

## Child Labor and Associated Problems (The Case of Damot Gale District in Wolaita Zone, Ethiopia)

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### Abstract

The study was carried out at Damot Gale district of Wolaita zone in Southern nation nationalities regional state with the main objectives to describe factors of child labor in the study area. In order to attain this objective the study made use of cross-sectional household survey data collected from 94 sample households. The data collected were analyzed and discussed by using both descriptive statistics and binary logit regression model. To this end, identifying children's who were in child labor and those who were not in child labor; descriptive result shows that from different age category 73% of the children's were engaged in different activity and the remaining 27% responded as they were not working. Most children's started working below the age of 8 and major sectors of work were unpaid family work such as agriculture 58% Male and 7.24% Female and Home service 7.3% Female and 22% male. The result of the logistic regression model revealed that out of 8 variables included in the model, 4 explanatory variables were found to be significant at 1%, 5% and 10% level. Accordingly, family size and loss of parents have positive association with child labor and statistically significant up to less than 1% and 10% respectively. Meanwhile occupation status of the parents and education level of were found out to have strong negative association with child labor and statistically significant up to less than 1% level of significance.

**Keywords:** Child labor; Logit model; Damot Gale district

### Introduction

#### Back ground of the study

According to the ILO, child labor is "work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development." The ILO classifies work conducted by children into three categories: children in employment, child labor, and hazardous work. The ILO condemns both child labor and hazardous work with the goal of eliminating hazardous child labor by 2016.

Child labor is often characterized as pernicious and evil, something that has to be unequivocally rejected. Around 60% of all exploitative child labor takes place in agriculture, the (labor) dominant sector in LDCs. Children in rural regions of LDCs are often the only available "means" for producing agricultural goods and sustaining a livelihood. There are at least three reasons why agricultural production based on fair trade schemes can better tackle the problem of exploitative child labor. Firstly, control mechanisms are much more elaborated. Secondly, the shorter supply chain allows traceability, an important precondition for an efficient control system. Thirdly, a guaranteed minimum price prevents absolute poverty a major cause of child labor – while the fair trade premium can be used to overcome long-term structural barriers, thus addressing the root causes of exploitative child labor [1].

Of all children engaged in economic activities outside the house or household work, about 88% reside in rural areas. The highest rates of child labor are to be found in SNNP and Oromia (88.8% in each). The agriculture sector accounts the largest portion, which is 75% and service sector 12% and 4% in manufacturing [2]. This ranks the country among one of the countries with highest rates of child labor in the world. Poverty, lack of educational opportunity parent's choice, children's choice and societal attitudes are main factors in the Ethiopia [3]. Since studies done in Ethiopia on child labor are far from adequate, and almost all of them were conducted in the major urban settings of the country, the rural community where high prevalence of the problem is expected is not yet studied. Therefore this particular study

was done with the objective of determining the magnitude of child labor and associated problems in Damot Gale district.

### Objectives

#### General objective

The main objective of the study is to assess the magnitude of child labor and associated problems in the case of Damot Gale district in Wolaita Zone, Ethiopia.

#### Specific objectives

The study has the following specific objectives:

- To assess the challenges and abusive practices that these working children face;
- To investigate the causes for the involvement of children in the labor market.

### Methodology

#### Description of the study area

Damot Gale is one of 12 districts in Wolaita zone of SNNPR of Ethiopia. It is located at 139 km south west of the Hawassa town which is the capital of southern regional state and 365 km from Addis Ababa in the southern direction. Geographically, it is located between 6° 53' - 7° 6' 30" north latitude and 37° 46' - 37° 58' 40" east longitude. It has an

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altitude ranging from 1501-2950 meters above mean sea level. Mount Damota is the highest peak in the area. The study area covers an area of 24285.861 hectare. Damot Gale district is divided into three basic traditional agro-climatic zones such as Dega or highland (25.3%), Woina dega or midland (61.2%) and Kola or lowland (13%) (WARD office). Woina dega dominates the study area which has bimodal distribution of rainfall. Mean annual rainfall ranges between 1001-1400 mm [4].

