ST. MARY'S UNIVERSITY COLLEGE

SCHOOL OF GRADUATE STUDIES

INSTITUTES OF AGRICULTURE AND DEVELOPMENT STUDIES

IMPACT OF BUSINESS DEVELOPMENT AND DEMAND DRIVEN

EXTENSION SERVICES ON HOUSEHOLD INCOME AND FOOD SECURITY:

THE CASE OF MESKAN DISTRICT, SOUTHERN ETHIOPIA

By

YENUS HASSEN

JULY 2014
ADDIS ABABA, ETHIOPIA

IMPACT OF BUSINESS DEVELOPMENT AND DEMAND DRIVEN EXTENSION SERVICES ON HOUSEHOLD INCOME AND FOOD SECURITY: THE CASE OF MESKAN DISTRICT FARMERS, SOUTHERN ETHIOPIA

By

YENUS HASSEN

(ID: MAEC/0020/2004)

A THESIS SUBMITTED TO SAINT MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER'S OF AGRICULTURAL ECONOMICS

JULY 2014

ADDIS ABABA, ETHIOPIA

ST. MARY'S UNIVERSITY COLLEGE

SCHOOL OF GRADUATE STUDIES

INSTITUTES OF AGRICULTURE AND DEVELOPMENT STUDIES

IMPACT OF BUSINESS DEVELOPMENT AND DEMAND DRIVEN EXTENSION SERVICES ON HOUSEHOLD INCOME AND FOOD SECURITY: THE CASE OF MESKAN DISTRICT FARMERS, SOUTHERN ETHIOPIA

By

YENUS HASSEN

APPROVED BY BOARD OF EXAMINERS

_____   _____
Dean, Graduate Studies   **Signature**

_____   _____
Advisor   **Signature**

_____   _____
External Examiner   **Signature**

_____   _____
Internal Examiner   **Signature**

DEDICATION

This thesis is dedicated to my lovely and talented daughter Lili Yenus, whom l expect her to be one of the productive and responsible citizen of our country, Ethiopia.

ENDORSEMENT

This thesis has been submitted to Saint Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

_____   _____

Advisor   Signature and Date

DECLARATION

I, the undersigned, declare that this Thesis is my original work; prepared under the guidance of Dagnew Eshete (Ph.D). All the sources of materials used for this thesis have been dully acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

_____   _____

Name   Signature and Date

ACKNOWLEDGEMENTS

ACRONYMS

AE	Adult Equivalent
ATT	Average Treatment effect on the Treated
BDS	Business Development Services
CCI	Complementary Community Investment
CEE	Consumption Expenditure
CFI	Chronically Food In secured Households
CSA	Central Statistics Authority
DA	Development Agents
DDES	Demand Driven Extension Services
DECSI	Dedebit Credit and Saving Institute
FSP	Food Security Program
GOE	Government of Ethiopia
HABP	Household Asset Building Program
HH	Household
IFPRI	International Food Policy Research Institute
IGAs	Income Generating Activities
MFI	Micro-Finance Institution
MoA	Ministry of agriculture
MoARD	Ministry of Agriculture and Rural Development
MSEs	Micro and Small Enterprises
SNNPR	Sothern Nations Nationalities and Peoples Regional State
PSNP	Productive Safety Net Program
PSM	Propensity Score Matching
RK	Rural Kebele
RuSACCos	Rural Saving and Credit Cooperatives
TLU	Tropical livestock unit
VESA	Village Economy and Saving Associations
WB	The World Bank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

The aim of the study is to assess the impact of the Business Development Support (BDS) and Demand Driven Extension Services (DDES) on the chronically food insecure households income and food security. These services are run by the Household Asset building Program (HABP), which is the new component of the National Food Security Program being implemented by the Government of Ethiopia. The study was undertaken in Meskan District, Southern Ethiopia in four selected Kebeles within the same pilot district having similar socioeconomic and agro-ecological conditions. The study has adopted purposive sampling procedure for the selection of the sample households and a total of 180 sample households were selected based on probability proportionate to sample size. Accordingly, both primary and secondary data were collected and analyzed using various data analysis statistical and econometric tools i.e. descriptive and multiple regression models. However, to estimate the causal treatment effects, the study has used the most popular method of causal inference known as Propensity Score Matching (PSM).

Finally, the regression analysis results indicate that the independent variables business advisory services, development agent close coaching, savings, size of loan, and number of times loan availed have significant effect on household income increase. The study result has also indicated that households' consumption expenditure per adult equivalent and productive assets value were found to be generally positive and statistically significant, implying that the program has improved household incomes and food security. However, as evidenced from the statistical analysis study result, the impact of the program services on income sources diversification are found to be generally insignificant and the main reasons for the low rural income source diversification in to off farm and new rural business are reported to be: poor demand creation and input facilitation services of the program which in turn is believed to be resulted from the lack of institutionalized off farm and new business development support services at a grass root level. Thus, in view of the prevailing land degradation and arable land scarcity challenges of the chronically food insecure areas, it seems vital for policy makers to focus on the potential contribution of the rural off farm businesses and address the grass root level institutional and private sector service providers support gaps of the non farm sector.

Key words*: Business Development Service, Demand driven extension, Income sources, Farm asset values and Propensity Score Matching.*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Ethiopia is the second most populous country in Sub-Saharan Africa with total estimated population of 88 million (CSA, 2013). Agriculture is the primary source of livelihood for 84% of the country's population and generates 40% of the gross domestic product. The sector is challenged by smallholders' traditional, fragmented and backward farming practices coupled with a high risk of recurring drought and intra seasonal dry spells. As a result, most small holders' per capita food grain productions are very low that it doesn't cover annual consumption; hence, most of these households' are exposed to frequent food shortage (MoARD, 2009).

In the year 1982 to 2003 alone, a series of rain failures have caused a frequent worst famine that affected more than 14.5 million people. The proportion of people affected by recurrent drought and famine rose from 4% in the 1972-74 famine to over 20% during 2002-2003 food crises (MoARD, 2004). As a result, about 8.3 million rural populations are now receiving annual food assistance and food aid from donor countries persists to be an important source of food supply for chronically food insecure households.

Thus, to avert this food insecurity challenges, the Ethiopian Government and Development Partners have designed and implemented the Productive Safety Net Program-PSNP (2005 to 2009) coupled with credit package. The Productive Safety Net Program was aimed to meet the six months food gaps of the Chronically Food Insecure Households (CFI HHs) and to protect household asset loss. While the household credit package component of this program was designed to complement PSNP food transfers with additional incomes generated from income generating activities through the program credit support (World Bank, 2010).

However, similar to the previous efforts, the PSNP was also little successful in achieving the intended program objective especially in areas of increasing additional income and productive assets at the required level due to various constraints including: poor financial

practices in managing the rural credit services combined with the inability of extension workers to perform their extension tasks because of their engagement on routine loan disbursement and collection duties which is a task out of their mandate.

Thus, taking those lessons of past Food Security Program (FSP) interventions in to consideration, Ethiopian Government designed the ongoing 2010 to 2014 FSP comprising four sub- program components that include: Productive Safety Net Program (PSNP), Household Asset Building Program (HABP), Voluntary Resettlement and Complementary Community Investment (CCI).

In this comprehensive new approach, the Productive Safety Net Program (PSNP) and The Household Asset Building Program (HABP) have constituted the most important and complimentary program interventions to realize the graduation of chronically food in secure households from food self insufficiency. These two complementary sub programs were planned to deliver program target CFI HHs conditional and non conditional food/cash transfer integrated with demand driven extension and business development support services so as to enable CFI HHs create additional income and build productive assets. To realize this new food security program objective, government and development partners have incurred huge investments (MoARD, 2009).

Despite all these investments, efforts made so far to track the impacts of such huge interventions on CFI household's income and food self sufficiency are very limited for various reasons; and only few related studies have been conducted by International Food Policy Research Institute, (IFPRI, 2008), However the IFPRI study conducted on the impact of the Productive Safety Net Program food transfers on beneficiaries' food security status, but, this impact evaluation did not properly address the income generating aspects of the CFI households.

The MoARD report (2009) did also indicate that FSP impact assessment studies made on the first phase of Ethiopian Food Security Programs (2005-2009) and evaluation made on the new FSP (2010-2014) midterm impact did not also sufficiently address the impact of the recently designed integrated intervention approaches especially the impacts of demand driven extension and Business Development Services (BDS) of the HABP on household income and food self sufficiency.

On the other hand various studies conducted on business development and extension support related fields such as:

2

(Swanson, et al, 1997; Getaneh, 2004; Wolday Amha et al 2006; Davis et al 2007 and Geofrey et al, 2013;) indicated that access to credit and other microenterprise support services can expand household or enterprise income, increased fixed assets, diversifying income sources, enhancing employment opportunities. Similar related studies conducted on the "Impacts of the national agricultural advisory services program on household production and welfare in Uganda (Geofrey et al, 2013); the impact of extension services on farming households in Kenya (Jean, 2013) and impact of Ethiopian FSP (IFPRI 2006, 2008 and 20012) have also confirmed that the effectiveness of the business development services in enhancing credit access and business profits.

The main aim of this research is therefore to evaluate the contribution of the Demand Driven Extension and Business Development Services of the Household Asset Building Program on the CFI households' income and food security. From the study findings, the study will also identify existing gaps and thereby suggests viable intervention strategies that enhance the effectiveness of the next generation national food security programs.

1.2   Statement of the Problem

Although food self sufficiency is the stated goal of the Ethiopian government, the problem of food insecurity has continued to persist in the country. Many rural households have already lost their means of livelihood due to recurrent drought and crop failures and unable to rebuilt productive assets (World Bank, 2009).

According to the World Bank country report (2009), a pathway to move CFI households out of food insecurity requires: improving existing production systems, developing new income generating enterprises and built productive assets that enable them gain better earnings. However, CFI households in Ethiopia have very limited access and opportunities to credit, business development advices and market support services.

Thus, in line with these requirements, the government of Ethiopia has attempted to address the business development and extension service needs of CFI HHs through the ongoing Household Asset Building Program being implemented from 2010-2014. The program intervention is mainly focused on providing special support services and advices in areas of selecting viable IGAs, market oriented production systems, linking them to appropriate financial and input sources, and product and labor market.

Despite of all these efforts made towards alleviating CFI HHs food insecurity problem, official and non official information reported from program supported Regions and Districts indicated that rural alternative income generating businesses are not well promoted and diversified to the required level for the estimated or hypothesized reason that the current rural business development services are not effective enough to enhance the income and food security level of rural food in secured households (MoARD,2012) Consequently, the economic and food security contributions of the ongoing integrated BDS and extension services provided to CFI HHs remains being a question of local decision makers and development partners.

Previous empirical works done on areas of evaluating the impacts of the new FSP interventions were mainly focused on assessing impacts of PSP and household package transfers (food and livelihood transfers) on reducing food gap months and have limitations in areas of assessing the impact of the HABP services. For instance the interim and terminal program impact assessment and program reviews conducted by IFPRI on PSNP and Other Food Security Program (OFSP) in 2006 and 2008 respectively have shown that household level food insecurity was reduced and income and consumption levels were raised due to food and livelihood transfers.

However, the above stated study findings of IFPRI were entirely based on assessing the impact of the food transfer of PSNP and in kind or cash credit transfers of the Other Food Security Program (OFSP) interventions and failed to consider the impacts of the new FSP program provisions or the HABP service components that include: Micro credit and saving financial services, entrepreneur and business advices, skill training, marketing information, technology transfer and input linkage services.

Therefore, the aim of this research is to fill the above stated food security impact assessment research gaps through conducting a case study on the intermediate impacts the ongoing program interventions of the HABP on CFI HHs income and food security.

1.3   Basic Research Question

A basic research question of the intended study is "To what extent incomes and food

security of CFI HHs have changed through the ongoing integrated business development and demand driven extension service supports of the program?"

In addition to the stated basic research question, the study also assessed the differential impacts of the program services on household income source diversification (whether the ongoing program services are in favor of the on farm or in favor of diversifying in to off/nonfarm businesses) and the existing challenges and opportunities towards addressing demand driven business development and extension service to CFI households.

1.4   Objectives of the Study

The main objective of this study is to assess the contribution and impact of the integrated business development and demand driven extension service supports of the HABP on household income and food security by taking Meskan District CFI households as a case study. The specific objectives of the study include:

1. Assessing the impacts of business development and demand driven extension services on households' income, asset and food security;

2. Assessing the impacts of business development and demand driven extension services on CFI HHs livelihood diversification (whether the ongoing program services are in favor of non agricultural income sources beyond agricultural income);

3. Assessing existing challenges and opportunities on areas of providing demand driven business development and extension services and flag issues that needs improvement and policy level actions in designing and implementing the next generation food security programs.

Thus, the following working hypotheses were predicted as a tentative specific answer to the problem statement of the intended research:

Hypothesis 1:

Integrated rural business development supports and demand driven extension services of the HABP significantly improves the income and food self-sufficiency of CFI HHs. That is, ceteris paribus the predicted/estimated mean annual income of the program services

5

beneficiary HH is significantly greater than the mean annual income of their counterfactual non program participant household.

Hypothesis 2:

Integrated business development support and demand driven extension service supports provided to CFI HHs income generating business improves productive asset values of program beneficiary HHs than non program beneficiary HHs. That is, ceteris paribus the predicted/estimated mean farm asset value of the program services beneficiary HH is significantly greater than the mean farm asset value of their counterfactual non program participant household.

Hypothesis 3:

Rural business development and demand driven extension services have significant role in increasing and diversifying income source livelihoods of chronically food in secure households. That is, ceteris paribus the predicted/estimated mean income sources number of the program participant household is greater in number and diversity than mean income sources number of their counterfactual non program participant household.

1.5   Significance of the Problem

Though agriculture is the dominant sector in the Ethiopian economy, about 10% of the rural farming population are still chronically food insecure and bases their livelihood on small, fragmented and subsistence farming. These CFI HH have limited access to working capital for inputs purchase and limited access to business development services to improve productivity. Thus, cognizant to the existing constraints and the contributions of integrated business development and demand driven extension services on CFI household's income and livelihood diversification enables the policy makers to design most appropriate and effective way of utilizing these scarce production resources to the maximum benefits of the rural CFI HHs. Moreover, the study result on impact of BDS and DDES on the rural CFI income and food security enables private business development service providers to redesign their rural finance and input supply policies. In conclusion, the outcome of this study will inform government and non government food security actors to design appropriate food security intervention strategy that benefits

10% of the rural population in achieving food self sufficiency. It also informs the market opportunity for private business development service providers.

