

**Ethiopian Economics Association
(EEA)**



**PROCEEDINGS OF THE FIRST
ANNUAL CONFERENCE ON THE
EASTERN ETHIOPIA ECONOMIC
DEVELOPMENT**

Edited by:

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June 2013

Published: June 2013

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ISBN – 978-99944-54-34-1

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FOREWORD

The Ethiopian Economic Association (EEA) and its Dire Dawa and Haramaya Chapters are happy to issue the proceeding of the First Annual Regional Conference on the Eastern Ethiopia Economic Development. The conference organized on November 24, 2012 at the Dire Dawa University Conference Hall. EEA organized Regional Conferences in collaboration with its Chapters every year to broaden its activities and coverage at regional level. This enables the Association to contribute to the economic advancement of regional states through enhancing economic policy formulation capability; the dissemination of economic research findings; promotion of dialogue on critical socio-economic issues; promotion of education in economics in higher learning institutions; and enhancing networks of professionals and institutions.

The conference attracted about 140 participants drawn from members of Regional Parliament, higher officials and expertise from Dire Dawa City Administration, Somalie Regional State and Harreri Regional State, Dire Dawa University, Jijjiga University and Haramaya University, NGOs, private sector representative and EEA members in the Eastern Ethiopia. In the one day conference, six papers that focused on the Eastern part of the country regional socio-economic condition presented and discussed. The participants of the conference expressed their satisfaction on the organization of the conference and the content of the papers presented. They reflected that the papers largely focused on local issue that can contribute to the development of the Eastern part of Ethiopia. They also recommended that the issues raised in the discussion are critical that need to be taken by policy makers and implementing organs of the respective offices of the regions.

All papers which were presented at the First Annual Conference were reviewed by external reviewers and comments and suggestions including editorial comments were communicated to authors for improvement. Finally, those papers which passed all the review and editorial process published in the Proceeding of the First Annual Conference on the Eastern Ethiopia Economic Development.

I would like to take this opportunity to express my heartfelt gratitude, on my own behalf and on behalf of the Ethiopian Economic Association, to the many people and organizations that made the conference resounding success. First and

foremost, I thank the authors of the papers and the audience whose active participations made the Conference meaningful. The staffs of the Economics Department of the Dire Dawa University, Haramaya University and Jijjiga University for and the staff of EEA Secretariat deserve a special recognition for their passion and perseverance in managing the conference from inception to completion.

Our special thanks go to our partners who have shared our vision and provided us with generous financial support to materialize the activities of EEA. These include; The Friedrich Ebert Stiftung of Germany, The African Capacity Building Foundation (ACBF), The Think Tank Initiative of International Development Research Center (IDRC) of Canada; and Civil Society Support Program (CSSP).

Finally, I would like to extend my sincere gratitude to H.E. Ato Adam Farah, Deputy Mayor of the Dire Dawa City Administration, for his an insightful opening address; and other senior regional government officials from Dire Dawa City Administration, Somali Regional State and Harreri Regional State, who spared their busy schedule and participated in the conference. Dr. Wegayehu Bekele, President of Dire Dawa University and Dr. Gezahegn Ayele V/President of the Ethiopian Economics Association also deserve recognition for their welcoming addresses.

Alemayehu Seyoum Taffesse (DPhil)
President of the Ethiopian Economics Association

ANALYSIS OF MARGINAL INCOME CONTRIBUTION OF CHILD LABOUR AND ITS DETERMINANTS IN RURAL HOUSEHOLDS: THE CASE OF HARARI REGIONAL STATE

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Abstract

This study was initiated with the objectives of analyzing the marginal income contribution of child labour and its determinants in rural households of Harari region using sample households survey data collected from 180 households in the year 2008/09. Descriptive statistics and econometric models are used to analyze data. Results from descriptive statistics show that children are involved in four main activities: school attendance, working, combining school and work, and idle (neither attend school nor involved in work). The econometric results of Cobb-Douglas household production function model is used to simultaneously estimate the marginal contribution of child labour supply to a household income and its determinants. This model identified sex, education, adult working hours, parent employment, demand side characteristics, age, and family size as significant factors influencing the marginal contribution of child labour to family income. The Effective Labour Supply model results show that the marginal contribution of child labour supply was 22.1% (0.84AE per day per household). The multinomial logit model results showed that the probabilities of children involvement in schooling, working & combining school and work were 57.63%, 10.72%, and 16.85% respectively and the rest were idle. The results of multinomial logit model shows that farm work participation of children has a negative significant impact on school attendance and positive implication on combining school attendance with work. The demand side characteristic of child labour supply has a negative significant implication on school attendance and positive implication on the likelihood of child work. Parent's employment in a formal sector having stable job has a significant positive implication

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on school attendance and a negative implication on the likelihood of combining schooling with work. Another significant variable is domestic work of children which has a negative significant implication on children school attendance and has a positive implication on the likelihood of their working. Participation of children in family business has a negative significant implication on school attendance and a positive implication on their likelihood of combining work with school attendance. OLS multiple regression results showed that farm size, education, demand side characteristics, and adults working hours per day has statistically significant effects on child labour supply. Generally, the results of this study underline the dependency of the households on child labour to supplement their income. Hence, development policies and strategy should focus on the adult education and youth skill training, supply of labour efficient water harvesting and utilization technology in addition to productive agricultural inputs and establishment of formal or public sector in the study area.

Key words: Marginal income contribution, child labour supply, schooling, Harari, Ethiopia.

1. Introduction

1.1 Background

Child labour affects children's possibilities of becoming productive adults in the future. At the moment, over exploitation and abuse of child labour is a wide spread problem particularly in developing countries despite legislations prohibiting the participation of children in harmful work practices. Children in many developing countries contribute to the household's income either in cash or in kind; either by working in the labour market or directly contributing to the labour demand of household. All over the world, children continue to work, putting at stake their education, their health, their normal development to adulthood, and even their lives. Millions of them work under hazardous conditions, which present dangers to their health, safety, and welfare. They toil in mines and quarries, are exposed to agro chemicals in agriculture, squat in crippling positions to weave rugs and carpets and scavenge in rubbish collection centers. Many more are enslaved in bonded labour, isolated in

domestic service, and traumatized and abused in the commercial sex trade (Assefa, 2002).

According to Basu and Van (1998), poverty is the clearest manifestation of child labour and the incidence of child labour usually declines with rising per capital GDP. It is not because parents are irrational and unfeeling to their children that they send them to work but primarily to increase household income or as part of a survival strategy to minimise the risk of interruption of the income stream. It is often, a mitigation mechanism against a decline in income. The fact that poverty is one of the main predisposing factors to child labour undoubtedly places Ethiopia as one of the candidates for high incidences of child labour.

According to Bjerne (2001), ILO Convention 138 defines three critical ages. First, there is a general definition of a child as a person less than 18 years of age. No person under 18 should undertake work that includes health-threatening or hazardous activities. Second, the minimum age of legally entering the labour market as a full-time worker is set to 14 years of age for developing countries including Ethiopia and 15 in other countries. In all cases full-time work must begin only after the age of completing compulsory education. Third, the minimum age for entering the labour market doing light work is set to 12 for developing countries and 13 in other countries.

According to Ethiopian National Child Labour Survey (2005), in an effort to address the problem, the Ethiopian Government ratified ILO's Worst Forms of Child Labour Convention 1999 (No.182) in 2003, thereby committing itself to take immediate and effective measures to secure prohibition and elimination of extreme forms of child labour including the trafficking of children.

The study conducted by Tassew *et. al.* (2002), provides data on the distribution of child work between rural and urban areas and among regions in Ethiopia. About 52 percent of the children were reported to be engaged in productive activities. Girls were mainly engaged in domestic activities (e.g. collecting firewood and water, food preparation, washing clothes) while boys were involved in productive activities (e.g. cattle herding, weeding, harvesting, ploughing, petty trading, wage work). The participation rate in productive activities was 62 percent for boys and 42 percent for girls. The average number

of working hours of children involved in productive activities was 33 hours per week. One-third of children involved in productive activities worked for more than 40 hours per week (5.71 hours /day). The intensity of work in productive activities was higher for boys (36 hours/week) than girls (33 hours/week) in rural areas, whereas in urban areas it was higher for girls (31 hours/week) than boys (28 hours/week).

According to CSA (2002), about 41% of Ethiopian children aged 10-14 years were participated in child labour. Moreover, in Harari people national regional state in the same year CSA reported that working status of children aged 5-17 was about 49% were participated in domestic and productive activities. About 69% children aged 5-17 in Harari regional state in the year 2001 were attended school (Tassew *et.al.* 2002).

The above empirical evidence on the child labour indicates that income contribution of child labour is influenced by different factors and affects child physical and moral strengths. Moreover, it affects short-run and/or long-run income of the societies at different extents that can be an extremely expensive phenomenon both for the child and for the society in general. Therefore, giving due attention to combat the problems of child labour will benefit the societies as a whole. Any policy intervention on child labour will require research on income contribution of child which benefits all participants in the sector. The basic idea deriving this study is the analysis of marginal income contribution of child labour and factors that influence child labour in rural households of Harari people national regional state.

1.2 Statements of the Problem

In any context child labour supply remains a concern to any developing country's policy makers because too many children are affected by the problem of over exploitation and abusive use of child labour. Moreover, excessive child labour supply has a long term negative repercussions on the personal development of the child as well as on the economic and social development of a country.

According to Anker (2000), there may be several reasons why we should be concerned with the problem of child labour, but at least three reasons deserve mentioning. The first is the humanitarian concern, which emphasizes the protection of children from any form of exploitation and hazardous work. According to this view, children are fragile and need special protection. If children are put to work excessively they will have little time for play and recreation. The second concern about child work comes from the educational concern. This approach primarily emphasizes the normal development of children, which includes their right to attend schools. Excessive work can be harmful for children since they will not have time to go to school or even if they go, they have little time to study. So child work may affect the academic achievement of children. The last concern relates to the macro and micro economic effects of child labour.

Child labour may have serious implications on the economy and on the labour market of a country. On the one hand, children do make significant contribution to family income in many developing countries. In fact, without the support of their children many parents would not survive. So abolishing child labour may have serious implications on household income and survival. On the other hand, employment of children in work activities may displace unskilled labour from the labour market. This will create serious unemployment problems in an already fragile economic system of the developing countries (Anker, 2000).

Harari region is near to eastern boarder Djibouti where domestic products such as agricultural products and hand crafts are exported and different industrial products are imported. Due to this, there is in and out flow of labour including child from the neighboring regions and in the region itself with wide visibility of working children.

According to Lorenzo and Furio, (2007), the challenge of youth employment in Africa is especially large. In Sub-Saharan Africa, young people aged 15–24 account for 36% of the working-age population. Due to population pressure, the number of young people looking for work is expected to increase by 28% in the next 15 years, equivalent to about 30 million people. This is particularly the case for Ethiopia, home to one of the largest youth populations in Sub-Saharan

Africa. The lack of employment opportunities for Ethiopian young people is among the critical development challenges facing the country, and a key barrier to national efforts toward the Millennium Development Goals.

The population of Ethiopia is growing at an alarming rate and obviously, the backbone of the country's economy, agriculture directly depends on land, water, and cheap labour force. Likewise, in Harari regional state there is scarcity of resources such as land. The low productivity of land in addition to small land holding and the scarcity of water supply in the region require more labour input. This is to increase farm production which in turn increases burden on children. With these interrelated problems, over exploitation of child labour is widely observed in the region. Child labour is used to support the household labour supply or hiring out child labour to cover household's expenses. This is an observable problem with different factors that influence child to work which has an adverse effect on human capital formation of the region.

In Harari people national regional state 54.17% of the population lives in urban area and their main sources of income are engaged in trade of farm and non-farm products and hiring out labour. In the rural areas, farming, livestock production and hiring out of labour are the major sources of income. These economic activities require labour as a major input in farm and non-farm production and as a source of income generation. In the region, given these problems and the wide range of interest in child labour supply no studies had been conducted on child labour supply and its determinants. Since child labour is one component of household's labour supply, this study was designed to identify factors that influence child work, the major activities that children are involved in, and determine the magnitude of marginal contribution of child labour to the rural household's income and labour supply.

1.3 Objectives of the Study

The general objective of this study is to analyze the marginal income contribution of child labour and their determinants in the rural households of Harari people National Regional State of Ethiopia.

The specific objectives are:

Analysis of marginal income contribution of child labour and its determinants in rural households:

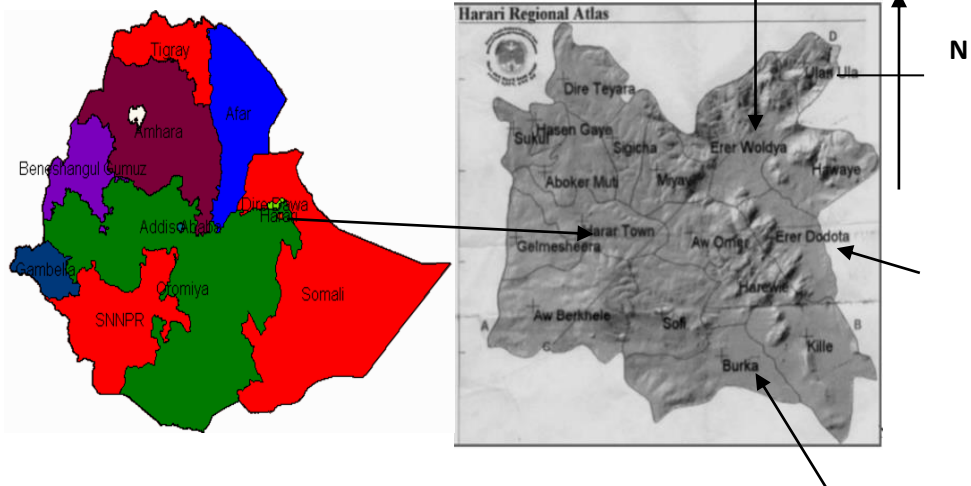
- i. To identify the livelihood activities that children in the study areas are involved in.
- ii. To estimate the marginal contribution of child labour to total family labour supply.
- iii. To estimate the magnitude of child labourer's contribution to the family income.
- iv. To analyze the determinants of child labour supply in the study area.

2. Research Methodology

2.1 Description of the Study Area

The study was conducted in rural areas of Harari Regional State; Dire Teyara, Erer and Sofi districts and nine Peasant Associations selected from these districts.

Figure 1: Map of Ethiopia Figure 2: Map of Harari people National Regional State N



2.1.1 Harari People National Regional State

Harari people national regional state is located at 512 km east of the federal capital Addis Ababa. It is surrounded by Oromia national regional State. Harari is located between $9^{\circ} 11'' 49' N$ and $9^{\circ} 24'' 42' N$ latitude and $42^{\circ} 03'' 30' E$ and $42^{\circ} 16'' 24' E$ longitudes. It has an elevation ranging from 1300-2200 meters above sea level (m.a.s.l). It was selected because of its commercial importance

as transit centre of domestic commodity export and import of industrial products. It is also a region with wide range of working children.

2.1.1.1 Demographics

Based on the figures from the Central Statistical Agency (CSA) published in 2008, Harari has an estimated total population of 183,344 of which 92,258 (50.32%) are men and 91,086 (49.68%) are women. About 84,023 (45.83%) of the population are estimated to be rural inhabitants, while 99,321 (54.17%) are urban dwellers. With an estimated area of 311.25 square kilometers, this region has an estimated density of 589 people per square kilometer. It is the third region next to Addis Ababa and Dire Dawa where the majority of its population lives in urban area i.e. 100%, 67.92% and 54.17% respectively. Out of 60,674 children (age 5-18 years), (52.23%) are rural inhabitants.

2.1.1.2 Economy

According to CSA (2007/08), rural households in Harari had a total of 40,780 head of cattle (about 0.086% of Ethiopia's total cattle), 5,040 sheep (0.019%), 41,230 goats (0.19%), 8,330 asses (0.15%), 36,290 poultry of all species (0.09%), and 1000 beehives (0.02%). The rural inhabitants cultivate crops like *chat*, sorghum, and vegetables while the urban communities use non-farm activities such as hiring out labour, providing services including trade of domestic farm products and hand crafts, and imported industrial products as a source of income.

2.1.1.3 Agriculture

To rural households in Harari, agriculture contributes much to food supplies and cash needs. The sector is characterized by its rain-fed and subsistence nature. In rural areas of the region intercropping of food crops with cash crops especially *chat* is widely practiced. The study area comprises mixed farming where crops are grown for food and cash, and livestock are kept for complementary purposes, as a means of security during food shortage, and to meet farmers' cash needs. Both crops and livestock productions are equally important for rural households in the region. Food crops and livestock

production in the study areas are virtually small-scale, subsistence and crucially dependent on rainfall.

2.1.1.4 Infrastructure

The development of infrastructures such as health services (both human and livestock), education services, communication networks, roads, etc. are important for sustainable agricultural development. Regarding educational establishments, the report of Bureau of Education (BOE) shows that in the study areas there are 17 elementary schools, nine elementary and junior secondary schools, and three farmers' skill-training centers (FTC). Better rural roads and electric services were networked throughout the districts.

2.2 Sources of Data

For the purpose of this study, both primary and secondary data were used. Secondary data were collected from published and unpublished materials. Primary data was collected through an interview using structured questionnaires. An interview was made for the head of household for all household members who were better informed about the activities of the children. The questionnaires were prepared in English language and translated to Afaan Oromo which is the local language.

2.3 Sample Size and Methods of Sampling

Three stages purposive and random sampling techniques were used to select 180 households from three districts. The special administrative feature of the region is that it has no zone but has a total of 12 districts. In the first stage, a total of three rural districts were purposively selected on the account that they were farming communities which best represent the rural areas of the region. On the second stage, based on the distance from the center of the region access to school a stratified random sampling method was used to select a total of nine PAs (three PAs from each district) among the three districts(Dire Teyara, Sofi and Erer). Finally, a systematic random sampling technique was used to select a total of 180 households from the nine PAs. During the selection, street children's were not included because the objective of this

study is to analyze the income contribution of child labour to rural households. The assumption is that they were not contributing any to the rural households' income (Table 1).

2.4 Methods of Data Collection

Data collection was conducted from December 2008 to April 2009. Primary data were collected from 180 sample households using a pre-tested structured questionnaire, which was designed to generate data on some socio-economic, institutional, and human capital variables that are related to child labour. Nine enumerators (one from each Peasant Associations) who are fluent in the local language were recruited and trained on the methods of data collection and interview techniques. Field trips were made before the actual survey to observe the overall features of the selected PAs and to pretest the questionnaire. For pretesting purpose, nine farm households were interviewed. After pre-testing, discussions were held with the enumerators on their field experiences, clarity of questions, language used unexpected responses, and additional response options for questions. After incorporating the comments, the final version of the questionnaire was prepared. Continuous supervision was made by the principal researcher to correct possible errors on the spot.

2.5 Methods of Data Analysis

This study employed both descriptive statistics and econometric methods to analyze the data.

2.5.1 Descriptive analysis

Descriptive statistics give a clear picture of the characteristics of the units under study. By applying descriptive statistics one can describe, compare, and contrast different categories of sample units with respect to the desired characteristics (Sonia, 2001). In this study, descriptive statistics such as mean, standard deviation, percentages, and frequency of occurrence were used to describe the sample units.

2.5.2 Effective labour supply model

The magnitude of the contribution of child labour to family labour was estimated by applying effective labour supply model:

$$E^S = \sum P_i L_i \quad (1)$$

Where: E^S : Effective labour supply per day per household (adult-equivalent),
 P_i : Man-day of the age group (i) which captures specific productivity differentials,
 L_i : The number of workers of age (i) per household.

The coefficient of P_i for adult-equivalent was adopted from Storck *et al.* (1991).

The difference in average effective labour supply is calculated as:

$$\Delta E^S = E_c^S - E_A^S \quad (2)$$

Where: ΔE^S : Change in effective labour supply,
 E_c^S : Effective labour supply of child of household in AE and,
 E_A^S : Effective labour supply of adults.

The effective labour supply model quantitatively measures the difference in labour supply between the child and adult in the households.

2.5.3 Cobb-Douglas household income function model

The Cobb-Douglas model was used to estimate household's income function with household characteristics (Adult wage market, demand side characteristics of child labour, household head sex, land, education and age of the household head) and labour variables (hours of labour by children, male adults and female adults) as explanatory variables (Cockburn, 2002).

Child work, whether it is enabling or productive, and the marginal product varies with the level of labour participation (law of diminishing returns). In the case of productive labour, we can evaluate the marginal income contribution of child labour by setting it to zero and the child work time in an estimated household production function and measuring the resulting change in predicted total income, assuming that all other variables are unchanged (Cockburn, 2002). Analysis of the marginal income contribution of enabling child labour requires the specification of household model. In Cobb-Douglas production function, household's income is the function of household labour (L), capital (K) including assets like land and technological influence (A), (α and β)= parameter to be tested.

$$Y = AL^\alpha K^\beta \quad (3)$$

To structure the discussion, a simple two-member (L_A = one adult labour and L_C = one child labour) agricultural household production model was adopted with competitive adult and child labour markets:

$$Q = f(L_A, L_C, K) \quad (4)$$

Household's income (Y) is equal to the sum of household profits, non-labour income (E), Q=production, and household labour earnings:

$$Y = (PQ - W_A L_A - W_C L_C) + E + W_A L_A^H + W_C L_C^H \quad (5)$$

This will help us to estimate the marginal contribution of household's labour that is used for domestic work or hire it from outside. P=the commodity price, Q=production, W_A = the market wage rate for adult, W_C = the market wage rate for child, L^H = labour time of household members, L_C^H = Household labour supplied by child, and L_A^H = Household labour supplied by adult, E= non-labour income. From equation (5) we can also derive the total time endowment of adult and child. Household's sources of labour are adult labour (L_A) and child labour (L_C) supply. These are specified as follows:

$$L_A^H + L_A^Z + h_A = T_A \quad (6)$$

$$L_C^H + L_C^Z + h_c = T_C \quad (7)$$

Where subscript A and C refers to adult and child respectively, h_c = non-work (school or leisure) time of child h_A = non-work time of adult, L=labour in household production, K=household assets, T_A = time endowment by adult, T_C = time endowment by child, Z= non-marketable "home goods" which is both produced and consumed by the household, K^Z = household assets supplied for home goods, L_A^Z = Adult labour supplied for home goods, L_C^Z = Child labour supplied for home goods. If the amount of adult or child work required for household production (L_A , L_C) exceeds the amount supplied by the household (L_C^H , L_A^H) for the child or adult household member, the household hires in labour. In the opposing case, excess household labour is hired out to earn market wages assumption is existence of labour market. To estimate excess household labour that will be hired out to earn market wages the empirical model by Cockburn, 2002 was adopted. It is specified as:

$$Pf_{LA} = W_A \quad (8)$$

$$Pf_{LC} = W_C \quad (9)$$

Where: W_A = The market wage rate for adult,

W_C = The market wage rate for children,

Pf_{LC} = Price as a function of hiring out of child labour,

Pf_{AL} = Price as a function of hiring out of adult labour.

Finally households' income can be calculated by using equation (5)

2.5.4 Multiple linear regression models

Multiple linear regression model was used to analyze factors that affect child labour supply. This model is selected for its simplicity and practical applicability. It is specified as:

$$L_C^H = \beta_0 + \beta_1 FMS_1 + \beta_2 AWH_2 + \beta_3 PE_3 + \beta_4 ED_4 + \beta_5 SX_5 + \beta_6 DSC_6 + \beta_7 FS_7 + \beta_8 NSG_8 + e \quad (10)$$

Where: L_C^H = is the amount of household labour supplied by child, β_i 's are parameters to be estimated, FMS is family size, AWH is adults working hours, PE is parents' employment, ED is household heads education level, SX is household heads sex, DSC is demand side characteristics for child labour, FS is farm size, NSG is non-school going children and e-random term.

2.5.5 The multinomial logit model

The multinomial logit model is used to analyze factors that cause a child to undertake several activities simultaneously. Although, there may be several activities that the children may undertake simultaneously, the study assumes child's unit-time endowment to be a function of four mutually exclusive activities. At a particular time, a child can be only attending school, only working, attending school and working at the same time or being idle (neither working nor attending school).

If the decision can be modeled in terms of a dichotomous choice model and the decision to work and to go to school are assumed to be independent, then a univariate logit or probit model can be used. However, if the two decisions are assumed to be made jointly, a bivariate probit model will be the appropriate approach. Under circumstances with more than two possible states in which a child could be at any one time, the bivariate or univariate logit or probit approach will not be suitable (Cockburn, 2001). Hence, when a simultaneous decision-making process is assumed for three or more alternative choices, a multinomial choice model is appropriate. This gives rise to the polychotomous choice framework.

Assuming that the inactive group is chosen as the standard or base alternative and considering the fact that the sum of the probabilities of the four alternatives must be unity. For dummy variables the marginal effect is computed as the difference in probabilities of the dependent variable between

the group with designated value 1 and the reference group (idle). The probabilities are constrained to sum to zero for each variable across the choices in the multinomial logit model. It should also be noted that the signs of the β coefficients are not necessarily equal to those of the marginal effects.