The study area is bordered on the south west by Sodo zuria, on the north west by Boloso sore and Damot Pulassa, on the north by Hadiya zone, on the east by Duguna Fango, and on the south east by Damot woyde. Based on the CSA [5] estimation and district finance and economy development office report, Damot Gale has a population of 177,570 out of this 103,011 are male and 74,559 are female. The total households of the district are 30,767 males, 26,417 and females 4,350 and have a total of 31 rural kebele. Children's age less than 15 year in the four kebele is 3148. Like other parts of the region agriculture is the main means of livelihood for the population both in terms of crop production and livestock.

### Data type and source

The research work was mainly used a primary data which was collected from the study area. Information on the demographic and socio economic condition of the children's and their family data was collected through structured questionnaires having a close ended elicitation format with open ended follow up questions. The structured questionnaires were posted to the children's and to their parents with face to face interviews. The purpose of the study was explained to the study subjects and their willingness to participate in the study asked before conducting interviews. Interviews were conducted during late afternoons and evenings as these were found to be optimal time to find children at home. Child labor: economic exploitation and any other circumstance under which children perform paid or unpaid work that might be directly detrimental to their development, or that might prevent them from exercising their education, health and leisure in the study area.

Secondary data was used to supplement the primary data and obtained from different published and unpublished documents. Both quantitative and qualitative methods were employed because these two types of data complement each other. Since the main aim of this research was mainly investigating statistically the relation between dependent variable i.e. child labor and explanatory (independent) variables that determine child labor in the study area. In addition to statistical investigation key informant and focus group discussion were taken place.

### Sample size determination

The sample size in this study was determined by using the minimum sample size formula of Fowler and then adjusted for the total population of the study area by Cochran's sample size formula as shown below

$$n = \frac{Z^2(p)(q)}{d^2} \tag{2.1}$$

Where, n=sample size, d=the level of risk the researcher has been decided to take that true margin of error may exceed the acceptable margin of error=0.06 (precision 6%) with confidence level 94%.

Therefore, the final sample size for the district becomes 94 which was the sum of four kebele as we can see in the Table 1 below.

Name of Kebele	Total population	Total children age <15	Sample children age <15
Damot Mokonissa	5215	834	25
Gacheno	3702	629	19
Wandara Gale	6073	971	29
Shasha Gale	4200	714	21
Total	19190	3148	94

Table 1: Sample size of the Kebeles.

### Sampling technique

The study population constituted of children's aged 5-15 years and who were residing in Damot Gale district in four kebele during the study period. For this study, multistage sampling procedures were used. In the first stage, Damot Gale district was selected purposively because it was one of the densely populated districts in zone level as well as regional level. In the second stage three kebele were selected from 31 kebele by simple random sampling. At the third stage, Systematic sampling technique was employed to identify the study subjects. The first household was selected by lottery method; a child from every 4<sup>th</sup> house was interviewed. If the number of children's were above one in a household, only one child was selected by lottery method. If no child was found in the selected household, the next household with a child was visited before going to the next fourth household. As the study was household based, homeless street children were not included in the study.

### Data collection techniques and instruments

The researcher used kebele agricultural development workers to collect primary source data. Before entering to survey, the development agents were given a training mainly focusing on the contents of the questionnaire and procedure of survey. Observation and discussion with district as well as kebele governmental officials and expertise was held by the researcher. The key points were prepared for discussion with key informant, employers and governmental officials. Structured and semi-structured interview questionnaires were designed to collect quantitative data.

### Method of data analysis

To achieve the objectives of this study, different methods of data analysis were used. The study used both descriptive and econometric analysis. The descriptive analysis uses percentages, graphs, tabulations and Binary logit regression analysis was used to identify the effect of determinants of child labor. Tools and statistics used in descriptive and econometric analysis were generated with the help of econometric software STATA version 11.

**Binary logit model:** In order to identify the determinants of child labor in the study area a binary response model is specified to be estimated by logit regression technique. The logit specification is designed to analyze qualitative data reflecting a choice between two alternatives, which in this case are being in child labor and not being in child labor. The choice of the logit model is premised on the fact that ordinary least squares assumes a continuous dependant variable while in the case of child labor the response is a binomial process taking the value 1 for being in child labor and 0 otherwise. The parameters of this model were estimated by using the maximum likelihood estimation rather than the movement estimation in which OLS regression technique rely on. The logit method gives parameter estimates that are asymptotically efficient, and consistent. Indeed, the logit approach is known to produce statistically sound results [6,7]. Probability of being

in child labor is specified as the value of the cumulative distribution function which is specified as function of the explanatory variables. The equation is of the form:

$$Y_i = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \dots + \beta_k x_{ik} + \varepsilon_i \dots \quad (2.2)$$

Where,

Y=probability of being in child labor or not in child labor

$\alpha$ =Intercept (constant) term

$\beta_k$ = Coefficient of the explanatory variables.

