional dummy took a value of one if it was in the Ashanti or Western cocoa region, and zero otherwise. Due to relatively better infrastructure and higher incomes in Ashanti region, it is expected that cocoa farmers in the region would be more inclined to let their children attend school exclusively. The larger cocoa farms in the Western region would imply a higher demand for labor and therefore farm households would want their children to undertake some farm work whether the children attend school or not. .

## III. Type of Producer (Migrant)

MMYE (2008) identified clearly that children of migrant workers, laborers and tenant workers were more likely to be exposed to harsher conditions at much younger age and school attendance could be a problem. It is therefore expected that children living in migrant households or tenant households would have a lower probability of enrolling in school. Therefore, the tenant owner or migrant caretaker variable is negatively related to a child attending school only.

a) *Results of logistic regression*

Equation (8), specified as a logistic regression function, was estimated using a maximum likelihood procedure. Results of the logistic regressions for households` decision on allowing the child to school exclusively, or doing some work on the cocoa farm are presented in Table 2. Using logistic specification with the dependent variable measured as 1= if the child attends school only and 0= if the child does some work on the cocoa farm, a maximum likelihood procedure was used to estimate the parameters. The percentages of correct prediction for the three models were generally high. The Chi-square values were also highly significant. The three models jointly explain the factors that significantly influence household`s decision on child labor and schooling in the cocoa sector of Ghana.

Results in the models are generally mixed. In model 1, eight out of the 13 explanatory variables were significant with four corroborating the *a priori* expectations. The results in the model showed that sex of child, age of child, sex of household head and main source of drinking water being borehole significantly influence the household`s decision on allowing the child to school exclusively or doing some work on the cocoa farm. The results in model 1 showed that other socio-economic variables are important in household`s decision to allow a child attend school only.

The differences in the models include the introduction of regional dummies and household per capita cocoa income in models 2 and 3. In model 2, the introduction of regional dummies and household per capita cocoa income variables resulted in significant change in the variables that were significant and also corroborating the *a priori* expectations. The results of the model show that age of child, main source of drinking water being borehole, household head residing in Western South and Ashanti cocoa regions significantly influence the household`s decision on allowing the child to school exclusively or doing some work on the cocoa farm. The study showed that the location of the household head is an important determinant for the household decision to let a child attend school exclusively.

A farmer staying in the Ashanti cocoa region (ASH) was positively and significantly related to the household`s decision to let the child attend school exclusively. A farmer staying in the Western South cocoa region (WSOUTH) was negatively and significantly related to the household`s decision to let the child attend school exclusively. Farms in the Ashanti region were not as large as those in the Western region and so labor needs in the former region might be lower than the latter region.

Age of child was found to be positively and significantly related to the household`s decision for a child to attend to school only in all the three models. According to Assaad *et al.* (2007), schooling has a

concave profile with age, with the probability of schooling increasing for very young children as children who are delaying schooling finally enroll but then declining as some children drop out after few years of schooling. One reason could be due to late enrolment in school; therefore children usually delay in starting school in the cocoa communities.

The household per capita cocoa income variable had the right sign but insignificant. This

corroborates Cockburn (2001) study which showed that household income had a weak linkage with child labor. Model 3 and model 2 are similar in terms of number of significant variables. The results in model 3 corroborate the results in model 2. Other household variables had a mixed outcome. Some were significant but did not corroborate the *a priori* expectation. Some were neither significant nor corroborate the existing literature.

*Table 2 :* Logistic regression model of the households decision to let a child attend school exclusively or do some work on the cocoa farm in Ghana