The probability of a child having activity j ($j = 0$ idle; $j = 1$ school only; $j = 2$ work only; and $j = 3$ school and work) will be estimated by the following multinomial logit model:

$$\Pr(Y_i = j) = \frac{\exp(x_i \beta_j)}{1 + \sum_{j=1}^3 \exp(\beta_j x_i)} \quad (11)$$

Where: β_j -parameters to be estimated,
exp- exponential that captures the explanatory variables,
x- Explanatory variables.

2.6 Variable Description and Working Hypothesis

Education (ED): It is a continuous variable that measures the level of household head's education. Previous empirical studies found ample evidences that parents' education affects child labour and school participation decisions. To capture the effect of parents' education continuous variables has to be used for each parent. Moreover, having less educated household head increases the working hours of children and decrease that of investing in schooling (Jackline, 2000).

Sex of the Household Head (SX): It is a discrete variable that takes one for male headed household and zero for female headed household. The gender of the head of household is another important factor affecting child labour and schooling. On one hand, female headed households usually have higher dependency ratio which may increase the livelihood of sending children to work. However, female-headed household may tend to be more rational in intra-household resource allocation patterns and invest in schooling of their children. So two dummies for male headed household and female headed household is used (Canagarajah and Coulombe, 1997).

Demand Side Characteristics (DSC): To capture factors that influence child to work, the percentages of adult workers engaged in manufacturing and in the rural or urban area are important. The higher the share of adults in manufacturing, the less would be the demand for children labour. Secondly, the share of adult workers employed in public sector in the province is high; the lower will be the demand for children employment (Jackline, 2000).

Households Heads Age (AG): The likelihood of a child attending school increases with the household head's age while child likelihood of working falls. Gender and age are important determinants of the probability of schooling and work. Most studies found that males are more likely to be economically active in the labour market than females. However, the effect of gender on schooling is more country-specific and cultural. Moreover, different studies found that if the age of the household head increases, the child school attendance increases (Chernichovsky, 1985).

Farm Size (FS): It is a continuous variable that enables us to compare children of land-rich households to work and also to be in school with the children of land poor households. Since land is the most important store of wealth in agrarian societies and a substantial fraction of the households do not own land, this challenges the commonly held presumption that child labour emerges from the poorest households (Sonia, 2001). Hence, it is hypothesized that households having relatively large farm size increases the child working hours (Cockburn, 2001).

Adult Working Hours (AWH): Appears to increase the likelihood of a child working, principally among young children. There is a negative relationship between adult wages and child labour as conjectured by Basu and Van (1998). According to them, higher adult wage would lead to higher supply of adult labour, and lower supply of child labour. They assumed that firms perceive adults and children as substitutes.

Family Size (FMS): It is measured in terms of adult-equivalent and it is the number of active labour force in the household. Farm households require labour for different farming operations. A household with large labour force can minimize child working hours more than a household with small number of labour force (Storck *et al.*, 1991).

Parents' Employment (PE): The nature of the parent's employment affects child labour supply decision. Parents' characteristics play an important role in influencing the working and schooling decisions of children. Having a father who is employed in the public sector increases the probability that the child attends school and decreases that of working. It is a dummy variable equals to one if the head of the household is employed in the public and/or formal sector (having a stable regular job) and zero otherwise (Jackline, 2000).

3. Results and Discussion

This chapter presents the results of descriptive and econometric analyses. Descriptive analyses were used to describe the general characteristics of sample households and child labour supply. Econometric analyses include the estimation of the Cobb-Douglas production function, multinomial logit model, effective labour supply model and multiple linear regression models (Table 2 and 3).

3.1 General Characteristics of the Sample Households

Of the sampled households, 88.89% are married, 6.11% are widowed, and 5% are divorced. Of the sampled respondents, 8.3% are female headed and 91.67% were male headed households. The average family size of the sample households was 5 persons, the largest family size being 9 and the smallest being 3. The average number of family members in the study area (8-64 ages) was 3.18. The average land holding of the sample households was 0.76 ha, where the largest holdings were 2.25 ha and the smallest was 0.25 ha. Regarding formal education of the sample households, about 24% were illiterate, 17% were between 1-4 grade levels, about 48% were 5-10 grade level and about 11% were above grade 10 levels.

3.1.1 Distribution of non-school going (NSG) children

Of the sample respondents, 33.3% send all their children to school or they have no children out of school or school age child. Results in Table 4 shows that the average working hours per day for these school attending children is 4.15. About 34% households have one child not attending school and the average working hours per day has increased to 5.4, and 21.6% of the respondent

households had two children not attending school with an average working hour of 5.42. Finally 11% of the sample households did not send their three children to school; with the average working hours of 6.85 while the average working hours per day of children in the study area is 5.15.

3.1.2 Primary reasons for children not to attend school

During the survey, sample respondents were asked why some of their children were not attending school. The results show that the majority of the respondents (54.5 %) reported that their children were not attending school due to work related reasons. Out of these work related reasons, 23.75% of the sample households reported that their children were not attending school because they require them for different household activities like fetching water and collecting wood, cooking, cleaning, and herding. Even though the result shows that the burden of children in household's activities decreases with age both for boys and girls, that of girls weigh that of boys. Moreover, 17.5% of the sample respondents reasoned out that their children are not attending school because they help them in farm related activities like messaging services, cultivation, weeding, harvesting, and transporting of farm inputs/outputs to and from the farm fields. The other reason reported by 6.25% of the households for not sending their children to school were, they require them to care for their baby even though this decreases with age. Moreover, 7% of the respondents reported the reason why their children were not attending school because they require them to work for wage. In the study area, during the survey period child wage was the same with adult's wage which was 20 Birr per day excluding children aged 5-10 years (Table 4).

This is because in the study area labour shortage was observed at the time of land preparation, cultivation, sowing/planting, harvesting, and transporting of farm inputs/outputs. The result also shows that 2% of the girls aged 5-10 years work for wage. They take care of baby and the payments were made directly to their parents and the amount depends on the informal agreements between parents.

In the study area, 13.755% of the respondents reported the reason for their children not attending school was because they are unable to cover educational

costs. Finally, 13.25% of the sample respondents reported other reasons like drop out.

3.1.3 Children's main activities

In this study, children included are individuals whose ages are between 5 and 17 years. About 57.63% of the children attend school. In the study area, 10.72% children in the sample households have work as their main activity, 16.85% children have both school and work as their main activities. Finally, 14.8% children do not attend school and do not work (Table 5).

3.1.4 Primary work activities of children

The study results show that fetching wood/water and herding livestock constitute the principal activities for 33.8% and 29.9 % of the children respectively. However, there are variations by age and sex. Younger children primarily herd, fetch wood/water, domestic work, and mind other children. About 44% of 11-17 years old boys practice farm work as their main work activity followed by herding and fetching wood/water, while about 45.7% and 29.2% of the 11-17 year old girls participate in fetching wood/water and domestic work respectively. Generally, more girls participate in domestic work and boys in farm work. Moreover, participation increases with age. Almost all work is accomplished within the household although roughly one in five of 11-17 year olds children participate to some degree in family business work, either selling of farm products and animal products or petty trade (Table 6).

Child labour supply is affected by age and gender of the child. Children begin to work at a very early age. Child work participation increases rapidly with age. The type of activity they perform changes as they get older. Participation in farm work among boys and domestic work among girls increases with age whereas child minding and herding decline with age. A significant proportion of the children are involved in fetching wood/water as they get older. Fetching water and wood involves increasingly more girls and fewer boys as they get older.

These changes may reflect the increasing marginal productivity and physical strength of children as they get older. For younger children, the critical decision

required is between work and inactivity, while for older children, the trade-off is increasingly between work and schooling. Child gender may matter due to the physical characteristics, cultural and social attitudes. There are diverse gender differences in child labour in the study area. Girls participate in domestic work such as fetching water and wood more than boys. This difference increases with age. Girls start working at a slightly younger age than boys and boy's school participation rises with age.

3.1.5 Education and child labour supply

Education level of the household head is one of the most important variables that influence child labour. It was hypothesized that education of the parents or the household head decreases the probability of child working and increases the probability of school attendance significantly. In the study areas, 31.67 % of sample household heads were illiterate and 27.78% were in the educational level ranges between 1-4 grades, 27.78% were between 5-8 grade and 6.67% were grade 9 and 10 and 6.11% were grade 11 and above. The survey results show that of the sampled respondent large portions were illiterate and children working hours per day for these groups of farmers were 6.61 with a standard deviation of 1.94, which is by far higher than the other groups (Table 7).

3.1.6 Farm size and child labour supply

Inadequate and irregular rainfall, high population density, and small land holding are the major features of the study area. In addition to small land holding, the less productivity of land requires more labour force to produce sufficient amount. The study results show that 29.4% of the sample households were holding a land less than 0.25 hectare and their children were expected to work for an average of 4.69 hours per day. The child working hours per day increases with land holding and it reaches its maximum (6.9 hours per day) for households holding 1.75 hectare (Table 8).

The wealth status of the rural households mainly depends on land holdings. The survey result also shows that 2.2% and 2.7% of the sample respondents holds land of 2 hectares and 2.25 hectares respectively. Moreover, children working hours per day for these households decreases to 4.5 hours per day and

5.8 hours per day because land holding increases the level of income for farming households.

As hypothesized land holding increases the child working hours per day. In this study the increased level of income in turn decreases the child working hours per day. The standard deviation within the households having 2.25 hectares of land is 2.38 which indicates that even though households having 2.25 hectare of land face more labour shortage on the farm they are economically in a better position to hire in labour than using the labour of their children. Generally, average child working hours per day increases with land holding even though the maximum land holdings of the household is limited to 2.25 hectares and average working hours of children is 5.15 hours per day and average land holding in the study area is 0.76 hectare.

3.1.7 Parent's permanent employment and child labour supply

As hypothesized parent's employment in the public or formal sector and households head having stable regular job affects child labour supply and increases children schooling by decreasing children working hours per day. Likewise the survey result shows that in the study area, 86.1% of the sample respondents were neither employed in public or formal sector nor had stable regular job. The average working hours per day of their children was 5.51 hours per day which was above the average working hours per day of children in the study area. However, 13.88% of the sample households were employed in public or formal sector and have stable regular jobs which decreased their children's average working hours per day to 2.96, which in turn increases children schooling (Table 9).

3.1.8 Sex and child labour supply

The gender of the head of household is one of the factors hypothesized to influence child labour supply and schooling. It was hypothesized that female headed households usually have higher dependency ratio which may increase the likelihood of sending children to work. So a dummy for male headed household and female headed household is used.

The survey result shows that of the total sample households 91.66% were male headed households in which their children's working hours per day is 3.64 (Table 10). Of the sampled respondents 8.33% were female headed households and their children were expected to work for 6.58 hours per day. That means children participate in different activities that are essential for the households. Generally, child burden in terms of working hours per day is higher for female headed households than male headed households.

3.1.9 Family size and child working hours

It was hypothesized that family size has a negative influence on child working hours per day. The survey result shows that in the study area for 10.55% of the sample households child working hours per day is 8.158. For households having family size of 3 persons is the maximum which decreases with family size and reaches at its minimum which was 2.277 hours per day for households having 9 family members. About 15% of the sample households were having 5 persons per family and their children's working hours per day is 6.518. The result shows that in the households having more family members, the child working hours per day decreases. This is due to large number of economically active labour force in the household which can share the work load. Generally, the average number of active labour force in the sample households is 3.18AE (Table 11).

3.2 Household's Labour Utilization

Farmers are engaged in different agricultural activities throughout the year. Labour requirement reaches its peak during the main agricultural periods (land preparation, sowing, cultivation, weeding, and harvesting). Human labour is also required for transporting farm inputs/outputs to and from farm. In the study area, almost all sample households reported labour shortage to effectively undertake their agricultural activities despite the higher average family size of five. This might be due to the extensive involvement in different activities and the low productivity of land. The insufficient water supply and mixed farming system on small scale, livestock, and crop production may require more labour (Table 14).

3.2.1 Mechanisms used by sample households to overcome labour shortage

The result presented in Table 15 shows that those farmers in the study area use different mechanisms to overcome labour shortage. Of the total sample households, 31.7% reported that they cover their labour shortage by their children. About 28.9% of the sample households overcome their labour shortage by hiring in labour and 22.7% cover it through labour exchange, which is the most common and potential labour supply mechanism in the study area. The rest (8.9 %) reported that they overcome labour shortages by the assistance they receive from their relatives. Another potential labour supply method during the critical labour shortage period was '*Dabo*' or '*Guza*'. It is the traditional way of supplying labour by a group of youth and old men from both sex to someone up on his/her request at the time of labour shortage; sawing, cultivation, harvesting and transporting. '*Dabo*' or '*Guza*' was also used at the time of construction of houses to accomplish the activities within short period of time. This type of labour supply has no payment for participants.

3.2.2 Activities performed by children to earn income for their families

The survey results show that in the sampled households there are 228 working children aged 5-17 to earn income for their families. Out of this, 67.98% of the children participated in petty trade such as chat, vegetables, root and tubers like potato and sweet potato and animal products like milk in which girls participated more than boys. Moreover, 17.98% children participated in work for wage or daily labourer where boys' participation is higher. About 9.21% children earn money from selling local products like fire wood. Finally 4.82% children participated in other activities that generate income for their families (Table 13).

3.2.3 Household member's labour contribution in terms of adult equivalent

In the study area there was a continuous demand for labour to undertake farm and domestic activities. All the required labour was supplied either by the household members or hiring in labour and/ social assistance and assistance from relatives. The main sources of households labour are adults and children. Survey results show that about 16.89% of the total household's labour was supplied by their children. Adult's supply 82.79% of the total household's

labour. That is, average AE of each sample household per day is 2.76. Though children aged 5-7 work for 3.7 hours per day and contributed labour to the household it was found to be difficult to measure their contribution since the conversion factor used to AE is zero for ages under 7. Children aged 5-17 work for an average of 5.1 hours a day and 4.5 days a week (Table 14).

3.3 Econometric Results

3.3.1 Results of the effective labour supply model

To estimate the magnitude of contribution of household's labour supply the effective labour supply model was adopted. The study focuses on children with age ranges between 5-17 years and adults, keeping other sources of household labour supply constant. To effectively estimate the magnitude of child and adult labour supply to total household labour supply the base unit used is working hours per day and working days per week and the conversion factors into adult equivalent (AE) by Strock *et al.* (1991).

In the sample households, children were working for 5.15 hours per day and 4.5 days per week, and adults were working for 8.35 hours per day and 5.40 days per week. The working hours per day were the maximum on Saturday and Sunday both for child and adults.

The average child labour contribution per day is 0.67 AE and the average adult labour contribution per day is equals to 1.55 AE. The average number of children per household is 1.27 and the total child labour contribution per household is 0.84 AE or 22.10% per day. The average number of adults per household is 1.92 and the total adult labour contribution per household is 2.97 AE or 77.90% per day. The difference in the average effective labour supply is - 2.13 AE. The negative sign shows that adult's labour contribution per day is greater than children's labour contribution per day. This indicates that households were characterized by labour shortage or deficit. Therefore, they were expected on average to hire in 2 AE per day per household. The total average household labour supply per day in AE for the sample households having 5 family members is 3.81 AE per day per household (Table 15). This means:

$\Delta E^S = 0.84AE(E_C^S) - 2.97AE(E_A^S) = -2.13AE$: Labour deficit in a household.

Table 15: Household labour supplies by labour class and age in terms of AE

Labour class	Age group (years)	Average working hr/day	Average AE contributed/day/person	Average AE contributed/week/person	Average number of active household members	Total average AE contributed/household/day
Children	5-17	5.15	0.67	2.99	1.27	0.84
Adults	18-64	8.35	1.55	8.37	1.92	2.97
Total					3.18	3.82

Source: Own survey result, 2009.

3.3.2 Results of Cobb-Douglas production function on child labour supply

The survey results provide information on the determinants of each child's main activities (work, school, work and school, or inactive). To compute children's marginal income contribution using a Cobb-Douglas production function the alternative child work was identified. The dependent variable is child working hours per day or child labour supply of households. The coefficients on the household variables are indicating the marginal contribution of variables on child working hours per day. At 1%, 5% and 10% significance level, the model hypothesis that the coefficients on the variables are $F(9,170) = 18.17 > F_{0.05}(9,170) = 1.93$. It has an adjusted $R^2 = 0.46$ that is practically identical to those obtained with logistic regression and the marginal effects of multinomial logit result (Table 16).

The distribution parameters such as household head sex, household head level of education, adult working hours per day, parent employment, age, and family size are the significant variables that affect child working hours.

Among the household's characteristics household head sex, demand side characteristics for child labour, and family size have significant positive effect on child working hour per day. That is, unit increases in parameters will increase the children marginal contribution by a factor of 0.279, 0.188 and 0.337, respectively.

Table 16: Econometric results of the household characteristics of child work

Variables	Coefficient	Standard Error	t-value	P-value
Constant	8.232***	0.681	12.08	0.000
Sex	0.279**	0.092	3.05	0.003
Farm size	0.022	0.031	0.69	0.491
Education	-0.360***	0.021	-16.94	0.000
Adult working hours	-0.188***	0.025	-7.40	0.000
Parent Employment	-0.513***	0.195	-2.62	0.010
Demand side characteristics	0.188**	0.096	1.97	0.050
Age	-0.068***	0.018	-3.74	0.000
Family size	0.337***	0.060	5.61	0.000
Non school going	0.078	0.069	1.12	0.264

Source: Own computational result, 2009.

*** 1% significance, ** 5% significance, * 10% significance level

Parent's employment, household head's education level, household head's age, and adult working hours per day have a significant negative impact on children's marginal contribution of labour. That is a unit increase in these four variables each will decrease child's marginal contribution by 0.513, 0.362, 0.068 and 0.188, respectively.

About 51.3% of change in child working hours per day is due to a unit change in parent employment in formal or public. About 36.2% of change in child working hours per day is due to a unit change in education level of household head. That is as the household head education level increases children get more opportunity to attend school by decreasing their working hours per day. About 18.8% of the change in child working hours per day is due to a unit change in adults working hours per day. That is, in the sample households as adults increases their working hours per day they share more labour supply of the household and children get more free time to attend school.

3.3.3 Results of the multiple regression model

As discussed earlier, the multiple regression models were used to analyze the determinants of the marginal income contribution of child labour supply. In this analysis four statistically significant explanatory variables were identified.

Analysis of marginal income contribution of child labour and its determinants in rural households:

Based on the model result, households head education level and adults working hours were found to have a negative significant impact on the child labour supply, while the remaining variables such as demand side characteristics of child labour and farm size have a significant positive impact on the child labour supply in the analysis of determinants of marginal income contribution of child labour supply in rural households of Harari region.

Out of the nine proposed variables, four of them were statistically significant in the model while the rest were not significant at 1%, 5%, and 10% significance level (Table 17).

Table 17: Regression results of the determinants of child labour supply

Explanatory Variables	Coefficient	Standard Error	t-value	P-value
Constant	7.32***	1.511	4.84	0.000
Sex	0.192	0.226	0.85	0.399
Farm size	0.117*	0.063	1.85	0.066
Education	-0.324***	0.047	-6.87	0.000
Adult working hours	-0.167***	0.060	-2.78	0.006
Parent Employment	-0.148	0.449	-0.33	0.742
Demand side characteristics	0.456*	0.243	1.88	0.062
Age	-0.046	0.043	-1.07	0.285
Family size	0.184	0.135	1.36	0.176
Non school going	0.147	0.156	0.94	0.349

Source: Model output, 2009.

*** Significance at 1%, ** Significance at 5%, * Significance at 10%

The significant variables included; households Farm Size, Households heads education level, Adult working hours per day, and Demand side of child labour supply. But the rest were insignificant variables.

Households Farm Size (FS): The land holding of a household has a significant positive impact on the child working hours per day. In other words, for the households having relatively large farm size the child working hours per day is high and low for small land holding households. This variable is significant at 10 percent and the slope shows that child working hour's increases by a factor of 0.117 as the farm size of the household's increases by one unit while other variables kept constant. As hypothesized large farm size has a significant

positive impact on child labour supply. According to Cockburn, (2001), families having relatively large farm size are more likely to look for child labour. This study confirmed that large land holdings increases child working hours per day. In addition to size the low productivity of land in the study area require more labour to produce sufficient amount of products. On top of that, large size of land holdings enhance the burden on household members particularly children. This study identified that parents use their children labour to overcome the labour shortage. Children were very busy in fetching water for household's consumption including for sanitation and watering of livestock in addition to farm activities.

Household Heads Education Level (ED): This variable has a negative significant influence on child working hours per day. In other words, in the sample households where the head of the household was educated their children were not expected to work many hours per day. This variable is significant at 5 percent level. The slope of the variable shows that child working hours decreases by a factor of 0.324 for 1 unit increase in household head education level while other variables kept constant. That is increasing the household head's education level would initiate their children to attend school than work. The opposite is also true for illiterate families. A study by Jackline, (2000) found that parents' education affects child labour negatively and school participation decisions positively. This study also confirmed that household heads education has a significant negative impact on child labour supply. The result shows that in the study area children from where head of the household was literate were participated less in work and more in school.

Adult Working Hours per Day (AWH): This variable has a statistically significant influence on child working hours in the study area. As hypothesized adult working hours has a significant negative influence on child labour supply. There is a negative relationship between adult wages and child labour as identified by Basu and Van, (1998) that is higher adult wage would lead to higher supply of adult labour, and lower supply of child labour. The result shows that the variable has a significant negative impact on the child working hours. That is, the child working hours decreases by a factor of 0.167 for a unit increase in adult working hours if all other variables were kept constant. In the households with more adults labour supply, the children working hours was the minimum.

The adult labour supply substitute child labour and let free children. In other words, households' having more supply of adults' labour, children working hours per day was the minimum and gets more free time to attend school.

Demand Side of Child Labour (DSC): This variable has a statistically strong positive significant effect on child working hours per day. As hypothesized the higher the share of adult's labour supply in the households, the less would be the demand for child labour. The more public sector job in the province, the lower will be the demand for children employment. This is because public sector does not hire children under 17 years old, and second it may reflect the fact that the labour market is more formalized. Finally, the more non-regular-casual and seasonal employment in the study area, the more would be the demand for children work in that market.

According to Jackline, (2000), the higher the share of adults in household labour supply, the less would be the demand for children labour. The higher adult wage would lead to higher supply of adult labour, and lower supply of child labour. The results of the study confirmed that the demand side characteristic has a significant positive impact on child labour supply. As the slope of regression model analysis shows; the child working hours per day increase by a factor of 0.456 for a unit increase of the demand for child labour employment in the study area, while all other variables kept constant.

3.3.4 Results of the multinomial logit model

There may be several activities that children may undertake simultaneously. The study assumes that child's unit-time endowment can be used for four mutually exclusive activities. At a particular time, a child could be only attending school, only working, etc. This gives rise to the polychotomous choice framework. Hence, the multinomial logit model was adopted to identify factors affecting the probability of a child having each activity.

The multinomial probability model assumes that the possible separating states are complete in that they cover all possibilities. The probability of each outcome is a function of the same set of explanatory variables X_i . In this study four possible decision outcomes have been considered: school attendance only (A), work only (B), combining schooling and work (C) and being inactive (D).

Assuming that the inactive group is chosen as base alternative and considering the fact that the sum of the probabilities of the four alternatives must be one.

By differentiating the log likelihood function given on equation (11) with respect to the parameters (β_i), the maximum likelihood estimators can be generated through the model.

For continuous variables the marginal effect is the probability change in response to an increase in the value of the independent variable by one unit evaluated at the mean value. For dummy variables the marginal effect is computed as the difference in probabilities of the dependent variable between the groups with selected value one and the reference group (Assefa, 2002).

The probability identified by the computation of multinomial logit model are school attendance only, work only, combining school and work are 57.63%, 10.72%, and 16.85%, respectively (Table 18, 19, and 20).

Table 18: Marginal effect on the probability of only school attendance (age ranges 5-17)

Dummy variables	Marginal effect	Std Error	Z-test	P-value
Constant	-4.293	2.384	-3.82	0.002
Sex	-0.685	0.951	-0.72	0.471
Parent Employment	4.359***	1.615	2.70	0.007
Demand side characteristics	-3.170***	1.043	-3.04	0.003
Herding	-0.338	1.450	-0.23	0.815
Family Farm work	-27.122***	5.226	-5.19	0.000
Domestic work	-4.071***	1.536	-2.65	0.008
Minding baby	-0.698	1.054	-0.66	0.508
Family Business	-21.209***	5.559	-2.95	0.000
Hiring out labour	-3.661	1.454	-1.54	0.125

Source: Model output, 2009.