$X_i$ =Explanatory variable.

$\varepsilon$ =Disturbance (stochastic) term.

For the case of a single independent variable, the logistic regression model can be written as

$$\Pr(event) = \frac{e^{\beta_0 + \beta_1 X_1}}{1 + e^{\beta_0 + \beta_1 X_1}} \text{ or equivalently,}$$

$$\Pr(event) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1)}} \quad (2.3)$$

Where,  $\beta_0$  and  $\beta_1$  are coefficients to be estimated from data,  $X_i$  is the independent variable e is the base of the natural logarithm.

For ease of exposition the model can be written as (for more than one independent variables)

$$\Pr(event) = \frac{e^{Z_i}}{1 + e^{Z_i}} \text{ Or equivalently } \Pr(event) = \frac{1}{1 + e^{-Z_i}} \quad (2.4)$$

This particular study was deal about the probability of being in child labor or not and this expression expressed in mathematical form as follows:

The probability of a child being in labor market (an event occurring) as the form:

$$\Pr(y = 1 / x) = \Pr(Y = 1) = \frac{e^{Z_i}}{1 + e^{Z_i}} = \frac{1}{1 + e^{-Z_i}} \quad (2.5)$$

$$Z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + \varepsilon \dots \quad (2.6)$$

Note: The error term  $\varepsilon$  also follows logistic distribution

For a non-event (not in child labor) cumulative logistic distribution, representing the probability is just (1-pi) i.e.

$$1 - \Pr(y = 1 / x) = \frac{e^{-Z_i}}{1 + e^{-Z_i}} \quad (2.7)$$

Therefore, by dividing equation (2.5) by equation (2.7) we can result in the odds-ratio in binary response, which is as stated below:

$$\frac{\Pr(y = 1 / x)}{[1 - \Pr(y = 1 / x)]} = \frac{P(Y = 1)}{1 - P(Y = 1)} = \frac{\frac{1}{1 + e^{-Z_i}}}{\frac{e^{-Z_i}}{1 + e^{-Z_i}}} = \frac{1}{e^{-Z_i}} = e^{Z_i} \quad (2.8)$$

Equation (2.8) is simply the odd-ratio in favor of a children is falling to labor exploitation. This is the ratio of the probability of a children will be in labor market to the probability that it will not be in child labor.

When we take the natural logarithm of odd-ratio of equation (2.8) will result in logit model as we can see below

$$Li = \ln\left(\frac{P(Y = 1)}{1 - P(Y = 1)}\right) = Zi = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 \quad (2.9)$$

### Assumptions of logistic model

1. Assumes a linear relationship between the logit of the independent variable and dependant variables, however, does not assume a linear relationship between the actual dependant and independent variable

2. Independent variables were not linear functions of each other, i.e. perfect multicollinearity makes estimation impossible.

3. The model was correctly specified i.e.

❖ The true conditional probabilities are a logistic function of the independent variables;

❖ No important variables are omitted;

❖ No extraneous variables are included; and

❖ The independent variables are measured without error.

Based on the above justification, we specified the logit model for probability of a children being child labor exploitation and determinants of child labor

$$Y_i = \beta_0 + \beta_1 Ag + \beta_2 Sex + \beta_3 FS + \beta_4 DR + \beta_5 Edu + \beta_6 Ocu + \beta_7 LosPa + \beta_8 DitSch + \varepsilon_i \dots \quad (2.10)$$

Therefore  $Y_i = 1$  if child is involved in child labor and  $= 0$  if children is not in labor market,  $\beta_i$  is regression parameters,  $\varepsilon_i$  is the error term and the explanatory variables defined in Table 2 below. The regression was estimated by Maximum likelihood technique.

