Addis Ababa University
School of Graduate Studies
College of Business and Economics
Department of Public Administration and Development Management

Assessing the role of Development partners on agricultural extension delivery: The case of Sasakawa Global 2000 Ethiopia in Gumer woreda

By:

Temesgen Tamrat

Advisor:

Mulugeta Abebe (PH.D)

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Department of Public Administration and Development Management

*This is to certify that the thesis prepared by Temesgen Tamrat Yohans entitled "**Assessing the role of Development partners on agricultural extension delivery: The case of Sasakawa Global 2000 Ethiopia in Gumer woreda**", which is submitted in partial fulfillment of the requirements for the Degree of Public Management and Policy (MPMP), complies with the regulations of the University and meets the accepted standards with respect to standards to originality and quality.*

Approved by Board of Examiners:

Mulugeta Abebe (PhD)	_____	_____
Advisor	Signature	Date
Elias Berhanu (PhD)	_____	_____
Internal Examiner	Signature	Date
Flimon Handaro (PhD)	_____	_____
External Examiner	Signature	Date

Declaration

Student ID: GSE/0632/06

I declare that this research report on '**Assessing the role of Development partners on agricultural extension delivery:The case of Sasakawa Global 2000 Ethiopia in Gumer woreda'** is my own original work with assistances and guidance from my advisor and not submitted before for any institution and any purpose. I further declare that all the sources used in this research report have been properly recognized and acknowledged as in-text-citation and reference list.

Temesgen Tamrat Yohans

_____ _____

Signature Date

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I cross my face and all of myself by the sign of the cross. In the name of father, and son and the Holy Spirit one God AMEN, “Glory be to God who is glorified in His Saints, Glory to our Lady St. Mary the Virgin Mother of God, Amen”, giving me the wellbeing, courage and resilience those were necessary to complete this work.

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ACRONYMS

Acronym	Definition
AGP	Agriculture Growth program
AGRA	Alliance for a Green Revolution in Africa
ASFG	African Smallholder Farmers Group
ATA	Agricultural Transformation Agency
BMGF	Bill & Melinda Gates Foundation
CSA	Central statics agency
CSOs	Civil Societal organizations
DA	Development Agent
EFY	Ethiopian Fiscal Year
FAO	Food and Agriculture Organization (United Nations)
FDRE	The Federal Democratic Republic of Ethiopia
FTC	Farmer Training Center
GTP	Growth and Transformation Plan
IFAD	International Fund for Agricultural Development
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Developmen
MoFED	Ministry of Finance and Economic Development
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PASS	Program for African Seed Systems
PBS	Promotion of Basic Services Programme
PSNP	Productive Safety Net Program
SDGs	Sustainable Development Goals
SEADE	Strengthening Agricultural Extension Delivery in Ethiopia
UNCTAD	United Nations Conference on Trade and Development
SMS	Subject matter Specialist
SG2000	Sasakawa Africa Foundation/Sasakawa Global 2000 Ethiopia
UNDP	United Nations Development Programme

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ABSTRACT

This thesis assesses the role of Sasakawa Global 2000 Ethiopia on agricultural extension delivery in Gumer woreda, SNNP, Ethiopia. The study has been focused on examining achievements and challenges of the implementation of SEADE project implemented by SG 2000 Ethiopia collaborating with stakeholders funded by Bill & Melinda Gates Foundation. The objective of the study is to evaluate the achievements and challenges of SEADE project to increase productivity of smallholder farmers by strengthen the agricultural extension delivery in Gumer woredas. In doing this, exploratory and explanatory approaches with qualitative and quantitative methods are employed. However, the research has involved more of qualitative than quantitative method. Purposive and random sampling techniques are employed in order to select the study sites within Gumer Wereda and study respondents respectively. To collect the required primary source of data, instruments of data collection which include questionnaire, interview, focus group discussion and practical site observation were used. Secondary source of data to strengthen the primary source of data was also carefully examined. In the study, it is revealed that Regarding research findings, erratic rainfall, low soil fertility, fragmented land of households, lack of education, shortage of capital and high cost of agricultural inputs, limit of credit access constrained the households while participating the SEADE project .Based on the results, the study concluded that SEAD project was valuable and relevant to smallholder farmers' agricultural activity needs and agricultural productivity of the study area. The major recommendations put forwarded are accelerating the agricultural extension delivery sustainably; capacitating and motivating with attractive incentive of DAs; timely provision of agricultural inputs and subsides; facilitating market linkage both for farm inputs and products by development partners; increasing the number of FTCs; and finally using low cost water harvest irrigation technologies with high yielding varieties and related packages.

Key words*: agricultural extension delivery, Sasakawa Global 2000 Ethiopia, *Bill & Melinda Gates Foundation*, Gumer woreda, smallholder farmers, *SEADE project

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Agriculture remains an integral part of the Ethiopian economy, The agriculture sector accounts for 50% of the country's GDP, 85% of exports, and over 80% of total employment in the labor force (Deloitte & Touche,2016) .Despite its central importance much of the potential of the sector is characterized as being low-input/low-output. The level of technology is generally basic, and productivity per hectare and per person employed are perhaps the lowest in which crop-based systems predominate and productivity is constrained by lack of knowledge, lack of financing and poorly articulated markets. A substantial proportion of farmers live at the edge of subsistence, and are food-insecure simply because they have limited access to land. in Ethiopia, almost 40 percent of farm households have less than 0.5 ha of land, and more than 60 percent have no more than 1 ha from which to support a family of between six and eight people (FAO,2016).

Agricultural extension (also known as agricultural advisory services) plays a crucial role in promoting agricultural productivity, increasing food security, improving rural livelihoods, and promoting agriculture as an engine of pro-poor economic growth. Extension as a rural support service is needed to meet the new challenges agriculture is confronted that affect rural livelihoods (ifpri.org, 2016)

To boost agricultural productivity and achieve much needed agricultural transformation in the country, significant financing will be required. In recent years, many observers have suggested that agricultural and rural development strategies would benefit from increased collaboration between government research and extension organizations and nongovernmental development organizations. Donors in particular have begun to call for more NGO involvement in programmes that have traditionally been implemented through the public sector, and there has been a recent upsurge of donor interest in direct-funding south-based NGOs (World Bank, 1991a, 1991b; Farnworth, 1991; Bebbington & Riddell, 1994).

The genesis of Sasakawa Global 2000 dates back to 1984 when the late Japanese philanthropist Ryoichi Sasakawa became aware of the famine that hit the Horn of Africa, Ethiopia being the worst

hit. In 1986, Sasakawa Africa Association became officially registered in Geneva as an international humanitarian NGO aimed to increase agricultural productivity in Africa to rid the continent of hunger and malnutrition.

The initiation of the Agricultural Development-Led Industrialization (ADLI) policy by the Ethiopian Government in 1992 created a policy environment conducive for growth in the agricultural sector. In 1993, the SG2000-Ethiopia Country Program was established as an "implant" into the Ethiopian national extension system. The SG 2000-Ethiopia initiative had as its main objective the more effective transfer of locally and externally available improved food production technologies appropriate to local farm-level circumstances. The goal was to increase production and productivity and help to achieve food security and increase farmer incomes.SG2000-Ethiopia is working to strengthen public/private partnerships in ways that will enable the country's emerging private sector to help strengthen extension advisory delivery systems. As Ethiopian agriculture has changed over time, however, the national extension system has responded by broadening its agenda. The extension system now often finds itself supporting farmers' efforts to organize into cooperatives, addressing post-harvest and marketing issues, and partnering with a range of service providers and organizations, often from the private sector.

In 2010, a tri-partite partnership with the Ministry of Agriculture (MoA), Oxfam America (OA) and SAA was entered into, in order to implement a project known as "Strengthening Extension Service Delivery in Ethiopia." funded by the Bill and Melinda Gates Foundation (BMGF). The objective is to improve extension service delivery to smallholder farmers for increased food security and income at household level. The MoA oversees project implementation while OA strengthens the infrastructure of FTCs and supports the mobility and communication skills of the development agents (DAs) being placed at each FTC to educate farmers on improved agricultural technology. For its part, SG 2000 introduces diversified and innovative agricultural technologies and approaches to the FTCs, builds DA capacity and introduces revenue generation activities through a loan guarantee fund, so that FTCs can eventually cover their operational costs. SAA also encourages the participation of the private sector by persuading input dealers and farmers' cooperatives to participate in extension service delivery and improve market access for smallholder farmers. The project is being implemented in all of Ethiopia's regional states – at 215 FTCs – and is strengthening the capacity needs of 645 DAs, 180

Subject Matter Specialists (SMSs) and some 215,000 farm families. The best practices from the pilot projects, involving SAA and OA, will be scaled up by the government, to be used in other agricultural development areas of the country.

This study mainly assesses roles played by Sasakawa Global 2000 Ethiopia (SG2000) to implement a series of innovations in extension system to improve productivity for smallholders in Gumer woreda. Thus, the study is specially made to look in to the SAEDE project achievements and challenges, then to draw lessons for scaling-up productivity of smallholder farmers within Gumer woreda. The study employed both quantitative and qualitative approaches.

1.1 Statement of the Problem

According to International Fund for Agricultural Development's Publication (IFAD, 2014) regarding specific causes of rural poverty in Ethiopia are: ineffective and inefficient agricultural marketing system; underdeveloped transport and communications networks; underdeveloped production technologies; Limited access of rural households to support services; environmental degradation and lack of participation by rural poor people in decisions that affect their livelihoods.

The extension structure in Ethiopia has been developed in such a way that it enables all farmers to access extension services. The major challenges are lack of resources due to constrained budget, as a result, most FTCs are not equipped and therefore not functional and land set aside for demonstrations at the FTCs lies fallow. There are no transport facilities especially for DAs to visit the farmers. There is also high DA turnover due to low salaries and lack of incentives. (Evelyne Kiptot, et al, 2010)

FTCs were established to serve as knowledge center at kebele level and provide extension services. However, most of the FTCs were not effectively functioning due to lack of capacity, facility, equipment, low access to agricultural technology, low skill of DAs and poor FTC management. Low level of agricultural production and productivity and poor living condition of smallholders makes the SEADE project activities relevant from the community perspective. Due to limited access to improved agricultural technologies and farming practices, farmers and pastoralists are producing below optimum, and became vulnerable to food insecurity. There is no extension system that addressed female headed households, women and resource poor farmers and pastoralists (Bezabih, 2015).