Model Summary Statistics

Number of observation =180

LR chi² (72) = 346.17

Percent identified = 57.63

Prob > chi² = 0.000

R-squared = 0.49

Adjusted R-squared = 0.42

Table 19: Marginal effect on the probability of participating in work only (age ranges 5-17)

Dummy variables	Marginal effect	Std Error	Z-test	P-value
Constant	-4.293	1.054	5.19	0.815
Sex	-0.685	0.951	-0.72	0.471
Parent Employment	-4.359***	1.615	-2.70	0.007
Demand side characteristics	3.170***	1.043	3.04	0.002
Herding	0.338***	1.450	0.23	0.003
Family Farm work	27.122***	5.226	2.95	0.000
Domestic work	4.071***	1.536	2.65	0.008
Minding baby	0.698	1.454	0.66	0.508
Family Business	21.209***	5.559	3.82	0.000
Hiring out labour	3.661	2.384	1.54	0.125

Source: Model output, 2009

Model Summary Statistics

Number of observation =180 LR chi²(72) = 346.17
 Percent identified =10.72 Prob > chi² = 0.000
 R-squared = 0.46 Adjusted R-squared = 0.410

Table 20: Marginal effect on the probability of combining work with schooling (for age ranges 5-17)

Dummy variables	Marginal effect	Std Error	Z-test	P-value
Constant	0.698	5.226	3.04	0.815
Sex	-0.685	0.951	-0.72	0.471
Parent Employment	-4.359***	1.615	-2.70	0.007
Demand side characteristics	3.170***	1.043	2.95	0.002
Herding	-0.338***	1.450	-0.23	0.003
Family Farm work	27.122***	1.454	5.19	0.000
Domestic work	4.071***	1.536	2.65	0.008
Minding baby	4.293	1.054	0.66	0.508
Family Business	21.209***	5.559	3.82	0.000
Hiring out labour	-3.661	2.384	-1.54	0.125

Source: Model output, 2009.

Model Summary Statistics

Number of observation =180 LR chi² (72) = 346.17
 Percent identified= 16.85 Prob > chi² = 0.000
 R-squared = 0.47 Adjusted R-squared = 0.440

The result shows that farm work participation of children in the study area has a negative significant implication on school attendance and positive implication on combining school attendance with work. As the number of hours on farm work increases by one unit children's likelihood of school attendance decreases by 27 percent. The probability of combining school with work increases by nearly three percent.

The demand side characteristic of child labour supply has strong negative significant implication on school attendance and positive impact on the likelihood of child work. As the demand for child labour increases by one unit, their likelihood of attending school decreases by about three percent.

The result also shows that parent's employment in a formal sector having stable job has a significant positive impact on school attendance and a negative implication on the likelihood of their combining school attendance with work. A unit increase in the probability of parents' stable regular job will increase the likelihood of their children's school attendance by more than four percent.

Another significant variable is domestic work of children which has a negative significant implication on children school attendance and has a positive impact on the likelihood of their working. As the domestic work increases by one unit the likelihood of their school attendance decreases by four units. Their likelihood of combining work with school is increased by the same amount.

The result also shows that participation of children in family business has a negative significant impact on school attendance and a positive implication on their likelihood of combining work with school attendance. As the participation of children in to family business increases by one unit their likelihood of attending school decreases by 21 percents. Their likelihood of combining school attendance with work increases by the same amount.

In the study area, respondent households used their children's labour supply as a coping mechanism of labour shortage. Moreover, they hire out their children's labour in order to secure the household income. Therefore, the result shows that hiring out labour has a significant negative implication on the

likelihood of children school attendance. As hiring out of child labour increases by one unit their likelihood of school attendance decreases by three percent.

Generally the analysis of the results from multinomial logit model confirms the hypothesis that parent employment, demand side characteristics of child labour, farm work, family business, and domestic work has a significant impact on children school attendance and child labour supply. The result also identified the probability of children time endowment to undertake a specific activity at a time, which is school only, is 57.63%, work only is 10.72%, school and work is 16.85% and idle is 14.8%.

4. Summary and Policy Implications

4.1 Summary of the Major Findings

In countries like Ethiopia, where subsistence agriculture and smallholder farming dominate the overall national economy, smallholder farmers often face financial shortage. In order to increase their production and productivity they exploit their children's labour to effectively undertake essential households' activities and increase their income. However, child labour exploitation and abuse are prohibited by law and has an adverse effect on human capital formation and economy of the country.

Hence identifying the livelihood that children are involved in, estimating their marginal contribution to household labour and income and identifying the main determinants of child labour supply are crucial for policy makers and the society at large.

In this book both purposive and stratified random sampling techniques were used. On the first stage three rural districts (Dire Teyara, Sufi, and Error) were purposively selected on the account that they were farming household areas which best represent the rural community of the region. On the second stage, a stratified random sampling method was used to select total of 9 PAs (3 PAs from each district) to keep homogeneity among the three districts. Finally, by using systematic random sampling technique a total of 180 respondent households were selected. During the selection households that had at least one child age ranges from 5-17 years were selected. In addition, secondary data

were collected from relevant sources to supplement the data obtained from the survey.

The results show that farm work participation of children in the study area has strong negative significant implication on school attendance and positive implication on combining school attendance with work. The demand side characteristic of child labour supply has a significant negative implication on school attendance and positive implication on the likelihood of children work. Parent's employment in a formal sector having stable job has a significant positive implication on school attendance and a negative implication on the likelihood of their combining school attendance with work. Another significant variable is domestic work of children which has a negative significant implication on children school attendance and has a positive implication on the likelihood of their working. The result also shows that participation of children in family business has a negative significant implication on school attendance and a positive implication on their likelihood of combining work with school attendance. The result shows that hiring out labour has a significant negative implication on the likelihood of children school attendance.

Regarding the main activities that children are involved in, the study identified four main activities: work only, school only, combine work and school, and idle. The results from Cobb-Douglas household production function show the marginal contributions of child labour in different household activities. Among the household's characteristics household head sex, demand side characteristics for child labour, and family size have significant positive implication on child working hour per day. Parent's employment, household head's education level, household head's age, and adult working hours per day have a significant negative implication on children's marginal contribution of labour.

The result of multinomial logit model is the probability of children involvement in the three identified main activities, that is the probability of children to attend school was 57.63%, the probability of children participation in work was 10.72%, and the probability of children attending school and working was 16.85% and the rest 14.8% were base reference or neither work nor attend school. The result of effective labour supply model shows that out of the total

3.81 AE per day per household labour is supplied by household members of which about 22.1% or 0.84 AE was contributed by children of the households.

The significant determinants identified by this book are farm size that is the land holdings of a household has a significant positive impact on the child labour supply, household heads education and adult working hours have significant negative impact on the child labour supply, and demand side characteristic of child labour has a significant positive impact on the child labour supply.

Understanding the determinants of child labour supply would help policy makers to design and implement more effective policies and programs for the child labour abuse and thereby helps to pave way for decreasing the child labour and increasing the child schooling.

4.2 Policy Implications

Based on the findings of this book, the following conclusions and policy implications can be drawn in order to minimize child labour exploitation and enhance child schooling which leads to better human capital formation the following measures need to taken.

1. The study shows that farmers face labour shortage throughout the year. To overcome the labour shortage they use their children's labour which increases for households having relatively big farm size. In addition, the scarcity of water supply in the area and long distance of the source enhanced the burden on child in fetching. Therefore, the agriculture and rural development strategy should focus on supply of improved farm inputs, water harvesting structure and efficient technology should be scale-up at household level in order to minimize children labour spending on fetching water and on farm activities. Moreover, any development strategy in the area should focus on the establishment of alternative energy sources so as to minimize child labour spending on collecting fire wood.

2. The findings of the study revealed that educated heads of households are more likely to send their children to school than to work and their

children's working hours per day was relatively found to be the minimum. Thus, education could be an effective instrument for decreasing child labour exploitation. Hence up grading the level of education for the household heads should be given special attention. Moreover, development programs should focus on the establishment of non-formal adult education besides the formal education at the local level.

3. One of the most important results of the study was households having more active adult labour force supply the child working hours per day was the minimum. Therefore, development programs should focus on the establishment of different skill training centers of youth and adults so that youth enter into job and households can utilize their active and legal labour force to earn better income and minimize child labour exploitation.

4. Another important result of the study was idle (neither working nor attending school) children is about 14% in the study area. Therefore, any development intervention should focus on those 14.8% of idle children so that they can attend school in order to increase human capital formation of the region.

5. Finally; another important result of the findings was the demand side characteristic of child labour in the study area was high. The results show that the higher the shares of adult labour supply in the households the less would be the demand for child labour. The more public sector job opportunity in the study area, the lower would be the demand for child labour. The more non-regular-casual and seasonal employment in the study area, the more would be the demand for children work in the market. Therefore, the development intervention should focus on the establishment and strengthening of formal sector like bureau of labour and social affairs and child care at local level to minimize child labour and to put corner stone for the future human capital formation of the study area.

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DETERMINANTS OF RURAL LIVELIHOOD STRATEGIES: THE CASE OF RURAL KEBELES OF DIRE DAWA ADMINISTRATION

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Abstract

This study investigates the push and pulls factors that influence rural households' choice of livelihood strategies. The data for this study are obtained from a survey of 200 households' selected using multi stages random and purposive sampling technique from rural areas of Dire Dawa Administration in the year 2010. Multinomial logit regression was applied to identify the determinants of rural livelihood strategies followed by the rural household heads. Descriptive results addressed the economic status and livelihood strategies practiced by rural households. The multinomial logit analysis revealed that livestock holding, family size, farming system, safety net, and dependency ratio were positively and significantly related at 1% to agriculture plus off-farm, at 5% to agriculture plus non-farm and at 1% to agriculture plus non-farm plus off-farm, at 1% to agriculture plus non-farm plus off-farm and at 5% off-farm plus non-farm, 1% to agriculture plus non-farm plus off-farm and at 5% probability level to off-farm and non-farm livelihood strategy respectively. In contrary, age of household head, sex, distance to the market, livestock holding, farming system and dependency ratio were negatively significant at 10% agriculture plus off-farm, 10% to agriculture plus non-farm plus off-farm, 1% to agriculture plus off-farm, 1% agriculture plus non-farm plus off-farm, 5% to agriculture plus off-farm and 1% probability level to agriculture plus off-farm livelihood strategy respectively. The findings of the study suggest that efforts should focus on the promotion of options, substitution between assets and activities to diversify household specific agriculture-linked non-farm and off farm livelihood rather than focusing on the single agricultural productive farm by taking action to improve information, mobility and asset accumulation.

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1. Introduction

1.1 Background of the Study

Ethiopia is a rural and agrarian society where nearly 85% of the population is directly dependent on agriculture for their livelihood. Agriculture is the mainstay of the economy. It accounts for about 50% of the GDP and 90% of the total foreign exchange earnings. The main types of farming activities are crop production, livestock husbandry and mixed farming (Beyene, 2008). The dominant type of farm input is labor and most of the farm labor comes from family members. Although of central importance, farming on its own is increasingly unable to provide a sufficient means of survival in rural areas.

In many parts of the world, the number of poor people in rural areas exceeds the capacity of agriculture to provide sustainable livelihood opportunities. According to World Bank (2007), between two-thirds and three-quarters of the estimated 1.2 billion people living below the one-dollar-a-day poverty line are estimated to live in rural areas. The rural livelihood diversification develops to become a major engine of economic growth not only for the countryside but also for the economy as a whole.

DFID (2000) defined livelihood as the capabilities, assets including material, social and activities required for a means of living. Briefly, one could describe a livelihood as a combination of the resources used and the activities undertaken in order to live. The same source defined the term livelihood strategies as the range and combination of activities and choices that people make in order to achieve their livelihood goals, including productive activities, investment strategies, reproductive choices, etc. Livelihood strategies are composed of activities that generate the means of household survival and are the planned activities that men and women undertake to build their livelihoods

In the last three decades, development researchers have focused on understanding the determinants of vulnerability of livelihood sources and intensification of poverty among rural people. This has produced much empirical studies on income and activity diversification, documenting various reasons why households simultaneously participate in more than one income earning activities (Ellis, 2000). Distinguished between pull and push factors that

necessitate diversification. Pull factors are incentives that afford households the choice to participate in multiple income earning activities because they are attracted by some business opportunities such as to take advantage of forward or backward business integration or to invest their savings from some other rewarding activity. Push factors however, are constraints that leave a household no other choice than to diversify in response to desperate circumstances where income from only one or two activities is insufficient to meet daily needs. For many poor rural households, diversification is conditioned by “push” factors.

Land is also the major determining factor of participation in non-farm employment. However, the relationship between land endowments and participation in the non-farm economy is a complex one. As land becomes scarce and agricultural productivity declines and households face fluctuations in their incomes, having more than one source of income becomes the only imperative option to survive. The relation between landholding size and the share of nonfarm income in total household income is likely to be depicted by a negatively sloped curve (Wandschneider, 2003). The reason is that rural households with good access to land are not compelled to diversify into non-farm employment to the same extent as landless or marginal farming households. In the contrary, those with limited or no access to land have to work as agricultural laborers and engage in non-farm activities in order to earn a living (Hagblade *et al.*, 2002). On the other hand, scholars who investigated livelihood strategies in sub-Saharan Africa theorize livelihood diversification as comprising “the multiple activities in which households engage to ensure their survival and improve their well-being”. A study by Bryceson (2002) points to a situation where this “scrambles” for living leads to de-agrarianisation or the shifting of livelihoods away from farming to other livelihood diversification. This study considers the extent to which diversification is shifting activities away from traditional agriculture.

Constrained access to credit and financial savings, where access is an increasing function of ex ante income and wealth for reasons familiar in the development economics literature, can impede acquisition of livestock necessary to diversify out of crop agriculture (Barrett *et al.*, 2001). These entry barriers tend to leave the poor with less diversified asset and income portfolios, thereby forcing them to bear both lower expected returns and higher variability in earnings.

Some studies showed that the poorest groups (landless and small-scale farmers) diversify into activities where wages are no higher than those in the agricultural sector, whilst higher income groups (larger scale farmers) also diversify, but into better paid sectors. Two processes are apparent: demand-pull, where rural people respond to new opportunities; and distress-push, where the poor are driven to seek on-farm employment for want of other on-farm opportunities. Likewise, Hagblade *et al.* (2002) share the opinion that within the rapidly changing rural economies of the developing world, economic opportunities for poor households emerge sectorally in agriculture and non-farm activities and location ally in rural areas, rural towns and urban centers. Destaw (2003) analyzed the non-farm employment and farm production of smallholder farmers in Edja district of Ethiopia using binomial logit model where the dependent variable is participation in non-farm activity, and found that distance from market and road, age, education and credit affected significantly the participation.

Glauben *et al.* (2005) analyzed the different labor market participation regimes of Chinese farm households by using household data from Zhejiang province and applying a multinomial logit model to empirically examine household, farm, and regional characteristics affecting the probability that farmers employ one of four alternative labor market regimes. Their results suggest that labor market decisions are significantly related to several personal, farm and village attributes.

The findings of Adugna (2006) in Ethiopia support the view that non-farm and farm activities compete over the limited household resources. It also implies that those households who expect secured agricultural income stay on farm and lower off-farm intensity. Despite the common knowledge that increased opportunities for rural non-farm employment would absorb the excess labor found in agriculture and tend to result in increased labor productivity.

Similarly, (Adugna,2008) study made on Livelihood Strategies and Food Security in Wolayta, Southern Ethiopia: The Case of Boloso Sore District by using multinomial model found that , age of household head, education level of household head , Dependency ratios, agro-ecology , livestock holding. Credit

use, Input use, cooperatives membership, receiving remittance and family size, were affect the choice of livelihood strategy.

Fikru (2008) study focused on a case study on dominant patterns of non-farm rural diversification identify and analyze the key constraints and opportunities as well as the determinants and principal motivations behind non-farm diversification in Lume *Woreda*, Oromia Regional State. The results indicated that diversification into low-entry-barrier, low-return activities predominate. The greatest extent of diversification was amongst the 'poor' and 'medium' inhabitants. According to Ellis and Tassew (2005), data from Ethiopia household surveys indicate that nonfarm income accounts for only 8 % of rural household incomes, the lowest of any country for which data are available. In addition, surveys repeatedly found that land tenure insecurity is an important factor impeding mobility of farm labor into nonfarm jobs, since rural households perceive that prolonged absence from their village is likely to result in loss of their land.

(DPFS, 2004) indicated, more than 48,275 people in rural Dire Dawa are identified to be chronically food insecure and another 60,000 people are acutely affected in bad production years. A complex combination of factors has contributed to the alarming increase of rural food shortage vulnerability. Making their living on marginal, heavily degraded and less productive land; households in rural areas of Dire Dawa are facing persistent food shortages. On top of the ever decreasing land holding size and increasing population, recurrent drought and resources (land, water, forest, and rangeland) degradation in the study area have made the food security situation worse. Realizing this issue, many non-governmental organizations and government are intervening at least to lessen the adverse effects of the food problem, but there is yet little success (Ayalneh and Shimellis, 2009). They also noted in their studies that rural areas of Dire Dawa are largely moisture stressed and drought prone where cultivation of crop is rudimentary. In Dire Dawa Rural Administration, where this research is conducted, there is not sufficient documented empirical study on the determinants of livelihood strategies. Hence, the overall aim of the study is to explore the determinants of rural livelihood strategies practiced by rural households in the study area.

1.2 Statement of the Problem

Households and individuals in rural areas face different constraints on their choice of income-generating activities. Since the price and non-price incentives influencing choice are likewise heterogeneous within most populations, observed income diversification patterns can vary markedly between the poor and the rich. This, in turn, determines the rural households' livelihood strategies they follow.

Identifying livelihood strategy is not so straightforward. Even in the same locality, there can be a big contrast between the strategies of those with different socioeconomic background, for example, for those with more land and those who are with less land or landless, there is a need to understand factors that influence preference for one or other type of development intervention (Wagayehu, 2000). The reasons that individuals and households pursue diversification as a livelihood strategy are often divided into two overarching constraints, which are necessity or choice. According to (Davies, 2004) positive impacts of diversification include seasonality, risk, employment, credit and asset effects. Given that food security is a critical human development need among rural community in our country including Dire, policy makers, by tradition, were favoring agriculture as means of rural economic development for a long time. This excluded rural diversity from much attention, thereby ignoring an important source of livelihood.

The livelihood of the rural population of Dire Dawa administration region is highly dependent on agriculture. The region has an estimated population size of 342, 827 of whom 32.1 % is comprised of rural households engaged in subsistence agriculture (IDP, 2004). In Dire Dawa Rural Administration, where this research is conducted, there is no documented empirical study on the determinants of rural livelihood strategies. In order to bridge the gap, this study, therefore, attempted to see the determinants of livelihood strategy choice of rural people in their struggle to achieve food security goal.

1.3 Objectives of the Study

The overall objective of the study was to assess the livelihood strategies practiced by rural households of Dire Dawa Administration. The specific objective of the study was:

1. to describe the livelihood strategies practiced by rural households in the study area; and
2. to identify determinants of rural households choice of livelihood strategies in the study area

1.4 Significance of the Study

The findings of the study, hopefully, would help the regional rural development planners, policy makers, NGOs as an input in formulating appropriate policy for rural livelihood diversification. Furthermore, the study will generate information which will be valuable for further research on the area.

1.5 Scope and Limitations of the Study

The study was limited to one region, namely, Dire Dawa Administration region. It would have been better if the research covers a wide range of areas in the country had it not been for the limited time and financial resources.

1.6 Organization of the paper

The paper is organized in five chapters. The first chapter deals with introduction, statement of the problem, objective, significance and scope and limitations of the study. The second chapter deals with brief description of the study area and methodology is presented. The results of the study are presented and discussed in chapter three. Finally, chapter four deals with summary and recommendations.

2. Research Methodology

2.1 Description of the Study Area

The study was undertaken in rural areas of the Dire Dawa Administration. Dire Dawa is located between 9°27'N and 9°49'N latitude and 41°38'E and 42°19'E longitude in the eastern part of Ethiopia. The Administration is bordered by the Shinile Zone of the Somali National Regional State on the north, east and west and eastern Hararghe Zone of the Oromia National State on the northwest, south, south east and east. Dire Dawa city is accessible by airplane, train and cars, and is about 515 kms road distance to the east of Addis Ababa and 311 kilometers to the West of Djibouti port. The total area of the region is about 128,802 hectare: out of which urban accounts for 2684 ha (2%) and the remaining 98% is rural (IDP, 2006).

2.1.1 Demographics characteristics

The total population of Dire Dawa was estimated to be 342,827 out of which 74% (253,692) live in urban areas while the rest 26% (89,135) live in rural areas. According to CSA (2007), Population and Housing census analytical report, the total projected households are 75,693 of which 47,998 households are male headed (MHH) and the rest 27,695 female headed (FHH). Out of the total population, 49.8 % (170,897) were female and the remaining 50.2% (171,930) were male. Being one of the largest urban centers in the country, Dire Dawa has become home for peoples from a number of nations and nationalities found in the country as well as for people from India, Yemen, Turkey, etc.

The administration region has two government structures: Administration cabinet and kebele levels. There are 9 urban and 38 rural kebeles. Government offices are organized under municipality and government executive organs (Bureaus). Owing to its strategic location and relatively better transport network agricultural products, such as coffee, livestock, fruit, vegetables and chat are produced and some of the items are exported to Djibouti. The city is acknowledged to be a centre of trade and industry in East Ethiopia. The majority of the people directly or indirectly derive their livelihood from agriculture, trade, industry and related activities.

2.2 Data Type and Sampling Techniques

Both primary and secondary data type were used in this study. Primary data were collected from 200 sample household heads using survey questionnaire, which was designed to generate a data on some household, farm and institutional characteristics that are related to livelihood strategies. The questionnaire was filled by six trained enumerators by interviewing the respondents. Continuous supervision was made by the researcher to correct the error on the spot. Secondary data were also gathered from various sources such as books, libraries, internet, Dire Dawa bureau of agriculture and rural development office.

2.2.1 Sampling Techniques

Multi stages random and purposive sampling technique was used to draw a total of 5 kebeles and 200 household heads from the total of 38 kebeles. At the first stage, 38 PAs were stratified into two strata, 16 agro-pastoralists and 22 sedentary farming PAs purposively. At the second stage 5 PAs was employed to draw 2 from agro-pastoralist and 3 from sedentary farming strata randomly based on probability proportion to size. Then, at the third stage as a total of 200 household heads were randomly selected from representative kebeles by using probability proportional to size.

2.3 Data Analysis

The study employed both descriptive statistics, and econometric models to analyze the data.

2.3.1 Descriptive statistics

Descriptive statistics were applied to describe, compare and contrast different categories of sample units with respect to the desired characteristics. The method used for quantitative data analysis were, mean, percentages, t-test, F-test and chi square test. One-way ANOVA F-test and t- test were used for continuous variables while chi square test was used for categorized variable. The multinomial logit model was used to identify the determinants of rural

livelihood strategies. The data analysis was conducted using STATA and SPSS software.

2.3.2 Multinomial logit model

In choosing models to identify the determinants of rural household decision to engage in various livelihood strategies, there is no natural ordering in the alternatives. Multinomial logit model is a straightforward extension of the binary logit model. The most commonly used are multinomial logit and multinomial probit. Multinomial probit model is less restrictive than multinomial logit model. However it is gained a considerable computational expense. It is also difficult to get accurate estimation of covariance matrix of the βp (Judge *et al*, 1985). On the contrary, it has some attractive features, including the provision of general patterns of cross elasticity's, it can be applied only when there is small number (usually three) alternatives, because for categories of more than three alternatives, its mathematical computation gets more complicated than multinomial logit.

Multinomial logit model is a straightforward extension of the binary logit model. However, it is worth noting that this model suffers from the assumption that the choice probabilities implied by the model must satisfy an Independence of Irrelevant Alternatives (IIA) property. This means that the ratio of probabilities of any two choices (in response categories) will be the same, regardless of what the other alternatives are. In other words, the ratio of probabilities of any two choices for a particular observation is not influenced systematically by any other alternatives. In this model, the choice probabilities are dependent on individual characteristics and the model estimates relative probabilities. The number of parameters to be estimated is equal to the number of individual characteristics multiplied by the number of possible choices minus one. An individual will then choose the activity type or sector that offers the highest utility.

Therefore, following Greene (2003), Multinomial Logistic Regression Model is used to identify determinants of livelihood strategies. The multinomial Logit model is specified as:

$$p(A = j) = \frac{e^{x_i \beta_j}}{\sum_{j=0}^k e^{x_i \beta_j}} \quad j=0, 1, 2 \dots J \quad (1)$$

Where: A= polychromous outcome variable with categories coded from 0... J.
 Where P is the probability of an economic activity, j is job category;
 e - is natural log; β coefficients associated with X_i independent variables.