1.6   Scope and Limitation of the Study

Due to time and other resource limitations, the study covers only one program region and one program district to infer the national program impact. Moreover, though many authors recommended that infrastructures are basic socio economic variables to be included in the survey, due to budget and time constraints this research did not address all infrastructures; and only those social service institutions engaged in rural finance and input supply services, marketing premises and the grassroots level government extension service centers are included in the study.

1.7   Organization of the Report

This thesis is organized into seven chapters. The first chapter deals with the background, statement of the problem, significance, objectives, and scope and limitations of the study. The second chapter presents the review of different literatures relevant to this research work (including theoretical, empirical and conceptual frameworks). The third chapters deal with the description of the study area, methodology of the study (including sampling design, data collection and analysis methods). Chapter four presents the study result and discussion based on the assessment findings. The summary, conclusion and policy suggestions drown based on the study results are discussed on chapter five.

CHAPTER TWO
REVIEW OF LITERATURE

2.1   Theoretical and Conceptual Framework

2.1.1   The Concept of Food Security

The concept of food security has evolved and expanded over time to integrate a wide range of food related issues and to more completely reflect the complexity of the role of food in human society. Early definitions focused almost exclusively on the ability of a region or nation to assure an adequate food supply for its current and projected population (Maxwell, S. and T. Frankenberger, 1992).

However, over the last two decades the concept of food security shifts from national or global level to the individual food entitlement or basic right and the evolution of this new concept of household food and nutritional security led to the development of the concept of household livelihood security. Thus, now a day the level of analysis for food security issues is seen at households and individual level (World Bank, 2010).

Consequently, following the new food security concept, various food security focused programs have been initiated and many project activities designed to improve implicitly or explicitly household and individual food security through improving overall food availability, increasing income-earning opportunities in farm and non-farm employment and reducing production and marketing risks (IFPRI, 2010).

Thus, the Household Asset Building Program, (HABP) was designed similarly in line with the latest concept of the new food security definition i.e. to increase production and incomes of CFI HHs and to complement the Productive Safety Net Program which mainly works towards asset protection.

2.1.2   Concept of Poverty line and food poverty

Despite food self sufficiency and eradicating extreme poverty or hunger is the key objectives of the Ethiopian government articulated in its GTP, food poverty remains still

high in rural areas of the country that the proportion of food-poor people that fall below the food poverty line are still above 33.6 % (MoFED, 2012).

The Ethiopian economy is highly vulnerable to droughts and adverse terms of trade by virtue of its dependence on primary commodities and rain-fed agriculture. Thus the country's growth performance is highly correlated with weather conditions. A one percent change of the annual average rainfall is associated with a 0.3% change in real GDP reflected in the following year (World Bank, 2004).

According to Ethiopian poverty status country report of MoFED (2012), poverty is defined as "unacceptable deprivation in well- being". This means there are absolute necessities without which the member of a society cannot function. It is estimated based on the cost of the bundle of goods "adequate" to ensure that basic needs are met. While food poverty index is an index that measures the proportion of food-poor people that fall below the food poverty line. The poverty line per adult equivalent for rural Ethiopia as of the year 2012 was Eth. birr 5360.

2.1.3   Concepts of on farm, off farm and nonfarm activities

Since the last three decades farming has failed to guarantee sufficient livelihood as a primary source of income for most farming households in developing countries, and agricultural development policies have largely produced little improvement, especially in Sub-Sahara Africa. Thus, small-holder farm households in developing countries are now rarely rely on agriculture alone, but often maintain a portfolio of income activities in which off-farm activities are an important component (Babatunde,R.O., 2009). Other similar study on a related field has also indicated that non-farm income accounts for   between 35% and 50% of total income of rural households in developing countries (Haggblade et al., 2010). Davis et al. (2007) put the global figure at approximately 58%, with some countries having a share as high as 75% of total income on average.

The share of off-farm income is expected to increase substantially in the coming years, especially in sub-Saharan Africa where increasing population growth and limited agricultural resources are threatening the growth of the agricultural sector (Haggblade et al. 2010). The distinction between on-farm activities and non-farm activities is ambiguous.

9

Gordon and Craig (2001) define non-farm activities that those activities that are not primary agriculture or forestry or fisheries. However, non-farm does include trade or processing of agricultural products (even if, in the case of micro-processing activities, they take place on the farm). 'Off-farm' used in this sense would not fall within the normal definition of 'non-farm'. Some authors used the term off-farm income and non-farm income interchangeably in several cases. However, according to Babatunde (2009), the difference between the off-farm and nonfarm is stated in that: off-farm income is much broader than non-farm income and it is made up of agricultural wage income plus non-farm income. Thus, in this paper income from agricultural employment on other people's farm is included as component of off-farm income the term off farm will be used as a compressive term representing both off-farm employment and nonfarm activities.

Non-farm activities play a principal role directly by contributing considerably to rural households' income, and indirectly by influencing agricultural activities with potential implications for sustainability. Gordon and Craig (2001) also conclude that poor people's access to education and skills, infrastructure, financial capital, social capital and natural resources (particularly land) is examined in relation to their participation in rural nonfarm activities. Improvements in infrastructure, education, health and financial services help to facilitate access to rural non farm income sources.

Pressure on natural resources could be reduced if households have alternative sources for their livelihoods. Promoting development of innovation for traditional job such as handicraft, ironing, diversifying sources of income, adapting small business would facilitate increasing of cash income from non-farm activities. Meanwhile, if there is no or few potential to keep the non-farm incomes increasing sustainably in the future, the farmers will face the options in dilemma. Promoting non-farm activities in rural area is gaining attention as a strategy for poverty reducing, job creation, promotion of education and consumption. However, the conditions for promoting and enhancing role of non-farm activities in the rural areas are not highly taking into account for rural development (Babatunde, R.O., 2009).

In China, wage income accounts for the largest net income of rural residents. Increasing rate of wage income accounts for 232% during 1995 to 2005, and mainly comes from non-farm production and business activities, especially from different types of enterprises (Babatunde, R.O., 2009).

Farming, in Ethiopia is largely dependent on rain fall. However, the pattern of rainfall is erratic and short in most cases. Thus, focusing in agricultural production alone may not be enough to combat food insecurity problem of the country; and therefore, engaging in

non-agricultural or nonfarm activities is recommended to have a paramount importance to sustain the people's livelihoods (Bereket Zerai, 2011).

However, the contribution of nonfarm activities in reducing poverty and improving household food security in Ethiopia is a subject of discussion; and has been rarely explored (Bereket and Zenebe, 2011).

2.1.4 Business Development Services (BDS)

Business Development Services include a wide range of financial and non financial services critical to the entry, survival, productivity, market competitiveness, and growth of rural micro and small on and off/nonfarm enterprises (IFAD, 2012).

Most rural poor in CFI areas of the country sustain their life through subsistence microenterprises in informal economy. Therefore, the role of Business Development Services (BDS) providers in supporting these rural poor micro entrepreneurs is vital and important not only to the well being of the poor households but also it enables them to play an important contributions to national economies through their products and services. Moreover these entrepreneurs will gain confidence, decision-making experience, and a greater sense of control over their lives through their businesses (World Bank, 2010).

According to Getaneh (2007), the micro-finance service is indeed having clear impact: in improving food security, health status, children education and creating additional assets, as well as empowering the marginalized portion of the society. However, this study in the mean time strongly suggest that any livelihood programs need to consider that Micro-credit alone cannot be the only intervention on poverty; and other interventions more importantly "Business Development Services" should also accompany it. It is reported that access to and efficiency of the financial services is important elements in reducing poverty through lessening the financial constraints of the poor and enabling them to invest in a risky, but profitable environment (Ayalneh, 2003).

Wolday Amaha (2001; 2003) has also recommended that in Ethiopia, government and non- governmental organizations (NGOs) should consider microcredit as a prime policy instrument in fighting poverty and increasing the productivity of the poor. Despite all this potential contributions, the role of microcredit on household food security and its impact on wider rural livelihood economy is very little known in Ethiopia.

Moreover, there is no consensus among academics so far about the actual impact of microcredit on poverty reduction and household food security (Siyoum et al. 2012). According to Woldehanna (2000), rapid expansion of microfinance credit services alone is meaningless, unless accompanied by some kind of marketable skills development, which the poor seriously lack. Credit alone can only increase the "scale" of existing activities rather than enabling the poor to move into new or higher value activities.

Therefore, business development services are important in assisting entrepreneurs to run their business more effectively; and if appropriately applied, can act as an enhancer of access to finance and as an alternative form of "collateral" in circumstances where tangible collateral may be an impediment to meeting traditional security requirements.

According to the impact evaluation report of Moldova IFAD (2012), business development services can help microenterprises solve their problems by advising small holders on viable IGAs, facilitating and linking them to financial and non financial services and inputs (it include credit and other financial products, less expensive higher quality inputs), linking them to market information and well functioning markets, introducing new or improved technologies and products, improving their technical and financial management skills.

However recent study findings of Gebrehiwot and Wolday (2006) have indicated that the Micro business development in rural Ethiopia are highly constrained by inadequate uncertain financial and extension services, poor transfer of technologies, poor marketing facilities and inadequate provision of training on sustainable basis.

2.1.5   Demand Driven Extension Services

Finding an appropriate extension approach is a special challenge in the African context, as poverty is growing and productivity is declining on the continent. Twenty-four

African countries have listed extension as one of the top agricultural priorities for a poverty reduction strategy (Braun et al. 2006).

Demand driven agricultural education, extension, and advisory services are a critical means of addressing rural poverty, because such institutions have a mandate to transfer technology, support learning, assist farmers in problem solving, and enable farmers to become more actively embedded in the agricultural knowledge and information system (IFPRI, 2004)). Demand creation service supports such as farmers field schools (FFS) and farmers training centers (FTCs) are thus the best ways to support such farmers in terms of demonstrating information, technology, advice, and empowerment. IFPRI (2004) investigated the effect of farmers field schools (FFS) on production and incomes of farmers in East Africa, and the result show that FFS participants had significant differences in outcomes with respect to value of crops produced per acre, livestock value gain per capita, and agricultural income per capita. Farmers' field demonstrations had a greater impact on crop productivity for those in the middle land area (areas with land poverty). Participation in farmers' field demonstrations increased income on average by 61 percent when pooling the three countries. It improved income and productivity overall, but differences were seen at the country level. The most significant change was seen in Kenya for crops (80 percent increase) and in Tanzania for agricultural income (more than 100 percent increase). Farmers' field demonstrations were shown to be especially beneficial to women, people with low literacy levels, and farmers with medium-size land holdings.

2.1.6   Concept of impact assessment

According to Patrick Premand (2013), the objective of impact evaluation is to estimate the causal effect or impact of a program on outcomes of interest. Thus, to estimate the causal effect or impact of a program on outcomes, any method chosen must estimate the so called counterfactual, that is, what the outcome would have been for program participants if they had not participated in the program.

Impact evaluation can provide robust and credible evidence on performance and, crucially, on whether a particular program achieved its desired outcomes (Paul J. Gertler, et al, 2011). Thus, impact evaluations are needed to inform policy makers on a range of

decisions, from curtailing inefficient programs, to scaling up interventions that work, to adjusting program benefits, to selecting among various program alternatives. Similarly, at the global level, impact evaluations are also central to building knowledge about the effectiveness of development programs by illuminating what does and does not work to reduce poverty and improve welfare (Paul J. Gertler, et al., 2011). In order to generate comparison groups and estimate the counterfactual, Patrick reported five possible impact evaluation (IE) tools that include: Randomized Assignment, Randomized Promotion, Regression Discontinuity Design, Difference-in-Difference and Matching Methods However, Heckman et al., (2004) recommended that Propensity Score Matching (PSM) method is the most popular and best method to evaluate the impact of economic policies on individuals or households.

2.2   Related empirical studies and application of PSM

Though it is difficult to review all the available related literature on PSM application, few but relevant empirical evidences were reviewed on the application of PSM as an alternative approach to evaluation of the impact of the programs that were conducted both outside and within the country.

Wole Wakjira (2013) stated that: in his work on assessing the impact of agricultural market improvement intervention on the livelihoods of rural farmers in Ethiopia, he has used PSM as impact evaluation tool and he also mentioned some of the related works done on this area elsewhere. Accordingly, this study has reviewed the stated reference documents and summaries of the previous empirical work findings are presented bellow.

In assessing the impact of extension service on the farming households in Kenya using PSM, Deschamps Laporte (2013) reported   that the program households were found better in adopting improved technologies, for example their fertilizer dosage increased by at least 24.91%, although productivity per acre is not affected by the program. Using the same approach, Mendola (2006) carried out an evaluation of whether adopting a modern seed technology causes resource-poor farmers to improve their income and decrease the propensity to fall below the poverty line in rural Bangladesh.

The result of this analysis indicated that there is a robust and positive effect of

agricultural technology adoption on farm household well-being. With the application of PSM to evaluate the impact of a pilot farmer field-school (FFS) program on farmers' knowledge of integrated pest management (IPM) practices related to potato cultivation in the Peruvian Andes, Godtland et al (2004) find out that farmers who participate in the program have significantly more knowledge about IPM practice and improved productivity than those in the non-participant comparison group.

In the same way, Davis (2010) assessed the impact of FFS on agricultural productivity and poverty in East Africa using PSM investigated that participation in FFSs led to increased production, productivity, and income of the participant households.

In Ethiopia few empirical studies are available with regards to the application of PSM in order to evaluate development programs. One of such recent studies is the impact of participation in the Extension Program on household income, investment and income diversification conducted by G/ Egziabhe et al (2013) in the northern part of the country. The study found that the extension program had increased income of the participating households with about 10 %. Moreover, the program had a large positive impact on investment and income diversification as well. Similarly, Guush Berhane et al (2012) analyzed the impact of productive safety nets program on food security and coping mechanisms in Ethiopia using the same approach. The result of their analysis revealed that as access to extension services increased food security by 1.53 months.

Although a detailed or comprehensive study has yet to establish whether the delivery of financial and business development services to the poor through the Micro Finance Institutes and business development service providers actually eliminated or reduced poverty, the results of the few case studies have clearly indicated that access to finance can indeed reduce poverty.