### Results and Discussions

This chapter deals with the results of descriptive statistics and binary logistic regression results of the causes for the involvement of children in the labor market; the analysis was done in line of the objectives of the study. Section 3.1 deals with descriptive analysis and section 3.2 presents the results of the econometric analysis.

S. No	Variables	Measurement	Expected signs
1	Occupation of the parents (Ocu)	Dummy (takes=1 if parent has occup; otherwise 0)	-
2	Dependency Ratio (DR)	Continues	+
3	Distance from School (DitSch)	Continues	+
4	Loss of Parents/Broken Marriages/Divorce (LosPa)	Dummy (takes=1 if broken/lost parent; otherwise 0)	+
5	Family Size (FS)	Continues	+
6	Sex	Categorical (1 stands for Male; 0 for female)	-/+
7	Age (Ag)	Continues	+
8	Parents Education (Edu)	Continues	-

Table 2: Expected signs of explanatory variables.

### Descriptive analysis

In this study a total of 94 children’s family or their parents were interviewed concerning child labor and associated factors that lead to exploitation of child labor. Majority of the head of the household were male 71 (76%) and the remaining 23 (24%) were female parents of the children who were sampled for this study. 86 (91.4%) of respondents were farmers, 2 (2.1%) government employee, 3 (3.1%), Daily laborers 1 (1.06%) and merchants 2 (2.1%). From the number of children’s engaged in different activities children whose parents occupation was agriculture ranked first in number, followed by merchants and daily laborers and less in parents whose occupation was government employee. This is due to the fact that the government employees’ access to participate/easily understanding of different child related laws either by reading or attending in meeting than the rest of parents whose occupation was farming, merchant and daily laborers (Figure 1).

### Age and child labor

The Table 3 below shows that the number of children in age category 5-8 accounts 27 (28.7%) and, age 9-11 the number of children 38 (40.5%) and age category 12-15 the number of children 29 (30.8%). Accordingly, the age category 9-11 ranked first in working which was 29 (42%), followed by age category 12-15 the number of children who were responded as working were 24 (35%) and the remaining 16 (23%) were from the age category 5-8. The survey result revealed that from different age category a total of 69 (73%) of the children’s were engaged

in different activity and the remaining 25 (27%) responded as not working. Most children started working below the age of 8 and major sectors of work are unpaid family work such as agriculture (58% M and 7.24% F), Home service (7.3% F and 22% M) agriculture and home services were activates that children’s were practicing

### Schooling of the children’s

The educational status of the children’s was one of the variables under consideration of this study. The result of the survey in Table 4 shows that 68 (73%) of the children’s were currently in the school, 22 (23%) never went to school and 4 (4%) students dropout in order to support their parents with different activities. As the focus group discussion members confirmed that the two major reasons for not attending school and for dropping were the need to work and financial problem to cover school expenses and those children’s who were attending school were also working different activities before and after school.

### Model analysis

To identify the major determinants of child labor in the study area dependent variable i.e. Probability of being in child labor was regressed against various explanatory variables. The regression table revealed that binary logistic model managed to predict 69% of the responses correctly. Apart from % correct predictions, the model Chi-Square with “n” degrees of freedom and Hosmer and Lemeshow’s were used to test goodness-of-fit test. Accordingly, p-values associated the Chi-Square with 8 degrees of freedom. The value of .0000 indicates that the model as a whole is statistically significant that shows the model fit the data well.

The variables included in the model were tested for the existence of multi-co linearity, if any. Contingency coefficient and variance inflation factor were used for multi-collinearity test of discrete and continuous variables, respectively. Contingency coefficient value ranges between 0 and 1, and as a rule of thumb variable with contingency coefficient below 0.75 shows weak association and value above it indicates strong association of variables. The contingency coefficient for the discrete variables included in the model was less than 0.75 that didn’t suggest multi-collinearity to be a serious concern. As a common practice continuous variable having variance inflation factor of less than 10 believed to have no multi-collinearity and those with VIF of above 10 are subjected to the problem and should be excluded from the model (Table 5) [7].