Equation (1) can be normalized to remove indeterminacy in the model by assuming that $\beta_0 = 0$ and the probabilities can be estimated as:

$$Pr ob(A_i = j / x_i) = \frac{e^{\beta_j x_i}}{1 + \sum_{k=1}^J e^{\beta_k x_i}}, j = 0, 2, \dots, J, \beta_0 = 0 \quad (2)$$

Estimating equation (2) yields the J log-odds ratios

$$\ln\left(\frac{P_{ij}}{P_{ik}}\right) = x'_i(\beta_j - \beta_k) = x'_i \beta_j, \text{ if } k = 0 \quad (3)$$

The dependent variable is therefore the log of one alternative relative to the base alternative. The multinomial logit coefficients are difficult to interpret, and associating the β_j with the j th outcome is tempting and misleading. To interpret the effects of explanatory variables on the probabilities, marginal effects are usually derived (Greene, 2003):

$$\delta_j = \frac{\partial P_j}{\partial x_i} = P_j \left[\beta_j - \sum_{k=0}^J P_k \beta_k \right] = P_j (\beta_j - \bar{\beta}) \quad (4)$$

The marginal effects measure the expected change in probability of a particular choice being made with respect to a unit change in an explanatory variable (Greene, 2003).

2.4 Hypothesis and Variable Specification

Once the analytical procedures and their requirements are known, it is necessary to identify the potential dependent variable and explanatory variable under considerations.

2.4.1 The Dependent variable

If the choice of the household lies in livelihood strategies, rational household head choose among the five mutually exclusive livelihood strategy alternatives that offer the maximum utility.

The dependent variable has five categories, namely:

A=0, AG	Agriculture alone
A=1, AG+OFF	Agriculture and off-farm combination
A=2, AG+NF	Agriculture and non-farm combination
A=3, AG+OFF+NF	Agriculture, off-farm and non-farm
A=4, OFF+NF	Off-farm and non-farm combination strategy

2.4.2 The independent variables

1. Sex of the household head (SEXHH): The household head is taken as a single decision-making body by which resources are allocated among household members. Men and women have different access to resource and opportunities (Ellis.2000). Female-headed households are hypothesized to participate less in both self employment and wage jobs relative to their male counterparts because of differential in access to credit and other resource (Zhang *et al.*, 2006). Therefore in this study sex was expected to be correlated negatively related to livelihood diversification.

2. Age of head of the household (AGEHH): Age refers to age of the sample HH heads in years. The study conducted by Destaw (2003) and Berhanu (2007) have indicated that age has significant effect on livelihood diversification. Although elder farmers are well established and more experienced in production and marketing strategies, they are more resistant to new ideas, and information, they are more likely to be set in their ways and may not venture

into new diversification activities (Walusimbi and Nkonya, 2004). On the other hand, young farmers are more likely to may be more innovative, more energetic; they are expected to be diversifier of livelihood strategies than older farmers. Thus, it is hypothesized that the older age of household head and diversification of livelihood strategies are negatively related.

3. Family size (FAMSHH): The household's family size affects the diversity of household income source. Adult household size is measured as the number of adults in the household which takes into account all individuals in the household over the age of 14 years who are considered to be part of the economically active population. It is hypothesized that this variable is positively related with probability of participation in manual wage (unskilled) RNF employment and the share of income from this sector.

4. Size of land holding (LND): size of land holding is measured in hectares. The variable is basic asset for the majority of the rural livelihood. More land holding means more cultivation and more possibility of production and improve food security (Tesfaye, 2003). Therefore, having more land landholding size was expected to affect livelihood diversification negatively. The reason is that rural households with good access to land are not compelled to diversify into off/ non-agricultural economic activity to the same extent as landless or relatively deprived farming households, and tend to show a strong attachment to diversify into off/ non- farm livelihood strategy as a way of life (Wandschneider, 2003 and Stamoulis *et al.*, 2008).

5. Level of education of the head (EDUHH): Better-educated members of rural populations have better access to diversification more likely to establish their own non-farm businesses (Stamoulis *et al.*, 2008). Education increases the skill and knowledge of a person thereby, increases the productivity of income generating opportunity to engage in diversification. The years in school of the head of the household are taken as a proxy for education. It is expected to have positive on choice of diversified livelihood strategies (Tassew, 2000).

6. Livestock (LVSTK): Through its income effects amount of wealth affects character of employment significantly. Difference in wealth also influences access to entry in small business, including nonfarm self employment. While

increase in livestock value decreases the probability of participation in unskilled wage employment and the opposite will hold true for skilled nonagricultural wage employment (Tassew, 2000). Total livestock unit (TLU) is served as a unit the share of income from nonfarm employment is expected to rise with this variable.

7. Dependency ratio (DEPR): dependency ratio refers to the proportion of economically inactive labor force (less than 14 and above 65 years old) to the active labor force (between 15 and 65 years old (Velazco, 2003). It determines the participation of individuals in the labor market, the expenditure patterns and investment in the social sector. Hence, this subsistence pressure tends to increase the participation in alternative livelihood strategies (Glauben *et al.*, 2005). Thus, the variable was expected to positively affect the choice of livelihood strategy by rural household.

8. Distance to market (DISTMK): Distance from the nearest market centers measured in kilometer (km). Proximity to the nearest market may create opportunity of more income by providing livelihood strategies, which determine income level of rural households (Douglas *et al.*, 2006). The same source implied that in remote area where physical access to market is costly, pattern of diversification is less. Improved market access can be expected to stimulate diversification. Therefore; this variable was expected to positively influence the decision of rural household to participate in diversified livelihood strategy.

9. Credit (CRDT): Access to rural financial services can provide important incentives to invest in improved land-use practices, increase the chance of starting a small business and skill acquisition both directly through the availability of liquidity and indirectly through reduced uncertainty (Rubben and Cruix 2003). The latter effect is considered particularly important, since credit can be used for activity diversification. Hence, this variable was included in the models to capture its effect on the decision of households' participation in rural livelihood diversification and its influence on the level of income from this sector. This variable was expected to have positive correlation in preferred livelihood strategy (Destaw 2003).

10. Access to Irrigation (IRRGT): Irrigation benefits the farm households through higher production, higher yields, lower risk of crop failure, and higher and year-round farm returns (Hussain and Hanjra, 2004). Hence, better access to irrigable water resources would increase the return on capital (land) which could probably increase the return from labor and, make the farmer better off in his wealth position, hence, reduces the subsistence pressure to participating in different livelihood activities (Velasco, 2003). Therefore, it is hypothesized negatively related with the share of income from off/ non-farm employment.

11. Membership in cooperatives (COOPER): Membership in cooperatives represents whether a household is member to cooperative or not. It is a dummy variable of which takes a value is 1 if a household head is a member of cooperative and 0, otherwise. This was expected to be hypothesized positively correlated with rural livelihood strategy and cooperatives are expected to promote livelihood diversification.

12. Receiving remittance (REMMIT): This refers to money sent from inside or outside the country. Although remittance constitutes a small part of total households' income, it is expected to have positive contribution to the diversification of livelihood strategies (Brown *et al.*, 2006). It is a dummy variable which takes a value one if for those who receive for service and otherwise zero.

13. Safety net program (SFTNTP). It is a transfer of resources to rural households and/or Individuals with the objective of enabling the community generate additional income and also build common asset thereby protect their asset depletion. It is a dummy variable of which takes a value is 1 if a household head is participate in Safety net program and 0, otherwise. This was expected to be hypothesized positively correlated with rural livelihood strategy.

14. Farming system (FARSTM). Farming system is a classification of agro ecological zone where diversity in land quality, distribution of rainfall, and ability to grow diverse food crop is differentially within the agro ecological zones. In the highland the distribution and amount of rainfalls better as compared to lowlands and midlands. Hence, it is hypothesized that the magnitude of household to secure in food crops decline as we go from highland

to low lands therefore, we expect that the variable has negative relation with the dependent variable (Tesfaye, 2003). It is a dummy variable, which takes a value of 1 if a household head is Agro pastoralist, otherwise 0=Sedentary.

Table 1: Definition of variable affecting livelihood strategies

Variable	Definition	Values/measure	Expected sign /
SEXHD	Sex of the household head	0=male 1=female	Dummy -
AGE HH	Age of the household head	Years	Continuous -
FMSHH	Members of family size	Number	Continuous +
EDUHD	Education of the	Years of schooling	Continuous +
DPENDR	Dependency ratio	Ratio of dep. to active	Continuous +
SLANDH	Total farm land cultivated	Hectares	Continuous -
LVSKHH	Livestock holding	TLU	Continuous -
DISTMK	Distance from the market	Kilometers	Continuous -
IRRGTN	Access to irrigation	1=yes, otherwise=0	Dummy -
CRDIET	Credit use by HHH	1=yes, otherwise=0	Dummy +
COOPER	Membership in cooperative	1=yes, otherwise=0	Dummy +
REMMIT	support to the HHH	1=yes, otherwise=0	Dummy +
SFTNETP	Safety net program use	1=yes, otherwise=0	Dummy +
FARSTM	Farming system	1=Agro. past, 0=Seden	Dummy -

Source: Own survey result, 2011

3. Results and Discussion

The study presented in this thesis employed data gathered from different sources. Accordingly, data on socio-economic characteristics and other relevant variables related to physical and institutional factors and livelihood strategy were gathered using survey questionnaire. All these were analyzed and pooled together to present results and discussion.

3.1 Sampled Household

3.1.1 Sex composition

Among the total sample household heads 87% were male and the remaining 13% were female. From the total sample household head about 39% of them were participating in agriculture only, 10.5% in agriculture, off farm and nonfarm; 25% in agriculture and nonfarm; 17.5% in agriculture, off farm and

nonfarm livelihood strategies respectively. The proportion of participation female headed is less by 14.94% the male headed.

3.1.2 Marital status

The majority of the respondents (92%) were married, while out of the total sampled household heads about (4%) ,(2%) and (2%) were widowed, divorced and single respectively. The marital statuses of the sedentary and agro-pastoralist household heads were presented.

3.1.3 Age composition

The age composition of a family is worth mentioning as it is a characteristic that has implication on the availability of labor for the various activities undertaken by the family. Age of the respondent household heads ranged between 20 and 85 years. About 71.5% were from age group of 20-40years. However, it worth only 3% of the households is held by the age group on the highest ladder (>60). The mean age of the head of the households is estimated to be 38 where as the standard deviation is 9. Survey respondents reflect a wide range of household heads were young on average (38 years) nevertheless, there was variation in the age of the household heads with an average number of six people

3.1.4 Educational status of sampled household heads

The empirical result shows that the educational status of farmers in the study area is considerably low. In the study area as a whole, a significant share (about 61.5%) of the household heads were illiterate i.e., they do not have both writing and reading ability either in their mother tongue or any other language. From the remaining 24.5%, of them either have joined the former Literacy campaign or informal schooling to read and write and about 6% have completed grade 1-4 level of formal schooling. Whereas 6.5%, 6.5% and 1% attended formal education from 5-8, 9-10 and 11-12 respectively in which they might be dropped at each levels. The surveyed areas also have less educational attainment. For instance, the average educational attainment of household head was less than one years of schooling.

3.1.5 Dependency ratio

The total dependency ratio was calculated by dividing the sum of young (below 14 years) and old (above 64 years), by economically active population (14 to 64 years old). The overall mean dependency ratio of sample households was 1.54 with standard deviation of 1.08. As dependency ratio increases, the need for basic needs also increase. About 80% of the sample households experience a dependency ratio between zero and two. Almost 15.5% of the households involved with a dependency ratio range of 2 and 3 respectively.

3.1.6 Family size

The family size of the sample households ranged from one to eleven among the sample households. The mean family size was found to be 6 people for the whole sample. About 49% of the sample households reported had a family size from four to seven. This range shows a slight difference in the two categories under consideration i.e. 48% for sedentary category followed by 50 % for agro-pastoralist. Whereas about 36% of the total sample households constitute family size ranging between 7-11 persons. The maximum and minimum of family size for households were 1 and 20 respectively. Thus household size is relatively large reflecting the existence of extended family system in the area.

3.2 Farm of the Sample Households

3.2.1 Size of land holding

Farming provides the primary source of livelihood for the sample households. The average holding size was about 0.5 hectare with standard deviation of 0.46 for the sample households. This means that, with an average family size of six persons, per capita holding size would be about 0.083ha in the study area. Out of the total sample house hold 12.5% were land less, while, about 58 % of farm households have less than 0.51 hectare of land and 29% have landholding size between 0.51-2 hectares. The maximum land holding for households' were only 2.5-3 hectare (0.5%). This indicates that farming is not business-oriented and entirely subsistence as it is a survival strategy.

3.2.2 Access to irrigation

Rural farmers have differential access to variety of institutional services and natural resources endowments. From the total respondents only 43 (22%) respondents are reported that they were to access to irrigation for their crop production activity in the last 12 months, while the rest 157 (79%) households did not access to irrigation.

3.2.3 Livestock holding of the sample households

Livestock production is the most important source of income. Hence, the number of cattle, camels, goats or sheep is a good indicator of the wealth status in the community. The mean livestock holding status of the household were four tropical livestock unit. The maximum TLU reported is 14 and the minimum is found to be zero. The majority of the households 56 (28%) hold had less than or equal to three livestock unit

3.3 Institutional Characteristics of the Sample Household

3.3.1 Users of credit

Credit is an important institutional service to finance poor farmers for input purchase, investment and ultimately to adopt new technology. However, some farmers have access to credit while others may not have due to problems related to repayment and down payment in order to get input from formal sources. The survey result indicated that 87 (44 %) of the total farm households were not users of credit while 113 (57%) of the total respondents had users of credit in a period of 12 months before the survey time.

3.3.2 Distance from the market

Proximity to the market centers creates access to additional income by providing opportunities to access to inputs and transportation. Only (18%) of the respondents are residing within range of nearer to the main road. In the same manner the majority 82% of the households are also found to be far from the main road and market access. A long distance measured in kilometers from the farm to the nearest market reduces the probability of working off the farm.

3.3.3 Co-operative in members

Membership co-operative participation coverage of the sample households is approached by asking the respondents whether they were membership co-operative in their vicinity in the last 12 months or not. From the total respondents 102(51%) respondents were reported that they have participated in membership co-operative for their common economic interest in the last 12 months, while the rest 98(49%) of households were not participated in any membership co-operative.

3.3.4 Received remittance

Remittances can have an important impact on the standard of living of households receiving them. It is another source of income for the medium, poor, and very poor households. Accordingly, 69% households are not receiving remittances within 12 months from their relatives or their families living outside their residences. Thirty one percent of the total sample households reported received remittances within 12 months from their relatives or their families living outside their residences

3.3.5 Participation in safety net program

It is a transfer of resources to rural households and/or Individuals with the objective of enabling the community generate additional income and also build common asset thereby protect their asset depletion. Accordingly most of the sample house hold heads were participated to the program (65.5%), while out of the total sample about (34.5%) was non-participants. This indicates the study area is one of the chronic food insecure regions.

Table 2: Distribution of household's by livelihood strategy

Livelihood strategy	Frequency	Percent	Valid Percent
Only agriculture	78	39.0	39.0
Agriculture and off farm	21	10.5	10.5
Agriculture and non farm	50	25.0	25.0
Agriculture off farm and non farm	35	17.5	17.5
Off farm and non farm	16	8.0	8.0
Total	200	100.0	100.0

Source: Own survey result, 2011

3.4 Tests for independent variables

F-test was conducted to see the influence of the continuous/discrete variables on the livelihood strategies. Table 3 shows that family size, dependence ratio, Size of land holding and livestock holding in TLU were found to have significant relation at 10%,5%, 10% and 5% probability level to livelihood strategy practiced in the study area respectively.

Table 3: Summary test for continuous and discrete independent variable

Variable	Mean	Std	Min	Max	F	P.value
Age	38.84	9.97	20	85.0	1.13	0.342
Education	0.62	0.98	0	5.0	0.45	0.775
Family size	6.10	2.40	1	20.0	2.19*	0.072
Dependence ratio	1.50	1.08	0	4.0	3.34**	0.011
Size of land holding	1.39	1.12	0	3.0	2.25*	0.065
TLU	4.02	3.10	0	14.6	2.41**	0.051
Distance from the market	1.80	0.53	0	2.0	1.67	0.158

***, **, *, Significant at 1%, 5% and 10% probability levels, respectively

Source: Own survey result, 2011

Size of land holding was significant at 10% probability level in descriptive statistics, but insignificant in the result of econometric model. Distance to the market is also insignificant in the descriptive statistics, while significant in the econometric regression result. Such inconsistencies may occur due to individual effect in conditional descriptive statistics and group effect in relational econometric regression which is more expressive and determinant than the former.

In case of dummy variable considered in this study the Chi-Square test and p-value were conducted to check the significance of the variable on the livelihood diversification. The variable such as, membership in co-operative, farming system between agro-pastoralists and sedentary and safety net were found to have significant influence on livelihood strategies at 10%,5%, and 1% probability level respectively (Table 4). Co-operative in membership was significant at 10% probability level in descriptive statistics, but insignificant in the result of econometric model. Sex was also insignificant in the descriptive statistics, while significant in the econometric regression result. The reason is similar to the continuous and discrete variable in (Table 3).

Table 4: Summary of independent test for dummy variable

Variable		Livelihood		Strategy		Total		χ^2	p-value
		A=0	A=1	A=2	A=3	A=4			
Sex	Male	61	12	76	19	6	174	1.336	0.855
	Female	9	4	11	1	1	26		
Access to Irrigation	Yes	21	3	14	3	2	43	5.68	0.224
	No	49	13	73	17	5	157		
Farming System	Sedentary	61	15	40	26	6	148	12.805**	0.012
	Agr-post	17	6	10	9	10	52		
Cooperative Service	Yes	32	6	47	14	3	102	7.867*	0.097
	No	38	10	40	6	4	98		
Credit Users	Yes	43	10	49	7	4	113	2.847	0.584
	No	27	6	38	13	3	87		
Remittance	Yes	22	5	27	7	1	62	0.484	0.975
	No	48	11	60	13	6	138		
Safety net	Yes	36	10	65	17	3	131	19.05***	0.001
	No	43	6	22	3	4	69		

***, **, *, Significant at 1%, 5% and 10% probability levels

Own survey result, 2011

Note: A=0= AG: Agriculture only; A=1= AG+OFF: Agriculture and off farm; A=2= AG+NF: Agriculture and nonfarm; A=3=AG+ OFF+NF: Agriculture, off farm and nonfarm; A=4= OFF+NF: off farm and nonfarm.

3.5 Econometric Results

A multinomial logit model was tested for independence of irrelevant alternatives (IIA) assumption to estimate whether variables representing clusters of livelihood diversification patterns have significant impacts on the level of total household income, along with characteristic variables ($p=0.214$). As mentioned earlier, this analysis used agriculture only as the base category for no diversification and evaluates the other choices as alternatives to this option. The first column of Table 5 for instance, compared the choice of agriculture and off farm, with agriculture only, where the marginal effects and their signs reflect the expected change in

probability of preferring to agriculture only (the base) per unit change in an explanatory variable.

Table 5: Multinomial logit regression output of livelihood strategies

VARIABLE	A=1		A=2		A=3		A=4	
	MR.EFT	P-VLE	MR.EFT	P-VLE	MR.EFT	P-VLE	MR.EFT	P-VLE
CONST	0.208	0.274	-0.346	0.149	-4.252	0.042	-0.085	0.162
SEX	0.036	0.53	-0.011	0.796	-0.142*	0.091	0.003	0.849
AGE	-0.004*	0.085	0.003	0.927	0.024	0.696	-0.002	0.193
FAMLYS	0.006	0.495	0.044**	0.016	0.039***	0.005	-0.006	0.717
EDUCA	-0.006	0.492	-0.086	0.107	-0.006	0.604	-0.003	0.668
SLANDH	-0.01	0.863	0.086	0.742	-0.024	0.829	0.03	0.466
IRRGAN	-0.034	0.159	-0.151	0.136	-0.051	0.218	-0.056	0.495
DISTMK	-0.054***	0.008	-0.023	0.812	0.057	0.395	-0.006	0.886
CREDIET	-0.034	0.224	-0.019	0.555	-0.052	0.247	-0.146	0.936
COOPRT	-0.077	0.180	-0.035	0.748	0.034	0.558	0.017	0.666
REMITT	-0.02	0.631	-0.034	0.715	-0.001	0.919	0.031	0.419
TLU	0.021***	0.005	-0.009	0.216	-0.053***	0.001	0.003	0.243
DEPNDR	-0.059***	0.009	0.07	0.219	-0.016	0.865	0.049**	0.028
SAFTNET	0.035	0.172	0.11	0.243	0.205***	0.002	-0.068	0.293
FARSTM	-0.096**	0.035	-0.055	0.654	0.25***	0.009	0.13**	0.011

Dependent variable livelihood strategy

Number of observations 200

Log likelihood -234.66

Restricted log likelihood -291.51

Chi-squared 113.69

Degrees of freedom 56

Significance level 0.000

Source: Own survey 2011 ***, **, *, Significant at 1%, 5% and 10% probability level

Note: A=0= AG: Agriculture only; A=1= AG+OFF: Agriculture and off farm; A=2= AG +NF: Agriculture and nonfarm; A=3=AG+ OFF+NF: Agriculture, off farm and nonfarm; A=4= OFF+NF: off farm and nonfarm, ME=Marginal effect, P-vle=p-value.

The significant variables included; Sex, age of household head, household's family Size, households' dependency ratio, livestock holding, distance to the market, farming system and safety net. But the rest were insignificant variables.

Age of household head (AGEHH): As expected, this variable was found significant negatively at 10% to influence farmers' decision to diversify livelihood strategy. Given all other variables in the model held constant, the

likelihood of household head simultaneous choice of agriculture plus off-farm strategy relative to the base agriculture only decrease by 0.4% when age increase by one year. This implies that the participation of the household head in agriculture plus off-farm strategy decrease as they get old. The possible reason is that farmers, whose age is relatively younger, could be pushed to engage more in agriculture plus off-farm strategy than agriculture alone. This is because, younger farm households cannot get enough land to support their livelihood compared to the older farm households. This result is congruent with previous studies by Berhanu (2007) and (Fikru Tsfaye, 2008).

Family size (FAMSHH): In line with expectation, family size was found to have positively significant relation to AG+NF and AG+ OFF+NF strategies at 5% and 1% probability level respectively. *Ceteris paribus*, one extra person in the household increases the likelihood of diversifying AG+NF and AG+ OFF+NF strategies increase by 4.4% and 3.9%. The positive correlation between family size and diversification might be due to the relation between larger family size and household labor in order to meet basic needs to the family relative to the benchmark alternative agriculture only. Furthermore large families are able to practice multiple activities whereas smaller ones tend to practice only agriculture with a livestock activity. In other words, additional family member decreases the likelihood of working only on farming. This finding is similar to that of Bezemer and Lerman (2002).

Dependency ratio (DEPR): Contrary to hypothesized, dependency ratio found negatively and significantly correlated to the choice decision of AG+ OFF at 1% probability level. This means when the dependency ratio increases by a ratio, the ability of farmers to meet family needs decrease and chance of diversifying livelihood to agriculture plus off-farm strategy decreases. If the dependency ratio increases the probability of the household's to work on agriculture plus off-farm livelihood strategy decreases by 5.9 %. This finding is similar to that of (Fikru, 2008). On the other hand, in line with the hypothesized it is found positively and significantly correlated with choice decision of the house hold to diversify AG+ OFF+NF. This implies that as family of inactive labour force increases by a ratio, the likely probability of the household to need more food for survival to their family would increase and the ability to meet subsistence needs declines. Therefore, the dependency problems make the household to

diversify their income source. This tends the house hold to increase the choice decision on the diversification of AG+ OFF+NF by 4.9%. This result is consistent with that of Warren (2002).

Safety net (SFTNT): As expected, this variable has a positive correlation and significant with livelihood strategy at 1% probability level. The multinomial logit estimate for an increase in Safety net with AG+ OFF+NF livelihood strategy to the base variable agriculture alone, given the other variables in the model are held constant. If a subject were to increase Safety net, the multinomial odds ratio for choice of AG+ OFF+NF livelihood strategy relative to the base variable agriculture alone would be expected to increase by 20.5%. The possible reason for the result could be, the intended of the program as criteria targeting and pre identifying the poor to help them in the event of hardship or misfortune to enable them reducing the riskier situation, especially something providing financial security in the form of food for work. This may enhance likelihood of household choosing AG+ OFF+NF livelihood strategy than agriculture alone. This result is consistent with that of (Adugna, 2008).

Sex of household head (SEX): Gender affects diversification options, including the choice of income-generating activities due to culturally defined roles, social mobility limitations and differential ownership of/access to assets. As expected sex of household head was found to be negatively and significantly correlated at 10% probability level to diversification into off farm activities by FEHs. Thus, keeping the influence of other factors constant; the likelihood of FEHs choice of agriculture and off farm livelihood strategy decreases by 14.2 %. The opposite is true for the male counterparts. This result is in agreement with previous studies conducted by Adugna (2006) and Berhanu (2007).