| Variables | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | Coefficient | S.E | Coefficient | S.E | Coefficient | S.E |
| CONSTANT | -2.774 | 1.026*** | -1.263 | 1.122 | -0.937 | 1.090 |
| SEX | 0.418 | 0.255* | -0.055 | 0.289 | -0.100 | 0.286 |
| AGE | 0.151 | 0.050*** | 0.106 | 0.059* | 0.118 | 0.058** |
| DISCKM | 0.204 | 0.131 | 0.167 | 0.138 | 0.158 | 0.137 |
| SEXH | -0.760 | 0.414* | -0.506 | 0.494 | -0.433 | 0.488 |
| AGEH | 0.012 | 0.010 | 0.003 | 0.012 | -0.005 | 0.010 |
| HH0 | -0.701 | 0.465 | -0.290 | 0.524 | -0.112 | 0.509 |
| HH1 | -0.107 | 0.489 | -0.213 | 0.525 | -0.180 | 0.521 |
| HH2 | -0.217 | 0.415 | -0.479 | 0.454 | -0.497 | 0.451 |
| MIGRANT | 1.115 | 0.369*** | 0.698 | 0.414* | - | - |
| FARMING | 1.175 | 0.482** | 0.915 | 0.484* | 0.961 | 0.476** |
| MARRIED | -1.122 | 0.449** | -0.584 | 0.467 | -0.619 | 0.463 |
| WATERSOU | 2.222 | 0.256*** | 0.855 | 0.327*** | 0.927 | 0.321*** |
| COAREA | 0.005 | 0.005 | - | - | - | - |
| WSOUTH | - | - | -4.521 | 1.031*** | -4.669 | 1.032*** |
| ASH | - | - | 2.449 | 0.458*** | 2.404 | 0.453*** |
| HHCAPITA | - | - | 4.13e-05 | 6.58e-04 | 6.47e-05 | 6.50e-04 |
| | | | | | | |
| Log likelihood | -212.0420 | | -161.5256 | | -163.0047 | |
| No. of observations | 441 | | 487 | | 487 | |
| LR chi$^2$ (13) | 161.05 | | 320.67 | | 317.71 | |
| Prob> chi$^2$ | 0.0000 | | 0.0000 | | 0.0000 | |
| Pseudo R$^2$ | 0.2752 | | 0.4981 | | 0.4936 | |

*, ** and *** means significant at 10%, 5% and 1% respectively

## IV. Conclusion

The issue of child labor on Ghana`s cocoa farms has come on the international spotlight and it has been taken seriously by the government of Ghana due to the importance of cocoa to the economy of the country. The 2007 cocoa survey provided data on the socio-economic conditions of cocoa farmers and sources and the use of labor on their cocoa farms as a prelude to the certification process for non-use of child labor in cocoa production in Ghana. This paper has taken the study forward by estimating a logistic regression function to explain the factors that affect the decision to send a child to school exclusively on one hand, and to work on the farm or to do both, on the other hand.

Defining child labor as any work that takes the child from his/her education, results indicate that child labor occurs in cocoa farming communities in Ghana.

Many cocoa farmers ask their children to help them on their farms but many of these children may also be enrolled in school and so may use school time or time to undertake private studies or do home work for the farm work. During activities that are labor intensive and which occur at peak periods (for instance harvesting of cocoa), some farmers ask their children to miss school and help them on the farm. However, the odds are that household heads would want their children to attend school exclusively. As farm incomes improve, farmers should hire labor for their farm activities and allow children to devote all their time to their education and use their spare time for private studies and much needed recreation. What the study did not do was to find out how providing labor at some of the time affects school performance of the children as they may not allow them to devote their full attention to their studies.

It is important that boreholes and other forms basic services and facilities are made available in the

cocoa-growing areas to increase exclusive school enrollment and attendance, instead of devoting time to some farm work and other housework.

Encouraging educated youth to go into cocoa farming will be a step to eliminate child labor completely since they would invariably enroll their children in school with a high probability of not letting them engage in any form of farm work. Not unexpected, many of the youth who were interviewed during the survey did not aspire to be cocoa farmers until rural conditions, the drudgery of cocoa farming and the returns to cocoa farming changed dramatically. This could be achieved if steps are taken to increase the profitability of cocoa production. It also implies that, improvement in the welfare of cocoa farm households and their communities would in the long-run help in the reduction of child labor in the cocoa sector of Ghana.

In addition to taking them from their education, there were instances where children who provided some farm labor were engaged in activities that would be considered hazardous to their health. For example, the use of cutlass by younger children to weed the farm or break cocoa pods might hurt them or using children to assist in spraying pesticides or getting them closer to the chemicals might lead to chemical poisoning. It was found that many of the children who did farm work did not wear protective clothing and this might cause injury to them.

Although farm households may require additional labor from time to time on their farms, this must not be sought from their children. A child`s development encompasses devoting his or her full time to education and parents must create learning environments for them instead of using them to substitute for hired labor.

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