For strengthening and improving the Ethiopian extension system to be successful, a range of actors, including Government of Ethiopia (GOE), Ministry of Agriculture(MOA), donors and NGO community, and the private sector, will need to work together to implement the various components and programs to address the missing link in increasing production and productivity based on knowledge and technological change. International donors need to mobilize resources to fill critical funding gaps and support Government response efforts. Ultimately, the transformational change required for greater extension impact will need to come from the Ethiopian people-from farmers and DAs at the front line of extension to the highest policymakers.

Agricultural extension now receives considerably less support from donor agencies. Among academics working in this field, some have recently argued that agricultural extension needs to be reinvented as a professional practice (Leeuwis, C. and van den Ban).Other authors have abandoned the idea of extension as a distinct concept and prefer to think in terms of "knowledge systems" in which farmers are seen as experts rather than adopters **(**Roling, N. and Wagemakers, 1998).According to odi.org , the debate about agricultural extension has focused on: The relevance, impact, coverage and financial sustainability of large, state extension systems which aspire to meet the needs of all farmers; the merits of the training and visit (T&V) extension model; finding ways to improve the linkages between extension and research; the relative roles of extension professionals, paraprofessionals and farmers as providers of agricultural information; rethinking the underlying objectives of external intervention in rural areas (eg. increased production, empowerment, environmental protection, poverty alleviation) and assessing whether extension is the most (cost-) effective tool to achieve these aims; the scope for cost recovery and fully private extension provision (www.odi.org.uk/keysheets/).

A number of published and unpublished materials are available concerning agricultural extension in Ethiopia. Many of them deal with the dominant extension approaches (Women Farmers' Participation in Agricultural Extension Services for Income and Nutrition improvement; socio-economic challenges of smallholder farmers in agricultural practice ; Factors Affecting the Implementation of Agricultural Extension Program; challenges facing Agricultural Extension agents, Commercialization of Ethiopian agriculture: extension service from input supplier to knowledge; forestry and agro

forestry extension package implementation; the performance of the current agricultural extension approach in food crop packages; impact of household extension package of food security and income of the rural households; extension service and smallholder agriculture-(see Huria,2014; Wubshet,2014; Ataklti,2011;Kasa,2004; Ilri ,2006; Destaw, 2010; Hailu, 2002;Tsegu,2006; Yilkal,2003); Even though some impact studies are available to study non-public sectors' roles such as ;The Role of Non Governmental Organizations (NGOs) in Promoting the Development of Urban Agriculture (Fekadu, 2011), The Role of Non Governmental Organizations (Degefa , Fekadu, et al,2012).The focuses of the studies concentrated on extension's role in increasing productivity or income of target farmers. Hardly any evidence exists on the impact of development partners on extension services of smallholder farmers in Ethiopia. Hence, the relationships between development partners and agricultural extension delivery are poorly understood in the country. This type of information is required to assess the strengths, weaknesses, and performance of agricultural development partner's projects, and to strengthen it to improve rural livelihoods.

Therefore, this study attempts to address the role played by development partner Sassakawa Africa Association (SAA) on the project "Strengthening Agricultural Extension Delivery in Ethiopian (SAEDE)". The project has two distinct but complementing components which are implemented by Oxfam America (OA) and Sasakawa Global 2000 Ethiopia (SG-2000) in partnership with Ministry of Agriculture (MoA). The study then examines the contribution of SG-2000, major outcomes and opportunities in enhancing smallholder farmer's productivity through case study of agricultural extension delivery in Gumer Woreda of SNNP Region where the SAEDE project has been extensively introduced and implemented. By bringing some of these issues to the fore, this paper aims to lay the groundwork for future research into an area of sparse formal evidence, and for better collaborative work among Government, donors, bilateral and multilateral organizations and NGOs on agricultural extension delivery.

1.2 Research Questions

This study will try to find clear and precise answer to the following basic research questions from the different sources of data:

- What are the nature, intensity, perception of agricultural extension projects and its effect in the study area?

- What are major contributions of SG-2000 Ethiopia for strengthen agricultural extension delivery?
- How is SG-2000 collaborating with government of Ethiopia and stakeholders in agricultural extension?
- Is SEADE project relevant to the priorities of smallholder farmers?
- What are the achievements/outcomes and challenges of the SAEDE project in the study area?

1.3 Objective of the Study

The study aims to assess the project entitled "Strengthening Agricultural ExtensionDelivery in Ethiopia (SAEDE)" implemented in Gumer woreda, then identifies and describes the major outcomes with constraints faced by the project. Based on the information to be gathered, the research gives detail description of the project performance, status and the short coming associated with it. In line with this, the following general and specific objectives are identified within the context of problem statement and research questions.

1.3.1 General Objective

The general objective of the study is to analyze the role of the SG2000 & BMGF in Strengthening Agricultural Extension Delivery in Gumer woreda ,Guragea zone, Ethiopia, and show how such development partners can advance productivity of smallholder farmers by strengthen the agricultural extension delivery .

1.3.2 Specific Objective

Specific objectives of the study are:-

- To assess the SAEDE project implemented in Gumer woreda ;
- To identify the major achievements, challenges and opportunities encountered in the use of the extension users in Gumer woreda;
- To examine the effects of the project on the income and food insecurity at household level;

- To depict the impacts of development partners in increasing the productivity of smallholder farmers from different prospective;
- To show how development partners collaborate with Government's plan and strategies in agricultural extension delivery.

1.4 Significant of the Study

The purpose of this paper is to examine conceptually and assess the roles played by SG-2000 Ethiopia to strengthen agricultural extension delivery in Gumer woreda. It also aims to encourage agricultural development partners to contribute better increasing the productivity and effectiveness of agricultural systems to improve the livelihoods of smallholder farmers. This research plays important roles as it gives better information about the performance and challenges encountered during SAEDE project; existing and potential problems of the project. The results help stakeholders working on agricultural development programs and other parties concerned to advance the future performance of agricultural extension delivery. Further, it contributes for further investigate regarding the role of private philanthropic foundation and NGOs in agricultural extension projects. Findings of the research can also stimulate the interest of other researchers to further investigate the various aspects of the problems which are not fully addressed by this particular study. Accordingly the study is expected to be a bench mark for the upcoming research investigations.

1.5 Scope of the Study

The scope of the research was restricted to assessing the impact of SG-2000 Ethiopia and BMGF in strengthening agricultural extension delivery with particular perspective to Farmers Training Centers (P/FTCs) and smallholder farmers of Gumer Woreda, Guragea Zone in Southern Ethiopia by taking 4 kebeles of the study woreda since it was difficult to assess every kebeles due to the presence of different constraints. Though SAA implemented the project in partnership with Oxfam America (OA) and Ministry of Agriculture (MoA) funded by the Bill and Melinda Gates Foundation (BMGF), this study only focused on SG2000 component of the project with the impact of BMGF financial support to manage the study. Extension agents Capacity building and smallholder productivity have got particular emphasis in the assessment. The study also covered the extension focus on women who have been given an opportunity to improve their knowledge and skill on agricultural practice in Gumer woreda.

1.6 Limitation of the Study

During the course of this study, the researcher faced some constraints and limitations which affected the process and outcomes of the study, some of these constraints were

1. Shortage of ample time to gather sufficient data and launch deeper exploration on the subject matter;
2. Lack of sufficient financial and material resources;
3. The researcher was challenged to contact the project participant households & DAs to conduct the household survey;
4. This study is a case study on Gumer woreda; this make difficult to generalize the findings to other 21 woredas the project implemented and does not have the nature of in-depth description which can be achieved by employing qualitative methods.

In addition, though the study was interested to include the real difference in productivity and income between extension users and non-user smallholder farmers of the project by survey study; however, the study relied mainly on the extension users of the project. Nevertheless, the result of this study can also be used as a reference for other similar areas.

1.7 Organization of Paper

This study has been organized in five chapters. The first chapter is about introduction of the study which deals with introduction, statement of the problem, objective of the study, the research questions, and significance of the study, scope and limitation and organization of the study. The second chapter reviews varied literature; it is also incorporated the theoretical framework of the study. The third chapter deals with study area description and the research methodology of the study comprising the methods and tools which are employed to achieve the stated objectives and lead to find answers the stated research questions ; chapter four examines the data analysis and discussion; and information gathered through the research work is analyzed. Finally, the last chapter (chapter Five) winds up the research work with short summary and conclusions following by recommendations given by the researcher.

CHAPTER TWO- REVIEW OF RELEVANT LITERATURE

2.1 Concept of Agricultural Development

The global community has begun to refocus its attention on agriculture. Rising food prices and concerns about feeding a growing population are prompting more and more organizations and governments to understand the urgency of supporting agricultural development (Gates foundation, 2011).

Agriculture development means providing assistance to the crop producers with the help of various agricultural resources. Providing protection, assisting in the research sphere, employing latest techniques, controlling pests and facilitating diversity all fall within the purview of agriculture development (economywatch, 2010).

Agricultural development promotes the proper conditions for farming so that planting, harvesting and processing of crops can be done effectively, which ultimately can reduce poverty and save lives. There are many agricultural challenges that the practice of rural development can overcome. Some of the obstacles developing countries facing which militate against the developments of agriculture as per Mhaya Severino (2015) are: problem of land tenure; poor financing; poor transportation; lack of good agricultural education; poor extension activities; poor tools and farm machines; unstable policies and programmes of government; poor marketing system; agricultural inputs. Solving these challenges is where agricultural development and government funding comes into play. Agricultural development extends beyond the physical conditions of farming and into research, technology and political policy.

In many parts of the world, it has long been the practice to define the aim of agricultural development strategy as increasing production levels. Frequently, that objective has been stated in narrower terms, as increments in the production of staple food crops, usually grains and sometimes principal root crops. However, while producing more staple foods can be important, a physical target of that nature is not sufficient for promoting the goal of human development, or even the objective of raising levels of material well-being. Production alone is not necessarily the best indicator of the economic status of rural households. Income is a better indicator, for it takes into account the prices farmers receive and

their costs of production. Even more relevant is real income, which adjusts net income levels for the rate of inflation, in order to measure the purchasing power of rural households (Roger D.,2004).

Ethiopia's agricultural policy is based on the agricultural development led industrialization (ADLI), where increasing agricultural productivity in smallholder agriculture is the government's top priority. ADLI by Vicente Ferrer presented under World Bank discussion document that agricultural country such as Ethiopia, agricultural growth is an essential ingredient for growth and for alleviating poverty –as China has shown us. Agricultural growth will depend on the country's ability to promote growth through one or more of the factors that decisively influence productivity: research, extension, rural infrastructure, education, institutional changes (market liberalization, availability of rural finance, improving the working of input and output markets), and structural changes, such as improving land property rights or land distribution.