Livestock holding (LIVESTOK): In line with prior expectation, livestock holding in TLU negatively influenced household's choice of agriculture plus off-farm and non-farm livelihood strategy (AG+OFF+NF) at 1% probability level and in contrary to the hypothesized it is found positively and significantly related with the choosing decision of livelihood strategy of agriculture plus off-farm livelihood strategy (AG+OFF) at 1% probability level. That means the household with lower livestock holding would be obliged to diversify his livelihood into agriculture plus off-farm livelihood strategy, while the household with higher

livestock holding would be obliged to household participate more in agriculture than livelihood diversification. *Ceteris paribus*, the likelihood of diversifying in (AG+OFF) strategies increase by 2.1% and the likelihood of diversifying into agriculture plus off farm and non-farm livelihood strategy (AG+ OFF+NF) decreases by 5.3% for households with more livestock number in TLU relative to the benchmark alternative agriculture only. The result is in line with the findings of Berhanu (2007) and Dereje (2008).

Distance to the market (DISTMK): Market access is another important factor affecting livelihood strategies.): As hypothesized it is found a negatively and significantly related with the choosing decision of livelihood strategy of agriculture plus off-farm livelihood strategy (AG+OFF) at 1% probability level. Therefore, keeping all other variables in the model held constant, the likelihood of household head far from the market simultaneous choice of agriculture plus off-farm strategy relative to the base agriculture only decrease by 5.4%. In other words, household who are nearer to the market expected to have more propensity choice by 5.4% to be engaged in agriculture plus off-farm livelihood strategy diversification compared to the referent baseline alternative agriculture only. The possible reason for the result could be, households far from market places have no easy and quick physical access to the market, to transport output and input from and to their residence and the chance of wage labor, and small business (petty trade) and other off-farm and non-farm activities are discouraging as the result diversification is decreasing. The result is in line with the findings of Tessema (2009).

Farming system (FARSTM): Contrary to prior hypothesis, this variable influence the decision of the household head to participate in agriculture plus non-farm livelihood strategy positively and significantly at 1% probability level to AG+ OFF+NF livelihood strategy. Keeping all other variables in the model held constant, the likelihood of household head simultaneous choice of AG+ OFF+NF and OFF+NF strategy relative to the base agriculture only increase by 25% and. The result suggests that the probability of the household head deciding on choosing the above strategy is higher than the probability of being in the reference base agriculture only. The possible justification for this could be the house hold may be nearer to the market or to the high land agro-ecology which have good opportunity for them to participate more in livelihood diversification

than agriculture in the area. However, In line with prior expectation, it is found negatively and significantly related with the choosing decision of livelihood strategy of agriculture plus off-farm livelihood strategy (AG+OFF) at 5% probability level. given the other variables in the model are held constant, the multinomial odds ratio for choice of (AG+ OFF) livelihood strategy relative to the base variable agriculture alone would be expected to decrease by 9.6%. The possible reason for the result could be, the house hold may be living in low land farming agro-ecological zone where agriculture is more practiced than diversification. This may reduce likelihood of household decision to diversify (AG+ OFF) livelihood strategy.

4. Summary and Recommendations

4.1 Summary

The result of the descriptive statistics showed the majority of the sample house holds 39% allocates all their labor to agricultural activities, while about 25% engaged in agriculture and nonfarm combination livelihood strategy, only 17.5% of the sample rural household's work on agriculture, off farm and nonfarm combination income generation livelihood strategy.

The result of the multinomial logistic regression model revealed that out of 14 variables included in the model only 8 explanatory variables were found to be significant at different probability level to the combination of livelihood strategies. Accordingly, the significant variables included sex; age of household head, household's family Size, dependency ratio, livestock holding, distance to the market, farming system and safety net. But the rest were insignificant variables.

Safety net and family size were positively and significantly related to livelihood diversification strategy, whereas, age of household head; sex and distance to the market were negatively and significantly associated to different choice of livelihood diversification strategy. On the contrary, livestock holding, dependency ratio and farming system were partially positively and significantly related to livelihood strategy respectively.

4.2 Recommendations

The key finding of the study was that diversification across livelihood strategy helps households to increase the probability of their maintaining livelihood security, basically appreciation of the way that combinations of activities secure livelihoods. Clear identification of livelihood strategies would provide a clear base on which to focus on practical intervention. The intervention strategy should address the rural poor.

Safety net was positively and significantly related to livelihood diversification strategy. Safety net program should focus on needs identification and self targeting to address both the basic needs as well as the needs that arise from wealth specific constraints to empower asset accumulation through livelihood diversification. Self-targeting provides a diversification option for those needing diversify to survive. Therefore, safety net mechanisms should be continuing, in coping to help vulnerable people to create asset by diversification.

Sex was negatively and significantly associated to the choice of livelihood strategy. Women are generally less likely to participate in diversification of livelihood activity than men due to social constraints and requirements to stay at home to manage the household activities. Therefore, actions that ensure gender equality by increasing women's access to assets, education and economic empowerment in decision making on choice of resource allocation for livelihood diversification should be encouraged by local government and other stockholders.

The result of the study showed that livestock holding have a significant correlation with the livelihood diversification strategies. Therefore the rural livelihood strategy should not only emphasis on increasing herding of livestock production ,but also attention should be given in promoting combination of activities to diversify livestock value added products for additional income generating activities.

Market access is another important factor affecting livelihood strategies. Distance to the market was negatively and significantly associated to the choice of livelihood strategy. Household who have access to market have higher involvement in livelihood diversification. Therefore, infrastructure in the study

areas particularly roads which affects both opportunities and access, should construct for labor mobility to enhance livelihood diversification.

Apply supportive mechanism which facilitates combination of livelihood strategies, promotion of options, substitution between activities and assets to diversify household livelihood through encouraging entrepreneur, self-employment (in petty trade, agro-processing, tailoring, construction or services), especially in rural areas where farming currently predominates.

The study suggests that efforts should focus on policy intervention mechanism that facilitates livelihood diversification in generating additional income sources for the rural poor by expanding networks (shared training or Apprenticeship) information, improve incentive and consultancy service on livelihood diversification opportunities to diversify agriculture-linked non-farm and off farm livelihood activities rather than focusing on the single agricultural productive farm to generate asset accumulation for rural poor.

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Appendix

Appendix Table 1: Tolerance level of continuous and discreet variables

Variable	TOL	VIF
AGEHH	0.964	1.04
FMSHH	0.616	1.62
DPNDR	0.652	1.53
LNDHLD	0.995	1.00
DISTRMK	0.885	1.13
LIVSTCK	0.892	1.12
EDUHH	0.961	1.04

Source: Own survey result, 2011

Appendix Table 2: Contingency test for dummy variables

Variable	SEX	IRRGTN	EXTNS	CRDT	COOPR	REMMIT	SFTNET
SEX	1						
IRRGTN	0.1868	1					
EXTNS	-0.2335	0.1505	1				
CRDT	-0.0507	-0.0318	0.2844	1			
REMIT	0.2231	0.0176	0.0383	0.1084	0.2029	1	
SFTNET	-0.0009	0.0214	-0.2616	-0.064	0.3827	0.2590	1

Source: Own survey result, 2011

Appendix Table 3: Conversion factors that used to estimate tropical livestock unit

Animal categories	TLU
Cow and Ox	1.00
Horse	1.10
Donkey(adult)	0.70
Donkey(young)	0.35
Sheep & goat(adult)	0.13
sheep & goat(Young)	0.06
Chicken	0.01
Camel	1.25

Source: Stork, *et al*, 1991

SOCIO-ECONOMIC IMPACTS OF HIV/AIDS ON ETHIOPIAN HOUSEHOLDS: THE CASE OF DIRE DAWA ADMINISTRATION

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Abstract

The study assessed the impact of HIV/AIDS on households' health care spending and individuals' work time loss in nine selected kebeles of Dire Dawa Administration. According to FHAPCO (2010), the Administration stood second in the prevalence of HIV/AIDS among the nine regions of the Country. For better rural-urban representation of the data collected using survey method, the task of sampling was stratified into three urban and six rural kebeles. In the study, samples were drawn from two types of households namely HIV affected and non-affected. A total of 240 households were sampled from which 120 were from the general/non-affected households and 120 were from households that are explicitly identified to have an HIV positive adult member. HIV affected urban households were sampled purposively in collaboration with Local NGOs working with people living with HIV. Whereas, rural health posts were the main entry point for identifying HIV affected respondents from the rural locations. Non-affected households were randomly identified from each of the nine kebeles in collaboration with Administrators of the respective kebeles. Following Canning et al. (2006), the study compared HIV positive people with a control group with similar observed characteristics, using propensity score matching (PSM) approach. The key assumption in this approach is the Conditional Independence Assumption (CIA), which states that conditional on the propensity score, assignment to the treatment (HIV-positive) and control (HIV-negative) groups can be taken to be random. If this is the case, then the difference in outcomes between treatment and control groups can be directly compared to give the effect of "treatment". Results from the propensity score regression suggest that HIV prevalence declines with age at first and then rises. Primary and

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secondary school education appear to lower the risk of HIV while no schooling increases the risk. The Average Treatment Effect on Treated (ATT) estimation results showed that HIV is associated with significantly increased morbidity, health care spending and lost work time, relative to outcomes in the control group. Morbidity rate of HIV-positive individuals was found to be higher than matched HIV negative individuals by 22 percent, which is statistically significant at 5 % level of significance. Similarly, on average, HIV/AIDS has increased the incidence of major illness (illness of duration exceeding 3 months in the year preceding the survey) in the affected households by 41 %, which is also statistically significant at 1 % level of significance. The paper discusses these results in detail and draws their implications for policy makers. Moreover, following Ichino et al. (2006), the study employed a simulation-based sensitivity analysis for matching estimators, which aimed at assessing to what extent the estimates derived under the CIA are robust with respect to specific failures of this assumption. Although the results are robust to specific failures of the CIA, the study concluded that non-experimental studies on the effects of a treatment (i.e., studies based on the CIA) should not be automatically accepted; rather, they should be put under the scrutiny of a sensitivity analysis before being accepted as a guide for policy.

1. Introduction

Cases of AIDS have been reported in every nation of the world. About 90% of all People Living with HIV/AIDS live in the developing world. Particularly, AIDS has struck sub-Saharan Africa. Two-thirds of all People living with HIV/AIDS reside in African countries south of the Sahara (Bartlett and John, 2009).

There are many routes through which AIDS could affect socioeconomic outcomes at households' level. Obviously AIDS-related morbidity and mortality affect the health and life expectancy of an infected person, and these effects can spread to the caregivers or survivors in the household, the extended family, the community and the nation (Seeley, 2010).

In general, the available empirical literature on Africa highlights several forms in which HIV/AIDS affects households adversely. According to Booysen et al.

(2007), one implication of HIV/AIDS is reduced non-health consumption expenditures among household members; another is reduced nutrition and educational attainment for children in affected households. A third effect is the reallocation of household efforts away from income earning activity to care-giving roles.

Although much has been written to describe the potential routes of socioeconomic impacts of HIV/AIDS, these writings are largely theoretical, speculative and anecdotal (Kathleen and Joachim, 2008). And after many years of study, there are still large gaps in the empirical literature on the magnitude and heterogeneity of social and economic impacts of the pandemic. According to Russell, (2004), these gaps persist partly because of the demanding methodological and data requirement to investigate satisfactorily the socio-economic impacts of HIV at household level.

The HIV/AIDS epidemic in Ethiopia probably began in the late 1970s or early 1980s, with the first hospitalized AIDS patients reported in 1986, and the first sero-survey at a national scale conducted among military recruits in 1984-85 (showing a prevalence of 0.07% among 5,565 people tested). Initially, the epidemic was localized in urban areas, along the major commercial routes and among certain occupational groups. By 1988, high rates of HIV prevalence (17%) were detected among commercial sex workers residing along the main trading roads and long distance truck drivers (13%) (EHAPCO and GAMET, 2008).

By the year 2010, the national adult HIV prevalence rate for Ethiopia was estimated to be 2.4 percent and an estimated 1.2 million adult Ethiopians were living with the virus. In the same year, an estimated 14,802 people were living with HIV/AIDS in Dire Dawa Administration, making it the second most HIV affected region in the country with an adult prevalence rate of 4.9 percent (FHAPCO, 2010).

Hence, with nearly 5 percent of its adult population infected with HIV, studying the socio-economic impact of HIV/AIDS on households of Dire Dawa Administration is of obvious policy relevance. Central to investigating the socio-

economic impact of HIV is to understand the dynamics that arise when the household is HIV affected.

In this context, this study primarily endeavors to assess the impact of HIV/AIDS on households' socioeconomic conditions and identify the existing coping mechanisms of affected households to mitigate the adverse impacts of HIV.

2. Methods

2.1. The Study Area

Dire Dawa is the second largest city in Ethiopia organized under 38 rural and 9 urban Kebeles. The city is accessible by airplane, train, and cars, and is about 515kms road distance to the east of Addis Ababa (the capital) and 311kms to the west of Djibouti port. The total area of the region is about 128,802 ha; out of this urban accounts for 2684 ha (2%) and the balance 98% is for rural (IDP, 2005).

Dire Dawa hosts a number of most-at-risk population groups, including female sex workers, migrant day laborers, tourists, truck drivers and their assistants, and in- and out-of school youth (Amare, 2009). The same source also asserted that transactional and cross-generational sexual practices are common in the town (large numbers of female sex workers and students practice transactional sex).

In this regard, the current adult HIV prevalence of Dire Dawa Administration is estimated to be 4.9 %. While adult HIV incidence of the urban and rural Dire Dawa is 1.86% and 0.17% respectively. On the other hand, the total number of people living with HIV/AIDS in Dire Dawa is expected to be 14,389 in urban and 414 in rural. Female and male HIV positive is expected to be 8,714 and 6,086 respectively (FHAPCO, 2010).

2.2 Sampling

With reference to nine kebeles in the Administration, the study focused on assessing the socio-economic impact of HIV/AIDS at households' level. For better rural-urban representation of the data collected using survey method, the task of sampling was stratified into three urban and six rural kebeles.

In this study, samples were taken from two types of households namely HIV affected and non-affected households. In doing so, a total of 240 households were sampled, from which 120 were from the general/non-affected households and 120 were from households that are explicitly identified to have an HIV positive adult member.

Following Canning et al. (2006) and Aster (2005), HIV affected urban households were sampled in collaboration with Local NGOs working with people living with HIV. Whereas, rural health posts were the main entry point for identifying HIV affected respondents from the rural locations. Following Gebrehiwot (2005), non-affected households were randomly identified from each of the nine kebeles in collaboration with Administrators of the respective kebeles.

Due to the relatively lower prevalence of HIV and limited NGO activities in rural areas, the majority of the study sample was identified from urban locations accounting to 164 households (68% of the total sample), while the remaining 76 households (32% of the total sample) were drawn from the rural kebeles.

2.3 Data Collection and Analysis

At households' level, primary data were collected on a variety of demographic, socioeconomic and health related issues of individuals and households. An econometric model called, a propensity score matching approach, was employed to quantitatively estimate the impact of HIV on the health and socio-economic outcomes of affected households. The key assumption in the PSM approach is the Conditional Independence Assumption (CIA) and the overlap assumption.

CIA states that conditional on the propensity score, assignment to the treatment (HIV-positive) and control (HIV-negative) groups can be taken to be random (Rosenbaum and Rubin, 1983). If this is the case, then the difference in outcomes between treatment and control groups can be directly compared to give the effect of "treatment".

Hence, a matched comparison of health and socio- economic outcomes was performed between HIV affected and non-affected HHs who shared similar propensity scores (predicted probability of reporting HIV-positive, conditional on the full set of predetermined variables). In doing so, STATA 11 computing software was employed.

Heckman et al., (1997, 1998) emphasize that the quality of the match can be improved by ensuring that matches are formed only where the distribution of the density of the propensity scores overlap between treatment and comparison observations, or where the propensity score densities have “common support.”

The matching variables used in the propensity score estimation regression include household and individual level characteristics such as age, age squared, family size, share of males and dummies for marital status, schooling, place of residence and religion. Following Canning et al. (2006), the outcome variables used in the model include morbidity rates, inpatient stays, amounts spent out of pocket for health care and work-time forgone by sick person.

2.4 Variables Definitions, Measurement and Hypothesis

In-depth review of literature on the socio- economic impacts of HIV/AIDS, which include both theoretical and empirical research findings, as well as the author’s knowledge of the degree of impacts in the study area were used to identify the explanatory variables and establish working hypothesis for this study. In this context, a combination of socioeconomic and demographic factors was used to explain households’ probability of being affected by HIV/AIDS and the resulting health and economic outcomes. Table 1 presents the list of these variables and shows how they are measured in the present study with their respective hypothesized effect.

Table 1: Variable definition, type, measurement and hypothesized effect

Variable definition and type	Measurement	Hypothesized effect
Treatment Variable		
Dummy for HIV affected households	1 if a household has an HIV positive member and 0 if negative	
Outcome variables		
Dummy for illness in last four weeks	1 if respondent has been ill during the last 4weeks and 0 if not	Positive
Dummy for major illness in last one year	1 if respondent has been ill for a period of more than 3 months during the last and 0 if not	Positive
Dummy for hospitalization in last one year	1 if respondent has been hospitalized during the last 1 year and 0 if not	Positive
Household's health care expenses in last four weeks (Continuous)	Birr	Positive
Household's health care expenses in last one year (Continuous)	Birr	Positive
Work time lost due to illness in last four weeks (Continuous)	Number of days	Positive
Work time lost due to illness in last one year (Continuous)	Number of days	Positive
Predetermined explanatory variables		
Age of household head	Number of Years	both positive and negative
Age of household head squared (Continuous)	Number of years squared	Indeterminate
Dummy for place of residence	1 if respondent is from urban sample and 0 if not	Positive
Dummy for marital status	1 if household head is married and 0 otherwise	Negative
Dummy for no schooling	1 if household head is illiterate and 0 otherwise	Positive
Dummy for primary schooling	1 if household head had primary education and 0 otherwise	Negative
Dummy for secondary schooling	1 if household head had secondary education and 0 otherwise	Negative
Dummy for Religion	1 if household head is Muslim and 0 if Christian	Indeterminate
Share of males (Continuous)	ratio of the number of males to total family size	Negative
Family size (Continuous)	Total number of members in the household	Positive
Dependency ratio(Continuous)	Ratio of number of inactive members in a HHs to number of active members	Indeterminate

Note: the entries in third column (positive, negative and indeterminate) differ in their meanings when considered for outcome and explanatory variables. For outcome variables, the signs refer to the hypothesized mean difference between HIV affected households and their matched non affected households, while, for the explanatory variables, the signs refer to the effect of the variable on the households' probability of being affected by HIV/AIDS.

3. Findings

Table 2 presents the logistic-regression implemented to generate propensity scores which are used for matching controls to treated cases. In general, results from the propensity score regression suggest that HIV prevalence declines with age at first and then rises. Primary and secondary school education appear to lower the risk of HIV while no schooling increases the risk. Among the individuals sampled for the study, it has been found that Christian household heads appear to be more likely to be HIV-positive than Muslim household heads.

Table 2: Logit estimates for propensity scores

Variables	Coef.	Std. Err.	z
Constant	9.85	2.642	3.73***
Age (in years)	-0.321	0.12	-2.92***
Age squared	0.003	0.001	2.33***
Dummy for place of residence	0.342	0.529	0.65
Dummy for marital status	-1.174	0.317	-3.70***
Dummy for no schooling	0.48	0.838	0.57
Dummy for primary schooling	-0.552	0.944	-0.58
Dummy for secondary schooling	-0.257	0.976	-0.26
Dummy for Religion	0.647	0.383	-1.69*
Share of males	-0.052	0.09	-0.59
Family size (in numbers)	0.456	0.06	-3.76***
Number of observations		240	
LR chi2(10)		53.44	
Prob> chi2		0	
Pseudo R2		0.161	

*** and * means significant at the 1% and 10% probability levels, respectively

3.1 Matching Using Propensity Scores

This study implements three different procedures of matching, all of which use propensity scores to control for predetermined observable differences between the treatment and control groups. These include nearest neighbor method, radius method and the kernel method (Smith and Todd 2005).

Following Yibeltal (2008), the final choice of a matching estimator for this study was guided by three criteria such as equal means test referred to as the balancing test, pseudo-R² and matched sample size. Specifically, a matching estimator which balances all explanatory variables (i.e., results in insignificant mean differences between the two groups), bears a low pseudo-R² value and also results in large matched sample size was chosen as being the best estimator of the data considered.

Table 3: Performance of matching estimators

S.N	Matching Estimator	performance criteria		
		Balancing test*	Pseudo-R ²	Matched sample size
1	Nearest Neighbor Matching			
1.1	Without replacement	10	0.017	189
1.2	With replacement	9	0.022	219
2	Radius caliper Matching			
2.1	Caliper (0.01)	7	0.011	206
2.2	Caliper (0.25)	8	0.021	220
3	Kernel Matching			
3.1	No band width	8	0.016	220
3.2	Band width(0.25)	10	0.01	220
3.3	Band width(0.1)	10	0.012	220
3.4	Band width (0.5)	10	0.049	220

* Number of explanatory variables with no statistically significant mean differences between the matched groups of HIV affected and non-affected households

Table 3 presents the estimated results of tests of matching quality based on the above mentioned performance criteria. Accordingly, the kernel matching with 0.1 band width was found to be the best estimator for the data. As can be seen from the Table, this estimator has resulted in the lowest pseudo R² value, well balanced covariates and largest sample size by discarding only 20 unmatched

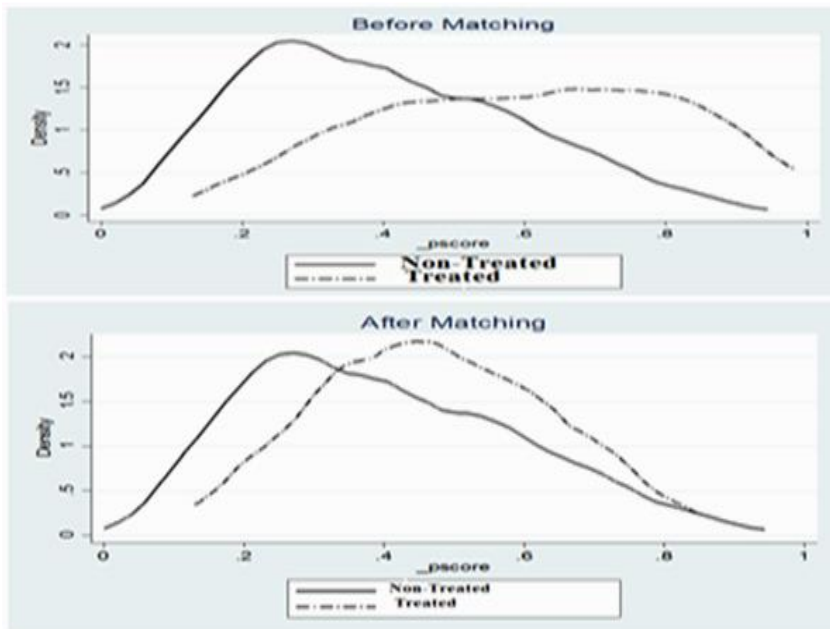
households from the sample. Hence, only the results obtained from this estimator were presented and discussed in the study.

3.2 Testing the Overlap Assumption

Following Carolyn (2010), density-distribution plots of propensity scores for treated and untreated groups was employed to visually check the overlap condition and to see if the matching is able to make the distributions more similar. The distributions of the propensity scores, before and after matching as well as after the imposition of a further common support condition are plotted in Figure 1 and 2 respectively.

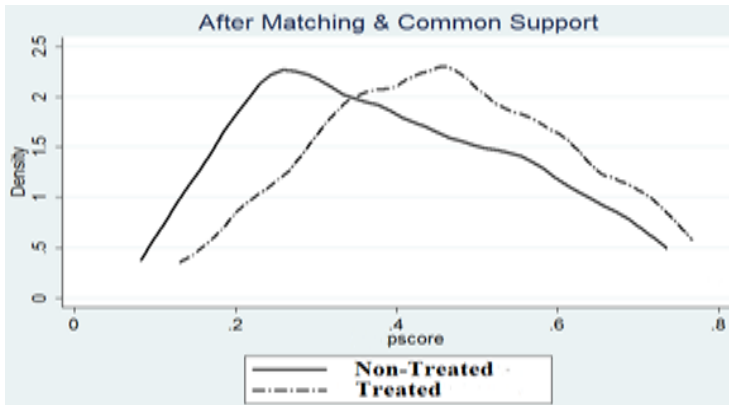
Visual inspection suggests that the densities of the propensity scores are more similar after matching. However, one can visually inspect that there are clear and sizeable differences in the minima and maxima of the propensity score density distributions for the treatment and comparison groups even after matching.

Figure 1: Distribution of propensity scores before and after matching



As a result, a further common support condition, as in Marco and Sabine (2008), is imposed to delete all observations whose propensity score is smaller than the minimum and larger than the maximum in the opposite group. Figure 2 depicts the distribution of propensity scores after the further common support condition is imposed.