Empirical work done in Ethiopia by Ayalneh Bogale (2012) on the impact of Productive Safety Net Financed Livestock Credit on Food Security and Poverty Status of Rural Households indicated that: the effect of providing credit for all non-credit users equivalent to the average amount to users (as case-1) and doubling the amount of credit initially provided only for credit users (as case-2) were analyzed in simulation.

15

Accordingly, the simulation result for case-1 has shown an impact of increasing mean consumption per AE by 0.5% while simulation results of case-2 increases by 1.0%. In the mean time, the poverty measures, poverty head count declined by 12% in simulation case-1 and by 16% in simulation case-2. The same Empirical work has also assessed the effect of increasing agricultural income by 20% for all households on mean consumption and poverty was examined (as simulation case-3). Results depicted that the impact was very small (due to magnitude of the coefficient), this change can only increase consumption per AE by 0.1% and had reduced poverty head count by only 2%.

The study has also simulated the impacts of increasing farm assets by considering the live stock asset increases in two ways. One way is increase in livestock holding by one TLU and the other way is by increasing livestock assets two TLU for all households respectively. These simulations resulted in a rise of household consumption per AE by 0.6 and 1.1%, for one and two TLU increases respectively. Accordingly, the headcount poverty declined by 8% for one and by 16% for two TLU increases respectively. Meehan (2001), in her case study of DECSI, reveals that overall credit provision had as significant impact on increasing agricultural production through building up of production assets, particularly draught oxen and thereby enabling clients to get more land through rental scheme. The increased income generated by the credit input had a possible impact primarily on household food supply, and on educational provision for children as well as on clothing and other basic necessities. According to Rural Business Development Program performance report of Moldova (IFAD, 2010) the program investment directly benefited rural enterprises in terms of profits and fixed assets as a result of business growth. Accordingly, the average productive assets of program financed enterprises increased annually by 27 per cent and the average net profit by 18 percent. The highest profit increases were seen in non-agricultural activities.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1   Description of the Study Area

The study area, Meskan District is located at 133 Km South of Addis Ababa and 155 Km North of Hawassa, the capital of the Southern Nation Nationalities and Peoples Regional State. Geographically, the District lies between 8°07′00″ N latitude and 38°22′00″ E longitude with an elevation of 2123 meter above sea level.

The main landscape features of the study area are; 10 % mountainous, 55 % plain; and 35 % undulated. The two major traditional climatic categories of the District are Dega and Woina dega covering 20% and 80% of the total area, respectively. The average temperature of the District ranges from 7.5^{o}C to 10.5^{0}C; and the mean annual rainfall ranges from 1001 mm to 1200 mm.

Agriculture is the main sources of livelihood for the rural households and currently the total cultivated land covers 19,296 hectares. Out of the total cultivated land, annual and perennial crops covers 78.3% and 21.7% respectively. The average agricultural land holding for CFI households is 0.25 ha.

Though the livelihood of people living in the study area is mainly dependent on agriculture, the area is known for its low productivity due to land degradation. As a result, about 28,326 people are currently supported under safety net program to meet their 6 months annual food gap. Agricultural production is basically dominated by rain-fed crops. Livestock and forest products are the principal sources of income for the farmers. Maize, Pepper, Wheat, Barley, Haricot Beans, Faba beans and Linseeds are the major crops   grown in the area. Farmers also keep a significant number of livestock (cattle, sheep, goats and equines) for various purposes in addition to income generation. Red pepper is the main vegetable cash crop in the study area. Maize and Enset (false banana) are the main staple food crops. Moreover farmers are growing vegetables by using seasonal and permanent irrigation during the dry season (District Agriculture Office report, 2005). Islam is the dominant religion followed by Orthodox Christian followers.

3.2 Types and sources of data

Both primary and secondary data were collected from the respective District and Kebele level respondents. Respondent households living in four selected Kebeles having similar socioeconomic; and agro-ecological conditions were interviewed by locale professional selected and trained for the purpose. The data were collected by locally selected professional enumerators and supervisors which were trained intensively on each question of the structured questionnaire prepared for the study. The data were collected from purposively selected 180 sample households (60 treatment and 120 control).

The primary data collected from the respondents through the structured questionnaires were focused on demographic profiles, land holding and characteristics of agricultural resources, availability and accessibility of credit and business development services, household income, and expenditure and assets status.

The structured questionnaire was first pre tested on 10 households selected for pilot test before applied to wider samples and then finalized considering the feedbacks from pilot test findings. The secondary data consisted of relevant information on the quantitative and qualitative aspects of the business development and extension services and the capacities of DAs and BDS service providers against the demand driven extension service delivery. The secondary data have also included the inventory and capacities of the social service infrastructures currently supporting the HH socio economic services.

The sources of the secondary data used for this study include: different literatures, Central Statistical Authority Publications, annual; and interim reports of Federal, Regional; and District Government Bureaus/Offices; from Publications of the World Bank; On-line and Electronic data bases; reports and publications of various associations, business organizations; various publications of international, multilateral and non-governmental Organizations; and Report of research scholars and consultants.

3.3 Sampling Design

The sampling methods of the study were dictated by the availability time and financial resources. Accordingly, the study area, sampling units and the sample households were selected using purposive sampling procedures.

18

Based on the consultation of the federal and regional level program technical advisors, Southern Nations Nationalities and Peoples Regional State (SNNPR) was purposively selected. The reason for choosing SNNPR among the six Program regions was due to the fact that SNNPR is one of the main regions where HABP was active in implementing both on farm and off/nonfarm generating activities (IGAs). Similarly, following the above criteria one sample district namely District and Kebeles were purposively selected from the purposively selected region.

Both treatment and comparison sample HHs were also selected purposively from the 4443 Productive Safety Net Program beneficiaries living in Meskan District four rural Kebeles. Out of the district total 4443 PSNP beneficiaries, 1095 HHs are currently accessing the HABP services as complementary support and the remaining 3348 HHs are not currently accessing the HABP services because of the program resources limitation.

Accordingly, 60 sample households were selected randomly out of 1095 HABP and PSNP service beneficiary households as treatment group; and 120 samples HHs were also selected from 3348 Non-HABP service beneficiary PSNP clients as a comparison or control groups. The reason for varying the sample size of the two groups (60 HHs from as treatment and 120 HHs as a control group) is simply to maintain the proportionality of the prevailing actual sizes of the sample sources.

The control sample households were selected from the list of PSNP beneficiaries registered for the HABP service; but who are not currently benefiting from the program services due to credit resource scarcity (see appendix B for sample size proportionality). In selecting the control groups, maximum efforts were made to include HHS having similar observable characteristics the treatment group in average family size, land holding, education level; and farming system.

The control and the treatment survey areas were arranged to be adjacent to each other and located at equal distance from the main market, development and social service centers of the district. However, in order to avoid or minimize the spill-over effect, the sample HHs were selected from the extreme border of each Kebeles.

Both primary and secondary data were collected and used as input for analysis this study.

The primary data collected from the sample respondent through the structured questionnaires were focused on demographic profiles, land holding and characteristics of agricultural resources, availability and accessibility of credit and business development services, household income, and expenditure and assets status. The structured questionnaire was first pre tested on 10 households selected for pilot test before applied to wider samples and then finalized considering the feedbacks from pilot test findings.

The secondary data consisted of relevant information on the quantitative and qualitative aspects of the business development and extension services and the capacities of DAs and BDS service providers against the demand driven extension service delivery. The secondary data have also included the inventory and capacities of the social service infrastructures currently supporting the social and economic service needs of the district mainly District Microfinance branch offices and Rural Credit and Saving Cooperatives.

3.4   Data Collection Method

Four enumerators and two supervisors were recruited and trained intensively on each question of the structured questionnaire prepared for the purpose. They were then involved in the pilot testing in one of the sample Kebe collectively. The questionnaire was refined and finalized based on inputs from the pilot survey, which was then administered to the sample HHs. Inspected closely by supervisors; each enumerator handled 45 respondents and completed the questioner within the consecutive three days. Completed questionnaires were finally checked for errors and inconsistencies at two levels: first, supervisors in each cite were made to thoroughly check every questionnaire immediately after completion and those with errors returned to the enumerators for correction. The second check involved a data analyst.

3.5   Data Analysis

Both qualitative and quantitative techniques were used to analyze the data. Multiple regression model, PSM and descriptive analysis method were used to analyze the impact of Demand Driven Extension and Business Development Services on CFI HH's income and food security.

3.5.1 Descriptive Analysis

The level of household income/consumption expenditure and food security is influenced by several interacting factors that include demographic, socioeconomic and farm and nonfarm characteristics and land resources. Thus, under descriptive analysis, the mean value differences of treated and comparison group sample households' were assessed on all independent and dependent variables of demographic, socio economic and farm and nonfarm characteristics including: gender, age, family size and adult equivalent, HHs education, land holdings, cropping pattern, livestock holdings, and extension services including development agents technical coaching.

The descriptive analysis has also assessed the mean value differences of treated and comparison groups on areas of Business Development Services (BDS), such that: non-financial services and products offered to entrepreneurs at various stages of their business needs (providing consultancy and advisory services, technical/ skill training, marketing assistance, information, technology development and transfer (demonstrations), access for formal credit and loan size, input and market premises services, business linkage and promotion aspects of the sample HHs' mean values were assessed.

Generally, the quantitative and qualitative information generated from primary sources and formal interviews on results of the intervention and non intervention were narrated and described using descriptive statistics, such as: mean, standard deviation, percentages and cross tabulations used for analyzing the data collected through formal surveys by employing SPSS; and transformed in to STATA12MP-1.

3.5.2 Empirical Analysis

The descriptive analysis part mainly focuses on assessing the quantitative and qualitative information mainly on independent variables; and the results of those variables were described using descriptive statistics, such as: mean, and standard deviation. However, according to Rosenbaum and Rubin (1983), the descriptive analysis results alone cannot

give us the real picture and value of the impact of the program and needs to be supported by appropriate impact assessment tools known as Propensity Score Matching (PSM)

Thus, the study has also used both parametric (a multiple linear regression model) and non-parametric or propensity score matching (PSM) methods.

3.6   Model Specification and Application

3.6.1   Propensity Score Matching (PSM)

According to Patrick (2013) PSM is the most popular method to evaluate the impact of economic policies on individuals or households. Thus, in order to deal with the research question of this study based on the available data at hand, propensity score matching (PSM) was selected as the best alternative analytical method to estimate the impact of the business development and demand driven extension services of the program. The reasons for selecting PSM among the available other non experimental methods are because of: (1) base line data was not available for the program, (2) treatment assignment was not random; and (3) PSM is the second best alternative available to that of experimental design in minimizing selection bias (Baker, 2000).

The impact of the intervention on a given outcome (Y) can be given as:

$$T_i = Y_i (D_i=1) - Y_i(D_i=0) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where T_i is the treatment effect due to participation in the program, Y_i is the outcome variable observed on household I and D_i indicates whether household I participated in the program or not. In this case, however, $Y_i (D_i=1)$ and $Y_i (D_i=0)$ never be observed at the same time for a given household. As a result, it is impossible to estimate the individual treatment effect. Hence,   one   needs   to construct counterfactuals. In principles, there are two types of average treatment effects, average treatment effect (ATE) and Average Treatment Effect on the Treated (ATT). In the literature, ATT is preferred as it reports the effect of an intervention for which the program was intended and thus useful for policy makers (Heckman et al, 1997). It can be specified as:

$$T_{ATT} = E (t/D=1) = E (Y_1 /D= 1) - E(Y_0 /D= 1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

However,   in order to estimate the ATT one needs to find a proper substitute by using the mean outcome of comparable individuals through establishing a control group. This

can be possible only after dealing with selection bias through correcting the differences between both groups. Thus, by subtracting $E(Y_0/D=0)$ from both sides of the above equation, one can arrive at equation (3) for ATT.

$$E(Y_1/D=1) - E(Y_0/D=0) = \qquad T_{ATT} + E(Y_0/D=1) - E(Y_0/D=0)………..… (3)$$

Under social experiments, however, it is impossible to get rid of selection bias completely and thus we need to introduce two basic assumptions, the Conditional Independence Assumption (CIA) and Common Support Condition that help to deal with this problem. The CIA is given as:

$$Y0 \perp D/X………………………………………………..….. (4)$$

Where Y0 stands for non participants, $\perp$ stands for independence, and X is asset of observable characteristics. This means that given the asset of observable characteristics(x) which are not affected by the program potential outcomes are independent of the treatment assignment.

The Conditional Independence Assumption implies, that selection is solely based on observable characteristics and that all variables that influence treatment assignment and potential outcomes simultaneously are observed by the researcher. The second assumption is about the common support region, which is the region where the balancing score has positive density for both groups. This assumption rules out perfect predictability of D given x. That is given by:

$$0 < pr(D=1/X) < 1……………………………………….…. (5)$$

By excluding the tails of the propensity score distribution,(X), this assumption tries to improve the quality of the matches although it is done at the cost of probability that sample size might be considerably reduced. Yet, it is only over regions of common support that non-parametric matching methods can be meaningfully applied (Rosenbaum and Rubin, 1983). Based on the above two assumptions, ATT can be rewritten as:

$$T_{ATT} = E[Y_1 - Y_0/D=0, p(x)] = E[Y_1/D=1, p(x)] = -E[Y_0/D=0, p(x)]………….. (6)$$

Where, P(x) is the propensity score calculated based on the covariates. Then, the PSM estimator according to equation (6) can be explained as the mean difference in outcomes over the common support region appropriately weighted by the propensity score distributions.

3.6.2   Multiple linear regression model

In addition to PSM, the study has also used a multiple linear regression model to analyze the separate impacts of business development and demand driven extension services on household income/consumption expenditure. The natural log of household income/ consumption expenditure per AE is used as the dependent variable because its distribution more closely approximates the normal distribution. The simple mathematical expression of the model is given by: $\ln C_i = \beta' X_{i+} \varepsilon_i$

Where: $C_i =$ consumption expenditure per adult equivalent of household i

$X_i =$ the set of independent variables that are hypothesized to determine consumption expenditure which includes household demographic and socioeconomic characteristics

$\beta =$ a vector of coefficients to be estimated on these independent variables,

$\varepsilon_i =$ a stochastic term assumed to be normally distributed with $\varepsilon \sim N(0, S)$

$S^2 =$ the variance of the regression.