According to United Nations Economic and Social Council (ECOSOC),in addition to implement policies addressing poverty, most notably the Sustainable Development and Poverty Reduction Programme (SDPRP) and the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the Government of Ethiopia has adopted a policy response specific to Ethiopia's food security and agricultural productivity challenge, including the Agricultural Development Led Industrialization (ADLI) strategy. The Agricultural Development Led Industrialization (ADLI) strategy is the Government's overarching policy response to Ethiopia's food security and agricultural productivity challenge. Major emphasis was given to ADLI as the agricultural sector is the source of the country's livelihood. In addition, it has the potential to generate primary surplus to fuel the growth of other sectors of the economy, specifically the industrial sector.

Sasakawa Africa Association (SAA) is an international agricultural development NGO that has worked with the Carter Center's Global 2000 Program to establish Sasakawa Global 2000 (SG 2000) agricultural programs in 15 sub-Saharan countries. Currently, this study is focused on Ethiopia. Working with national partners, SG 2000 programs have improved the productivity and profitability of smallholder farmers by encouraging the adoption of higher-yielding varieties and enhanced production practices.

2.2 Food Security Concept and Definition

Food security concept originated in the mid 1970s during the international discussion on global food crisis. The initial focus of food security attention was primarily on food supply problems of assuring the availability and to some degree the price stability of basic food stuffs at the international and national level (FAO, 2005). Thus, in the 1970s the issue of food security referred to the national food supply's capacity to meet the population's energy and nutrient needs. The concept of household food security has been understood by many development workers as the availability of food in the world market place and on the food production systems of developing countries (Bedeke, 2012).

Different organizations defined food security in different ways. According to Clay (2002), food security is a situation that exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. On the other hand, in the present study, food security is defined as adequate availability of and access to food for households to meet the minimum energy requirements as recommended for an active and healthy life (Hussein and Janekarnkij, 2013).

Land degradation has been identified as one of the major causes of food insecurity in Ethiopia. The effects are being felt by over 80 per cent of the population and in some regions, such as Tigray, up to 50 per cent of the productive capacity of the soil has been lost. The risks facing populations that were already vulnerable to food shortages are being further multiplied by the impact of climate change. (Greg Barrow, 2013)

Many factors are contributing to trap Ethiopia in the current state of food insecurity and poverty. These include production fluctuations, low non-farm employment, low income, regional fragmentation of markets, high rate of natural degradation, low level of farm technology, high level of illiteracy and inadequate quality of basic education, poor health and sanitation, high population growth, poor governance and inter-state, intra-state military conflicts and wars. These factors impede the achievement of food security and sustainable economic development. It has one of the lowest per capita incomes in the world and high incidence of absolute poverty with 50% of the population below the poverty line (Asefa and Zegeye, 2003).

Poverty is still a big obstacle to overcome in Ethiopia. Nearly one third of the population lives below the poverty line and a vast majority depends on subsistence agriculture. Consequently, chronic and acute food insecurity is prevalent, especially among rural populations and smallholder farmers. About 10% of Ethiopia's citizens are chronically food insecure and this figure rises to more than 15% during frequent drought years. 2.7 million People will require emergency food assistance in 2014 and 238,761 children require treatment for severe acute malnutrition in 2014 (UNICEF, 2014).

2.2.1 Household food security

The concept of food security has been used extensively at the household level as a measure of welfare and attempts have been made to make the concept operationally useful in the design, implementation, and evaluation of programs, projects and policies. The many definitions and conceptual models all agree that the key defining characteristics of household food security is secure access at all times to sufficient food. (S Maxwell et al, 1992).A household is considered food secure if it has the ability to acquire the food needed by its members to be food secure. A distinction is frequently made between transitory and permanent food insecurity, where the former describes periodic food insecurity as for example seasonal food insecurity, while the latter describes a long-term lack of access to sufficient food. There are two reasons why household food security may not assure food security for all its members. First, the ability to acquire enough food may not be converted into actual food acquisition. Household preferences may not prioritize food acquisition over the acquisition of other goods and services such as school fees and housing. Second, the intrahousehold allocation of the food may not be based on the needs of each individual member. The existence of a large number of households with both undernourished and obese members is a case in point. Furthermore, the extent to which individual food security results in good nutrition depends on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care. Thus, food security does not assure nutritional security (Per Pinstrup, 2009)

2.2.2 Determinants of food security:

Factors that affect household food security in various developing countries **es**pecially in Africa have been documented in some literature and these factors or determinants are most often than not location-specific (i.e. different study areas were found to have variant attributes as food security determinants with some attributes recurring) (Aidoo *et al*., 2013).

The study conducted in Nigeria by Oluyole *et al*. (2009) using probit model found out that sex of household head, educational level, age and income have positive influence on food security; whereas, household size has negative influence on household food security. However, study by Sikwela (2008) in South Africa using binary logit model showed that per aggregate production, fertilizer application, cattle ownership and access to irrigation have positive effect on household food security; whereas, farm size and household size have negative effect on household food security.

Several studies revealed that different factors affect both household food security and insecurity in Ethiopia because of difference in resource availability, topography, time dimension and other factors. The study by Tilaye (2004) using binary logit model indicated that farmland size, small ruminant holding in TLU and oxen holding in TLU affect household food security positively; whereas, family size has negative effect on it.

Alem (2007) in a study of food security using Household food balance model and discriminant analysis showed that family size, low annual production, small farm size, attitude on food aid and poor wealth status significantly affect food security status. On the other hand,Fekadu (2008) using multivariate logistic regression analysis indicated that age household heads, labor and market accessibility have shown significant and negative effect on food security; whereas, cultivable land size, fertilizer utilization, engagement in rain water harvesting have shown significant and positive role for food security.

The study conducted by Bogale and Shimelis (2009) using binary logit model revealed that age of the household head, cultivated land size, livestock ownership, total income of the household, irrigation and amount of credit received have negative and significant effect on household food insecurity; on the other hand, family size has positive and significant effect. Similarly, As studied by Beyene and Muche (2010) using binary logit model showed that age of the household head, size of land cultivated, use of fertilizer, livestock ownership, soil and water conservation practices and oxen ownership have positive and significant relationship with household food security; whereas, education of household head, household size (AE) and off-farm/non-farm income have a negative and significant influence on household food security.

According to studies conducted in Ethiopia, ownership of livestock, farmland size, family labor, off farm income, market access, use of improved technology, education, health, amount of rainfall and distribution, crop diseases, number of livestock and family size are identified as major determinants of household food security (Bedeke, 2012; Eden *et al*., 2009; Regassa, 2011).

The study by Gebre (2012) using binary logit model indicated that household size and age of the household head have positive and significant effect on household food insecurity; whereas, educational status of the household head, asset possession, credit access and access to employment have negative effect.

According to Hussein and Janekarnkij (2013) conducted in Jigjiga District of Ethiopia, use of fertilizer by farming households, total household income, access to veterinary services and access to extension services was found to have a positive and significant impact on household food security; whereas, the agro-ecology stratum in which the household's farmland was located found to have a negative and statistically significant impact on food security. On the other hand, the studies of Kahsay and Mulugeta (2014) using multiple linear regression indicated that age of the household head, use of improved seed and adult equivalent have negative effect and statistically significant factor for calorie intake; whereas, land size in hectare and number of livestock in TLU positively affect calorie intake of households (Birara Endalew et al., 2015)

2.3 Smallholder Farmers

Africa's agriculture is dominated by a variety of staple food crops (maize, rice, sorghum, millet, cassava, yams, sweet potatoes, etc.) and a few traditional cash crops (coffee, cotton, cocoa, oil palm, sugar, tea, and tobacco). The sector is also characterized by a high percentage of smallholder farmers (80 percent) cultivating low-yield staple food crops on small plots with a minimal use of inputs. These farms depend on rainwater, thus subjecting production to the vagaries of the weather (The Africa Competitiveness Report, 2015).One third of the global populations -- 2.5 billion people -- are smallholder farmers who live on and manage 500 million small-scale family farms. They currently produce 80 percent of the food consumed in the developing world, but they need to become significantly more productive if we are going to feed two billion more people worldwide by 2050 (Hugh Locke, 2015).

Smallholder farmers are defined in various ways depending on the context, country and even ecological zone. Often the term 'smallholder' is interchangeably used with 'small-scale', 'resource poor' and sometimes 'peasant farmer'. In general terms smallholder only refers to their limited resource endowment relative to other farmers in the sector. Smallholder farmers are also defined as those farmers owning small-based plots of land on which they grow subsistence crops and one or two cash crops relying almost exclusively on family labor. One of the main characteristics of production systems of smallholder farmers are of simple, outdated technologies, low returns, high seasonal labor fluctuations and women playing a vital role in production.[1]

According to Stephen Carr , among the issues exercising the minds of those concerned with the future welfare of the African continent and its people is the issue of farm size. Many debate if land should be in the hands of larger scale commercial farmers or a multitude of smallholders. But, the hundreds of millions of small-scale farmers of Japan, China, and elsewhere in Asia show us that farm size is not the key determinant of productivity. These farmers obtain levels of productivity per unit area of land which are equal to or greater than those achieved by large-scale farmers anywhere in the world. A new dataset (Samberg et al 2016) shows the geographical distribution of average farm sizes in Latin America, Africa and South, East and Southeast Asia, as well as the share of global production of key crops originating from regions likely dominated by smallholders. Farm size is a key component in the hot debates about the future of farms, food production, food security and smallholders, being strongly tied to multiple dimensions including land and labor productivity, income and poverty, energy return on investment, and linkages between agriculture and other economic sectors. The results shown by Samberg et al (2016) establish the strong role of smallholders in current agricultural production, while enlightening the regional and crop-specific patterns of this contribution. This provides a solid basis on which agricultural and rural development strategies have to build.

There are about 12.6 million smallholder farmers in Ethiopia with an average farm size of only 1.2 hectares whose production accounts for 85 percent of the country's agricultural output, valued at Birr 221 billion (or US$13 billion)in 2011 (Access Capital,2012). In addition to the fact that agricultural

[1] http://www.nda.agric.za/doaDev/sideMenu/cooperativeandenterprisedevelopment/docs/FRAMEWORK-%20OF%20SMALL%20FARMERS%20(2).pdf

productivity among smallholder farmers is as low as 1.25 tons per hectare for teff, there is also great variability in productivity across farmers with the most productive farmer producing 3.66 tons per hectare compared to the average yield of 1.83 per hectare for cereals (Access capital, 2012). Smallholder farmers in Ethiopia face various challenges that impede their growth and ability to effectively contribute to food security relative to the commercial farmers. Some of the constraints they face relate to lack of access to land, poor physical and institutional infrastructure. Most smallholder farmers are located in rural areas and mostly in the former homelands where lack of both physical and institutional infrastructure limits their expansions. There is therefore a need to significantly increase the productivity of smallholder farmers to ensure long term food security.