Figure 2: Distribution of propensity scores after imposition of further common support



3.3 Average Treatment Effect on Treated (Att)

Table 4 presents the findings on the effect that HIV has on health outcomes, spending and work-time lost, based on the sample of matched treated and control groups.

Results are based on questions referring to the 4-weeks preceding the survey and questions based on outcomes in the previous year. Irrespective of the time frames considered, the Average Treatment Effect on Treated (ATT) estimation results showed that HIV is associated with significantly increased morbidity, health care spending and lost work time, relative to outcomes in the control group.

For instance, morbidity rate of HIV-positive individuals was found to be higher than matched HIV negative individuals by 22 percent, which is statistically significant at 5 % level of significance. Similarly, on average, HIV/AIDS has

increased the incidence of major illness (illness of duration exceeding 3 months in the year preceding the survey) in the affected households by 41 %, which is also statistically significant even at 1 % level of significance.

Table 4: Estimates of average treatment effects

Outcome indicators	N. treated	N.control	ATT	Std. Err.	T
For the last four weeks					
Incidence of illness (%)	104	116	0.22	0.06	2.91**
Health care expense (birr)	104	116	32.57	14.4	2.27**
Work time lost due to illness (days)	104	116	0.794	0.46	1.72**
For the last one year					
Incidence of major illness (%)	104	116	0.412	0.06	7.36***
Health care expenses (birr)	104	116	190.61	48.1	3.96***
Work time lost due to illness (days)	104	116	7.71	3.16	2.43**

*** and ** means significant at the 1% and 5 % probability levels respectively.

Furthermore, HIV-positive individuals spent nearly 32 and 190 birr extra from out of pocket than matched HIV-negative individuals in the last four weeks and one year period preceding the survey respectively. The t test results also revealed that these findings are statistically significant at 5% level of significance. This finding was also in line with the findings of Canning et al. (2006) who reported that direct health care costs and indirect income loss per HIV positive individual were 16,569 Naira and Wyss et al. (2004) who found that, on average, a household spends USD78.6 a month directly on AIDS treatment and care.

Considering the difference in work time lost due to illness, HIV positive individuals spent an extra seven days as an inpatient in the last one year period and less than an extra one day in the last four weeks period. The corresponding t values of 2.43 for the longer time frame and 1.73 for the shorter, show that the estimated ATTs are statistically significant at 5 % and 10 % level of significance respectively. In support of this, Grant and Palmiere (2007) has also reported that time lost due to illness was 15.8 days a month and household

members provided assistance at an average of 8.3 days, abandoning their daily activities or occupations.

3.4 Sensitivity Analysis

The study employed a simulation-based sensitivity analysis for matching estimators, which aimed at assessing to what extent the estimates derived under the CIA are robust with respect to specific failures of this assumption.

Although the results were found robust to specific failures of the CIA, the study concluded that non-experimental studies on the effects of a treatment (i.e., studies based on the CIA) should not be automatically accepted; rather, they should be put under the scrutiny of a sensitivity analysis, like the one proposed here, before being accepted as a guide for policy.

4. Conclusion

Measuring the socio- economic impacts of HIV/AIDS provides an important contribution to the limited literature on the impact of the epidemic on affected HHs especially in the study area. Hence, the matched comparison of health and socio- economic outcome has shown that HIV-affected HHs in Dire Dawa Administration is likely to face serious socio-economic challenges, when compared to their HIV-negative counterparts. These include the likelihood of Substantial incidence of illness, an increased work time loss and an increased out-of-pocket health care spending.

In summary, the particular findings of the study translate into significant losses to households in terms of direct medical care costs, as well as incomes foregone by sick members. Besides, the results indicated that HIV affected households do not have adequate mechanisms to cope with these financial shocks. Therefore, it is possible to conclude that the pandemic is being a great threat to the households of the study area and if the existing condition remains unchanged, it is evident that these impacts persist for the generations to come.

5. Recommendation

Based on the findings of the study, the following short and long term recommendations are forwarded.

- Facilitating a condition by which HIV affected HHs could get shelter at a reasonable price
- Increasing access of HIV-positive individuals to income generation schemes;
- Supporting PLHIV in nutrition so that adherence to Antiretroviral Treatment (ART) will be enhanced and morbidity and mortality reduced among the affected individuals.
- Increasing access to palliative home based care services, especially for bed ridden patients;
- Providing formal and informal anti AIDS education that can remove the hidden stigma and create awareness about HIV/AIDS especially among communities of rural dwellers.

Finally, as this study is based only on the case of Dire Dawa Administration, it is difficult to take it as representative of the whole Country. Thus, it leads us to suggest a further in-depth study to investigate adequate information about the socio-economic impacts of HIV/AIDS at households' level.

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ASSESSING THE GAPS AND PROBLEMS THAT EXIST BETWEEN THE BUSINESS COMMUNITY AND TAX AUTHORITIES OF DIRE DAWA ADMINISTRATION

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Abstract

This study was conducted to assess the challenges faced by the business community of Dire Dawa City in relation to taxation. Although data for the study was collected from various sources, a survey of tax payers' and focus group discussions were the main ones. A total of 183 tax payers have participated in the study as a source of information. In addition, key informants from Dire Dawa Chamber of Commerce and Sectoral Association (DDCCSA), Tax and Revenue Authority (TRA) and Federal Customs and Inland Revenue Authority (FCIRA) were interviewed to support and check the reliability of the data collected using the survey. Descriptive statistics such as mean, standard deviation, percentages, frequency, charts, and graphs were used to summarize the study findings and present the results. Moreover, the KruskalWallis chi square test was implemented in testing the statistical significance of mean differences, with respect to some variables, between category "C" and categories "A" and "B" tax payers. Generally, findings of the study revealed that most of the taxpayers, especially those in the category "C", have faced various problems related to the taxation system. Despite the business community's positive attitude towards the general concept of taxation, most of the surveyed tax payers stated that what they are taxed is beyond their ability to pay and that they neither have trust in the employees of the authority nor in the overall tax estimation, assessment and collection procedures. In light of these facts, the study concluded that the tax authority of the city administration is not being effective or is being reluctant in making the tax procedures objective, transparent and understandable to taxpayers. Thus, it is recommended that the responsible tax authorities should revise their working system and promote transparency so that trust of tax payers on the tax system will gradually develop.

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1. Introduction

1.1 Background of the Study

Taxes are important sources of public revenue. Public goods such as roads, power, municipal services, and other public infrastructures are normally supplied by public agencies due to their nature of being non-rival and non-excludable (Joseph, 2008). Government intervention in the supply of public goods is therefore inevitable and can only be done if the public pays taxes for the production and supply of such goods (Fjeldstad, 2004).

According to the current federal income tax proclamation no.286/2002 taxpayers are categorized into three, namely category "A", "B", and "C" based on their volume of sales and form of business. Category "A" includes any company incorporated under the tax law of Ethiopia domestically or in a foreign country, and other entities having annual turnover of Birr 500,000 and more. Category 'B' includes those enterprises having annual turnover of more than Birr 100,000 and less than Birr 500,000. These categories of taxpayers must submit profit and loss statement at the end of the year. The law requires all entries in the records and accounts to be supported by appropriate vouchers (Council of Ministers Regulation no. 78/2002: Article 18, Sub Article 2).

Category 'C' unless already classified in categories 'A' and 'B' include those taxpayers whose annual turnover is estimated by the Tax Authority at Birr 100,000 or less. Unlike the case for category "A" and "B" tax payers, the income tax liability of Category 'C' taxpayers is determined using standard assessment. This type of assessment is a fixed amount of tax determined in accordance with the Council of Ministers Regulation established Schedules.

This category of tax payers is the most problematic. This is due to the fact that these taxpayers pay taxes at fixed rates on the income estimated by the income tax authority not on their income declared by themselves. Their daily income is estimated by assessment committees and the taxpayers have little room to express their views as a result of which frequent friction is observed in this area (Lemessa, 2007).

According to DDCCSA 2011, the prevailing condition of taxation in Dire Dawa City has been a cause for wide- spread complaints by the majority of traders especially by the tax payers of category “C” over unfairness and overstated tax. The same source indicated that Tax payers of category A and B have also complaints related to accounting procedure and validity of receipts and business related expenses.

1.2 Objectives of the Study

The general purpose of the study is to assess, in an objective way, the current problems and gaps that exist between the business community and the Dire Dawa Administration relating to taxation. Being initiated and funded by the DDCCSA, which is a non-governmental organization working to safeguard the overall rights and benefits of the business community, the study primarily intends to scientifically identify and prioritize basic problems of the business community and seek out sustainable solutions.

The specific objectives of the study are:

- to identify tax payers’ problems related to the overall taxation system, tax assessment, collection and service delivery of tax authorities, and
- to provide important information on how to narrow the gaps and create better working condition between the business community and the government

2. Methods

2.1 Data Source and Sampling

Both primary and secondary data was collected to attain the research objectives. The data collected had qualitative and quantitative nature. In collecting the primary data, the survey method, key informants interview as well as Focus Group Discussions (FGDs) were employed. Tax payers were sampled from stratified sectors and market places which included exporters; importers; Construction, Garage and Taylor’s associations; and small traders operating in the four main market areas of Dire Dawa City: (1) Taywan, Roosetera and Hafetessa (2) Kefira, Megala and Alaibed (3) Gendekore and (4) Sabean Market areas.

For methodological simplicity, tax payers were first re-grouped/stratified into two groups: Group 1 (Category “C” tax payers) and Group 2 (Category ‘A’ and ‘B’ Tax payers). Then, a proportional random sampling method was employed to select 165 tax payers from the first Group and 18 tax payers from the second, leaving a total of 183 tax payers participating in the study as survey respondents or FGD participants.

Key informants from Dire Dawa Chamber of Commerce and Sectoral Association (DDCCSA), Tax and Revenue Authority of Dire Dawa (DDTRA) and Federal Customs and Inland Revenue Authority (FCIRA) were also interviewed by the study team. The purpose of using different respondents was to triangulate the data and obtain full information. Secondary data of both published and unpublished documents was also collected and reviewed to supplement the primary data.

2.2 Method of Data Analysis

Descriptive statistics such as mean, percentage, frequency, chart and graph were used to process the collected data. Moreover, an inferential statistics called the kruskalwallis chi square test was implemented in testing the statistical significance of mean differences, with respect to important variables, between the two groups of sampled tax payers.

Triangulation Method was also employed to support and check the reliability of the data obtained from various subjects. STATA 11 Computing Software was used to carry out data analysis.

3. Findings of the Study

Findings of the study focus on selected variables related to taxation and tax payers in the City Administration. These include: taxpayers’ knowledge and awareness about taxation, problems related to tax assessment, organizational effectiveness of tax authorities and other relevant issues.

3.1 Taxpayers' Knowledge about Taxation

The following table shows the responses of survey respondents regarding the reasons for paying taxes.

The majority of the respondents (79.17% from categories 'A' and 'B' and 30.77% from category 'C') said that they pay taxes in anticipation of public services from the government. However, 52.56% of the sample respondents from category 'C' said that they pay taxes to avoid disturbances while 16.67% said, "it is an obligation to the government". On the other hand, 20.83% of the respondents from categories 'A' and 'B' said that they pay taxes because it is an obligation while none of the respondents from this group mentioned avoidance of "disturbances". Generally, the results indicate that there is a positive understanding as to why the tax payers pay taxes.

Table 1: Reasons why taxpayers pay taxes

Reasons	Category 'A' and 'B' (%)	Category 'C' (%)	Chi-square test	
			χ^2	p-value
To avoid disturbances	0.00	52.56		
In anticipation of public services	79.17	30.77		
It is an obligation towards the government	20.83	16.67		
Total	100	100	6.505	0.0108

Comparing the responses of the two groups, the results show that Category "A" and "B" tax payers have a better understanding for paying taxes, which is also confirmed by the statistically significant mean difference, in the responses of the two groups at 1% probability level (Table 1).

When respondents were asked whether the tax they pay is based on their ability-to pay or not, 70.41% of category 'C' tax payers said that the tax is not fair and not based on their ability to pay while only 29.49% of the respondents from this category believed that what they pay is fair and equitable (Table 2).

The results also show that 100% of the sampled, category 'A' and 'B' tax payers, perceive what they pay is fair. The chi-square value of 7.150, with a p-value of

0.0021 also shows that there is a statistically significant difference in the perception of fairness of tax between the two groups of tax payers at 1 % level of significance.

Table 2: Tax Fairness by category of tax payers

Is your tax liability overstated or understated?	Tax payer's Category		Chi-square test	
	Category 'A' and 'B'	Category 'C'	χ^2	p value
	Percent	Percent		
Understated	0.00	0.00		
Overstated	0.00	70.41		
Fair	100.00	29.49		
Total	100	100	7.150	0.0021

3.2 Tax Assessment

Category 'C' tax payers, the main targets of this study, are those who pay their taxes on the basis of tax assessment by estimation. To this effect, they were asked whether they have any problems when their tax is assessed using standard tax assessment scheme.

Table 3: Problems of tax assessment based on estimation

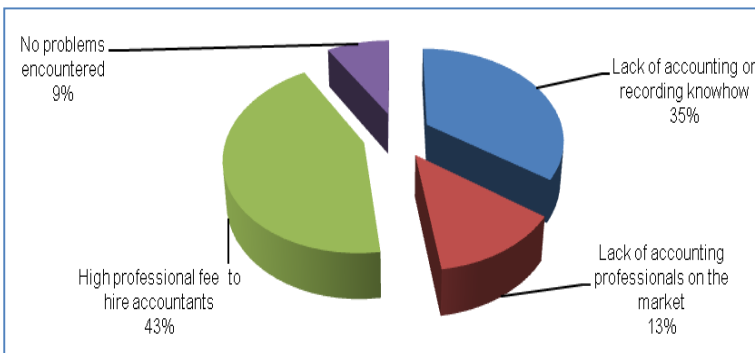
Problems	Agree (%)	Disagree (%)
Method of assessment is a simple guess or subjective	85.71	14.29
Inflated daily/annual income in tax estimation	97.14	2.86
No fair tax among similar businesses in same proximity	97.14	2.86
No trust of tax payers' statement of volume of daily sales	100.00	0.00

As can be seen in the above table, all of the respondents (100 %) agree that the tax authority does not trust tax payers' statement of daily sales volume and almost, all of them (97.14%) believed that there is no fair taxation among similar businesses in the same area and that their daily/annual incomes are inflated in the process of estimation. Similarly, 85.71% of the respondents believe that the method of assessment is based on simple guess and that it is subjective.

Results from the focus group discussions held among category ‘C’ tax payers suggest that the procedures of the standard assessment and computations are not objectively understood by most of the category “C” taxpayers and that the tax authority is reluctant to make these procedures objective, transparent, and understandable to taxpayers. To put it differently, the majority of taxpayers do not exactly know how to determine or calculate their tax by themselves. Furthermore, some of the participants expressed their fear and concern about the effects of the prevailing inflation, which is making their daily nominal sales inflated and eventually leading to overstating the tax although they do not gain real profit from executed sales.

Key informants from the DDCCSA have also asserted that the actual practice of tax assessment by Tax and Revenue Authority is very hard to tolerate and practically very difficult to fulfil mainly by the tax payers of category ‘C’. In their defence, key informants from the tax authority have firmly stated that category ‘C’ tax payers have never been honest to the tax assessment officers. They added that most of the business communities are not even willing to declare their daily sales when they are told to do so.

Figure 1: Problems encountered while keeping accounting records



Category ‘A’ and ‘B’ tax payers, who are legally obliged to keep accounting records, were also asked whether they face problems while keeping records. As can be seen in Figure 1, only 8.70% of them said that they faced no problems while the majority of them (43.48 %) said that high professional fee for accountants is their major problem in keeping records.

At the same time, 34.78 % said that the lack of accounting and recording knowhow is their major problem while 13.48% of them put lack of accounting professionals and firms in the market as their major problem.

Table 4: Problems encountered while submitting book of account

Problems	Percent
Unjustifiable and deliberate rejection of expenditure receipts	57.14
Unnecessary frequent calls by the authority to defend and explain issues related to the accounting book	28.57
No problems encountered	14.29

Concerning the problems of tax payers while submitting accounting books, the survey findings indicate that 57.14% of the respondents encountered unjustifiable and deliberate rejection of expenditure receipts while 28.57% of them said they are fed up of the unnecessary frequent calls by the authority to defend and explain issues related to the accounting books. However, 14.29% of the respondents said that they have not faced any problems while submitting accounting books to the authority.

Likewise, in the focus group discussion held among category ‘A’ and ‘B’ tax payers, the majority of the participants said that the authority rejects their statement of expenses for no good reason.

Furthermore, most of the participants vigorously complain about the follow up system of the authority regarding VAT implementation. They said that the tax authority employees seriously oversee the compliance of some businesses while turning a blind eye to many others who breach the law.

In response to this issue, key informants from both the tax authority and the Federal Customs and Inland Revenue Authority admitted that they face shortcomings in enforcing vat laws due to lack of qualified and competent manpower working in the area of intelligence. However, they highlighted that it should primarily be the responsibility of the tax payers themselves to report those law breaching business owners to the respective authorities. They also stated that their respective authorities have a system of rewarding people who report such business owners.

3.3 Organizational Effectiveness of the Tax Authority

Survey respondents evaluated the Tax Authority with respect to certain parameters. The following table shows their responses to these questions in percentages by category.

The parameter, service delivery, which refers to the ability of the authority to handle customers, was rated by category 'C' respondents as excellent (5.51%), good (39.74%), poor (32.05%), and very poor (22.69%) while category 'A' and 'B' respondents rated service delivery as excellent (51.01%) and good (48.97%). The chi square test indicates that there is a significant mean difference in service delivery between the two groups of tax payers at 1% level of significance.

Table 5: Organizational effectiveness of the tax authority

Parameter	Excellent (%)		Good (%)		Poor (%)		Very Poor (%)		Chi-square test	
	Cat.	Cat.	Cat.	Cat.	Cat.	Cat.	Cat.	Cat.	χ^2	p value
	'A' & 'B'	'C'	'A' & 'B'	'C'	'A' & 'B'	'C'	'A' & 'B'	'C'		
Service delivery	51.01	5.51	48.97	39.74	0	32.05	0	22.7	15.022	0.000
Tax collection effectiveness	51.01	2.56	48.97	25.9	0	32.05	0	39.5	23.105	0.000
Awareness creation	33.39	12.32	16.67	9.42	8.33	33.33	41.61	44.9	2.7	0.101

Regarding tax collection effectiveness, which refers to the ability of the Authority to establish a trustworthy tax system, law enforcement and fairness of the taxing system, category 'C' respondents rated it as excellent (2.56%), good (25.90%), poor (32.05%), and very poor (39.50%) while the same responses as in the service delivery parameter, was obtained from category 'A' and 'B' respondents with the mean differences still significant between the two groups at 1% level of significance. These results clearly indicate that the tax authority is not relatively being effective in providing satisfactory service to category 'C' taxpayers.

Concerning efforts being made by the tax authority to promote tax awareness, category 'C' respondents rated it as excellent (12.82%), good (9.42%), poor (33.32%) and very poor (44.87%) while category 'A' and 'B' respondents said excellent (33.33%), good (16.67%), poor (8.33%) and very poor (41.61%). The chi square test indicates that the mean difference in awareness creation between the two groups is statistically insignificant ($p=0.101$).

Focus group discussion participants from category "C" also raised the issue of service delivery, effort of awareness creation by the authority. They bitterly complain about the lack of concerted and consistent efforts from the authority in the area of awareness creation and below standard service delivery.

Contrary to this, category A and B focus group discussion participants noted that the tax authority made improvements, and underscored that the authority has to work hard to maintain the on-going progress.

From the key informants' interview made with representatives from tax authority, the study found out that there is a substantial capacity gap in the Dire Dawa Tax and Revenue Authority. According to the informants, inappropriate organizational structure of the authority coupled with the prevalence of high management staff turnover are the key sources of incompetence.

Giving an example, one of the informants said that there are only four officers in the authority to provide customer service for around 16, 000 tax payers in the city. The informants also emphasized that, with their limited capacity, they work as hard as they can, although the prevailing situation has made their efforts worthless.

3.4 Access to Tax Education/Training

Results from the key informants' interview made with representatives from both the Tax Authority and the Federal Customs and Inland Revenue Authority suggest that their respective offices have been doing their level best in building the capacities of the business community using various ways.

For instance, the informant from the Dire Dawa Tax Authority said that a series of awareness creation training programs were provided to the business community at each of the 9 urban Kebeles in the last fiscal year. The informant added that the Authority broadcasts tax awareness creation programs in three languages (Amharic, Oromiffa and Somaligna) using the available local media (FM Dire and Dire TV).

The key informant from the Federal Customs and Inland Revenue Authority also expressed that various efforts were made by the authority to build the capacity of the business community, through provision of training, distributing reading materials such as brochures and booklets, construction of billboards and broadcasting messages in four languages (Amharic, Oromiffa, Tigrigna and Somaligna) using the local media. For instance, the informant added that last year, six awareness creation discussion sessions were conducted with tax payers selected from the various sectors by category.

Both of the respondents from the Tax Authority and Customs and Inland Revenue admitted that the efforts made so far are not enough and that more should be done to bring sustainable behavioural change among the business community.

This issue of tax education was also a major area of concern in the focus group discussion held among tax payers of all categories. The majority of participants in each category highly stressed that the tax authority has not provided sufficient tax education to taxpayers to boost awareness. Furthermore, some of the category 'C' tax payers said that they were often called for training but the authority uses the opportunity to intimidate/threaten the tax payers, by referring to penalties as the sole weapon to make people comply with tax laws, rather than using tax education as a tool to bring more people into the tax network.

4. Summary and Conclusion

The major concern of this study in identifying the gaps and problems that exist between the Dire Dawa business community and the tax authority, is to provide important information on how to narrow the gaps and create better working conditions between the business community and the government in the study area.

Although the majority of tax payers interviewed and reached through focus group discussions, did not feel it is unfair to pay tax, almost the entire study sample representatives mentioned certain problems and suggested potential measures to be undertaken by the tax authority to close the gaps and ensure fairness and equity.

Generally, results show that most of the taxpayers, especially those in the category 'C', do not exactly know how the tax is assessed or calculated and the procedures in the tax assessment and computations are not objectively understood by most of the taxpayers. In light of this fact, it can be concluded that the tax authority of the city administration is not being effective in designing and implementing a sustainable system to make this procedures objective, transparent, and understandable to taxpayers.

To summarize, most of the problems identified by the study, rest on the category "C" tax payers, though category A and B have also complaints. The following six issues are pointed out as major problems creating the existing gap between the private and public sector in Dire Dawa Administration.

- Over taxation as result of over estimation of daily/annual income
- Applying nontransparent, non-participatory standard assessment by the authority for category "C"
- Lack of fairness or equity of taxation among similar businesses of category "C"
- Poor tax laws enforcement especially for VAT implementation and a large number of tax defaulters.
- Poor communication and understanding between the tax authority and taxpayers.
- Weakness in tax collection and unsatisfactory service delivery of the tax authority

5. Recommendations

It is clear that a reform strategy to deal with such problems requires a concerted, long-term, coordinated and comprehensive plan. However, possible recommendations and policy implications are forwarded based on the findings of the study. These include:

- The tax authorities should revise their system not only to ensure that equal taxes are levied on individuals who have equal income but also to make sure that each taxpayer is paying according to his/her ability to pay;
- The authority must also actively involve taxpayers or their representatives while estimating the daily sales or revenue of taxpayers so that trust of tax payers on the tax system will develop gradually.
- The tax authority needs to strengthen itself by recruiting qualified manpower, educating and training its employees, computerizing its operations and devoting additional resources. ‘
- The city Administration and DDCCSA should design a mechanism to bring more accounting professionals into the business of private auditing, so as to reduce the high professional fees of certified accountants that the tax payers are being charged.
- Human resource administration of the authority should be revised in order to enhance its overall organizational effectiveness.
- Creation of sustainable system through which tax payers will be well informed as to how their money is being utilized.
- Awareness creation should not only be giving tax education to taxpayers but should also seek the participation of Influential groups in the society (elderly, religious leaders, prominent personalities).

Finally, it is recommended that a joint effort should be made by the tax payers and all concerned bodies of the Government to bring about a spirit of team work, so that sustainable growth and development will be ensured in the near future.