Using the estimated parameters of the model, predictions of consumption per adult equivalent for each household i can be generated and that makes it possible to compute the probability of a household to be classified as above or below poverty line.

3.6.3   Propensity Scores Estimation

Estimation of propensity score can be possible using either logit or probit models so that the household's probability of participation is predicted. For this study, however, logit model was used although both provide similar results (Gujarati, 2004).

In calculating the propensity scores, observable household characteristics (covariates) were used for the logit model which simultaneously affects household's participation decisions and the outcome variables. Then, participants with similar propensity scores were matched with their counterparts from non-participants. The dependent variable for the logitit model, in this case, is participation in the program which takes the value of 1 if a household participated in the program and 0 otherwise.

3.6.4   Propensity Score Matching

In order to deal with the research questions at hand, a non-experimental method called

propensity score matching (PSM) was selected as the best alternative analytical method available to estimate the impact of the intervention based on the available data. PSM selected among the available non-experimental methods because of three reasons: (1) baseline date was not available for the project; (2) treatment assignment was not based on random selection, and (3) PSM is assumed as the second best alternative available to that of experimental design in minimizing selection bias (Baker, 2000). PSM estimates impact by controlling for the households' observable characteristics and compare the outcomes of program participants with that of matched non participants and thus, minimizes the first bias, but, removing bias due to unobservable characteristic remains the main drawback of this method. However, Rosenbaum and Rubin (1983) recommended that the problem bias due to spillover effect can be tackled through constructing control groups that share the same socio economic conditions and similar agro-ecology that help to ensure the validity of PSM.

3.6.5   Choice of Matching Algorithm

On the basis of propensity scores calculated based on observable characteristics, participants and nonparticipants whose propensity scores fall in the common support can be matched using different matching algorithms. The most commonly known matching algorithms include: nearest-neighbor (NN) matching, caliper and radius matching, and kernel matching. They all provide similar results given the CIA and the common support condition assumptions are satisfied (Rosenbaum and Rubin, 1983).

However, according to Baker (2000), unlike to the above matching algorithm which uses only a few observations from the comparison group to construct the counterfactual outcome of a treated individual, kernel matching uses the weighted averages of nearly all. Individuals in the comparison group to construct the counter factual outcome.

Accordingly, all treated units are matched with a weighted mean of all controls with weights which are inversely proportional to the distance between the propensity scores of treated and controls. The Kernel method weights the contribution of each control group member so that more importance is attached to those comparators providing a better match.
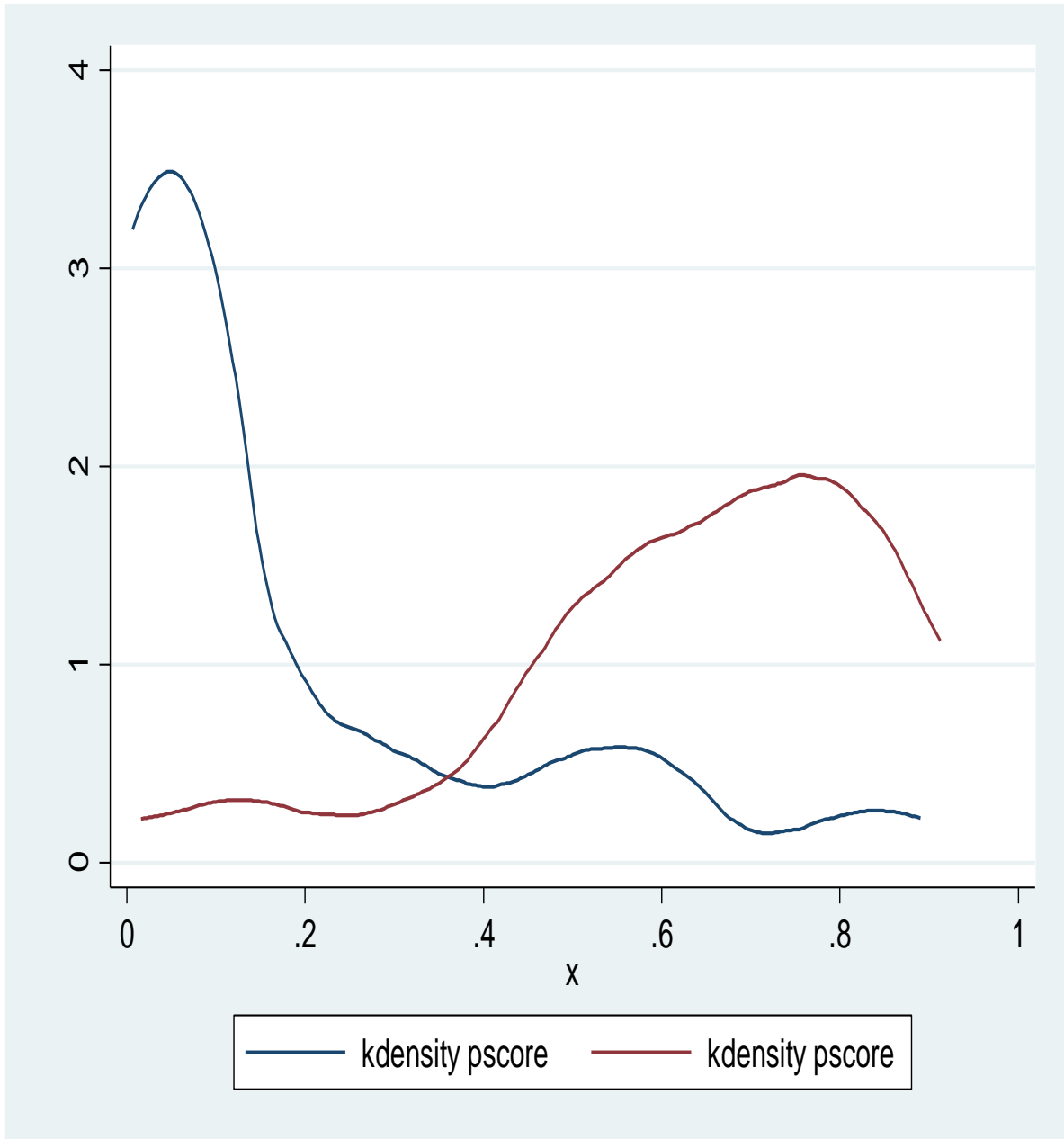
Fig 1: Graph showing the results of common support for treatment and control

However, according to Caliendo and Kopeinig (2008), a shortcoming of this approach is that likely bad matches are used as the estimator includes individual observations from the control group for all treatment observation; and they recommend the proper imposition of the common support condition is of key importance for the kernel matching method. Accordingly, the study has used the kernel matching method and both the CIA and common support assumptions are satisfied.

3.6.6 Testing the Matching Quality

According to Heckman (2004), the basic idea of this approach is to compare the situation before and after matching and check if there remain any differences after conditioning on the propensity score. Thus, the matching procedure has to be checked if it is able to balance the distribution of the relevant variables in both the control and treatment group. Then, the T-test and the pseudo-R2 needs also to be cheeked.

Accordingly, a two-sample t-test was used to check if there are significant differences in covariate means for both groups. The pseudo-R2 test has also been conducted in order to check how well the regressors X explain the participation probability.

Thus, following the above stated propensity score matching rules and procedures, the expenditure per adult equivalent, household farm asset value increment; and main household livelihood (main income sources) were computed as an outcome variable.

3.7   Definition of variables and hypothesis on relationships

3.7.1   Dependent Variables of the Model

Food security refers to the sustained ability of all people to have physical and economic basic food consumption needs at all time (World Bank, 2010). Based on this concept Income or consumption can be used to measure this basic need deprivation. However, consumption rather than income is viewed as the preferred welfare indicator because consumption may better reflect households' ability to meet basic needs (MoFED, 2012). Thus, the dependent variable selected for the study is household income that will be computed in terms of adult equivalent consumption expenditure. Thus, this variable is believed to have strong association with food security status.

3.7.2   Explanatory variables of the model

Many factors have been hypothesized to affect income or expenditure per adult equivalent. Some researchers emphasized exogenous factors such as natural, economic and social factors. Thus, variables like: gender, family size, age of the farmer and literacy farm size and livestock holdings, credit utilization, extension coaching and business advisory services were taken and analyzed

3.7.2.1 Demographic and Farm related Explanatory variables

i. *Sex of household head (GENDER):* This is a dummy variable, which takes a value1 if the household is male, and 0 other wise. Gender differentials among farm households play a significant role in the economic performance of a given household.

ii. *Age of household head (AGE):* This was defined as the age at the time of interview measured in years completed. Through time, farmers are expected to acquire better experience on agricultural production, formal and informal financial management skills. In addition, older farmers may accumulate more wealth than younger ones. Therefore, this variable was hypothesized to have appositive impact on better adopting the BDS services and increase production.

iii. *Average family size (FAMSZE):* Family size is an independent variable included with a hypothesis that household consumption expenditure could be higher with larger family size. Similarly, an Adult Equivalent (ADUEQ), which is the converted form of family size, is hypothesized to have either positive (when low) or negative (when high) impact on household consumption.

iv. *Education level of household head (HHEDU):* This is a continuous variable, which is taken with a hypothesis that educated farmers are expected to have exposure to external environment; to be acquainted with agricultural technologies; too frequently meet DA advices; and get written business plan, etc. Therefore, an educated farmer would be expected to perform better.

v. *Farm size (FRMSZE):* It is independent variable included with a hypothesis of having positive relationship with agricultural production and thereby increases farmers' income.

vi. *Cropping System (CROPSYS):* The number of crop varieties, grown per unit of farm land has significant impact on income. Thus, the more crop diversity means the more risk minimization and increased production. In addition, it complements the household consumption and nutrition.

vii. *Total livestock holdings in TLU (LSHTLU):* This refers to the total number of domestic animals possessed by the household; and it is measured in tropical livestock unit (TLU).

Livestock is considered as wealth or capital which secures the household against crop failure; beyond other production; and transport uses.

3.7.2.2 Explanatory variables of business development services

This is a dummy variable takes a value 1 if the household accessed business development support services (BDS) and 0 otherwise. BDS includes all financial and non financial services provided to the HH at all level starting from advising the HH on viable IGAs and market opportunities. Though BDS are very wide, the program, on which this impact assessment is conducted, provides the following main provisions.

i. *Access to financial services (FSACS:* The continued access to loans has many implications for both legal lenders and as well as to CFI HHs. Due to the continued access to loans, HH can reduce dependence on other sources of borrowing (illegal money lenders) in exorbitant interest charge. Thus, availably of financial service providers around is hypothesized to have positive impact on agricultural production and household income.

ii. *Accesses to Loan and associated Loan management services (LNACS)*: Shortage of funds discourages the smooth operation and development of IGAs/MSEs. Thus, household that received credit had better chance to be non-poor. Credit can create capacity to purchase agricultural inputs and thus increase household income which helps to purchase food and non-food items during shocks and in normal time. Moreover, credit will help households to accumulate asset. However, even if there are credit facilities, some of the Producers/MSEs do not use the money for the intended purpose. They rather divert it for other unintended and non-productive expenditures. Consequently, the enterprises fail to return the money back to the lender in time. This can result in a loss of credibility to get repeated loans when needed most. In order to minimize the impact of shortage of working capital producers/MSEs should be able to: have a budget/plan on how to use credit funds most effectively and for the intended purpose; have to be able to save money on their own for future investment for their business. On top of this, the experience of producers/MSEs is confined only to local conditions; and they are not well aware of what is going on in other parts of the country. Most operators/MSEs do not know

whether they actually make profit or not. They express their success only by accentuating the changes.

iii. *Amount of loan (LNSZE):* Loan size used for production purpose has great impact on production and productivity of on farm and nonfarm businesses.

iv. *Frequency of loan (LNFRQ):* By availing repeated loan, CFI HHs can make investment to start new business and expansion of the existing business, which will improve the income and the living standard of the CFI HHs.

v. *Marketing Services (MARKTSER):* This aspect being very vital to overcome marketing problems, like: Lacks of information where the best market areas are located; inabilities to analyze their respective market; lack of skills to set competitive prices; inability to effectively promote products. The fact is, in most cases, market studies are not carried out before a venture is undertaken within the market. It is also believed that HHs receiving a bulk marketing services have better bargaining power and can attracts better price with a relatively low cost.

3.7.2.3 Explanatory variables of demand driven extension services

Demand Driven Extension Services generally aim at transferring specific knowledge to producers, advising producers on marketable and viable income generating businesses, the transfer of technology, the improvement of management practices or capacities. The provisions of these services take a wide range of forms that include:

i. *Business Advisory Services (BADS):* The business line of IGAs/MSE activities in Ethiopia is relatively similar. Most small businesses are constrained by lack of market orientations and product diversity; as a result similar products are over-crowding the market. Thus, a shift from one product to another captures better market opportunities. Thus, the support to IGA/MSEs promoters in developing viable and appropriate business plans to implement the investments, as well as advice on new technologies, improved production practices and credit management (if loans are used to finance the investments) have a positive attribute.

ii. *Access for input facilitation services (INPLINK):* Availability of inputs from appropriate suppliers would be seen as an opportunity for farmers and MSEs to overcome this working capital problem. There are also cases where suppliers consider

credit sales only for raw materials with inferior quality. In such cases MSEs should take care of using such poor quality raw materials, which could be directly reflected on the quality of finished products and prices. Thus, accessing quality input providers is vital for increasing HHs product and incomes.

iii. *Development Agent (DAVSIT):* Agricultural extension and business development services provided by agricultural and micro and small enterprise development and NGOs to farmers are mediated by DAs, promoters or technicians. The DAs play an important role in the introduction, dissemination and adoption of new technologies. Therefore, development agents close or frequent coaching has a great effect on building farmers capacity to keep the quality and quantity of product/service to acceptable standards positive value on product price and income.

iv. *Access to Demonstration Services (DEMOACS):* Demand creation service supports such as farmers field schools (FFS) and farmers training centers (FTCs) are thus the best ways to support producers in terms of demonstrating information, technology, advice, and empowerment. Thus, producers with better access to FFS and FTCs can perform better than those who do not have such access.