In logistic regression analyses the variables that were positively

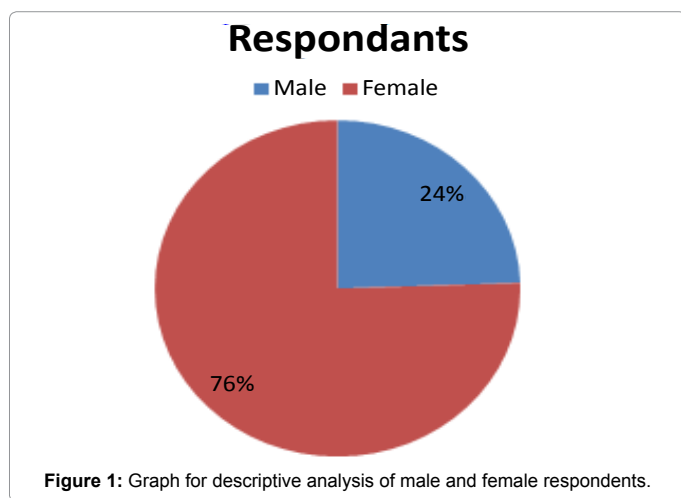


Figure 1: Graph for descriptive analysis of male and female respondents.

S. No	Age	No	%	Working		Not working	
				No	%	No	%
1	5-8 years	27	28.7	16	23	11	44
2	9-11 years	38	40.5	29	42	9	36
3	12-15 years	29	30.8	24	35	5	20
	Total	94	100	69	100	25	100

Table 3: Age and child labor.

No	Schooling	No	%	Working		Not working	
				No	%	No	%
1	Currently in school	68	73	53	77	15	60
2	Never went to school	22	23	12	17.2	10	40
3	Drop out	4	4	4	5.8	0	0
	Total	94	100	69	100	25	100

Table 4: Educational status of the children’s.



Prb. of being in Child labor	Coefficient.	Std. Err.	z	P> z
Sex of parents	0.8604187	1.298265	0.66	0.507
Age of the Households	0.0131227	0.0283364	0.46	0.643
Family Size	0.8290725	0.3150063	2.63	0.008***
Dependency ratio	0.7416148	0.4888516	1.52	0.129
Head education	-.1986955	0.0379914	-5.23	0.001***
Occupation of parents	-4.285659	1.599432	-2.68	0.007***
Distance from School	0.0067724	0.0279624	0.24	0.809
Loss of Parents	3.829672	2.057537	1.86	0.063*
_cons	-5.185204	3.1686	-1.64	0.102

Number of obs=94 Log likelihood=-19.87  
 LR chi<sup>2</sup> (8)=90.40  
 Prob>chi<sup>2</sup>=0.0000  
 Pseudo R<sup>2</sup>=0.6946.

NB: \*significant at 1%, \*\*significant at 5% and \*\*\*significant at 10%.

Table 5: Logistic regression result.

related with the probability of being in child labor were household head sex, age, family size, dependency ratio, distance from school and loss of parents. The negatively correlated variables with the probability of being in child labor were head education and occupation of parents.

Out of 8 explanatory variables, 4 variables such as household family size, distance from school, parents' educational status and occupation have a significant effect on children's failing into child labor at the significance level at 1%, 5% and 10%. The negative values of explanatory variables in the table above indicate that when the unit change in independent variable lead to decrease in probability of being in child labor.

In order to identify the factors of child labor in the study area this study employed the logit model. Since the model used is not linear, the marginal effect of each independent variable on the dependant variable is not constant but it depends on the value of the independent variables. Thus, marginal effects can be a means for summarizing how change in a response is related to change in a covariate. For dummy variables, the effects of discrete changes are computed, i.e., the marginal effects for dummy variables show how P(Y=1) is predicted to change as X<sub>k</sub> changes from 0 to 1 holding all other X<sub>s</sub> equal.

Whereas for continuous independent variables, the marginal affect measures the instantaneous rate of change, i.e. we compute them for a variable while all other variables are held constant that means in this study change in the probability of being in child labor with a unit change in continuous independent variable [8]. Thus, opposed to linear regression case, it is not possible to interpret the estimated parameters as the effect of the independent variable up on being in child labor. However, it is possible to compute the marginal effects at some interesting values of the significant explanatory variables. As we can see in Table 6 below.

### Family size and child labor

The size of household was found positive in this finding and the coefficient is statistically significant at 5% level. Other things remain constant, as it was expected that household family size increase by a unit, the probability of a child to be included in child labor increase by about 17.75%. This is due to the fact that additional household member shares the limited resources that lead the household to become poor and expose the children's of that family to child labor in order to fill their consumption short fall [9-11].