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MARKET CHALLENGES AND OPPORTUNITIES OF MICRO AND SMALL SCALE ENTERPRISES IN DIRE DAWA, ETHIOPIA

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Abstract

The progress of the performance of MSEs relies on fulfillment of a number of preconditions; of which availability of favorable market access for products of the sector is the major one. In cognizant of this, this study was undertaken (taking the case in Dire Dawa city) to analyze the extent of market access of operators engaged in the sector, to identify the major challenges and determinants of market of MSEs, and to figure out the extent of demand for different types of products of the sector across different places of the city. Findings of descriptive analyses of this study came up with a conclusion that majority of the sampled operators of the sector face problem of lack of favorable market access; and the major reasons which are expected to be responsible for the problem were stated in rank based on their extent of seriousness across different types of selected enterprises. In addition, the types of more demandable products across different places of the city were stated based on their rank of demand. A quantitative analysis of this study, involving an ordered probit econometric regression, revealed that 'types of some businesses', 'age of the enterprises' and 'variation in concentration of the same types of businesses in a given place' are the major factors which were found to be significant to influence favorability of market access of the sector. The findings of this study are limited to a sample of only four types of enterprises in the city of Dire Dawa as well as only some variables for which information can easily be accessed were considered (particularly, to analyze the first two specific objectives). Hence, further researches on the issue under consideration are recommended to fill this gap taking all the possible types of enterprises and all the possible variables in to account for the country at large.

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Acronyms

DED:	Deutscher Entwicklungsdienst
GMP:	Good Manufacturing Practices
GRATIS:	Ghana Regional Appropriate Technology Industrial Service
HACCP:	Hazard Analysis and Critical Control Point
KIE:	Kenya Industrial Estates
LDC:	Least Developed Country
MoTI:	Ministry of Trade and Industry
MSE:	Micro and Small Scale Enterprise
MSME:	Micro, Small and Medium Enterprises
NBSSI:	National Board for Small Scale Industries
UNIDO:	United Nations Industrial Development Organization
USAID:	United States Agency for International Development

1. Introduction

Different economists and scholars state a number of multi-dimensional reasons for the presence of underdevelopment in LDCs. Lack of sufficient capital and investment is expected to be among the major tangible reasons for the underdeveloped economic status of these countries (Todaro and Smith, 2003). In consideration of this, a number of policy measures were being taken to increase the rate of capital accumulation and to expand investments across these economies.

However, initially much emphasis was being given to the expansion of investment on large scale economic activities which constitute a very little proportion of the aggregate economic activities of the countries. It is common that, in most LDCs, very large proportion of the people are engaged in small scale economic activities. Hence, all the efforts that were made for decades which neglect the small scale economic activities could not achieve the desired mission of the societies (White, 1999).

Therefore, different studies started to lay the thought of focusing on small scale economic activities. Consequently, recently, different developing country's

governments begin to design economic policies and strategies that can broadly embrace these initially neglected economic activities.

Generally, in most fast developing countries, MSEs by virtue of their size, location, capital investment and their capacity to generate greater employment have proved their powerful propellant effect for rapid economic growth. The sector is also known as an instrument in bringing about economic transition by effectively using the skill and talent of the people without requesting high-level training, much capital and sophisticated technology (MoTI, 1997).

In consideration of this, the Government of the Federal Democratic Republic of Ethiopia has recognized and paid due attention to the promotion and development of MSEs for they are important vehicles to address the challenges of unemployment, economic growth and equity in the country. To this effect, the government has formulated a National MSE Development and Promotion Strategy, which enlightens a systematic approach to alleviate the problems and promote the growth of MSEs (Ibid). However, the worthiness and the capability of the enterprises to realize the desired mission, is conditional on fulfillment of different factors; of which the availability of favorable market condition is the major one.

Theoretically, it is expected that the progress of MSEs relies on their profitability and their ability of capital accumulation. This is, in turn, highly correlated with the availability of sufficient market² for their products. The lower the demand for their products, the lower will be the sales and revenue generated by the enterprises. The opposite is likely to hold if the demand for the products is higher with greater access to the market.

Different empirical studies show that small enterprises usually regard market constraints and the inability to sell their products as one of the most serious obstacles to the starting of businesses and growth beyond mere subsistence level.

Access to markets and lack of market information is one of the most critical constraints to the growth of emerging MSEs in Kenya. The policies for

² Market demand is one of the sources to increase monetary sale (total revenue) as well as to charge favorable price. Higher revenue coupled with favorable price has a tendency to increase profitability of firms (Varian, 1992).

addressing this problem do not seem to have achieved much success because access to market and information on competitors continues to be a severe problem for MSEs (Ronge et. al, 2002). According to the study of Kayanula and Quartey (2000), in Malawi, there was a general lack of marketing skills and information by MSEs. Their study shows that processors had little knowledge of their customer preferences regarding product range, taste and packaging.

All these assertions also hold true in the case of Ethiopian MSEs, as revealed from various studies undertaken concerning the MSE sector (MoTI, 1997). Accordingly, responsibility for steps to overcome this constraint falls upon many different groups: individual entrepreneurs and groups of small businesses which have to compete with others for the same clients, regional governments, chambers and business associations who should see to it that there are no hindrances to market access of new comers, and big enterprises who should re-orient procurement towards small suppliers and subcontractors (Ibid).

Hence, keeping the upper mentioned understanding in mind, the researcher analyzed the existing marketing phenomena empirically thereby an attempt was made to identify the major challenges and determinants of favorability of MSEs' market, taking a case study on operators of the sector in Dire Dawa city. In addition, the researcher undertook a multi-dimensional need assessment of demand for the products to figure out the compatibility between the existing actual situation of the businesses and what ought to be.

Basic research questions of the study include:

- How does the extent of favorability of market access for MSEs in the city of Dire Dawa look like?
- What are the major possible challenges and determinants of demand for products of MSEs in the city?
- What are the more demandable and less demandable products of MSEs in the city?

Different empirical literatures in developing countries reveal that marketing problem is among the major constraining factors hindering the success of MSEs. The extent of its dominance in terms of its rank among the other constraining factors was investigated in different developing countries. In Ghana, a research conducted on clients of GRATIS indicates that limited

marketing access is one of the major pressing constraints of MSEs (Michalowski, 2008). In Ethiopia, in general, limited market access was ranked among the major constraints of MSEs next to lack of finance (MoTI, 1997).

A number of factors can influence the possibility of the existence of favorable market access for MSEs. These factors are stated based on theoretical and empirical justifications. This study focuses on analysis of both theoretical postulates and empirical observations of the effects of these factors on favorability of market access of such businesses.

Theoretically, according to Varian (1992), some of the major determinants which are expected to influence favorability of market access for a product (volume of sale of a product) include price of the product; number of buyers of the product; the extent of substitutability of the product; income of customers; taste/preference of customers; expected price of the product; expected income of customers; and level of competition.

In addition, according to Hawkins et. al (2007), proximity of location of the supply of the product to a well known market; application of need assessment and advertisement; appropriate customer handling; well interaction of the operator with customers; good skill of the operator; use of communication; favorable seasonal factor; the extent of interest of the operator to engaged in the business and educational level of the operator are obviously expected to enhance the level of sale of the product. Profitability of the business or successful back ground of the business is also expected to increase the level of sale of the product for the fact that expansion in scale of operation of the business has the tendency to control the market.

Thus, some of the basic questions raised in this study include: Of the aforementioned factors, which ones are really affecting the market access of the MSEs, in the context of the study area? What are the major market challenges of the sector other than the mentioned factors? What policy measures should be taken, in the context of the study area?

Here, it is also important to state some empirical investigations on the issue under consideration.

In Ghana, a research conducted on clients of GRATIS shows that problem of marketing for the sector arises due to the limitation in the size of the market. Findings of the research shows that limited access to regional, national and international markets is the major constraint MSEs in Ghana are confronted with. Many of the entrepreneurs sell their products on the local markets which they can reach by foot (Michalowski, 2008). The high competition on the local markets leads to low profit margins.

A study conducted in Nairobi, Kenya reveals that destructive competition is the most pressing constraint of MSEs are facing. This arises due to the businesses action of taking price reduction as a tool of competition. The study shows that considerable number of operators of businesses of MSE use price and discount offers as a competitive by selling more cheaply than their competitors. Using price to compete may mean lower profits, even if it may translate into higher volumes (Bowen et. al, 2009).

In consideration of this, the government of Kenya proposed a number of policies to enhance the markets for MSEs. The government undertook to conduct market surveys;

- To identify new opportunities for product development and diversification in the MSE sector;
- To identify new potential markets in the rural areas for MSEs; and
- To establish a subcontracting exchange through the Ministry of Industry to promote inter-industry linkages (Ronge et. al, 2002).

According to Murphy (2007), competition is a factor which influences business performance of MSEs (performance of marketing in particular) due to liberalization policies and globalization. This has been problematic for industrial development in Sub-Saharan Africa at the beginning of 1980s. Trade liberalization policies have led to an increase of foreign competition and an increased reliance on foreign products.

In consideration of this, Murphy (2007) proposes that by upgrading the products and the production systems, small scale manufacturers are able to reduce the attractiveness of imported goods in domestic markets and build profitable and sustainable ties with global markets. To reduce the reliance on

foreign products, it is necessary to improve the quality and standards of locally made products.

Moreover, Romijn (2001) notes the importance of technological support to MSEs to coup-up the problem of competition. Hunt (1983) states that most non-farm activities of MSEs in developing countries are demand-driven and lack the capacity to expand markets due to poor technologies, lack of innovative capabilities, low marketing skills, and lack of information about market structures.

In Thailand, in consideration of the existence of marketing problem, a policy prescription, (in formulation of MSEs promotion action plan), addresses the following:

- product development and the promotion of product standards;
- assistance with marketing;
- managerial systems development;
- information assistance, including information technology;
- promotion of linkages with medium and large-scale enterprises;
- infrastructure for MSEs investments;
- incentives to compensate for the disadvantages and limitations of SMEs; and
- other issues related to strengthening MSEs and improving their competitiveness.

(White, 1999)

2. Methodology

To undertake this study, both primary and secondary data were taken into account. The secondary data was gathered from different organizations which are concerned with the activities of MSEs, such as both regional and national agencies of MSE, Ministry of Trade and Industry and others. To collect the primary data, questionnaires were systematically designed and distributed to both the MSE operators and the individuals who use the products of MSEs (or consumers of the products) in the city of Dire Dawa.

Note that, the rationale to consider the users of the products of MSEs as a category of respondents is that they are very important to undertake the need

assessment and to analyze the demands for the products of the MSEs in different places of the city. Moreover, we have to note that information was also collected through observations and focus group discussions in addition to the use of the questionnaires.

For this study, a sample of associations of some selected major categories of micro and small scale enterprises were considered, purposively. The major categories of associations of MSEs that were selected for this study include: operators of metal and wood works, operators of building and construction materials, operators of cobble stone paving, and suppliers of cobble stone.

The justification behind to select these categories of associations is the ease to access information and their high concentration in number. Specifically, sampling procedures require sampling frame. It is only these kinds of associations which are greater in number and under the control of Dire Dawa MSEs Development Agency for which information related to the sampling frame can easily be accessed.

Area³ sampling (proportional cluster sampling) method was employed as a primary tool to identify the appropriate and relevant respondents of operators of these sub-sectors. The justification for using this sampling technique is that the associations (operators) are located in different places of the city, and variations in market phenomena are expected across different places. Hence, the associations had to be selected from each place proportionally in order to get representative sample. Accordingly, all the areas of the city were categorized into different clusters (9 kebelles) based on the new administrative classification of the city; and respondents for which the questionnaires were distributed identified randomly under each cluster.

The total number of these associations is 320. Initially, the researcher had the intention to select a sample of 180 of these associations. However, due to some inconsistencies in information, the researcher was forced to use only 122

³ It is theoretically viable to use cluster (area) sampling technique if our parameters of interest (elements of the population) are distributed geographically. And, once the sample size is determined, proportional cluster sampling technique is one of the mechanisms to identify our parameters of interest (Kothari, 1994).

of these associations; of which, 23 are associations of operators of metal and wood work, 36 are associations of operators of construction, 25 are associations of operators of cobble stone paving, and the rest 38 are associations of suppliers of stones to be paved.

We have to remind that the respondents are both the operators of MSEs and the individuals who use the products of MSEs (customers of the products). Hence, data collection was undertaken for each category, separately. The researcher was expected to face difficulty while using random sampling method for identifying respondents under the category of users of the products; hence, he was enforced to use purposive sampling method to select the specified respondents from each cluster (kebelle). Accordingly, 180 respondents of users (customers) of the products were purposively selected where each kebelle constituted 20 respondents of customers. However, 168 of the total 180 respondents were considered for the analysis due to lack of sufficient information for the remaining 12 respondents.

Descriptive ways of analysis was used to analyze the extent of favorability and challenges of market access of the sector. In relation to this, the degree of favorability of market access was categorized into high favorability, medium favorability and unfavorable market access based on the responses of respondents. And, to identify the more demandable products of MSEs, a need assessment targeted on the users (consumers) of the products of MSEs was carried out, in all areas of the city.

Both descriptive and quantitative ways of analysis were used to discuss the issues related to the major determinants of demand (market access) of products of MSEs in the city. The major possible determinants of demand for the products were identified, quantitatively, using econometric model. In particular, ordered probit econometric regression was applied taking the possibility of occurrence of the three categories of favorability of market access as a dependent variable, while the major possible variables that are expected to affect favorability of the market access were taken in to account as explanatory variables.

The justification to use an ordered response model (ordered probit regression, in this case) is that there is a logical ordering of the three market access alternatives as an independent variable. The major indicator of market access of the operators (associations) is their qualitative responses over the three possibilities of favorability of market access. As additional tool to overcome problem of subjectivism in responses of the respondents, the associations' average per capita monthly income was considered.

As it was explained above in the sampling design part, some of the associations which were found to respond inconsistent answers compared to their per capita monthly income were removed from the sample. These include those who reported that they have unfavorable and medium market access having higher per capita monthly income. We have to note here that the associations were categorized in terms of their extent of market access through the following steps.

First, the minimum per capita monthly income of those who reported that they have high favorability of market access was taken as a boundary to high favorability of market access. The justification for this is that there is no any rational business man who claims that he/she has highly favorable market access having lower level of monetary sale.

Second, those who reported that they have no market access having per capita monthly income of equal or greater than the boundary to high favorability of market access were removed from the sample. And those who reported that they have medium market access having per capita monthly income of equal or greater than the boundary to high favorability of market access were removed from the sample.

Third, the minimum per capita monthly income of those who reported that they have medium favorability of market access was taken as the lowest boundary to medium favorability of market access.

Finally, those who reported that they have unfavorable market access having per capita monthly income of equal or greater than the lowest boundary to medium favorability of market access were removed from the sample.

Accordingly, the minimum per capita monthly income as the boundary for high favorability of market access was found to be 4230.76 birr whereas the minimum per capita income as the boundary for medium favorability of market access was found to be 1666.67 birr. In other words, those who have per capita monthly income of greater than 4230 birr were categorized as those with high favorability of market access; those who have per capita monthly income of greater than 1666 birr and less than or equal to 4230 birr were categorized as those with medium favorability of market access; and those who have per capita monthly income of less than or equal to 1666 were categorized as those with unfavorable market access.

Functional specification of the ordered response model

We can express the ordered probit regression model as:

$$y_i^* = x_i' B + e_i; \quad y_i = j \text{ if } \gamma_{j-1} < y_i^* \leq \gamma_j; \quad j = 1, 2, \dots, M$$

For unknown γ_j s with $\gamma_0 = -\infty$, $\gamma_1 = 0$ and $\gamma_M = \infty$, the probability that alternative j is chosen is the probability that the latent variable y_i^* is between two boundaries γ_{j-1} and γ_j . In this particular study, we have three possibilities of y_i or $M = 3$. Hence, the implied probabilities are obtained as:

$$\begin{aligned} P \{y_i = 1/x_i\} &= P \{y_i^* \leq 0/x_i\} = \Phi(-x_i' \beta), \\ P \{y_i = 3/x_i\} &= P \{y_i^* > \gamma\} = 1 - \Phi(\gamma - x_i' \beta) \\ P \{y_i = 2/x_i\} &= P \{0 < y_i^* \leq \gamma\} = \Phi(\gamma - x_i' \beta) - \Phi(-x_i' \beta) \end{aligned}$$

(Verbeek, 2004)

Where: y_i^* denotes the latent variable (in this case, favorability of the market access)

γ is an unknown parameter that is estimated jointly with B

x_i represents vector of factors determining the three possibilities (in this case, it represents vector of the aforementioned explanatory variables)

B represents vector of coefficients of the explanatory variables

e_i is vector of error terms

$y_i = 1$ if the market access is unfavorable; or if $y_i^* \leq 0$

$y_i = 2$ if the market access is with medium favorability; or if $0 < y_i^* \leq \gamma$

$y_i = 3$ if the market access is with high favorability; or if $y_i^* > \gamma$

$\Phi(-x_i'\beta)$ = the probability density of unfavorable market access

$\Phi(\gamma - x_i'\beta)$ = the probability density of medium and unfavorable market access

Note that in ordered probit regression model, one of the boundaries is normalized to zero in order to fix the location (M. Verbeek, 2004). Thus, in this case, the highest boundary of unfavorable market access (i.e. per capita monthly income of 1666 birrs) is normalized to zero. Hence,

- If $0 < \text{per capita monthly income} \leq 1666$, $y_i^* \leq 0$
- If $1666 < \text{per capita monthly income} \leq 4230$, $0 < y_i^* \leq \gamma$
- If $\text{per capita monthly income} > 4230$, $y_i^* > \gamma$.

Keeping all these necessary procedures into account, the ordered probit regression was computed with the assumption of normalization on the scale of y_i^* (i.e. e_i is NID (0, 1)). And, once the expected determinants are stated in the regression, their significances to influence the favorability of the market access were tested using different statistical tools such as Z-statistic and χ^2 , at 10%, 5% and 1% levels of significance.

The major explanatory variables considered in the ordered probit regression are described with their expected theoretical effect on favorability of market access as follows:

- General work experience (gework): General work experience of representatives of the associations is a continuous variable which shows the number of years on work. This variable is expected to have a positive relationship with favorability of market access for the fact that as years of work experience is greater, there are great possibilities to have the skill how to handle customers and the market (Hawkins et. al, 2007).
- Education level (educyr): Education level is also a continuous variable which was reflected by the number of years that representative of the associations have attended the regular education. This is expected to associate with favorability of the market access positively. It is logical that as the number of years of regular education is higher, there is great tendency to possess the skill how to handle the market (Hawkins et. al, 2007).
- Types of the businesses (typebusi): Types of the businesses refer to the four selected types of businesses. Accordingly, this is a dummy variable with four possibilities including code 1, code 2, code 3 and code 4, denoting

cobble stone suppliers, cobble stone paving, construction and wood and metal work types of businesses, respectively. For this variable, we don't have any theoretically expected link with favorability of the market access. But, it is important to know the type of business having better market access which is investigated by this study.

- Age of the businesses (agebusin): Age of the businesses is a continuous variable which was reflected by the number of years the businesses have stayed so far starting from periods of their establishment. This is expected to associate positively with the favorability of the market access. It is obvious that as age of the businesses is longer there are tendencies to control the market due to their recognition (Hawkins et. al, 2007).
- Status of recognition (statrecog): Status of recognition refers to dummy of the type of recognition assigned by the DD MSE Development Agency to the associations. There are four types of status of recognition including permanent for less than a year, temporary for less than a year, permanent for more than a year, temporary for more than a year, which are denoted by code 1, code 2, code 3 and code 4, respectively. It is likely that, the more a business is recognized by the agency, the more favorable is the market access for the business. This is because more recognized businesses are expected to have more contractual agreements to sale their products (Hawkins et. al, 2007).
- Current capital of the businesses (currentca): Current capital of the businesses is a continuous variable which is expected to associate positively with the favorability of market access for the fact that there is greater possibility to produce more and to control the market with relatively greater capital (Sievers & Vandenberg, 2007).
- Access to credit (accesscre): Access to credit is a dummy variable with two possibilities (those who got the access and who do not get it). Those who have no access to credit are denoted by code 1 whereas those who have the access are denoted by code 2. Access for credit is expected to have the tendency to acquire more capital through which market may be controlled (Sievers & Vandenberg, 2007).
- Number of operators (numoperators): Number of operators of the same type of businesses in a given place (in a given kebele) is a continuous variable which is expected to associate with favorability of the market access inversely. It is expected that substitutability of products being sold

in a given place results in a rise in the level of competition which may affect the market access unfavorably (Varian, 1992).

3. Results and Discussions

i. Market Access and Challenges of MSEs in Dire Dawa

A. The Extent of Favorability of Market Access for MSEs

The extent of favorability of the market access of MSEs was assessed based on a qualitative data generated from the responses of the sampled operators of the sector. These sampled operators were made to weigh the extent of the favorability of market access having three possibilities (high favorability, medium favorability and unfavorable). This is indicated in table 1.

Table 1: The extent of favorability of market access for sample MSEs in Dire Dawa

Operators (associations) with high favorability of market access		Operators (associations) with medium favorability of market access		Operators (associations) with unfavorable market access		Total Number	Cumulative percentage
Number	Percentage	Number	Percentage	Number	Percentage		
14	12%	60	49%	48	39%	122	100%

Source: Own survey, 2011

As indicated in Table 1, operators with medium favorability of market access constitute the largest percentage (49%) of the total sampled operators followed by operators with unfavorable market access with a percentage of 39%. The assessment shows that only 12% of the sampled operators claimed that they are with high favorability of market access.

Given that operators with medium favorability of market access have also some reservations on the favorability of the market access, 108 or 88% of the total sampled respondents (the sum of the number of operators with medium and unfavorable market access) are facing problem of market access. This may reveal the significance of the presence of problem of market access for MSEs in the city of Dire Dawa. Even, without consideration of operators with medium

favorability of market access, 39% of the sampled operators claiming the non favorability of the market access, by themselves, can be good evidence for the presence of problem of unfavorable market access in the city.

If we assign scales⁴ for favorability of the market access giving a scale of 1, 0.5 and 0 for high favorable market, medium favorable market and unfavorable market access, respectively, the extent of favorability of the market access will be only 36.5% (i.e., 12% (1) + 49% (0.5) + 39% (0)). Hence, the implication is that the extent of the existence of unfavorable market is very significant.

B. Severity of Lack of Marketing Access across the Businesses and Major Marketing Challenges of these Businesses

Table 2 shows that operators engaged in coble stone shaping sub-sector, 60.53% of the total operators are claimed to have unfavorable market access and 36.84% were reported to face medium favorability of market access; in cobble stone paving sub-sector, 36% of the selected operators reported that they are with unfavorable market access whereas 48% were claimed to face medium favorability of market access; in construction sub-sector, 11% and 75% of the selected operators were reported to face unfavorable and medium favorable market access, respectively; and in wood and metal sub-sector, 52.2% and 30.4% of the selected operators were found to be with unfavorable and medium favorable market access, respectively.

If we assign scales for the extent of severity of problem of market access (in such a way that 0 is assigned for high favorable market access, 0.5 is assigned for medium favorable market access and 1 is assigned for unfavorable market access), the extent of severity of problem of market access across the selected types of businesses can be computed as shown below.

For cobble stone shaping: Level of severity = $36.84 \times 0.5 + 60.53 = 78.95$

For cobble stone paving: Level of severity = $48 \times 0.5 + 36 = 60$

⁴ The approach of scaling severity of the market problem was derived from the fact that we have three options of market favorability (high, medium and unfavorable market access). Accordingly, it is logical if we assign 100% of market favorability for high favorable market access, 50% of market favorability for medium favorable market access and 0% of market favorability for unfavorable market access.

For construction: Level of severity = $75 \times 0.5 + 11 = 48.5$
 For metal and wood work: Level of severity = $30.4 \times 0.5 + 52.2 = 67.4$

This may reveal that the business of cobble stone shaping is the one that mostly faces problem of lack of market access. The rest of the selected businesses are ranked in terms of their severity of marketing problem in descending order as: metal and wood work, coble stone paving and construction.

Table 2: Extent of market access across the selected types of businesses

Type of the busines s	With high favorability of market access		With medium favorability of market access		With unfavorable market access		Total	
	Percentage	Numbe	Percentage	Numbe	Percentage	Numbe	%	No
Coble stone shaping	2.63	1	36.84	14	60.53	23	100	38
Coble stone paving	16	4	48	12	36	9	100	25
Construction	14	5	75	27	11	4	100	36
Metal and woodwork	17.4	4	30.4	7	52.2	12	100	23

Source: Own survey, 2011

As of the responses of the operators, ten major reasons and challenges which are responsible for the unfavorable market access of each sector were stated. These include:

- Problem of being far away from a well known market
- Problem of lack of recognition
- Problem of non attractiveness of the market
- Problem of lack of communication
- Problem of absence of advertisement
- Problem of lack of market place
- Difficulty in payment system and supply of products
- Problem of non attractiveness of prices
- Problem of insufficient private customers, and
- Absence of linkage with other producers

Table 3: Marketing challenges and their extent of seriousness

Type of marketing challenges	Types of the businesses and seriousness of the marketing challenges in terms of number of											
	Coble stone shaping			Coble stone paving			Construction			Metal and wood work		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Problem of being away from	0	0	3	0	0	2	4	1	2	9	4	5
Problem of lower status of	1	1	2	4	1	2	3	4	2	0	8	1
Problem of lack of	0	0	3	0	0	2	2	1	1	9	8	6
Problem of lack of	0	1	2	0	3	2	0	9	2	4	4	1
Problem of absence of	1	1	1	9	5	1	1	1	9	1	6	5
Problem of lack of market	0	0	3	0	0	2	1	0	3	1	0	2
Difficulty in payment system	8	0	3	7	0	1	0	0	3	0	0	2
Non attractiveness of selling	6	0	3	0	0	2	3	0	3	0	0	2
Problem of absence of	1	0	2	1	0	1	1	0	2	0	0	2
Absence of linkage with	0	0	3	0	0	2	4	0	3	2	0	2

Source: Own survey, 2011.