3.7.3 Outcome variables

As objectively verifiable outcome, the HABP demand driven and business development services are expected to achieve the following outcome targets:

- 90% of CFI HHs achieves a 50% average real value increase in productive assets.
- 90% of CFI HHs with sustainable income increase; and
- 75% of households' report a new source of income from non-farm activities.

Thus, the aim of this impact assessment study is therefore, to track whether these food security proxy indicator outcome variables have shown significant change and the food

security status of the households improved. Therefore, the basic food security proxy indicators such that: income (in terms of consumption expenditure per adult equivalent), farm asset values, and households' income sources diversification to off farm businesses have been selected to be assessed as outcome variables.

i   **Household Income/Expenditure per adult equivalent (EXPADUEQ)**. Income or consumption is traditionally used to measure material deprivation; especially consumption rather than income is viewed as the preferred welfare indicator because it better captures the long-run welfare level than current income. Moreover, in most developing countries, income report of households is likely to be understated compared to consumption expenditure report (MoFED, 2012).

But, consumption to be an indicator of households' welfare, it has to be adjusted for differences in the calorie requirement of different HH members (for age and gender of adult members). Therefore, expenditure per adult equivalent is measured by the amount of expenses that a HH spent on food and non food consumption requirements per year divided by that HHs adult equivalent size.

ii   **Household productive asset or Farm asset Value (FASSETV):** According to the HABP program implementation manual (HABP-PIM) definition, HH productive asset means a tangible thing which can be used in a productive way, either self-reproducing or to produce something of value. Examples of self-reproducing assets are animals and crops. Producing assets include: land, family labor and rental housing (MoARD 2010). However, for this study farm asset mean only self-reproducing productive assets and farm and nonfarm tools and machineries directly used as input to produce on farm and off/nonfarm products and services. This include: livestock, perennial crops (including wood and fruit trees), farm tools and farm and nonfarm machineries, water pumps, construction materials and land estimated in current prices.

iii **Household main livelihood (HHMLH):** As one of the objectively verifiable indicator of the HABP outcome stated that 75% of households expected to report a new source of income from off farm activities (MoARD, 2009). Thus, this variable is assumed will measure the proportion of HHs with diversified income sources.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1   Descriptive Analysis Results

Based on the descriptive analysis methodologies discussed above in section 3.4.1, both the quantitative and qualitative information collected on independent and dependent variables from the treatment and comparison groups were analyzed using SPSS and STATA12MP-1. Accordingly, the results are described using descriptive statistics such as mean, standard deviation, percentages and cross tabulations. The results of the outcome variables have also been assessed in terms of change in income and in family living condition. The change in income is measured in terms of change in average income generated from the income generating activities. The change in farm asset value was measured by counting the productive farm assets developed by program beneficiary HH after joining and accessing the program services. Its value is then estimated based on the current market prices.

A. Demographic characteristics of sample households

 In general, in descriptive analysis of this study it is observed that participant and non-participant households are almost similar in most of the HH basic characteristics and there is no significant difference between the two sample groups in basic variables i.e. variables that are assumed to be fixed over time. Table 1 below presents the   results of the test for the difference in means between participant and non-participant households over a set of control.

i. **Household head sex (GENDER):** The mean statistical distribution of the samples households are found to be composed of 78% men and 22% women headed households for comparison and 82% men and 18 % women headed households for treatment groups. The program was initially intended to address both male and female headed HHs at equal ratio(50% each).Thus in view of this target, the gender assessment result implies that in terms of the program service coverage, women headed households are less favored than male headed one and the share of women participation is only 18%.

However, this coverage seems significant when we compare it from global experiences point of view. International lessons indicated that extension services addresses only 2 to 10 % of the women (Swanson, Bentz, and Sofranko 1997). Thus, no significant result was obtained in terms of encouraging gender participation in the program.

ii. **The age structure (AGE):** The mean age structure of the sample households shows that, the average age of the treatment and comparison groups were found to be 45.4 and 44.3 years respectively. This suggests that there is no as such big age difference between households of both groups; and both groups have almost similar and adequate farming experiences.

Table1: T-test for equality of means between groups for HH characteristics

Variable	Control		Treated		t-value
	Mean	Std. Err.	Mean	Std. Err.	
Male headed household	0.78	0.04	0.82	0.05	0.64
Age of the household	44.63	10.00	45.37	9.82	0.64
Average family size	6.17	0.16	5.93	0.23	-0.83
Household head education	2.12	0.30	2.42	0.42	0.58

Source: Own calculation based on the survey data

iii. **Family size (FAMSZE):** The mean statistical distribution of the study result shows that no statistical difference between the treatment and control group households in terms of average family size. Thus, the mean family size is found to be 5.93 for the treatment samples and 6.16 for control groups respectively. This indicates that both respondent families have almost similar mean consumption expenditure.

iv. **Household head literacy (HHEDU):** The mean statistical distribution result of the sample households' education reported that about 43% of the program participant and 18% of non participant household heads are found to be literate (have got basic education). Among which 65% of the participant samples and 61% the non participant samples have completed primary education. Thus, this indicates that program participants have a better education background when compared with their counterfactual control groups. This in turn suggests that program participation is encouraged by the household education.

A. Farm characteristics of sample households

Generally, except for the HH livestock holding, no significant difference between the two groups as far as farm characteristics is concerned (for details refer table3 bellow).

i. **Farm Size (FRMSZE):** The household farm holding statistical distribution result of the study indicate that about 100% of the program participant and 95% of non participant samples found to have own farm holding. Respondents were also asked to express their feelings about whether or not their land holdings are sufficient enough to meet home consumption requirements and other needs. Accordingly, 100% of all sample respondents reported that the existing land holding did satisfy neither home consumption nor other needs.

ii. **Cropping System (CRPSYS):** The statistical analysis result of the HH farm holding shows that the mean holding size of the participant and the control HH samples are 0.44 and 0.40 ha respectively. But no significant difference is shown on the number of crops diversity grown per HH plot and it is found to be 2.32 crops for participant and 2.29 crops for non participant HH.

iii. **Livestock holding in TLU (LSHINTLU):** Livestock is the main important asset for about 94 (78.3%) total sample households. Accordingly, 93.3% of program participants (56HHs) and 63% of non participant (96HHs) were found to own livestock of different types and number. Number of HHs without livestock holdings is high for control (22HHs) and low for treatment groups (4 HHs).

Table 2: T-test for equality of means between groups for HH farm characteristics

Variable	Control		Treated		t-value
	Mean	Std. Err.	Mean	Std. Err.	
HH Farm size	0.40	0.02	0.44	0.03	1.3
Cropping diversity in number	2.29	0.11	2.32	0.24	0.11
HH livestock holding in TLU	1.00	0.08	1.43	0.14	2.64

Source: Own calculation based on the survey data

The statistical analysis result of the average livestock holding in TLU (Tropical livestock unit) is also found to be 1.43 and 1.01 for program participants and non

participants respectively. Thus, Livestock holdings are found to have significant effect on program participation.

B. Household Access to Demand Driven Extension Services

In line with this important variable, statistical analysis has checked whether the HH accessed demand driven extension support where farmers are expected to be advised on viable and market oriented production plans and production techniques; linked to appropriate financial services; inputs sources; and technology demonstrations. Accordingly, the study result indicated that, the mean difference for all variables, such as: accesses to intensive DA coaching on viable businesses, linking to agricultural technology and input sources are found to be significant (see table 3).

i.   **Access to Business Advisory Services (BADS):** The main objective of HABP from the onset was to transform CFI HHs traditional subsistence farming in to agribusiness through intensive coaching and advices on viable and market oriented businesses followed by linking them to sustainable rural finance and business development services, particularly improving rural entrepreneurs towards developing new business ventures and extend to new markets. Thus, in view of this the research survey was focused on assessing whether or not these CFI households have accessed such business advices and coaching on viable IGAs and whether HHs have converted those advices in to business plans and practices. Accordingly about 96 % 0f participant group respondents reported that they have accessed business advisory services and have engaged on operating viable IGAs.

ii. **Access to development agents close coaching (DAVISIT):** The descriptive statistical analysis result computed on the frequency the extension agents coaching visits shows that the average number of development agents coaching visits per month found to be 2.87 and 1.93 days for treatment and control groups respectively. Thus, this result suggests that treatment group receives more frequent coaching visit that exceeds the control groups coaching visit by 33 % (significant at 1%level).However, the increase in DAs coaching is believed to be resulted from the two way communication approach in that not only the DAs but also the HH have started visiting the business development service providers centers to access further

coaching for their business, financial services; and market value chain advices. Thus, these dynamics reflects that a shift from supply driven to demand driven extension services are being realized through HAB Program.

iii. **Adoption of new technologies and demonstrations (DEMOACS):** The descriptive analysis result of technology adoption shows that, 92% of the program participant and 30% of non program participant sample HHs have accessed technology demonstrations at FTCs. However, the rate adoption for new technologies and improved practices is insignificant for both groups as observed from their livelihood diversification analysis result. Thus, this suggests that, either the demonstration centers are not properly functioning or demonstrated technologies are not being replicated for various reasons.

Table 3: T-test for equality of means for demand driven extension services

Variable	Treated		Control		t-test
	Mean	Std. Err.	Mean	Std. Er.	
HH access to business advisory services	0.97	0.02	0.06	0.02	26.25 ***
HH access to Input linkage services	0.88	0.04	0.57	0.05	4.48***
HH access to technology Demonstrations	0.92	0.04	0.30	0.04	9.53***
DAs close coaching	2.86	2.04	0.82	0.14	5.65***

Source: Own calculation based on the survey data

C. Household Access to Business Development Services

The main objective of HABP from the onset is to transform CFI HHs traditional subsistence farming in to agribusiness through intensive coaching and advices on viable and market oriented businesses followed by linking them to sustainable rural finance and business development services, particularly improving rural entrepreneurs towards developing new business ventures and extend to new markets.

i. **Access to financial services (FSACS):** The program was initially intended to facilitate short and medium term loans to CFI HHs; through capacitating and involving locally available MFIs and Rural Saving and Credit Cooperatives (RuSACCos). However, Omo Micro Finance Institution is the only formal financial

service provider through which 55% the program participants access the credit and saving services. The remaining 45% program beneficiaries access their micro loan from informal sauces known as Village Economy and saving associations (VESA).

ii. **Loan access (LNACS)**: On average program participants found to have accessed an average loan birr 4273; and saved birr 179. Though, the loan size obtained from the VESA groups is generally very small, in terms of credit and saving service coverage they are by far better than the formal financial institutes and covers 80% of the program participant credit and saving and 13% of none participants HHs saving services.

iii. **Loan sources (LNSOR):** The descriptive analysis result indicates that no one from either of the sample groups reported to have accessed loan from Rural Saving and Credit Cooperatives (RuSACCos). Similarly, no one from control group reported a loan access from MFIs. This informs that, though the Program was initially intended to engage formal and semi formal multiple financial sources for CFI HHs business support, OMO MFI is found to be the sole formal financial service provider currently operating in the selected four sample Kebeles. According to the District Cooperative Office report, the main reason for weak involvement RuSACCos is due to limited capacity to manage such huge loan and saving services due to less organizational support from the government line department

Table 4: T-test for equality of means for business development services

Variable	Control		Treated		t-value
	Mean	Std. Er.	Mean	Std. Er.	
HH accessed financial institute in close distance (%)	0.76	0.04	1.00	0.00	4.35***
%age of HH accessed loans	0.13	0.03	1.00	0.00	19.64***
Loan uptake frequency per HH	0.13	0.03	1.75	0.16	13.43***
No of HH Loan sources	0.50	0.05	1.37	0.06	11.03***
HH loan size in birr	129.17	31.59	4272.67	531.02	10.99***
%age HHs accessing marketing services	0.50	0.07	0.16	0.03	5.18***

Source: Own calculation based on the survey data.

Furthermore, the regional government is working in favor of OMO MFI than strengthening RuSSACCos which was thought to be the most accessible and non bureaucratic grassroots level financial service provider for CFI households.

iv. **Access to marketing services (MARKTSER):** Statistical analysis result related to marketing services indicates that 50 % of the program participant and 16% of the non participant HHs reported to have accessed marketing services that include product and labor market linkages and market price information both for their input output marketing. However, though the rates of market information usage are high for participant HH relatively to none program participant HHs, it still represents a poor performance in the program objective context (75% of HABP clients are expected to have increased access to market and market information).

D. Descriptive Analyses Results of Outcome Variables

i. **Total Annual Income (TINCOM):** The result of this study supports the first hypothesis of this research that predicts the mean annual income of the program beneficiary HH is significantly greater than the mean annual income of the non program participant HH. Accordingly, annual income for program participant and non participant HHs it is found to be birr 15496 and 12600 respectively. Thus, the program participant HHs receiving technical and financial services experienced an estimated 19% income increase over non program participant HHs. This implies that the program has positive impact on the probability of being food secure. The possible explanation is that, households who earn business advices, credit and other business development services have helped CFI HHs to manage their IGAs to be more profitable and had very high chance of securing access to food than those who had not. In other words, larger annual income per AE may also affect the probability of being food secure by providing the source of cash flow to buffer the risk associated with crop failure due to bad weather condition.

ii. **Expenditure per Adult Equivalent (EXPADUEQ):** According to the descriptive analysis result this study, a mean annual income is found to be birr 3551 and 2849 for program participant and non participant HHs respectively.

Table 5: T-test for equality of means between groups for main outcome variables

Variable	Treated	Controls	S.E.	T-stat
Annual HH Expenditure/Income	15496	12600	530.68	5.46***
HH Expenditure per adult equivalent	3551.4	2849.3	0.049	7.5
Household productive asset value	15411	8118	0.54	3.17***
HHs with multiple livelihood sources	0.29	0.30	0.072	0.23

Source: Own calculation based on the survey data

Thus, this result shows that, though not to the expected level, significant income/expenditure increase per adult equivalent is recorded (achieved 83% of the program plan). However in terms of coverage, HHs attaining the poverty line covers only 45% of the program participants out of the expected 90% households.

iii. **Household Farm Asset Value (FASETV):** According to HABP implementation manual definition productive assets are a tangible thing which can be used in a productive way, either for self-reproducing or to produce something of value. Thus, for this study, farm asset means, a productive farm assets that include: self-reproducing assets (i.e. livestock, perennial fruit and wood trees), farm tools; and farm machineries like water pumps. Therefore, the estimated value of the stated productive assets is taken as proxy indicators to track HHs food security status.