2.4 Agricultural Development partners in Ethiopia: SG 2000 & BMGF

2.4.1 Bill and Melinda Gates Foundation (BMGF) Ethiopia:

The Bill & Melinda Gates Foundation was founded in 2000 by Bill and Melinda Gates and it is the largest openly operated charitable foundation in the world. Around the world the Gates Foundation works to reduce extreme poverty and promote better health and information resources. The Foundation is organized into three specific programs: Global Health, Global Development, and United States. Global Development Division works to help the world's poorest people lift themselves out of hunger and poverty. The Global Development Division aims to identify and fund high-impact solutions that can help hundreds of millions of people lift themselves out of poverty and build better lives. It works closely with its partners to support innovative approaches and expand existing ones so they reach the people who are most in need. It has Country Representatives based in Ethiopia, Nigeria, and South Africa who work to advance its priorities in those countries and deepen relationship with partners in the public and private sectors and other organizations.(gatesfoundation.org)

In 2000, the Bill & Melinda Gates Foundation made its first grants to support partners 'efforts to improve health and development in Ethiopia. Over the past decade, the foundation has made more than 125 grants to organizations working in Ethiopia or conducting research and development that is intended to benefit the country and its citizens. The foundation currently has more than $265 million (U.S.) invested in grants to benefit Ethiopia. In 2012, the foundation appointed a representative in

Addis Ababa to support closer partnerships with key stakeholders in government, nongovernmental agencies (NGOs), and the private sector. The foundation vision in Ethiopia is to reduce poverty and help all Ethiopians live healthy and productive lives. It has made grants to partners working in Ethiopia to improve agricultural productivity and increase the coverage of life-saving family health services. Development of health services and transformation of the agriculture sector are top priorities for the Ethiopian government. It is working with partners to unlock the country's potential and help achieve sustainable rises in productivity for farming families through increasing knowledge and access to suitable tools, services and markets.

According to the in-depth interview with Senior Program Officer of Ethiopia Agricultural Development, Global Development Program within Bill & Melinda Gates Foundation in Ethiopia, different documents, annual reports and partner's publications review, the foundation's goal in Ethiopia is sustainable productivity growth for smallholder farmers, with an emphasis on women farmers. The foundation defines sustainable productivity growth to include not only increases in productivity, but also increasing the net value smallholder get from their farms and improvements in nutritional outcomes .BMGF sees increasing the return that smallholder farmers (SHFs) get from their agricultural activities as a key lever to reducing poverty in Ethiopia. Increases in agricultural productivity are shown to have a multiplier effect in reducing poverty in heavily agricultural economies. Ethiopia undoubtedly meets this condition with agriculture continued to form the backbone of the Ethiopian economy in 2013/14 accounting for 40.2% of GDP, 80% of employment and 70% of export earnings (UNDP, 2015).

While the foundation identified many potential investment themes it could pursue in Ethiopia, it selected a subset of those using the following criteria to prioritize: alignment with BMGF priorities; impact (delta for sustainable productivity) and potential scalability; gap in investment; alignment with GoE priorities; comparative advantage; coordination opportunities with other major donors.As part of the past five-year (2006-2011) Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the government was continuing to invest heavily in agriculture. The basic direction of agricultural development included the utilization of human labor, proper use of agricultural land, the combining of endogenous and exogenous knowledge (a "foot on land"); focused on innovations adapted to agro-ecological zones; and an integrated development approach. The MOARD has aligned donor support with plans to scale activities in the sector and to meet the

resource gaps identified. A core part of the government's investment in agriculture is the public agricultural extension system. In early 2009, the Bill & Melinda Gates Foundation (BMGF) was requested by the Government of Ethiopia (GOE) to undertake a review of agricultural extension in the country. The purpose was to provide a review of the strengths and constraints of the public extension system, and to give suggestions on "best fit" solutions and their scale-up opportunities, in close consultation with the government and other stakeholders (IFPRI, 2009).

The BMGF contracted a team of extension scholars and international management experts to conduct a full review on the Ethiopian extension system. BMGF also provided support in the study. As a part of the process, the review team engaged a wide set of stakeholders, including the Ethiopian Development Research Institute (EDRI), Ethiopian Economic Association (EEA)/Ethiopian Economic Policy Research Institute (EEPRI), and relevant local institutions; bi/multilateral donors; NGOs; and national agricultural universities. The team has developed a set of recommendations and potential change actions across the extension system. The recommendations such as strengthening farmer-driven orientation and DA knowledge /capabilities are some of the themes.

The foundation's efforts to build effective partnerships, specifically related with my study, after review of agricultural extension in Ethiopia was its support to implement a project known as "Strengthening Extension Service Delivery in Ethiopia." In 2010 , a tri- partitepartnership with the Ministry of Agriculture (MoA) , Oxfam America (OA)and SAA was entered into; the objective was to improve extension service delivery to smallholder farmers' for increased food security and income at household level. It has provided USD $7,149,533 to Sasakawa Africa Association (SAA) and $5,382,083 to Oxfam-America Inc (OA) to implement a series of innovations in Ethiopia's extension system to improve the system's overall performance at a national-scale and generate productivity improvements for smallholders (Gatesfoundation, 2016).

The purpose of the project was to increase the capacity of DAs in selected woredas to effectively identify and demonstrate locally appropriate technologies and practices through the Farmer Training Centers and improve market linkages. This was intended to increase smallholder farmers (SHF) adoption of improved practices and technologies and ultimately increase SHF productivity and

incomes. While increasing smallholder farmers' productivity through the provision of extension services is central to Ethiopia's national development plans, the 2010 foundation-funded diagnostic showed that Ethiopia's extension workforce (primarily made up of Extension (development) agents, or "DAs") generally lacked the capacity to deliver effective extension services. This was due to a few key factors including:

(1) DAs lacked sufficient training and knowledge;
(2) Poor incentives for DA performance;
(3) The farmer training centers which served as the hubs for extension services were lacking critical equipment/demonstration facilities.

2.4.2 Sasakawa Africa Association (SAA)/ SG2000 Ethiopia

In the late 1970s and early 1980s, an increasing number of African countries were struggling to cope with worsening hunger caused mainly by prolonged drought. Ryoichi Sasakawa (the founder and former Chairman of today's Nippon Foundation) responded by providing food aid to several of the hardest hit countries. But it was clear to him that food aid provided only partial and temporary relief, so he reached out to Nobel Laureate Dr. Norman Borlaug and to former US President Jimmy Carter in search of a more sustainable solution to Africa's food challenges. His vision was for a Green Revolution in Africa, similar to that in the Asian Subcontinent that was sparked by research done by Dr. Borlaug on higher yielding wheat varieties, and he was prepared to fund the long-term effort needed to achieve it (Sasakawa Africa Association,2016) .The Sasakawa Africa Association (SAA) and the Global 2000 program of The Carter Center joined hands to launch a joint initiative to alleviate hunger and poverty and improve health in sub-Saharan Africa. At the time, many experts agreed that the research-based technologies needed to quickly increase food production were already available. The challenge was to get the right technologies into the hands of Africa's rural smallholders, and to teach farmers how to use them. Generally weak and ineffective extension services were identified as a key problem, and the Sasakawa-Global 2000 (SG2000) program was formed to help public extension organizations strengthen their delivery of existing technologies and information to farmers. Success would bring hope to many of those living in poverty and hunger; it would enable many resource-poor farmers to realize more of their own potential and help them prevail with both pride and dignity (ibid).

Over time, the SG 2000 partnership has worked with thousands of frontline extension workers and millions of farmers in 14 African countries to promote the use of higher-yielding technologies for maize, wheat, rice, grain legumes, roots and tubers, and other important crops. SAA leads the grassroots efforts to modernize the techniques smallholder farmers use to produce food, and helps them organize to get credit, acquire inputs, and market their harvests more successfully. Global 2000 focuses on helping policy makers design and implement more effective, smallholder-friendly policies that encourage efficiency and participation across the agricultural value chain and increased economic returns to the sector and on health-related interventions.

In late 2010, the Bill & Melinda Gates Foundation (BMGF) and Sasakawa Africa (SAA) signed an agreement to implement the project Strengthening Extension Service Delivery in Ethiopia (SEADE).SG2000 was involved in demonstration and promotion of improved agriculture technologies and practices that would bring about changes in agricultural productivity and sustainability of PFTC operations. For its part, SG 2000 introduced diversified and innovative agricultural technologies and approaches to the FTCs, built DA capacity and introduced revenue generation activities through a loan guarantee fund, so that FTCs could eventually cover their operational costs. SAA also encouraged the participation of the private sector by persuading input dealers and farmers' cooperatives to participate in extension service delivery and improve market access for smallholder farmers.

From 2010 to 2014, SG2000 implemented the SEADE project that covered ten administrative regions, 22 woredas and 215 Pastoralist and FTCs and was strengthening the capacity needs of 645 DAs , 180 Subject Matter Specialists (SMSs) and some 215,000 households . SG2000 organized itself into five thematic areas. These were: (Theme 1) Crop and Livestock Productivity Enhancement, (Theme 2) Postharvest and Agro-processing , (Theme 3) Public-Private Partnership and Market Access, (Theme 4) IT and Human Resources Development, (Theme 5) Monitoring ,Evaluation, Learning and Sharing .

The best practices from the project intended to be scaled up by the government, to be used in other agricultural development areas of the country. As part of the Theme 1 activities, SG2000- Ethiopiaused a participatory approach to establish training platforms where farmers could

learn by doing and adapted new technologies to their own needs and circumstances. A growing number of women farmers were involved in the learning process, primarily through the use of Women Assisted Demonstrations (WADs). SG2000 - Ethiopia provided the inputs required for both Technology Option Plots (TOPS) and WADs, as well as backstopping for the extension agents who provided technical support and supervision to TOP and WAD farmers. As part of activities under Theme 2, Postharvest Extension Learning Platforms (PHELPs) were established at the FTCs of the various kebeles (farmer associations) based on a needs assessment.SG2000- Ethiopiaalso organized field days to demonstrate improved postharvest technologies .In line with the objectives of Theme 3, public private partnership activities in Ethiopia aimed to build the capacity of the country's emerging private sector agricultural enterprises, such as input suppliers and post- production processors, in order to bolster agricultural advisory services to smallholder farmers (Sasakawa Africa Association documents,2015)

2.4.3 Overview of the SEADE Project

The project was designed with the purpose of enhancing the agricultural productivity and production of smallholders and pastoralists through the development of innovative, systematic, and demand driven agricultural extension services. The project aimed at developing an effective institutional model of extension through promotion of farm enterprise diversification and increase food security and additional sources of income, especially for groups that have not been well served by extension in the past. The project focuses on strengthening farmer-driven extension; equipping P/FTCs with necessary resources; promoting innovative agricultural technologies; building capacity of P/FTC-Management Committees (P/FTC-MC), improving market and credit access; improving DAs and farmers knowledge and capabilities; improving DA motivation and retention; implementing performance culture and transparency at all levels of extension. Piloting Agricultural Extension Performance Management (AEPM) is an area of key intervention of the project. The main goals of the project, as specified, in the project document, were:

- Improve farmers' livelihood through increased productivity and incomes by strengthening a set of 215 pilot P/FTCs in a sustainable manner;
- Capture the lessons of the project in ways that facilitate its later scale-up to, potentially, all P/FTCs in the country; and

- Strengthen the ability of DAs and SMS of selected P/FTCs to deliver a more diverse array of extension services to the smallholder farmers they serve, and especially to such marginalized groups as women, agro-pastoralists, youth and very poor farmers.