Given these stated problems, the extent of their seriousness was investigated in terms of the number of operators, under each type of business, claiming them to be serious. This was carried out having three major possibilities of seriousness⁵.

A) Major marketing challenges of the coble stone shaping sub-sector

Table 3 shows that the major challenges facing the stone shaping type of business include problem of absence of advertisement, problem of absence of private customers, difficulty in payment system and supply of products, non attractiveness of selling price, problem of lower status of recognition and problem of lack of communication. Of these challenges, problem of absence of advertisement was claimed to be the most serious problem on which 15 of the 38 sampled operators of the sub-sector (39.5%) reported that it is a serious problem.

⁵ S1 = the problem is serious S2 = the problem exists but it is not serious S3 = the problem doesn't exist at all

The second major problem is absence of private customers with proportion of 34.2% (13 of the 38 sampled operators indicated it to be a serious problem). According to the explanation of the sampled operators of the sub-sector, this challenge arises for the fact that their product is almost all in all supplied to the government (Dire Dawa City Administration) only. There is little or no tendency to provide their products to private customers in addition to the existing demand. Hence, it is claimed that there is great possibility of their being idle without production by the time the City Administration has little or no construction of coble stone roads. In other words production and supply of operators of coble stone shaping is limited to the demand of the Dire Dawa City Administration.

B) Major marketing challenges of coble stone paving sub-sector

Some of sampled operators under the coble stone paving sub-sector stated that absence of private customers, absence of advertisement, and difficulty in payment system & to supply their products, lower status of recognition, and lack of communication, respectively, are the major marketing challenges facing the sub-sector, in descending order of their seriousness.

Table 3 shows that problem of absence of private customers was taken to be the most serious marketing challenge of this sub-sector on which 14 of the 25 sampled operators (56%) claimed it to be a serious problem. The second major marketing challenge of the sub-sector is problem of absence of advertisement followed by difficulty in payment system & supply of their products and problem of lower status of recognition with proportion of seriousness of 36%, 28% and 16%, respectively. Problem of lack of communication is among the major challenges but was not claimed to be serious.

As it was explained in the preceding session, problem of absence of private customers arises for the fact that the operators serve almost entirely the public through the order of the government (Dire Dawa City Administration). By the time the city administration has little or no plan of coble stone road construction, they are likely be unemployed, since there is little or no private demand of coble stone paving.

C) Major marketing challenges of the sub-sector of construction

The major marketing challenges of the construction sub-sector include problem of farness from a well known market, problem of lower status of recognition, problem of lack of attractiveness of the market, problem of lack of communication, problem of absence of advertisement, problem of lack of market place, non attractiveness of selling price of the products, problem of absence of private customers, absence of linkage with other operators to which the products may be supplied.

Of these challenges, problem of absence of advertisement was reported to be the most serious for which 13 of the 36 sampled operators of this sub-sector (36%) claimed that it is a serious problem. The second severe marketing challenge of this sub-sector is problem of absence of private customers for which 10 of the 36 sampled operators of the sub-sector (28%) indicated that it is a serious problem.

D) Major marketing challenges of wood and metal work sub-sector

Major marketing challenges of wood and metal work sub-sector are stated in descending order of their extent of seriousness as: problem of absence of advertisement, problem of lack of attractiveness of the market, problem of farness from a well known market, problem of lack of communication, absence of linkage with other producers to which their products may be supplied as inputs, problem of market place, with proportion of extent of seriousness of 52%, 39%, 39%, 17%, 9% and 4%, respectively. Note that problem of lower status of recognition is among the major marketing challenges of this sub-sector, but it is claimed to be not serious.

ii. Econometric Analysis of Determinants of Market Access of MSEs

The result of the ordered probit regression model is presented in Table 4. *The independent variables (regressors) of the model were described with their theoretically expected effected on favorability of market access, in the methodology part.* The result shows that all the variables are jointly significant to influence the probability of favorability of the market access, at 5% and even

at 1% level of significance, as revealed by the value of Wald chi2 which is 70.72. It is also indicated that $\text{Prob}>\text{chi}2 = 0.0000$ which is lower than 0.01 that assures the joint significance of the variables to influence the probability of favorability of the market access, at 1% level of significance.

Individually, only types of the businesses (typebusi1 & typebusi3), age of the businesses (agebusin) and concentration of the same type of businesses in a given place (numoperators) were found to be significant to affect the probability of the favorability of the market access, at 10%, 5% and 1% levels of significance, respectively. *Only these variables were found to be significant to affect favorability of the market access of the sector, in this regression. This may show that some more important variables that had to be included in the regression (which can significantly affect the market access) were not considered in the regression. Hence, further study in the area is recommended to fill such a gap*

The individual significance of the stated variables is tested using their respective values of $P>/Z/$. The table shows that the values of $P>/Z/$ for typebusi1 (or the cobble stone shaping subsector), typebusi3 (or the construction subsector), age of the business and concentration of operators are 0.039 (which is lower than 0.05), 0.068 (which is lower than 0.1), 0.013 (which is lower than 0.05) and 0.000 (which is lower than 0.010), respectively.

This implies that, of these four variables, concentration of the same types of businesses in a given place is relatively the most significant to affect the probability of favorability of the market access (which is significant even at 1% level of significance). Engagement in cobble stone shaping type of business and age of the businesses are the other major variables which are significant to affect the favorability of the market access, at 5% level of significance. The table also shows that engagement in construction type of business is a variable which was found to affect the probability of favorability of the market access, at 10% level of significance.

As shown in Table 4, the value of coefficient of typebusi1 is -0.8204079 which is negative implying that as individuals are engaged in the business of cobble stone shaping, they face the probability of getting unfavorable market access,

at 5% level of significance, *ceteris paribus*. On the other hand, if they are engaged in business of construction subsector, they probably enjoy favorable market access, at 10% level of significance, *ceteris paribus*; since the coefficient of *typebusi3* is 0.8082147 which is positive.

The table also shows that coefficient of age of the business (*agebusin*) is 0.1908124 which is positive implying that as the age of the businesses get older, the probability of having favorable market access increases, other things remaining the same, at 5% level of significance. It is also indicated that the value of coefficient of number or concentration of the same types of businesses in a given place (*numoperators*) is -0.0393675 which is negative implying that the probability of having favorable market decrease as the number or concentration of the same type of businesses in a given place increases, *ceteris paribus*, at 1% level of significance.

Table 4: Result of the ordered probit regression⁶

Explanatory	Coefficients	Robust Standard	P>/Z/
Gework	0.0009455	0.0274638	0.973
Educyr	0.0536873	0.0450842	0.234
<i>typebusi1</i> **	-0.8204079	0.3983841	0.039
<i>typebusi3</i> *	0.8082147	0.443652	0.068
<i>typebusi4</i>	-0.7141771	0.4367574	0.102
<i>agebusin</i> **	0.1908124	0.0770204	0.013
<i>Currentca</i>	-1.42e-06	1.39e-06	0.305
<i>statrecog1</i>	0.833063	0.7944624	0.294
<i>statrecog3</i>	0.3637942	0.6632454	0.583
<i>statrecog4</i>	0.0943678	0.7692073	0.902
<i>accesscre1</i>	-0.2857686	0.3008687	0.342
<i>numoperators</i> ***	-0.0393675	0.0072065	0.000
Number of obs = 122		Prob > chi = 0.0000	
Pseudo R2 = 0.2949		Wald chi2 (12) = 70.72	

The table shows that all the rest variables have P>/Z/ value of greater than 0.1 implying that they are not significant enough to alter the probability of

⁶ *** significant at 1%,

** significant at 5%

* significant at 10%

favorability of the market access, at the specified levels of significance; even these variables are not significant at 10% level of significance (making the level of significance less tight). Hence, it may not be relevant to have detail explanation of their relationships with the market access; rather let us have brief explanation for the aforementioned two variables which were claimed to alter the market access significantly.

Table 5 represents concentration of the four types of sampled businesses in different places of the city of Dire Dawa. As it was explained in the methodology part, the total number of associations of the four types of businesses under the recognition of the Dire Dawa MSEs Agency is 320; of which 105, 32, 128 and 55 are operators engaged in coble stone shaping, coble stone paving, construction, and wood and metal works, respectively.

Table 5: Concentration of operators (associations) of the four selected types of businesses in each kebele

No	Types of the business	No. of each type of business under each kebele									Total	Variation in concentration
		k01	k02	k03	k04	k05	k06	k07	k08	k09		
1	Coble stone shaping	6	4	12	9	44	4	4	15	7	105	161.75
2	Coble stone paving	-	5	7	9	11	-	-	-	-	32	20.278
3	Construction	4	61	16	12	9	9	3	3	11	128	327.194
4	Wood and metal works	1	34	3	8	2	4	-	2	1	55	114.861
Total											320	

Source: Compiled from documents of DDMSEDA, 2011

Table 5 shows that, of the 105 operators which are engaged in coble stone shaping business, 44 (45%) are located in kebele 05 whereas the remaining 55% are located in the rest 8 kebelles with very insignificant proportion. With regard to the business of coble stone paving, all the 32 operators are located in only 4 kebelles (k02, k03, k04 and k05) with closely similar proportion. In the case of the business of construction, 61 (48%) of the 128 operators are located in kebele 02 whereas the remaining 52% are located in the rest 8 kebelles with relatively very lower proportion. Finally, out of the 55 operators of wood and metal works, 34 (62%) are located in kebele 02 whereas the remaining 38% are

located in 7 of the other kebelles excluding k07 with relatively very insignificant proportion.

If we recall the result of the severity of the problem of market access across the sampled types of businesses, as it was explained in the preceding session, the four types of the businesses are ranked in terms of the severity of the problem in descending order as: cobble stone shaping, metal and wood works, cobble stone paving, and construction. Taking this and the variation in concentration of the businesses in different kebelles (as shown in Table 5), one may claim somehow that the possibility of positive association between severity of the problem of lack of market access and concentration of the same types of businesses in a given place.

Disregarding the sub-sector of construction, there seems positive association between severity of the problem and variation in concentration of the businesses, as shown in Table 5. The table shows that the sub-sector of cobble stone shaping is with largest value of variation in concentration (next to construction, i.e. 161.75) which is also ranked first in terms of severity of the market problem, the sub-sector of metal and wood works is with the second large value of variation in concentration (i.e. 114.861) which is also ranked second in terms of severity of the market problem, and the sub-sector of cobble stone paving is with the third value of variation in concentration (i.e. 20.278) which is also ranked third in terms of severity of the market problem.

Unlike these three types of businesses, the sub-sector of construction is with largest value of variation of concentration (327.194) but with least rank of severity of market problem. The justification for this is likely that the sub-sector of construction is a business which currently has relatively larger demand for its products. It is currently observed that the construction sector is registering large level of increment in annual output all over Ethiopia. Hence, it is justifiable to treat this case as a special case.

iii. Demand for Products of MSEs across Different Places of the City of Dire Dawa

The major possible types of businesses (products) of MSEs existing in the city of Dire Dawa, as mentioned in DDMSEDA (2010), include:

- | | | |
|---------------------------------|---------------------------------|--------------------------|
| a) Textile and Garment | i) Leather and leather products | p) Food & beverage |
| b) Chemical products | j) Wood including furniture | q) Metal products |
| c) Cultural products | k) Agricultural products | r) Building materials |
| d) Precious stones | l) Cobble stones | s) Café and restaurants |
| e) Store service | m) Service of tourism | t) Service of lamination |
| f).Hair cut/beautification café | n) Service of repair | u) Internet |
| g) Products of animal | o) Service of garmenting | v) Fruits |
| h). Cultural mining products | | |

Analysis of the need assessment was made through tabular presentations to show:

- The extent of demand for each type of product across different places of the city in terms of number of selected customers using the product, and
- Non-accessibility of demandable products in different places of the city

A) Demand for Each Type of Product across Different Places of the City

The extent of demand for each type of product across different places of the city was measured using the number of selected customers using the product. Table 6 shows the number of selected customers using each type of product frequently in different kebelles of the city. It is indicated that all (100%) of the selected customers use agricultural products and service of hair cut & beautification in all the specified kebelles. This implies these two types of products (businesses engaged in these types of products) take the leading position in terms of the availability of demand. These are followed by products of food & beverage, fruits, café & restaurant, and products of animal, for which there are 134, 117, 102 and 93 (78%, 70%, 61% and 55%) users from the selected customers, respectively.

The rest of the products are with relatively insignificant demand for which there are only less than 50% users from the selected customers. These are ranked in terms of users of the products (from the selected customers) in

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descending order as: wood including furniture (with 43% of users), textile and garment (with 40% of users), chemical products (with 30% of users), service of repair (with 30% of users), cultural products (with 27% of users), metal products (with 24% of users), internet café (with 23% of users), building materials (with 19% of users), leather and leather products (with 18% of users), service of garmenting (with 17% of users), cobble stone (with 4% of users), store service (with 2% of users), precious stones (with 1% of users), cultural mining products (with 1% of users), service of tourism (with 0.5% of users) and service of lamination (with 0.5% of users).

Table 6: Types of products consumed and number of selected customers using the products in each kebele

No.	Types of the products consumed	Number of customers using the products in each kebele									Total
		K01	K02	K03	K04	K05	K06	K07	K08	K09	
1	Textile and Garment	12	14	9	3	2	4	9	7	7	67
2	Chemical products	0	4	2	10	15	13	3	2	1	50
3	Cultural products	1	5	2	7	1	3	13	11	2	45
4	Precious stones	0	0	0	0	0	0	2	0	0	2
5	Store service	0	0	0	1	2	1	0	0	0	4
6	Hair cut/ beautification	15	19	18	19	20	20	20	19	18	168
7	Products of animal	13	12	14	11	8	6	8	12	9	93
8	Cultural mining products	0	0	0	0	0	0	0	2	0	2
9	Leather and leather products	1	6	1	1	0	2	7	7	5	30
10	Wood including furniture	4	14	14	2	6	3	11	8	10	72
11	Agricultural products	15	19	18	19	20	20	20	19	18	168
12	Cobble stones	0	0	1	0	2	1	1	1	0	6
13	Service of tourism	0	0	0	0	0	0	0	1	0	1
14	Service of repair	5	10	9	2	7	2	7	5	3	50
15	Service of garmenting	10	9	7	0	0	0	1	0	1	28
16	Food and beverage	7	13	14	15	18	20	15	17	15	134
17	Metal products	0	4	3	2	11	5	7	4	5	41
18	Building materials	2	2	5	5	0	3	6	4	5	32
19	Café and restaurants	7	15	7	15	10	9	14	14	11	102
20	Service of lamination	0	0	1	0	0	0	0	0	0	1
21	Internet café	1	6	7	5	0	2	6	5	6	38
22	Fruits	14	17	17	14	8	6	18	11	12	117
No. of selected customers from each kebele		15	19	18	19	20	20	20	19	18	168

Source: Own survey, 2011

Rank of demand for some products vary across different places of the city for reasons such as differences in culture and religion of the people. Table 6 shows that products of agriculture and service of hair cut & beautification are remaining leading in availability of demand in all kebelles of the city. But for the rest of the products, the rank of demand varies across the kebelles.

B. Non-Accessibility of Demandable Products in Different Places of the City

Table 7 shows the types of demandable products and their extent of non-accessibility in different kebelles of the city. These products were ranked based on their extent of non-accessibility. The extent of their non-accessibility was measured using the number of selected customers (who claimed so) as a unit of analysis.

As shown in the last column of Table 7, service of internet café was found to be the leading demandable product with little accessibility, for which 47 (28%) of the 168 selected customers reported that it is a service they need but cannot get easily, in the city as a whole. This is followed by textile and garmenting, wood and furniture, and café and restaurants for which 46 (27%) of the selected customers so.

Rank of non-accessibility of the rest demandable products is stated in descending order as: agricultural products, products of animal, leather and leather products, cultural products, metal products, products of fruit, food and beverage, building materials, hair cut and beautification, service of repair, service of tourism, service of garmenting, chemical products, precious stones, store service, service of lamination and cultural mining products; for which 22%, 21%, 20%, 18%, 17%, 14%, 13%, 11%, 10%, 10%, 7%, 5%, 3%, 2%, 2%, 2% and 1% of the selected customers from the city as a whole reported so, respectively.

Table 7: Types of demandable products and the extent of their non-accessibility in different kebelles of the city

No	Types of the products for which demand is higher but cannot be	Number of selected customers who mentioned the products for which their demand is higher but cannot be accessed easily in different kebelles of the city									Total
		K01	K02	K03	K04	K05	K06	K07	K08	K09	
1	Textile and Garment	12	6	5	1	9	3	3	3	4	46
2	Chemical products	1	1	1	0	0	0	1	1	0	5
3	Cultural products	1	6	1	6	1	2	4	4	5	30
4	Precious stones	0	0	0	0	0	0	3	1	0	4
5	Store service	0	0	2	1	0	1	0	0	0	4
6	Hair cut/beautification	1	2	6	3	1	1	1	0	2	17
7	Products of animal	3	5	5	5	2	1	1	6	7	35
8	Cultural mining products	0	0	0	0	0	0	0	1	0	1
9	Leather and leather products	1	4	1	4	7	2	4	6	4	33
10	Wood including furniture	4	4	0	4	3	3	9	8	11	46
11	Agricultural products	7	7	10	4	3	1	2	1	2	37
12	Cobble stones	0	0	0	0	0	0	0	0	0	0
13	Service of tourism	0	0	0	1	4	2	1	1	2	11
14	Service of repair	0	3	2	4	4	1	0	1	2	17
15	Service of garmenting	0	4	2	0	0	0	1	1	0	8
16	Food and beverage	3	1	1	0	1	2	3	7	4	22
17	Metal products	0	3	0	3	3	4	5	4	6	28
18	Building materials	0	0	0	4	4	2	4	1	3	18
19	Café and restaurants	2	2	2	3	11	10	4	9	3	46
20	Service of lamination	0	0	0	1	0	1	1	0	0	3
21	Internet café	0	4	2	9	12	9	3	3	5	47
22	Fruit	1	5	4	0	1	1	2	6	4	24
Number of selected customers from each kebele		15	19	18	19	20	20	20	19	18	168

Source: Own survey, 2011

Note that none of the selected private customers mentioned cobble stone as a non-accessible demandable product. This is likely due to the fact that it is not familiar for private customers to use cobble stone for their private purpose.

Some of the reasons for non-accessibility of the aforementioned products, according to the responses of the selected customers, include: facing higher prices of the products and lower supply of the products. Even, the existing supply of these products is expected to be with uneven concentration across the different kebelles of the city as revealed by the variation in non-accessibility of the products in different kebelles. Table 7 also clearly reflects that the extent of non-accessibility of the aforementioned demandable products vary across different kebelles of the city.

4. Conclusions

Result of the analysis, shows that about 39% of the selected businesses face unfavorable market access; 49% of the selected businesses face medium favorability of market access; and only 12% of the businesses enjoy high favorability of market access. This is likely to reveal that majority of the businesses have reservation on the extent of their market access. This implies that problem of marketing is one of the major challenges that need to be considered.

Of the four types of selected businesses, the business of cobble stone shaping is the one which mostly faces problem of lack of market access. The rest of the selected businesses are ranked in terms of severity of the problem in descending order as: wood and metal works, cobble stone paving and construction.

Much attempt was made to find out the major challenging factors for lack of market access.

In the sub-sector of cobble stone shaping, five of the stated problems were found to be serious. These problems are ranked in terms of their extent of seriousness in descending order as: problem of absence of advertisement, problem of absence of private customers, difficulty in payment system and supplying products, non-attractiveness of selling price and problem of lower status of recognition.

For the sub-sector of cobble stone paving, four of the stated problems were found to be serious. These problems are ranked in terms of their seriousness in descending order as: problem of absence of private customers, problem of absence of advertisement, difficulty in payment system and supplying products, and problem of lower status of recognition.

For the sub-sector of construction, eight of the stated problems were found to be serious. The problems are ranked in terms of their extent of serious in descending order as: problem of absence of advertisement, problem of absence of private customers, problem of farness from a well known market, absence of linkage with other producers, problem of lower status of recognition, non attractiveness of selling price, problem of lack of attractiveness of the market, and problem of lack of market place.

Finally, for the sub-sector of metal and wood works, six of the stated problems were found to be serious. These problems are ranked in terms of their extent of seriousness in descending order as: problem of absence of advertisement, problem of farness from a well known market, problem of lack of attractiveness of the market, problem of lack of communication, absence of linkage with other producers, and problem of lack of market place.

Of all the stated problems, problem of absence of advertisement was found to be the major serious marketing challenge which was reported to be more serious for all of the selected businesses. The other major marketing challenge which was reported to be more serious by the first three types businesses is problem of absence of private customers. It is explained that this problem arises for the fact that the products of the first three types of businesses are mostly and primarily supplied to government body. This is likely to make the operators of these sub-sectors to lose customers in case there are no tendencies from the government to demand their products.

The ordered probit regression was computed taking favorability of the market access as a dependent variable and those factors which are expected to influence the favorability of the market access as explanatory variables. The result shows that engagement in the business of cobble stone shaping has the tendency to result in the possibility of facing unfavorable market access

whereas the construction sub-sector creates favorable market access, *ceteris paribus*. The result also indicates that with a rise in the age of the businesses, the probability of having favorable market access increases, other things remaining constant. On the other hand, the result indicates that the probability of having favorable market access reduces with a rise in the concentration of the same type of businesses in a given place, *ceteris paribus*.

Result of analysis of the need assessment shows that products of hair cut & beautification and agricultural products take the leading position, in all places of the city, in terms of demand, which are used by all the selected customers. Rest of the products are ranked in terms of their demand in descending order as: food & beverage, fruit, café & restaurant, products of animal, wood including furniture, textile & garment, chemical products, service of repair, cultural products, metal products, internet café, building materials, leather & leather products, service of garmenting, cobble stone, store service, precious stones, cultural mining products, service of tourism, and service lamination.

The result also shows that there are differences in rank of the rest of the products in terms of the availability of demand across different places of the city. This may arise from the differences in culture and religion of the people living in different kebelles of the city.

Under this specific session, analysis was carried out to figure out types of demandable products which cannot be easily accessed in different kebelles of the city. These products are ranked in terms of their non-accessibility in descending order (all over the city) as: internet café, textile & garmenting, wood and furniture, café & restaurants, agricultural products, products of animal, leather and leather products, cultural products, metal products, products of fruit, food and beverage, building materials, hair cut & beautification, service of repair, service of tourism, service of garmenting, chemical products, precious stones, store service, service of lamination, and cultural mining products. However, the result also indicates that there are differences in non-accessibility of the products in different kebelles of the city.

5. Recommendation

The possible ideas of recommendation follow the findings of the study. The findings of this study show that majority of the four selected associations are facing problem of lack of market access. Hence, problem of marketing should be considered as one of the major constraints of the sector which needs much attention.

The major challenges which are expected to be responsible for the existence of the problem of lack of market access were stated with their rank of seriousness, in general. These challenges, thus, have to be treated in priority of their rank of seriousness. The challenges were also ranked with their extent of seriousness across the four selected types of businesses so that priority of treatment of the challenges is also required across these four types of businesses.

Of the stated major marketing challenges of the sector, problem of absence of advertisement and problem of absence of private customers for products of the sectors are the more special ones. Problem of absence of advertisement arises because the enterprises face lack of capital; hence, Dire Dawa MSE Development Agency is expected to exert its effort to create a system how products of these enterprises are advertised. With regard to problem of absence of private customers to some products such as cobble stone and construction materials, it is important to create a connection between the producers and private customers.

The study also reveals that problem of lack of market access arises from variation in concentration of the same types of businesses across different places (kebelles) of the city of Dire Dawa. This possibly arises for the fact that producers mostly decide to establish a business only for it is convenient to establish, without undertaking a need assessment as well as disregarding the existing concentration of the same type of businesses in the place where they operate. Hence, much attention should be given to application of need assessments in consideration of the concentration of the existing types of businesses before the decision of establishing a business.

Finally, analysis of the need assessment has come up with findings of the types of products which are frequently used (consumed) by the customers with their rank in terms of the number of their customers (or demand). Hence, the quantity of the supply of each type of product should be prioritized according to their rank of demand. The priority should also be in consideration of the products' rank across different places (kebelles) of the city. Moreover, the study also indicated that there are demandable products with unease of accessibility across different kebelles of the city. Therefore, attention should be given to these types of products with the place where they are not easily accessible.

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