### Loss of parents/divorce and child labor

One of the determinants of child labor in the study area was loss

Prb. of being in child labor	dy/dx	Std. Err.	Z	P> z
Sex of parents'	.1635031	.20486	0.80	0.425
Age of the Households	.0028106	.00604	0.47	0.642
Family Size	.1775689	.06877	2.58	0.010**
Dependency ratio	.1588374	.11334	1.40	0.161
Head education	-.0425562	.00801	-5.31	0.000***
Occupation of parents'	-.6764956	.13494	-5.01	0.000***
Distance from School	.0014505	.00606	0.24	0.811
Loss of Parents*	.5893056	.15177	3.88	0.000***

(\*) dy/dx is for discrete change of dummy variable from 0 to 1.

NB: \*,\*\*significant at 1%, and \*\*\*significant at less than 5%.

Source: Survey result using STATA, 2017.

Table 6: Marginal effects result.

of parents by different reason i.e. by death, divorce etc. The variable is positively related with the probability of the child to be in child labor and the coefficient is statistically significant at 1% level. Holding all the model variables at their mean value, change from *having parent status* to *no parents' status* the probability of a children being in child labor increase by 58.9%. The possible explanation for this finding was children who have broken family and those who lost parents early were forced to work for survival. A family with complain (mother and father), dysfunctional family, unproductive family, divorce, inability of mother or father or both by natural and artificial cases, and death of either father or mother or both by any cases increase the vulnerability of children to work [12-15].

### Education level of the households and child labor

The level of education is negatively correlated to the probability of a children being in child labor and the coefficient was statistically different from zero at 1% significance level. As it was expected, other things remain constant when the education level of parents increased by one unites the probability of children to fail in to the child labor decrease by 4.2%. This is due to the fact that educated parents can capture easily any awareness creation to child labor and related problems and protect their children from child labor.

### Occupation of parents and child labor

Occupation of parents is one of the factors determining child labor in the study area. The variable is negatively related to the probability of a children being in child labor and the coefficient was statistically significant at 1% level. Holding other variables constant change from no occupation status to occupation status of parents the probability of a children being in child labor decrease by about 67.64%.

This may be the case that the parents who have access to occupation that can feed their family have better chance of keeping their children's from child labor exploitation than those who were dependent on others (it may be relatives, government etc.)

## Conclusion and Policy Recommendations

### Conclusion

This study was analyzed the child labor and factors affecting children's in the study area. The study used 94 sample parents and data was collected from four kebeles i.e. Damot Mokonisa, Gacheno, Shasha Gale and Wandara Gale. To attain the stated objectives of the study we used both descriptive and Econometric model analysis i.e. binary logit model.

Despite limitations like exclusion of homeless street children who were expected to encounter the worst forms of child labor, lack of uniformity in the definition of various forms of child labor and limited sample size, this study has tried to show the magnitude of child labor in a rural community setting.

The study showed that nearly 73% of the interviewed children were working and only 27% were not working. Result of these findings shows that most of the children were started working below the age of 8 and major sectors of working were unpaid family work such as agriculture 58% male and 7.24% female, Home service 7.3% female and 22% male.

The binary logit regression result shows that out of 8 variables included in this study to determine the influence of explanatory variable on probability of child to be failed in child labor 4 variables were found significant at 1%, 5% and 10% level. Among the significant variables family size and loss of parents positively related the probability of a child to be in child labor. On the other hand parent's occupational status and educational level negatively relate with the probability of a child being in labor market.

### Policy recommendation

➤ Child labor is serious negative phenomenon of our world that requires joint contributions of all societies. The desired areas of intervention stated by the subjects included family support education to children, raising community awareness about child labor, family planning, legislation, and implementation of law enforcement on child labor.

➤ Implementation of family planning and related measures should be taken to limit household family size.

➤ Creating job opportunity for parents can reduce child labor, large government infra-structure construction such as rural roads, water, building constructions and others one way of creating job opportunities.

➤ In this study educational status of parents have negatively correlated to child labor exploitation. Education may be the most important tool to reduce child labor exploitation and it needs the close follow up of parents education implementation in rural area in order to hand over the problems related with child labor.

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