Accordingly, the descriptive analysis result reported that program participant and non participant sample HHs are found to have accumulated a productive asset with an estimated mean value birr 15411 and 8118 respectively. Thus, this significant difference in asset value between the two groups implies that, the program is on the right track in achieving its main objective in terms of building productive asset and enhancing HH food security.

iv. **Household with multiple livelihoods (HHLH):** One of the main program objectives is to diversify income sources of the program participant HHs. Thus, the descriptive analysis conducted in line with this objective shows that only 29 % of the program participant sample HHs have diversified their income source to off/nonfarm business and majority (71%) of the program participant HHs still generate their main income

from the usual on farm activities. While 33% of non participant HHs are reported to have diversified their main income from off farm income sources.

4.2 Empirical Analysis Results

In the descriptive analysis part of this paper we have seen that program participant households performed much better in most of the outcome variables than non program participants. However, empirical analyses of household outcome variables presented in revealed that there are also substantial differences in the underlying outcome variables between program participant and non-participant households.

Both the multivariate regression and Propensity Score Matching (PSM) analysis methods were used to analyze the intermediate impacts of the program provisions on outcome indicators including increased access on BDS and DDE services; key food security proxy outcome variable indicators, mainly on household income/expenditure per adult equivalent; and productive asset values. In addition the level of HH livelihoods diversification for both the treatment and control sample groups has also been assed using both methods.

4.2.1. Estimating average treatment effect on the treated variables

According to Lahai, et al., (2000), the simplest way to carry out estimation of treatment effects (teffect) is to use the basic syntax of the t-effects command used for propensity score matching for two main reasons. Firstly, psmatch2 by default reports the average treatment effect on the treated (which it refers to as ATT). Secondly, psmatch2 by default uses a probit model for the probability of treatment. Thus, based on the above directions the average treatment effect on the treated (ATT) was computed both for covariates and outcome variables using the STATA12 software. The results of the ATT estimate after controlling for observable confounding factors are presented in Table 6 and 7 below.

A. Access to Demand Driven Extension Services

Generally, the ATT analysis results reported on areas of DDDES intervention indicated that only accesses to intensive DA coaching and business advisory services

41

are found to have a significant impact on HH income and food security (at 1% significance level). However access to agricultural technologies demonstrations and improved inputs linkage services; which were reported to be significant under descriptive analysis results are now found to be insignificant (refer table 6 for detail).

i. **Access to Business Advisory Services (BADS):** The main objective of HABP from the onset was to transform CFI HHs traditional subsistence farming in to agribusiness through intensive coaching and advices on viable and market   oriented businesses followed by linking them to sustainable rural finance and business development services, particularly improving rural entrepreneurs towards developing new business ventures and extend to new markets. Thus, in view of this the research was focused on assessing whether or not these CFI households have accessed such business advices and coaching on viable IGAs and whether HHs have converted those advices in to business plans and practices.

Accordingly about 96 % 0f participant group respondents reported that they have access to business advisory services and have prepared business plan on viable IGAs.

ii. **Access to development agents close coaching (DAVISIT):** The empirical analysis result of the ATT on the frequency the extension agents coaching shows significant impact at 1% significance level. However, the increase in DAs coaching is believed to be resulted from the two way communication approach in that not only the DAs but also the HH have started visiting the business development service providers centers to access further coaching for their business, financial services; and market value chain advices. Thus, these dynamics reflects that a shift from supply driven to demand driven extension services are being realized through HAB Program.

Table 6: Estimated ATT for variables of demand driven extension services

Variable	Treated	Controls	Difference	S.E.	T-stat
HH access to Business Advisory	0.96	0.01	0.96	0.05	17.56***
HH access to Development Agent close follow-up	2.86	2.10	0.76	0.15	5.17***
HH access to Input Linkage Services	0.88	0.85	0.03	0.11	0.25
HH access to Demonstration	0.91	0.92	-0.01	0.10	-0.05

Source: Own calculation based on the survey data

iii. **Adoption of new technologies and demonstrations:** The empirical analysis result of the ATT on variable of technology adoption indicates insignificant impact for both groups. The most likely reasons for this outcome is expected to be either the technology demonstration centers are not properly functioning or demonstrated technologies are not replicable for various reasons; including affordability and accessibility related problems of the demonstrated technologies for CFI HHs.

iv. **Access to Input Linkage Services (INPTLINK):** The empirical analysis result of the ATT on variable of access to input facilitation services is also found to be insignificant. The most likely reason for insignificant result of this outcome is expected to be due to government dominant role in supplying most of the commonly used farm inputs like seeds and fertilizers and these inputs are equally served for both groups regardless of their program participation. As a result the role of private sector on input supply business is not well attracted by the existing input market practices in the study area.

B. Access to Business Development Services

The empirical analysis result of the ATT for all BDS variables is generally found to be significant. However, as evidenced from the table 7 bellow, the significance level of each BDS variables varies widely.

Generally, 100% of the program participants and 93% of the non program participants were found to have close access to financial service providers in a close distances. Thus, 100% of the programs participant and only 26% of the non program participant sample HHs are found to have loan access from this financial institute. The reason for low loan uptake performance of the control group is resulted from the variation in accessing the financial services mainly the financial literacy intervention of the program. Omo Micro Finance is the only formal financial service provider through which 55% the program participants access the credit and saving services.

The remaining 45% program beneficiaries access their micro loan from informal sources known as Village Economy and saving associations (VESA). The main reason for Omo MFI to be a sole formal service provider in the study area is

Table7: Estimated ATT for variables of business development services

Variables	Treated	Controls	Difference	S.E.	T-stat
HH access to financial service providers in close distance	1	0.93	0.07	0.09	2.06**
HH accessed financial services	1	0.26	0.74	0.07	10.74***
Loan uptake frequency per HH	1.72	0.26	1.46	0.18	8.32***
HH with a multiple loan sources access	1.35	0.81	0.54	0.12	4.48***
loan size accessed by HH (birr)	3857.	255.36	3601.83	407.11	8.85***
Access to marketing services	0.473	0.454	0.019	0.100	0.19

Source: Own calculation based on the survey data

due to limitations in capacitating and involving grass root community level financial service providers like Rural Saving and Credit Cooperatives (RuSACCos). The ATT analysis result shows that on average program participants found to have accessed an average loan birr 3857. Though, the loan size obtained from the VESA groups is generally very small (birr 255), they perform better as far as the household credit and saving services coverage is concerned.

The ATT analysis result related to marketing services are also found to be insignificant. The reasons for the low significance of the marketing services is due to lack of strong marketing actors at grass root level at the one hand and both the program participants and non participant HHs commodities are mainly livestock's that usually produced and marketed mostly for holyday markets at equal market opportunities and prices.

However, though the rate of market information usage is relatively higher for program participant HH compared to non program participants, in view of achieving the program target set in line with this outcome, (75% of HABP clients to have an increased access to marketing services) the program performance is very low.

C. Empirical Analyses Results for Outcome Variables:

Both the multivariate regression and Propensity Score Matching (PSM) analysis methods were used to analyze the impacts of the program provisions on key food security proxy indicator outcome variables, mainly on household income/expenditure per adult equivalent, productive asset values, and level of livelihoods diversification for both the

treatment and control sample groups. Accordingly, results found under the multivariate regression have shown significant AE income/expenditure increase (83% of the expected 50% increase). However, number of HHs meeting the mean annual poverty line income level covers only 31% of the expected 90% of the program participant HHs.

D. Propensity score matching results for main outcome variables:

The average treatment effect on treated (ATT) estimated results indicate a significant difference between the two sample groups both in terms of HH income (total income/adult equivalent expenditure) and HHs asset value at 1% significant level. Accordingly, the mean value of adult equivalent consumption expenditure is birr 3539 for treated and birr 2519 for non treated HHs groups. Hence, according to MoFED Ethiopian Poverty level category report (2012) the program beneficiaries who meet an average annual adult equivalent income/consumption expenditure birr 3519 have almost meet the national absolute poverty line birr 3781 set for adult equivalent of Ethiopian rural poor requirement by 93.5% (a little below the poverty line by 6.5 %).

While the mean incomes of the control groups are below the poverty line by 35.5 %. This suggests that program participant households are in a better status to attain their food security shortly than the non program participants.

Table 8: Estimated ATT for main outcome variables

Variable	Treat.	Cont.	Diff.	S.E.	T-stat
HH annual mean income(birr)	15541	13753	1788	834	2.14**
Annual Expenditure per AE(birr)	3539	2553	986	200	4.93***
HH asset values(birr)	15412	8681	6730	2567	2.62***
HHs diversified their income sources to off farm(%age)	0.28	0.35	14.1	0.11	0.74

Source: Own calculation based on the survey data

Similarly, the ATT results of the HH asset value indicated a mean productive asset value estimate of birr 15411 for treated and birr 8118 for control group respectively.

Table 9: Total Absolute and food poverty line in Birr (average price)

No	Description	Estimated value for 2012
1	Kilo calorie per adult per day (Kcal)	2200
2	Food poverty line per adult per year (Birr)	1,985
3	Total poverty line per adult per year (Birr)	3781

Source: Ethiopian poverty status progress report (MoFED, 2012)

4.2.2 Multivariate regression results of main outcome variables

Generally, the multivariate regression results reported on areas of DDES intervention have also indicated similar result to that of the ATT result in that except to access to agricultural technologies demonstrations services; which is reported to have insignificant impact, most other DDES variables i.e.

Access to business advisory, accesses to intensive DAs coaching and access to input linkage services are found to have a significant impact on HH income and food security (at 1% significance level).

Table 10: Multivariate regression result on impact of demand driven extension on household income

Variables	Coef.	Std. Err.	t-value
Access to Business Advisory Services	1521.392	674.6866	2.25***
Access to intensive DAs coaching	721.4204	458.5135	1.57
Access to Input linkage services	2515.597	910.7351	2.76***
Access to technology demonstration	419.9561	870.4356	0.48
_cons	9656.01	892.95	10.81

Source: Own calculation based on the survey data

However, the regression analysis result reveals that only DAs coaching and input linkage services of the DDES variables are found to have significant impact on HH farm asset value increase at 1 and 10% significance level (refer table 11).

Table 11: Multivariate regression result on impact of demand driven extension services on household asset.

Farm Asset Value increase	Coef.	Std. Err.	t-value
Access to Business Advisory Services	1438.522	1534.788	0.94
Access to intensive DAs coaching	3478.744	1043.034	3.34***
Access to Input linkage services	3744.337	2071.755	1.81*
Access to technology demonstration	-533.645	1980.081	-0.27
_cons	-558.252	2031.297	-0.27

Source: Own calculation based on the survey data

The empirical analysis result of most business development services variables such that: access to multiple loan sources, loan size and access to Marketing services are generally show significant impact on incomes of program beneficiaries. However, as evidenced from the table13 bellow, BDS variables like HH access to financial services and loan uptake frequency per HH have not shown significant impact on HH income but these variables are found to have significant impact on HH asset value increment.

On the other hand, the multivariate regression analysis result of all business development services variables including access to marketing services are found to have significant impact on increasing the asset values of the program beneficiaries.

Table 12: Multivariate regression result on impact of business development services on household income.

Variables	Coef.	Std. Err.	t-value
HH access to financial services	602.39	712.78	0.85
Loan uptake frequency per HH	97.66	415.01	0.24
Access to multiple loan sources	2820.17	578.40	4.88***
loan size accessed by HH (birr)	-0.15	0.12	-1.26
Access to Marketing services	1216.95	559.19	2.18**
_cons	10708.66	545.42	19.63

Source: Own calculation based on the survey data

However, level of significance varies from variable to variable and it is very high for access to multiple loan sources and less significant for loan size variable as evidenced from the table 13 bellow.

Table 13: Multivariate regression result on impact of business development services on household asset value increase

Variables	Coef.	Std. Err.	t-value
HH access to financial services	2654.368	1860.562	1.43
Loan uptake frequency per HH	-1622.818	1067.773	-1.52
Access to multiple loan sources	4644.193	1488.15	3.12***
loan size accessed by HH (birr)	0.394	0.306	1.29
Access to Marketing services	2598.905	1438.731	1.81*
_cons	3247.371	1403.283	2.31

Source: Own calculation based on the survey data

4.3   Discussion

Improving CFI households' livelihoods in the long-term involves not only providing access to food and agricultural inputs, but also creating greater access to productive assets of both on and off/nonfarm livelihoods and business development support services such as financial and non financial inputs including business advisory, market information , technology demonstration and skill development services which are very crucial. Increasing access to these productive resources is considered to be very important for increasing productivity of subsistence farming (World Bank, 2010).

The descriptive and empirical analysis results of this particular study conducted especially on areas of the predicted or hypothesized program impact on households' income/CEE and asset are generally found to be positive and highly significant statistically. Both outcomes were significant at less than 1 percent level of significance. Previously conducted similar empirical works done in Ethiopia on areas of business development services impact on PSNP beneficiary HHs income and poverty by Ayalneh Bogale (2012) indicated that: the effect of providing credit for all non-credit users equivalent to the average amount to users (as case-1) and doubling the amount of credit initially provided only for credit users (as case-2) were analyzed in simulation.

Accordingly, the simulation for case-1 has shown an impact of increasing mean consumption per AE by 0.5% while simulation results of case-2 increases by 1.0%. In the mean time, the poverty measures, poverty head count declined by 12% in simulation case-1 and by 16% in simulation case-2. This result is similar to the study finding of this study in that HABP clients who accessed a multiple loan services are found to have a 12% income increase than clients with a single loan access.

The same Empirical work has also assessed the effect of increasing agricultural income by 20% for all households on mean consumption and poverty. Results of this study depicted that the impact was very small in that, this change can only increase consumption per AE by 0.1% and had reduced poverty head count by only 2%. This implies that part of the income is invested on HH asset building.

However, the finding of this study has reported that an income increase by 12% has increased consumption per AE by 18% and reduced poverty head count by 31%.

Ayalneh (2012) has also simulated the impacts of increasing farm assets by considering the live stock asset increases in two ways: increase in livestock holding by one TLU and increase in livestock holding by two TLU for all households respectively. These simulations resulted in a rise of household consumption per AE by 0.6 and 1.1%, for one and two TLU increases respectively and the headcount poverty declined by 8% for one TLU increases and by 16% for two TLU increases respectively.