The following project objectives were set to contribute to the achievement of the above goals (SG2000, 2015):

- To equip 215 P/FTCs distributed across the country with a professional management structure and basic resources.
- To install appropriate community-led management systems in these 215 P/FTCs.
- To improve the skills, knowledge, and capabilities of 645 male and female DAs in these FTCs through in-service training.
- To refine the DA career paths in 215 FTCs, building on the improvements recommended by MoARD.
- To put in place a monitoring, evaluation, and learning system that helps to steer the project and captures relevant learning for a later scale-up of the project.
- Identify and establish need based innovative approaches and technologies (crop, livestock, postharvest & agro-processing natural resource, etc.), strengthen District Extension Resource Centers (WERC) through strategic investments that will enable SMSs effectively backstop DAs for delivering a broader range of extension services to help farmers increase and diversify agricultural income streams and to enable FTCs and WERCs to generate income to support farmer-driven extension programs.
- Strengthen the skills and technical capacity of the DAs and SMSs assigned to the selected FTCs/WERCs.
- Improve extension management systems at P/FTCs to strengthen farmer driven orientation and linkages within the extension system and between extension and other stakeholders; and
- Establish a robust project monitoring, evaluation and learning system that will enable modification of project activities on the basis of regular and frequent feedback, and documentation of lessons learned for use in scaling up efforts to strengthen the Ethiopian extension system.

The SEADE project was implemented from 2010-2014 in collaboration with OA in ten regions.Gumer is one of the 22 woredas where the project was applied. In Gumer woreda, SG2000 Ethiopia conducted needs assessment in 2011.It was conducted in collaboration with the woreda Agricultural office. The main purpose of the Survey was to identify partners and beneficiaries needs and priorities that could serve as a guide to effectively carry out SG 2000 interventions. Generally, the Survey is designed to obtain information on the farmers' needs for technologies to guide SG 2000 and partners' interventions. The aim was to align the findings with the SG 2000 extension to improve efficiency, increase outreach, identify bottlenecks and devise ways and means to overcome problems of poor farmers in Ethiopia. Furthermore, it aimed to identify P/FTC level needs and priorities to establish innovative agricultural technologies in crop and livestock production, natural resource management, postharvest handling and agro-processing, and identify extension and training needs of farmers, DAs and SMSs.

Therefore, this research wants to study and analyzed the achievements and challenges of SEADE project on smallholder farmers in Gumer Wereda.

CHAPTER THREE-STUDY AREA DESCRIPTION AND METHODOLOGY

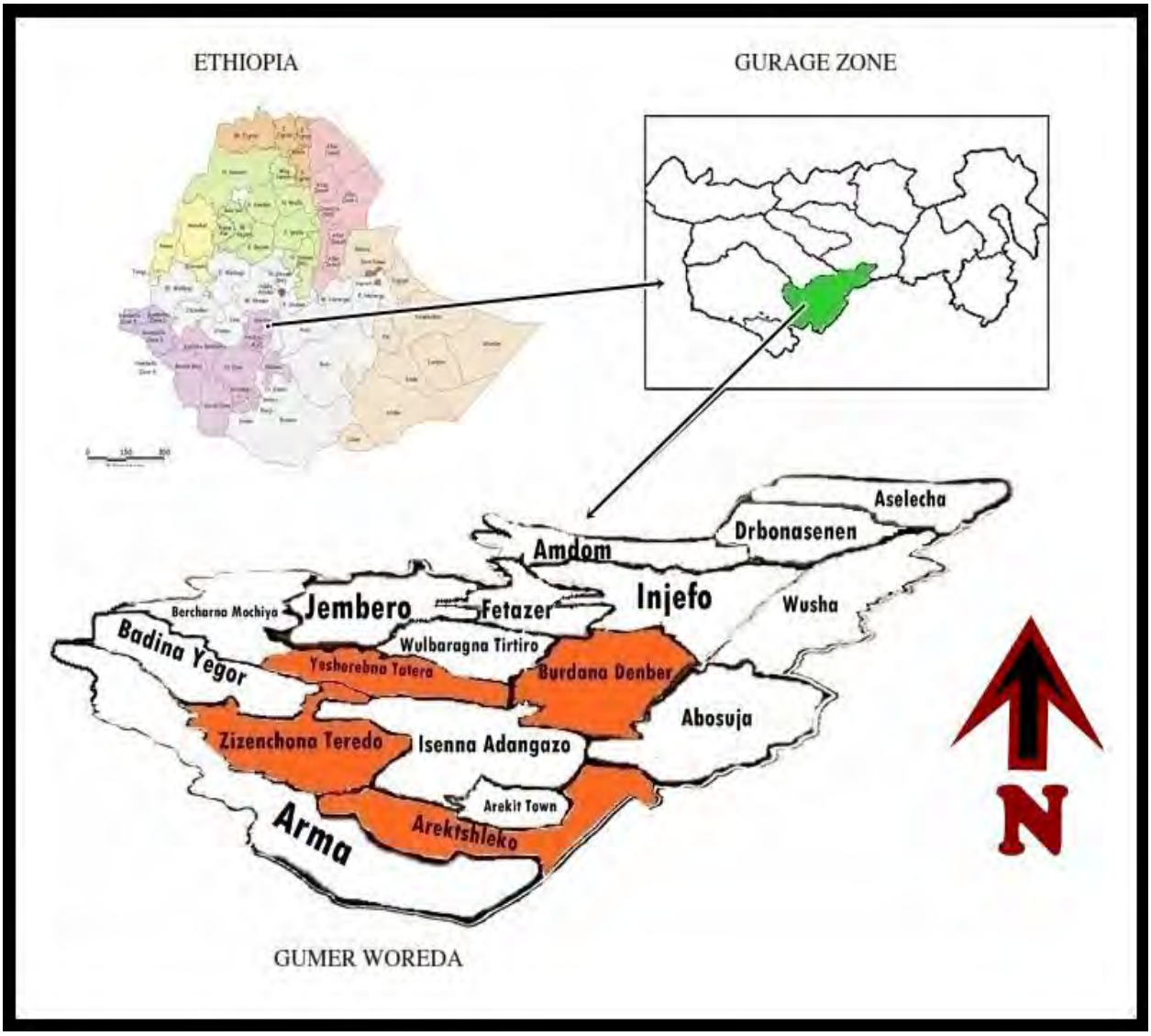
3.1 Description of the Study Area

The study area is located in Gumer woreda, Guragea zone, in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia. Gumer woreda is one of the fifteen woredas of the Guragea zone. The wored's capital, Arekit is located 220 kilometers south of Addis Ababa. This woreda is named after one of the sub- groupsof the Sebat Bet Gurage , the Gumer . Part of the Gurage Zone , Gumer is bordered on the southeast by the Silt'e Zone , on the southwest by Geta, on the northwest by Cheha, and on the north by Ezha .The woreda has a total area of 23,555 hectares .The geographical location of this woreda's area is around 8° 2' 17" N, 38° 19' 30" E (maphill.com accessed in June 2016) ,with altitudinal range from 2700–3078 m.a.s.l. (Gumer woreda Report,2014).Based on the 2007 Census conducted by the CSA, Gumer has a total population of 80,178, of whom 37,495 are men and 42,683 women ; 2,923 or 3.65% of its population are urban dwellers. The majority of the inhabitants are reported as Muslim , with 59.98% of the population reporting that belief , while 29.81% practice Ethiopian Orthodox Christianity , 9.27% are protestants , and the least 0.86% , 0.06% , 0.01% are catholic ,traditional, and other kind of belief respectively (Census 2007 Tables: Southern Nations, Nationalities, and Peoples' Region , Tables 2 . 1 , and 3.4.) .

Table3.1 Number of Population in Percentage and Sex in Rural and Urban Area

location	Year	M	%	F	%	Total	%
Rural	2014	36,083	45%	41,172	51.35%	77255	96.35%
Urban	2014	1,412	1.76%	1,511	1.89%	2,923	3.65%
Total	2014	37,495	46.76%	42,683	53.24%	80,178	100

Source: CSA, 2007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GURAGE ZONE
Aselecha
Drbonasenen
Amdom
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Bercharna Mochiya
Badina Yegor
Wulbaragna Tirtiro
Yesherebna Tetera
Burdana Denber
Abosuja
Zizenchona Teredo
Isenna Adangazo
Arekit Town
Arekitshleko
Arma
N
GUMER WOREDA

3.1.1 The Study Kebeles

A. Arekit sheloko

Arekitsheloko is one of the 18 rural kebeles of Gumer woreda that is bordered on the north by Arekit town,on the south by Abeke kebele,on the east the Silt'e Zone and on the west by Zizencho and Arma kebeles .The Kebele is close to the Arekit lake suitable for different agricultural activities by irrigation .Based on the 2016 report by the Gumer woreda,The targeted kebele covers an area of 930ha and is inhabited by 5,316 people. The total households in the study kebele are 829 persons. Among which 82.5 percent is male and the rest is female accounted for 17.5 percent (Gumer woreda Report, 2016).

The average annual temperature in this sample kebele is 26 °C .It is located in the Dega agro-climatic zone types with a rainfall of minimum 1,200mm and maximum 1,500mm levels and with altitudinal 2850 m.a.s.l. The major crops grown in this kebele are: *Enset* ,Barley, Faba bean and Field pea, Wheat, Potato and vegetables .Rust (ዋግ), Enset Bacterial Wilt Disease (እንሰት አጠውልግ ባክቴሪያ) and weed (አረም) are the main type of plant diseases in the kebele. The major portion of this sample kebele is covered by brown soil. Some of water bodies found in this Kebele include 200 wells, 3 hand-pump, 1 lake, 6 spring and 2 ponds. There are 34.5 Ha land area irrigated. Majority of the markets have been weekly and bi-weekly with a distance of 10km to Kebul market and 12km to Bole market from kebele center. 5 km long all weather road passes through the kebele. In terms of mode of transportation, it is dominated by access on foot travelling 9km on average. The most important source of credit in the kebele is Omo Micro finance that grants loan at interest rate of about 15% for short term loans. Very few local loan providers (such as Iddir, and Ikub) and private lenders also provide credit with interest rates of 5% and 50%, respectively.