Similarly findings of this research indicated that participation in PSNP and HABP increased growth in livestock holdings by 0.43 Tropical Livestock Units (TLU) over comparable households. The empirical analysis result has also indicated that the effect of increasing agricultural income by 20% can only increase consumption per AE by 0.1% and had reduced poverty head count by only 2% respectively.

Similar empirical analysis conducted in Nicaragua (IFAD, 2012) on areas of assessing the impact of Rural Business Development Services (technical and financial assistance activities) on HH farm income reported an estimated 15 percent increase in targeted farm income over the baseline level(using traditional analysis methods,), but using a more innovative methodology that compares farmers with a shorter duration of exposure to treatment to farmers with longer exposure, the evaluator found that farmers with longer exposure experienced a 30 percent increase over their baseline level in targeted farm income, with a $2,000 increase in mobile capital and a $1,300 increase in fixed capital.

IFPRI (2004) has also investigated the effect of farmers' field schools (FFS) demonstrations on production and incomes of farmers in East Africa, and the result show that FFS participants had significant differences in outcomes with respect to value of crops produced per acre, livestock value gain per capita, and agricultural income per capita. Farmers' field demonstrations had a greater impact on crop productivity for those in the middle land area (areas with land poverty). Participation in farmers' field demonstrations increased income on average by 61 percent when pooling the three countries.

The IFPRI empirical PSNP impact analysis result report (2014) has also indicated that the PSNP beneficiary HHs who received the HABP services (demand driven extension

and BDS services) have increased their average food secured months by 1.53 months while PSNP HHs who did not access the HABP services increased their food secured months only by 0.4 months.

Similarly, findings of this research on areas of assessing the impact of DDES and BDS on HHs food security indicate that program participants are found to have additional 3.1 food secured months than the control group. Accordingly, the average annual food secured months for program participant and non participant HHs are found to be 11.2 and 8.1 months respectively. In the mean time the ATT result of this study indicate that 71% of the program participants' agricultural income and AE consumption expenditure /CEE have increased by 12% and 28% respectively. The effect of this HH income increase by 12% in turn has reduced poverty head count by 31%. In line with farmers' demonstrations impact on household income previous study conducted in Kenia and Uganda indicate generally shows that the farmers field school (FFS) or demonstration are found to have insignificant impact on the agricultural income of small holder households (farming the smallest land areas) while households who have middle land holding size showed a significant increase in agricultural income for all countries, Kenya (155 percent), and Uganda (79 percent).

Similarly, findings of this research reported that farmers' demonstrations have insignificant impact on household income increase for both groups. This result suggests that when poverty is measured using land area, the farmers' field demonstration approach had a limited impact on the land poor farmers.

Thus, in view of the previous empirical study results and experiences, the findings of this study can generally be concluded in that: access to business development and demand driven extension services have resulted a significant improvement on the livelihoods of most program beneficiary households through income increase, improving food insecurity status and in reducing poverty head count.

However, the results obtained on areas assessing the program impact on HHs livelihood or income sources diversification is generally found to be insignificant as clearly indicated from either of the study method results. According to the PSM-ATT analysis

result of this study, 72% of the program participants HHs are found to have engaged on farm business as their main income source; and only 28% of the CFI HHs are reported to have diversified their income sources to off/nonfarm business. On the contrary, 33%; the control groups are found operating off farm business as their main income sources by non program participant CFI HHs.

Thus, when this outcome or result is seen from the overall program target that expects 75% of CFI households to report a new source of income from off farm/non-farm activities, the program impact appears to be insignificant and stands against the earlier predicted program hypothesis and expectations.

In line with this lively hood diversification aspect, previous study from other countries, it was found that off-farm income is important for the vast majority of the households: almost 90% of the sampled households have at least some off-farm income and on average it accounts for about 50% of total household income (Babatunde, R.O., 2009).

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1   Summary and Conclusion

The main research question of the study was what would have been the income   and assets value outcomes of participating households if the intervention had not been in place. Thus, non-participant households without the program were constructed to be used as the control group for this reason.

Taking into account the agro-ecological criteria, assumed difference in terms of distance to minimize spill-over effect and accessibility of the kebeles, target and non- target kebels within the pilot district were identified for the study. A sample size of 60 program participant and 120 non-program participant households having nearly similar basic farm and socioeconomic characteristics were purposively selected using the techniques of   probability proportionate to sample size. Accordingly, the primary data for the study   was, thus, collected from a total of 180 farm households coming from the same pilot district using the same instruments.

The propensity score matching and multivariate regression techniques were found to be the most suitable estimators for the data at hand. Especially PSM technique is capable of extracting a comparable pair of participant and nonparticipant households in a non-random program setup and absence of baseline data.

According to the PSM and multivariate regression analysis results of the study report, there are clear signs that the program has had significant impacts on the treated households. The increased household income corresponding to the program design is one of the positive outcomes of the program. The response of treated households in terms of

farm asset accumulation is also crucial and an important finding. Though the overall program objective was aiming at uplifting non agricultural income sources, the results of the study found to be insignificant and the pre program trend is still unchanged,

suggesting that on-farm incomes are stile the dominant income sources.

The question is then: why didn't the program lead to better results in terms of diversifying income sources? There is much room for speculation, but the following answers can be sketched from the overall study analysis and focus group discussions point of views.

According to the qualitative and quantitative analysis findings of the study the main structural obstacles hampering HHs income sources diversification are: lack of sufficient institutional and business development service supports at grass root level to off farm business; poor access to demand creation services; lack of proper demonstrations for new viable business; and lack of integrated value chain and marketing.

One of the possible root causes for the limited impact of HABP on livelihood diversification is the mismatch between agriculture prioritized government policy and the land poor nature of the program beneficiaries. The Government of Ethiopia has laid down Growth and Transformation Plan (GTP) to transform the country by 2025 in to middle income country and has set goals of increased food production, as well as improving the country's food security status.

The strategic direction set to achieve this master plan is however mainly geared towards working closely with large-scale or better-off farmers living in agricultural potential areas. HABP on the contrary targeted the poor, small landholder and vulnerable households. Thus, with such beneficiaries, it is arguably understandable that returns from agricultural business are low, since the beneficiaries are generally less endowed.

On the other hand, in the context of publicly or privately provided business development services, these CFI households have limited technical advisory and credit access for off-farm business mainly due to lack of off-farm focused institutional and business development support services at grass root level.

Moreover beyond the lack of proper institutional and business development support services at a grass root level, the potential for off-site learning and skill development

support for non agricultural business is limited due to the high capital and other resource requirements of the off-site nonfarm business skill trainings. Another root cause hampering income sources diversification is also slow adoption of new businesses and

technological packages resulted from lack of proper demonstrations for new business. Generally, the demand creation aspects of the program intervention have not been effective as evidenced from insignificant results of the ATT and multivariate regressions.

Similarly, previous study conducted by IFPRI (2010) on the effect of farmers field schools (FFS) on production and income of farmers in East Africa show field demonstrations had a greater impact on crop productivity for non land poor households. For households with better land holding, participation in farmers' field demonstrations are reported to have increased income on average by 61 percent when pooling the three countries.

However, as evidenced from the results of ATT on Table 6 and 7, the impact of the demand driven extension and business development services are found to be insignificant for input facilitation, technology demonstration and marketing services.

5.2   Policy Implications

The overall objective of the government led demand driven and business development services were to achieve the three basic objectively verifiable indicators that include: 90% of CFI HHs develop new sources of income, achieve a 50% increase in the average real value of productive assets and 75% of households secure a new source of income from non-farm activities.

Thus, in view of achieving those objectively verifiable indicator outcomes, the overall contribution of program interventions seem patchy. Regarding the broader outcome indicators of HH income and asset increase, it is found that direct participation is generally positively associated with an improving situation and negatively associated with worsening the food insecurity situations. However, the result gained on areas of achieving a new source of income from off farm businesses and diversifying income sources are generally found to be insignificant.

Thus, from a policy perspective, the study findings such that: the domination of on farm income and the limited impact of farm demonstrations on agricultural income of the land poor farmers suggests that, the rural development policies aimed at poverty reduction

interventions should give equal policy and implementation level focus for both the farm and the off-farm sectors. It is also vital, for land poor farmers the demonstration approaches should focus on new and improved off farm technologies and practices.

Similarly, it is also interesting to investigate through further research with sufficient sample size to explore the relative income contribution off farm and on farm businesses for land poor farmers, so as to help the policy makers give equal focus to off farm businesses as the current intervention did not capture these due to lack of supportive data on areas of rural off farm economy.

Finally, it is vital and worthy for policy makers to revisit existing urban focused Micro and Small Enterprises institutional arrangements and extend institutional business development support services for rural off farm enterprises, to further enhance households' access to off farm and new farm business incomes, hence arable land is a scarce and highly degraded resource in chronically food in secure areas.

REFERENCES

Ayalneh Bogale .2003. Impact of Productive Safety Net Financed Livestock Credit on Food Security and Poverty Status of Rural Households in Ethiopia: A Simulation Approach. Paper presented at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguaçu, Brazil, 18-24 August, 2012.

Babatunde, R.O.2009.Patterns of Income Diversification in Rural Nigeria: Determinants and Impacts. Quarterly Journal of International Agriculture, 48(4): 305-320.

Belay Kassa.2004.Data Collection and Analysis Techniques: Research Report Writing Guideline, Harromaya University, Ethiopia.

Bereket Zerai.2011.Effect of Non-farm Income on Household Food Security in Eastern Tigrai, Ethiopia: An Entitlement Approach ISSN 2224-6088 (Paper) Ethiopia: An Entitlement Approach.ISSN2224-6088(Paper) ISSN 2225-0557 (Online)Vol 1,2011.www.iiste.org, Accessed April 10, 2014.

Braun, A., J. Jiggins, N. Röling, H. van den Berg, and P. Snijders. 2006. A global survey and review of farmer field school experiences. Nairobi: International Livestock Research Institute.

Braun and Olofinbiyi .2007. Famine and Food Insecurity in Ethiopia. Cornell University, Ithaca, New York.

Bryson, A., Dorsett, R. and Purdon, S.2002. "The use of propensity score matching in the evaluation of labour market policies" Working Paper No.4, Department for Work and Pensions.

Caliendo,M.,&Kopeinig,S.2005.Some practical guidance for the implementing of propensity score matching. IZA Discussion Papers No. 1588.

CSA(Central Statistical Agency of Ethiopia).2007. Household Income, Consumption and Expenditure (HICE) survey 2004/05 Analytical report. Volume I, Statistical Bulletin 394. Addis Ababa.

Davis, B., Winters, P., Carletto, G., Covarrubias, K., Quinones, E., Zezza, A., Stamoulis, K., Bonomi, G. and Digiuseppe, S. (2007). Rural income Generating Activities: Cross Country comparison. ESA Working Paper No. 07-16, Agricultural Development Economics Division, FAO, Rome, Italy.

Deschamps-Laporte, J.P. 2013. The impact of extension services on farming households in Western Kenya: A propensity score approach" Economics Department, Örebro Business School, Örebro University, Örebro.

Ehui, S., S. Benin, T. Williams and S. Meijer, .2002. Food Security in Sub-Saharan Africa to 2020.Socio-economic and Policy Research Working Paper 49. ILRI. Nairobi, Keniya.

Fisher, T. and Sriram, M.S .2002. Micro-Credit: Putting Development Back into Micro Finance. Vistaar Publications. New Delhi.

Swanson, B. E., R. P. Bentz, and A. J. Sofranko, eds. 1997 Geofrey Okoboi, Annette Kuteesa and Mildred Barungi .2013. Impacts of the National Agricultural Advisory Services Program on Household Production and Welfare in Uganda. Africa Growth initiative Working Paper 7. Uganda, Kampala.

Getaneh, G. 2004. Microfinance Development: Can Impact on Poverty and Food In-Security be improved upon?; A paper presented for the International Conference on Microfinance Development in Ethiopia, 21-23 January, Bahir Dar, Ethiopia.

Getaneh Gobezie . 2001. Some Challenges of Micro-finance as an Anti-Poverty Strategy; A paper presented to the International Workshop on Dimensions of Microfinance Institutions in Sub-Saharan Africa: Relevance of International Experience,7-8July 2001. Mekelle University.

Getaneh Gobezie.2007.Impact Assessment of Microfinance in Amhara Region, Northern Ethiopia.,Submitted to International Conference on Rural Finance Research: Moving Results into Policies, FAO Headquarters, and Rome Italy.

GFDRE (Government of the Federal Democratic Republic of Ethiopia). 2009a. Food Security Program, 2010-2014. Ministry of Agriculture and Rural Development. Addis Ababa.

GFDRE (Government of the Federal Democratic Republic of Ethiopia). 2009b. Household Asset Building Program, 2010-2014. Ministryof Agriculture and Rural Development, Addis Ababa.

Gilligan, D.et al.2007. Ethiopia Food Security Program: Report on 2006 Base line Survey. International Food Policy Research Institute. Washington, D.C.

Gilligan,D.,et al.2009a.Ethiopia Food Security Program: Report on 2008 Survey. International Food Policy Research Institute. Washington D.C.

Gertler et al.2011.Impact Evaluation in Practice, an interactive textbook at http://www. world bank.org/pdt. Accessed February,2014. Washington D.C.

Haggblade, S., Hazell, P. and Reardon, T. 2010. The Rural Non-farm Economy: Prospects for Growth and Poverty Reduction. World Development, 38(10): 1429- 1441

Heckman, J., & Navarro-Lozano,S.2004.Using Matching, Instrumental Variables, and Control Functions to Estimate Economic Choice Models. The Review of Economics and S tatistics, 30-57.

IFAD. (2012). Measuring Results of the Nicaragua Rural Business Development Services and Technical and Financial Assistance Activities | October 23, 2012. Moldova.

IFPRI.2011. Evaluation of Ethiopia's Food Security Program: Documenting Progress in the Implementation of the Productive Safety Nets Program and Household Asset Building Program. Washington DC.

IFPRI (International Food Policy Research Institute). 2010. Impact of Farmer Field Schools on Agricultural Productivity and Poverty in East Africa: Discussion Paper 00992 Washington DC.

IFPRI.2014. Evaluation of Ethiopia's Food Security Program: Documenting Progress in the Implementation of the Productive Safety Nets Program and Household Asset Building Program. Washington DC.

Jean Philippe and Deschamps Laporte .2013.The Impact of Extension Services on Farming Households in Kenya .A Propensity Score Approach. Nairobi.

Kifle, Tesfamariam.2012.European Journal of Business and Management. www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol 4, No.3, 2012

Lahai, B., P. Goldey, and G. E. Jones. 2000. "The Gender of the Extension Agent and Farmers' Access to and Participation in Agricultural Extension in Nigeria." Journal of Agricultural Education and Extension 6 (4): 223–233.

Leuven, E., and B. Sianesi .2003. "PSMATCH2: Stata Module to Perform Propensity Score Matching, Common Support Graphing, and Covariate ImbalanceTesting." Accessed February 2014. http://ideas.repec.org/c/boc/ bocode /s432001. Html

Lowell Hargens.2008.Product Variable Models of Interaction Effects and Causal Mechanisms. Center for Statistics and the Social Sciences.Working Paper no. 67R. University of Washington.

Maxwell,S.andT.Frankenberger.1992Household Food Security: Concepts, Indicators and Measurements: A Technical Review. New York and Rome.

Meehan F.2001,"Usage and Impact of Micro Credit Provision: A case Study Based on the Credit Operations of Dedebit Credit and Saving Institution (DECSI),Tigray Ethiopia, "A Paper Presented at the International Workshop on Dimensions of Microfinance Institutions in Sub Saharan Africa: Mekelle University, Mekelle.

MoARD (Ministry of Agriculture and Rural Development). 2009. Food Security Program 2010 to 2014, Addis Ababa, Ethiopia

MoARD (Ministryof Agriculture and Rural Development).2013.Food Security Program Midterm review for 2010-2012, Addis Ababa, Ethiopia

Omoto,W.,2003.Impact assessment of urban agriculture research and development in Nairobi, Kenya.

Rosenbaum, P. R., & Rubin, D.B.1984.Reducing bias in observational studies using sub classification on the propensity score. Journal of the American Statistical Association 79 (387), 516-524

Patrick Premand.2013. Impact Evaluation for Safety Nets Methods and Applications: Safety Nets Course, December 2013.World Bank, Washington DC.

Paul J. Gertler, Sebastian Martinez, Patrick Premand, Laura B. Rawlings, Christel M. J. Vermeersch. 2011. "Impact Evaluation in Practice: The International Bank for Reconstruction and Development, World Bank, Washington, DC.

Siyoum, A.D., Hilhorst, D. and Pankhurst, A .2012. The differential impact of Microcredit on rural livelihoods: Case study from Ethiopia, International Journal of Development and Sustainability, Vol. 1 No. 3 (In Press)

Storck, H., Berhanu Adenew, Bezabih Emana, R. Begander and Getu Hailu. 1997. Management strategies for Farming Systems in an Uncertain Environment and Approaches for their Improvement. Farming Systems and Resource Economics in Tropics, vol.27,Wissenschaftsverag Vau Kiel KG, Germany.

Swanson, B.E.,R.P.Bentz, and A. J. Sofranko, eds.1997.Improving Agricultural Extension: Reference Manual. Rome: Food and Agriculture Organization of the United Nations.

Woldenhanna T.2000.Economic analysis and policy implications of farm and off farm employment: a case study in the Tigray Region of Northern Ethiopia. Ph.D. thesis, Agricultural Economics and Rural Policy Group, Wageningen University, Holland. 277p.

Wolday Amha.2001.Development of Micro finance Industry in Ethiopia: Performance, Problems and Prospects, A paper presented at the 11th Annual Conference of the Ethiopian Economy, 2-4 November, Adama, Ethiopia

Wolday Amha .2003. Microfinance in Ethiopia: Performance, Challenges and Role in Poverty Reduction, Occasional Paper No.7, Association of Ethiopian Microfinance Institutions (AEMFI), Addis Ababa.

Wolday Amha and Gebrehiwot Ageba.2006.Micro and Small Enterprises (MSE) Development in Ethiopia: Strategy, Regulatory Changes and Remaining Constraints. Addis Ababa.

World Bank. 2004. Project Appraisal Document for a Productive Safety Net Project. Report No. 29767-ET. Washington, D.C.

World Bank.2008. Rural households and their pathways out of poverty. http:worldbank.org. Accessed February 2014.

World Bank. 2010. Designing and Implementing a Rural Safety Net: Lessons Learned from Ethiopia's Productive Safety Net Program 2005-2009. Washington, DC

World Bank.2010.Impact Evaluation in Practice Handbook: The World Bank, Washington, DC

APPENDICES

Appendix A.:   Map showing the location of Meskan District, Butajira, (SNNPR).

Figure 2: Location of Study area

Appendix B: Meskan District Population and Household Size

No	Name of kebeles	Population	Male	Female	HH No
1	Woreda Total	174,647	85,637	89,000	35,211
2	Urban	12,767	6854	5913	2717
3	Rural	161879	78793	83086	32637

Source: Data from District agricultural office

Appendix C: Sample kebeles and household size selected for the study

No	Name of kebeles	Population	HH No	Sample Size		
				Treatment	Control	Total
	Yimerwacho 1ˢᵗ	4499	907	15	30	45
	Yimerwacho 2ⁿᵈ	3184	581	15	30	45
	Beresa	3436	693	15	30	45
	Dobenna Gola	2452	494	15	30	45
	Total Sample	**13,571**	**2,675**	**60**	**120**	**180**

Source: Data from District Agricultural Office

Appendix D. Propensity score matching test result

Variable	Unmatched	Mean		%reduction		t-test	
	Matched	Treated	Control	%bias	|bias|	t-test	p>t
AGE	U	45.37	44.63	10.2		0.64	0.524
	M	45.807	44.998	7.9	23	0.45	0.651
FAMSIZE	U	5.9333	6.1667	-13.1		-0.83	0.408
	M	6.0	5.9813	1	92	0.06	0.951
HHEDU	U	2.4167	2.1167	9.2		0.58	0.562
	M	2.4035	2.1134	8.9	3.3	0.48	0.631
INPLINK	U	0.88333	0.56667	75.4		4.48	0.00
	M	0.87719	0.84937	6.6	91.2	0.43	0.669
FTCDEMO	U	0.91667	0.3	162.1		9.53	0.00
	M	0.91228	0.91752	-1.4	99.2	-0.1	0.921
MKTINFO	U	0.5	0.15833	77.5		5.18	0.00
	M	0.47368	0.45446	4.4	94.4	0.2	0.839
FRMSZE	U	0.44	0.39781	20.4		1.3	0.196
	M	0.44035	0.42041	9.6	52.7	0.48	0.631
CRPSYST	U	2.3167	2.2917	1.6		0.11	0.913
	M	2.3158	2.2085	6.9	-329	0.36	0.718
LSHTLU	U	1.4347	1.0131	41.1		2.64	0.009
	M	1.3598	1.3725	-1.2	97	-0.06	0.953
ONFRMLH	U	0.71667	0.7	3.6		0.23	0.818
	M	0.7193	0.65492	14.1	-286.2	0.74	0.463

Source: Own calculation based on the survey data

I IDENTIFICATION PARTICULARS

1. ID number of questioner---
2. Interviewer's name---.
3. Name of district ---
4. Name of Peasant Association/Rural Kebele------------------------------------
5. Date of interview --
6. Respondents name (Household) ---.
7. Is the Household HABP/GRAD program Beneficiary-------------------------

II HOUSEHOLD/FAMILY BACKGROUND

1. Household size: 1. Male------   2. Female-----   3. Total------
2. Please provide information about the household members by circling one of the stated answers under each column

1	2	3	4	5	6	7
Name	Sex	Age	Marital Status	Literacy	Education level	Occupation
			1. Married	1.literate	1. Grade 1-6	Agriculture
			2 Unmarried	2.iliterate	2 Grade7-12	Handicraft
			3 Separated		3 Above 12	Daily labour
			4 Widowed			Fire wood sell
			5 .Divorced			Petty Trade
						Unemployed
						Other (specify)

III FARM RESOURCES CHARACTERISTICS

1. Do you owe land?   1. Yes   2. No
2. If yes, the total farm size in hectares (ha). Rained------Irrigated -------Total--
3. Size of land holding and productivity in 2005/2006EFY cropping season
4. Do you have livestock Holdings 1. Yes   2. No
5. Do you feel that your holding is sufficient to satisfy the consumption needs?
    1. Yes   2. No
6. Do you feel that your holding is sufficient to satisfy the other non food needs?
    1. Yes   2. No

7. If no, which of the following activities supplement your income?

        1. *Petty trade   2. Firewood and charcoal sale 3. Handicraft   4. Fattening*

        5.*Poultry   6. Selling labor 7. Remittance   9. Other (Specify)*

IV BUSINESS DEVELOPMENT SERVICES

1. Have you ever been advised on viable business investment options and financial management aspects?   *1. Yes,   2. No*

2. Have you chosen any IGA for income diversification and prepared Business plan for loan application   *1. Yes,   2. No*

3. Is there any Credit Service provider around your Kebele?   *1=Yes 2=No*

4. Have you ever taken loan from any of the sources?   *1=Yes 2=No*

5. If you answer yes specify the source , the form, the term and the purpose of the loan

6. If you did not access credit before what are the reasons for that? (Why?)

   1. Lack of Credit Service Provider,

   2. Because of previous loan debt, 3. Fear of credit

7. If yes what type of credit did you receive since you joined the program?

   1. Formal credit (credit from legal sources Banks, MFIs; RuSACCos)

   2. Informal Credit (Iddir,Eqube, local lender, Village saving and Loan groups 3. Both

8. Why did you choose to borrow from the sources you preferred above?

   1. Less collateral required 2. Easier to get loan, 3. Low interest rate

   4. Get terms to suit situations 5. Other reasons (specify)

9. What was your Main intension to take a loan?

   1. Purchase of tools/business assets   2.Working capital   3. Household assets

   4. Household expenses   5. Purchase farm inputs   6. Other (specify)

10. What was the Actual use of the loan?

   1. Purchase of tools/business assets   2. Working capital   3. Household assets

   4. Household expenses 5. Purchase farm inputs   6. Other (specify)

11. Did you get market advice/ information for your product and labour market?

   1. Yes,   2. No

12. Have you been linked to any formal buyer that pay fair price for your products?

   1. Yes,   2. No

13. If yes from which market actor did you get the market advice/information?

   1. Cooperatives, 2. Private sector   3. Government 4. If other (Specify)

14. Is there any Storage facility or services around to store perishable products?

   1. Yes,   2. No

15. Are there any market premises around to sell your product?   *1. Yes, 2. No*

16. If yes, how far is that market premises from your farm?

1. Nearby (1-10km) 2. a little far (10-30km)   3. Far (above 30Km)

V EXTENSION SERVICES

1. Did you get a technical advice on how to lead your business?

1. Yes, 2. No

2. If yes, how sufficient was the technical support or DA visit?

1. Sufficient (once in a week)   2. Medium (twice a month) 3. Not Sufficient (rarely)

3. Did you accessed/ linked to improved inputs? *1. Yes   2. No*

4. If yes, have you satisfied with facilitated input *quality*?

1. Highly satisfied   2. Satisfied 3. Less satisfied 4. Not satisfied

5. If yes, have you satisfied with input linkage *timeliness*?

1. Highly satisfied   2. Satisfied 3. Less satisfied 4. Not satisfied

6. From which sources you got the input?

1. Cooperatives, 2. Private sector, 3. Government/research institute 4. Specify if other

7. How far are the input sources from your farm?

1. Near (1-10km), 2. A bit far (10-30km) 3. Far (30-60Km) 4. Very far (above 60km)

8. Is there   Farmers Training Center and demonstration site around?   *1. Yes, 2. No*

9. If yes, did you benefited from the FTC demonstration services?   *1. Yes,   2. No*

10. Do you promote none farm business as main livelihood means? *1. Yes,   2. No*

11. If your answer is yes, why do prefer it to nonfarm businesses?

1. Lack of farm land   2. Because it is more profitable than on farm business

3. Because you have supportive institutions for nonfarm business in the area

12. If your answer is No, why don't you prefer nonfarm businesses?

1   Lack of knowhow   2. Lack of finance

3.   Lack of supportive institutions for nonfarm business in the area

VI. HOUSEHOLD INCOME/ EXPENDITURE AND WELFARE

1. How much is the household income / annum in the last production year?

No	Description	Qty/annum	Unit price in Birr	Total Sale in Birr/annum
1.1.	*Crop sales per annum*			
1.2	*Animal product sales*			
1.3	*Other off farm income*			
	Total Revenue			

2. How much is the household Expenditure (Food & Non food expense) ?

64

No	2.1 Food Expenses per month	Amount in Birr/month	2.2 Non food Expenses/annum	Amount in Birr/year
1				
2				
3				
	Total			

3. How is the status of household income since the program interventions?

    1. Increased   2. Remained the same   3. Decreased

4. If increased, what was the main source of income increment?

    1. On farm IGAs income   2. Off farm IGAs income   3. Good harvest season

    4.Use of agricultural inputs   5. Remittance from family members   6.Casual labor

5. If HHs income decreased what were the possible reasons for that?

    1. Crop faller due to bad weather   2. Livestock disease and death

    3. Market faller   4. Any other, specify

6. Since the program interventions, how is the status of the household food gap?

    1. Decreased   2. Remain same   3. Increased

7. What is the status of medical services and expenses in the last 2 years?

    1. Decreased   2. Remain same   3. Increased

8. What is the status of school attendance and expenses in the last 2 years?

    1. Decreased   2. Remain same   3. Increased

VII.   HOUSEHOLD FARM ASSET AND HOUSING STATUS

1. Please provide the following details on the assets of the household

No	Type of own Asset	Before program		After the program		Total value
		Yield	Value (Birr)	Yield	Value (Birr)	
1	Livestock(specify)	No				
2	Permanent crop	kg/yr				
3	Machinery/ tools	No				
4	Capital at hand/Bank					

2. Do you own a house after joining the program? *1. Yes   2. No*

3. If yes, what is the service of the house now?

    1. Rented   2. Residence 3. Business service 4. 2&3

4. Did your housing type changed to a better status after joining the program?

    1. Yes   2. No

5. If yes, please specify the improvement you made on the house?

    1. The wall   2. The floor   3. No of rooms 4. Electricity   5. All