Like most farmers in Ethiopia, the farmers in Arekitsheloko produce both crops and livestock. Sheep, Cow, and Horses constituted the largest proportion of total livestock in the kebele. The largest contributor to the livestock population in the Kebele was sheep (38.99%) followed by cows (24.93%), horses (15.03%), calves (6.98%) and heifers (6.76%). These top five accounted for 92.69% of the livestock population excluding chicken and beehives. The remaining 7.31%

contained donkeys (3.89%) and others (oxen, bulls, goats and mules with combined contribution of 3.42%).

Table 3.2: Contribution of livestock types to the total inventory in Arekitsheloko kebele

Type of livestock	Cows	Oxen	Bulls	Calves	Heifers	Goats	Sheep	Horses	Mules	Donkeys	Total
Quantity	3174	32	290	789	765	9	4410	1700	56	440	10546
percent	41.84%	0.28%	2.56%	6.98%	6.76%	.08%	38.99%	15.03%	0.50%	3.89%	100%

Source:Gumer woreda report, 2016

Table 3.3 below reveals that farm land for annual and permanent crops covers 39.25 percent of the total geographical area in the kebele .Grazing; forest and Meadow Rush cover 52.09 percent. Villages with Institutions account for 8.05 percent and the land covered by water covers 0.6 percent. A comparison of the land utilization in 2016 reveals that the farm land covers the larger area than the other geographical areas. It implies that the sample kebele has the second wider size of cultivated land among the categories of geographical areas. So, it contributes for the enhancing the magnitudes of the agricultural production of the farmers. Therefore, this production helps to improve the livelihoods of the households in the target Kebele.

Table 3.3: land utilization of Arekitsheloko kebele

Total	Annual crops Land (Ha)	Permanent crops Land (Ha)	Grazing Land (Ha)	Forest and Bush land (Ha)	Artificial Forest land (Ha)	Villages (Ha)	Institutions (Ha)	Land covered by water (Ha)	Meadow Rush (Ha)
930	**282.5**	**82.5**	**357.25**	**4.5**	**120.2**	**67.4**	**7.5**	**5.25**	**2.5**

Source:Gumer woreda report, 2016

The major crops in the sample Kebeles of the Woreda are Barley, Faba Bean, Wheat, Potato, Enset and Field Pea. Wheat Potato and Barley are also the top three contributors to farmers' income. Production analysis of the woreda for the year 2016 under the table below shows that Annual crop productivity of major crops (excluding enset),

Table 3.4: Annual crop productivity of major crops in Arekitsheloko Kebele

Crop name	Wheat	Barley	Faba Bean	Field Pea	Potato
Productivity(Qt/Ha)	**40**	**36**	**19**	**21**	**38**

Source:Gumer woreda report, 2016

B. Burdana Denber

Burdana Denber is one of the sample rural kebeles of Gumer woreda that is bordered by many kebeles such as Injefo,Fetazer,wulbaragna Tirtiro,Yisherebna Tatera,Isenna Adengazo, Abosuja, Wusha. The targeted kebele covers an area of 1363ha and is inhabited by 5,460 people. The total households in the study kebele are 941 persons. Among which 819 are male and the rest female accounted for 122 (Gumer woreda Report, 2016). Among the total land of 1363ha, farmland accounts 1138.5ha of which the land cultivated accounts 590.5ha and forest land covered 226.5ha of the total land of the kebele .There are sources of water such as 106 Water wells ,6 ponds ,36 lake and water harvesting.

Table 3.5-Burdana Denber kebele's Contribution of livestock

Type of livestock	Cattle	Goats	Sheep	Horses	Mules	Donkeys	Total
Quantity	3174	18	3160	770	39	425	7586
percent	41.84%	0.24%	41.66%	10.15%	0.51%	5.6%	100%

Source:Gumer woreda report, 2016

C. Zizencho Kebele

Zizencho kebele is one of kebeles in Gumer woreda 6 km away to west of Arekit town. Its total geographical area covers 1067ha ;lands for annual and permanent crops covers 253.25ha and 626.78ha respectively ,grazing land accounts for 15ha, forest and Meadow Rush covers 66ha,the rest institutions ,water bodies and others accounts 15ha. 6,320 peoples are living and among which there are 827 male households and 170 female households in the kebele (Gumer woreda Report, 2016).The temperature ranges from 17-20°c and is located in the woinadega agro-climatic zone type with altitudinal 2700m.a.s.l. Barley, wheat , Faba bean ,Field pea ,Potato and vegetables are the major annual crops while Enset, poem and other types of fruits are some of permanent crops grown in the kebele.wheat-rust, yellew-rust, Potato Blight(የድንች ስር አበስብስ), Enset Bacterial Wilt Disease (እንሰት አጠውልግ ባክቴሪያ) are the main types of plant diseases whereas tryponosmiasis (የ ዶሮ ፈ ን ግ ል) , **black leg** (አ ባ ጎ ር ባ)፣ ጉ ረ ብ ር ብ are well known animal diseases in the kebele.There is also large production of livestock in the kebele;4780 cows,3159 poultry,5906 sheep,8 goats and 1468 equines. Some of the households are also involved in business activities besides agriculture .Bad, Bole and Aftir are nearby markets to the kebele.Omo microfinance is the only institution that provides loan access to the farmers.

Table3.6: Annual crop productivity of major crops in Zizencho kebele

Crop name	Wheat	Barley	Faba Bean	Field Pea	Potato
Productivity (Qt/Ha)	35	38	22	18	320

Source :Gumer woreda 2016

D. Yesherebna Tatera

Yesherebna Tatera kebele is one of the 19 kebeles of Gumer woreda 15km away to west of Arekit town.Its total geographical area covers 600ha ; lands for annual and permanent crops covers 380ha and 200ha respectivily,grazing land accounts for 72ha, forest and Meadow Rush covers 80ha,the rest institutions ,water bodies and others accounts 12ha. There are 2015 male households and 1935 female households in the kebele (Gumer woreda Report, 2016).The temperature ranges from 19-25°c and is located in the woinadega agro-climatic zone type with altitudinal 2700m.a.s.l. Barley, wheat , Faba bean ,Field pea ,Potato and vegetables are the major annual crops while *Enset, poem* and other types of fruits are some of permanent crops grown in the kebele.wheat-rust,yellew-rust,የድንች ብላይት ስር አበስብስ, Enset Bacterial Wilt Disease (እንሰት አጠውልግ ባክቴሪያ) are the main types of plant diseases whereas tryponosmiasis (የዶሮ ፈንግል), black leg (አባጎርባ)፣ጉረብርብ are animal diseases in the kebele .There is also large production of livestock in the kebele;2411 cows,4500 poultry,1310 sheep and 750 equines. Some of the households are also involved in business activities besides agriculture .Bad, Bole and Aftir are nearby markets to the kebele .Omo microfinance is the only institution that provides loan access to the farmers.

Table 3.7: Annual crop productivity of major crops in Yesherebna Tatera kebele

Crop name	Wheat	Barley	Faba Bean	Field Pea	Potato
Productivity (Qt/Ha)	**34**	**32**	**18**	**14**	**280**

Source :Gumer woreda 2016

3.2 Research Methodology and Methods

Research Methods and Research Methodology are two terms that are often confused as one and the same when strictly speaking they are not so as they have many differences between them. One of the primary differences between them is that research methods are the methods by which the research is conducted into a specific subject or a topic. Research methods are the tools, processes, or ways by which researchers obtain data. (Patrick, 2015).Research methodologies are employed at the beginning of the experiment to explain the purpose of the chosen methods and how they will serve its function. Research methods are more useful during the latter part of a research or an experiment since they are being utilized for conclusions to be appropriately made. One can say while research methodology is a multidimensional subject, research methods constitute a part of the broad term of research methodology.[2]

3.2.1 Research Methodology

This study employs a single case study approach by integrating both quantitative and qualitative research strategies. The quantitative strategy will use to analyze the data that will be collected using structured household survey questionnaire. The qualitative research strategy analyzes data that will be collected using the unstructured interviews with key informants: agricultural extension experts, Government officials, Development partners and others who are interested on the project. Qualitative methods will be used to triangulate quantitative methods and also to make deeper analysis of the areas where we cannot get quantitative information. This interview with the key informants will be conducted to supplement some information that are not captured by the questionnaire and to crosscheck the consistency of the responses from the household survey. However, the researcher is leaning more to use the qualitative approach due to the fact that quantitative measures and statistical analyses simply do not fit the problem under the study or the research problem has no adequate measure, or difficult to capture with precise yardstick.

The study begins without hypotheses but only a general question because its research problem or issue needs to be explained that is why selecting a case study .The value of case studies is to provide thick data, descriptions and explanations of the researched phenomenon. The need for case study

[2] http://pediaa.com/difference-between-research-methods-and-research-methodology/

research stems from the desire to understand the complexities of social phenomena (Dilthey, 1976). Case study is assistive in assessing and understanding the challenges, opportunities and achievements done by the project. Explanatory and descriptive case studies are used to grasp a detailed understanding of the issue in order to explain and answer research questions which include "how" and "why" questions, and ask for explanations.

3.2.2 Methods of Data Collection

The study intended to assess the role of agricultural development partners on SAEDE project and its approach, outputs and gaps/challenges of the project on agricultural extension delivery in Gumer woreda. In order to validate and construct the analysis; Data were collected from multiple sources. Both primary and secondary sources were used to construct the description of the thesis; the most important instruments were employed to generate relevant information such as questionnaire, key informant interview, field observation and focus group discussions with farmers and DAs. Primary data were collected from 4 kebeles purposively selected in Gumer woreda where the project was implemented and a field survey was conducted. Direct observation was conducted on the livelihoods of small farming households and their living condition. It was mainly emphasized to have clear information in comparison to the interview. The observation was conducted with the local kebele DA and local managers; Kebele I (**Arektshelcko**), Kebele II (**Yesherebna Tatera**), Kebele III (**Burdana Denber) and** Kebele IV (**Zizenchona Teredo**), and structured questionnaire was used to obtain information from beneficiary households in P/FTCs, DAs, SMSs .It was administered by the researcher on 131 farmers , 12 DAs ,6 SMSs adding up a total of 149 respondents that were in sampled Kebeles.

The questionnaire was required to obtain information on the SAEDE project, achievements, challenges productivity and income change of smallholder farmers where the project was implemented in Gumer woreda's sampled kebeles. Unstructured interviews carried out with the four *Kebeles'* administrators, the head of *Woreda* Agriculture Office, Agriculture and Rural Development experts, project organizers and donor foundation representatives thoroughly to address the research questions. Secondary Data were in essence collecting data that already existed and published. Relevant Secondary data has been reviewed from desk review of documents/studies, baseline studies, need assessments, synthesis reports, implementation reports, progress reports,

evaluation report, research documents, and agricultural policies and reports from government woreda and kebele officials, CSA, MOA, ATA ,BMGF, SAA, OA etc.

3.2.3 Sampling Design

Yamane (1967:886) provided a simplified formula to calculate sample sizes. This formula is used to calculate the sample sizes shown below. A 95% confidence level and P = .5 are assumed for equation. Where n is the sample size, N is the population size, and e is the level of precision. When this formula is applied to the sample below, we get the sample size that the researcher is intended to conduct the survey.

Where n= is the sample size

N= total population size

e= level of precision (sampling error)

$$n = \frac{N}{1 + N(e)^2}$$

This formula is used since the households population under study was homogenous in character so the marginal error (SE) of this study was 8%, which is equal to 0.08 and the confidence level is about 95 %. The sample size of this study was therefore determined:

$n=N/1+N\,(e)^2$

n= 3,272/1+3,272 (0.08)2

= 149 households

3.2.4 Sampling Technique

Gumer woreda has 19 kebeles of wich 18 are rural and 1 is town kebele. The sampling frames for this study are rural households that are found in four Gumer woreda where the SAEDE project was implemented. The study employed random sampling techniques to select the representative samples and four rural kebeles namely Arektshelcko ,Yesherebna Tatera , Burdana Denber and Zizenchona Teredo that were purposively selected. The selection was made through their closeness to the town of the Gumer Woreda so called Arekit town and appropriate 149 respondents were selected randomly for the study from these sample kebeles including both male and female headed households. So as to generate relevant information, the sample households were proportionally selected with respect to the number of total households of each kebele through the following formula:

$$n = \frac{N\,(S)}{\sum N}$$

Where, n= the number of required samples of each kebele
N= Total households of each kebele
S= Total sample households to be treated
∑N= Total households of the four sample kebeles

S is determined to be 5% of the total households of all sample kebeles (∑N) =149. According to population census commission population of the sample kebeles, the total households are listed under the table 3.9. Hence, based on the above formula and population data, the required sample households (n1, n2, n3 and n4) are drown from each Kebeles.

Table 3.8: Distribution of populations per each *kebeles*

Name of sample *Kebeles*	Total Number of population of sample *kebeles*			
	Male	Female	Total	Percent
Arektshelcko	1,960	2401	4361	23.13%
Yesherebna Tatera	1,447	1596	3043	16.14%
Burdana Denber	2,422	2,712	5,134	27.22%
Zizenchona Teredo	2,220	4100	6,320	33.51%
Total	8,049	10,809	18,858	100

Table 3.9: Distribution of sample respondents per each *kebeles*

Name of sample Kebeles	Total Number of households of sample *kebeles*				Sample respondents		
	Male	Female	Total	Percent	Male	Female	Total
Arektshelcko	684	145	829	25	30	7	37
Yesherebna Tatera	449	56	505	15	20	3	23
Burdana Denber	819	122	941	29	37	6	43
Zizenchona Teredo	827	170	997	31	38	8	46
Total	2779	493	3272	100	125	24	149

According to data obtained from Gumer woreda 2015 report the total households are:

Arektshelcko kebele = 829 =N1
Yesherebna Tatera kebele = 505 =N2
Burdana Denber kebele = 941 =N3
Zizenchona Teredo = 997 =N4

Total = 3,272 Σ (N1, N2, N3 and N4)

Based on the above formula the required sample household (n1, n2 , n3 and n4) are drown from each sample *kebeles* (**Arektshelcko**, **Yesherebna Tatera , Burdana Denber and Zizenchona Teredo**) resulting **37,23,43 and 46** Sample respondents respectively.

3.2.5 Data Analysis and Interpretation

The data gathered from different sources through questionnaires, key informant interview, observation and formal and informal discussions were presented, analyzed and interpreted qualitatively and quantitatively depending on the available data obtained. The interviewed data was analyzed by "Daily Interpretive Analysis." The objective of the DIA was to assemble and interpret the information that was collected. In other words, at the end of every day of interviewing, it was essential to review the notes and the tapes and to write a report that would summarize and interpret the information obtained. The data collected manually were encoded and entered into to SPSS. The data were checked for consistency and completeness and edited against the original questionnaire .Descriptive analysis was made to produce tables and figures which along with the qualitative data served as basis for this study

The remaining data were discussed, described and narrated qualitatively. The analysis is supplemented with visual photographs recorded during field observation.

CHAPTER FOUR: DISCUSSIONS AND RESULTS

This chapter presents the results of my analysis. It deals with the analysis and interpretation of major findings of the study on the role of development partners on agricultural extension delivery in Gumer *Woreda.*It focuses up on general socio- demographic characteristics of the sample households; their access to land, inputs ,credits ,market ,training, technologies and other productive resources ;food security of the of the households , understanding about agricultural extension delivery project (SEADE) ;benefits and challenges that occurred during the overall performance of the project. It explicates the information obtained from sample household respondents derived from analysis of each variable through descriptive statics; the data were tabulated using absolute figures and percentage followed by quantitative analyses or descriptions.

4.1 General socio- demographic characteristics

In relation to the main objectives of this particular research; sex, age, marital status, religion, family size, occupation, access to media and income are considered as the basic socio-demographic characteristics of the sample households; besides these educational level, work experience and field of study are also assumed to be the main indicators of the extensions workers .

According to the 2007 census result, there are about a total of 18,182 households with an average of 4 persons per household in Gumer woreda. As per Gumer woreda 2016 report (see table 3.8), a total of 3,272 households are found in four sample kebeles which are selected among 19 kebeles of Gumer woreda .From these Kebeles, randomly selected sample households, 83.89% and 16.18% are male and female headed, respectively. When we sort out the sex of those sample respondents (households and Extension workers) of the case study, 75.17 % of respondents are male headed households and the remaining 12.75% are female headed households. Similarly, 8.72% of the respondents are male extensions workers and the rest 3.36% are female extensions workers. In both cases, the numbers of male respondents are larger than that of the female respondents.

Table 4.1.1 Sex of the sample households and Development agents

Name of sample kebeles	Sex of the household head		Sex of DAs & SMS respondents		Total	
	Male	Female	Male	Female	No	%
Arektshelcko	26	5	4	2	37	24.8
Yesherebna Tatera	17	2	3	1	23	15.4
Burdana Denber	34	5	3	1	43	28.9
Zizenchona Teredo	35	7	3	1	46	30.9
Total	112	19	13	5	149	100
%	75.17	12.75	8.72	3.36		100

Source: own survey (June, 2016)

Family size and age composition influence accessibility of economically active labor for different activities. According to the survey result, the average family size of respondents of the total sample households is 5.11 with SD of 2.66 and ranged from 0-11 members in four sampled *Kebeles* as indicated in table 4.1.2.As far as consider the age of the sample households, the total sample households have an average age of 45.05 years. As indicated in same table, the DAs and SMS have an average age of 28.11. Likewise, age distribution of respondents ranged from 26-72 years for *HH* and 22-50 years for *DAs & SMS*. However, about 14 (77.8%) of Extension workers and about 83 (63.4%) of HH respondents were below the average.

Table 4.1.2 Family size and age of the sample households

	Minimum	**Maximum**	**Average**	**Std. Deviation**
Family size of HH	0	11	5.11	2.66
Age of HH	26	72	45.05	10.148
Age of DAs & SMS	22	50	28.11	7.411

Source: Own surveys (June 2016)

As regards to the marital status of the households of the study kebeles, majorities of the sample

households are found to be married. As indicated in table 4.1.3, from the total of sample households, 96.9% married, 1.5% single (unmarried), 1.5% are widowed. Concerning the extension workers, 44.4% are married and 55.6% are single with closer and similar ratios.

Table 4.1.3 marital status of the sample households and Extension workers

Marital status	HH respondents		DAs & SMS respondents		Total	
	No	%	No	%	No	%
Married	127	96.9	8	44.4	135	90.61
single	2	1.5	10	55.6	12	8.05
Widowed	2	1.5	0	0	2	1.34
Total	131	100	18	100	149	100

Source: own survey (June 2016)

Like other developing countries Ethiopia is characterized by low level of education and high level of illiteracy. Different studies stated that, educational level determines readiness of households to accept new ideas and technologies and enhance ability of farmers to cope with climatic hazards. Concerning education, during the census data of the year 1994, 20.06% of the population were considered literate, which is about the same as the Zone average of 20.62%; 13.24% of children aged 7- 12 were in primary school, 1.94% of the children aged 13- 14 were in junior secondary school, and 4.19% of the inhabitants aged 15- 18 were in senior secondary school. Though there was no empirical data collected regarding the educational status of household heads, the extension workers were requested to respond their educational level, field of study and their work experience as shown in table 4.1.4a-c below.

4.1.4a-Educational level

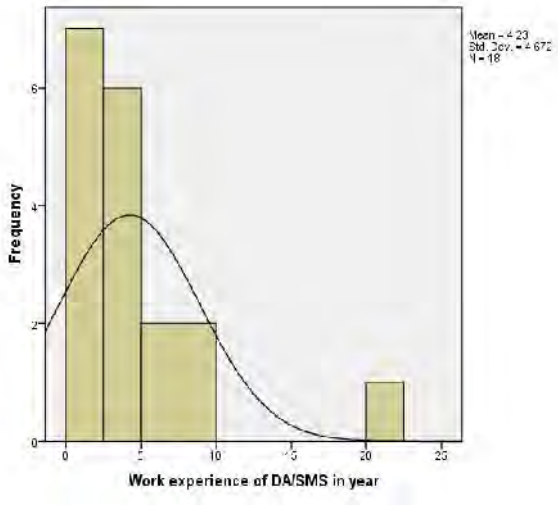
Level	Frequency	Percent	Cumulative Percent
Diploma	11	61.1	61.1
Degree	7	38.9	100.0
Total	18	100.0	

4.1.4C.Work experience as DA/SMS in year

Work Exp years	Frequency	Percent	Cumulative Percent
1	2	11.1	11.1
2	5	27.8	38.9
3	6	33.3	72.2
5	2	11.1	83.3
8	2	11.1	94.4
21	1	5.6	100.0
Total	18	100.0	

4.1.4b-DAs & SMS' Field of study

Field of study	Frequency	Percent	Cumulative Percent
Natural resource mgt	6	40.0	40.0
Agriculture	2	13.3	53.3
Plant Science	4	26.7	80.0
Horticulture	1	6.7	86.7
Animal Science	2	13.3	100.0
Total	15	100.0	



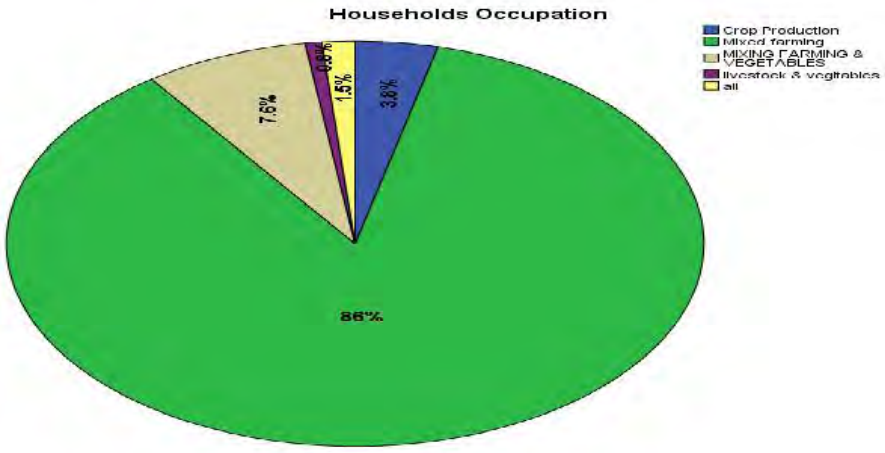

Households Occupation
Crop Production
Mixed farming
MIXING FARMING & VEGETABLES
livestock & vegitables
all
3.8%
1.5%
7.6%
86%

Table 4.1.6 HH Annual Income			
	Frequency	Percent	Cumulative Percent
300-500	13	9.9	9.9
501-1,000	39	29.8	39.7
1,001-1,500	3	2.3	42.0
1,501-and above	74	56.5	98.5
20,000-30,000	2	1.5	100.0
Total	131	100.0	

Source: own survey (June, 2016)

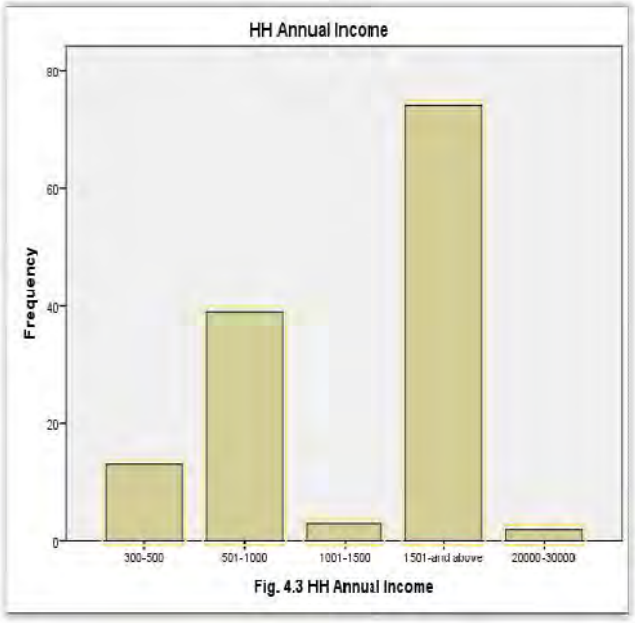


Fig. 4.3 HH Annual Income

Agricultural information to households in the study area is obtained from different sources such as friends, neighbors, DAs, SMS, FTC, and mass Medias as a primary source for information. 97.7% of the household farmers from sampled kebeles have an access to follow Mass Medias / Television, Radio, Newsletter, etc (refer Table 4.1.7).

Table 4.1.7 HH Access to mass media		
	Frequency	Percent
Exposed	128	97.7
Not Exposed	3	2.3
Total	131	100.0

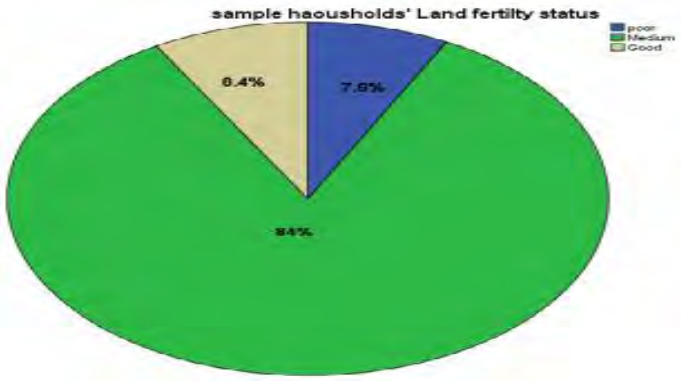
Source: own survey (June, 2016)

4.2 Access to land and other productive resources

The economy of the study areas is mainly depending up on agriculture and land is considered as the basic asset. In Ethiopia, almost 40 percent of farm households have less than 0.5 ha of land, and more than 60 percent have no more than 1 ha from which to support a family of between six and eight people(FAO,2000). Survey results of the study indicate that the average landholding size of the sample farmers is 1.3495ha and about 96.9% of respondents own land. That means, only 3.1% of

Table 4.2.1 Land-holding size of the sample households

land use (in ha)	Minimum	Maximum	Average	Std. Deviation
Cultivated land size	.1250	2.5000	.7152	.4548
Grazing land size	.0500	2.0000	.3354	.3665
Forest land size	.0500	1.0000	.1666	.1455
land size used for Other purpose	.0000	1.0000	.1323	.2102
Total land holding size	.3750	6.5000	1.3495	1.0186



Smallholder farmers in the study area undertake both crop production and livestock rearing activities. Therefore, the importance of livestock was basic and plays a vital role in food security of the smallholder farmers in the studied area. In the study area, livestock are kept mainly for source of food, manure, generation of cash income and transportation, but lesser for supply of draught power. The majority of the sampled respondents owned livestock for their own milk production; only 30.5% of respondents own draught animals and 69.5% of them do not have such animals for agricultural use as they own small land not enough for grazing and to rear. The smallholder farmers of the study area sleep with their cattle and animals in same partitioned hut together in order to protect them from dangers.

4.2.2 Household respondent's draught animal distribution

number of draught animals	Frequency	Percent	Cumulative Percent
0	91	69.5	69.5
1	26	19.8	89.3
2	10	7.6	96.9
3	4	3.1	100.0
Total	131	100.0	

Source: Own survey (June, 2016)

4.3 Food security

FAO (2000) defines Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. Food insecurity exists when people do not have adequate physical, social or economic access to food[i].Agriculture in the region is, for the most part, characterized as being low-input/low-output. The level of technology is generally basic, and productivity per hectare and per person employed are perhaps the lowest. Productivity is constrained by lack of knowledge, lack of financing, poorly articulated markets and boundless access to land.

The sampled households were asked about whether they are food secure or not? Accordingly, 91.5 percent of respondent household of sampled kebeles were professed as they are food secured. Though sampled respondents are food secured, they had various problems mainly related to challenges faced in agricultural practice such as, insufficient farm land holdings, lack of access to agricultural technologies, lack of access to adequate credit service for agricultural activities and poor market situation for agricultural produce.

Those who did not meet their food requirements, 52% of them overcame the problem by engaging in non-agricultural activities, 16% by sharecropping with other farmers and 8% by renting additional plot of land and, the rest involved in two or more activities mentioned. From the table 4.3.1, the agricultural practice can make household farmers food sufficient in the study area that can be responded by 90.1 percent of sampled respondents.

4.3.1: Household food security situation

Responses	**Sample household Respondents**	**percent**
Do you meet all food requirements of your household members from your own agricultural production by the last 12 months?		
Yes	105	80.2
No	26	19.8
Have you produced any surplus for sell?		
Yes	103	78.6
No	28	21.4
Do you think that your current agricultural practice makes your household food self- sufficient?		
Yes	118	90.1
No	13	9.9

Barley, *enset*, potato, wheat, faba bean and cabbage were reported dominantly grown in sample study areas which cover an average of 0.3433ha, 0.2951ha, 0.2471ha, 0.118ha, 0.0721ha and 0.0434 of sample respondents' total land, respectively. As can be seen from table 4.12 below there has been little variation regarding importance of major crops among sample kebele household respondents. Barley (0.4919 ha) and Enset (0.5806 ha) were the greater land sized crops among sample respondents of Arekitsheloko households where as potato (0.4028 ha) and wheat (0.1875ha) were found to be most important crops grown in Burdana Denber sample households. Similarly, fababean (0.0729ha) was the main crop among sample respondents of Zizenchona Tereda Kebele. Bean (0.1479ha) and cabbage (0.0434ha) in average were the type of crops that were grown and reported only by household respondents in Arekitsheleko.

Table 4.3.2: Average Area (ha) and Average production (in Qtls) of major crops grown in sample kebele

FTC_KEBELE	Barely		Enset		Potato		Faba Bean		wheat	
	in ha	in Qtl	in ha	in Qtl	in ha	in Qtl	in ha	in Qtl	in ha	in Qtl
Burdana Denber	0.4167	18.2639	0.2660	24.5077	0.4028	126.4444			0.1875	7.5
Zizenchona Teredo	0.2321		0.1816		0.1190		0.0729			
Arektshleko	0.4919	30.3871	0.5806	1.9355	0.3113	178.0968			0.12	36.4
Yesherebna Tatera	0.1958	23.1079	0.14	36.9444	0.1303	58.5526	0.055	50.5	0.0909	3.7727
Total	0.3433	23.7041	0.2951	19.1	0.2471	130.0640	0.0721	50.5	0.118	17.42

Source:own survey data,2016

4.3.3 Small holders' understanding about agricultural extension delivery

What is your level of understanding about Agricultural Extension?						
Responses	FTC_KEBELE				Total	percent
	Burdana Denber	Zizenchona Teredo	Arektshleko	Yesherebna Tatera		
low	0	0	0	0	0	0
medium	5	0	0	12	17	13
high	34	42	31	6	113	87
Total	39	42	31	18	130	100
Has any of Agricultural Extension Agents explained to you what Agricultural Extension Project (SAEDE) is?						
yes	39	42	31	17	129	99
no	0	0	0	1	1	1
Total	39	42	31	18	130	100
What is the role of the agricultural extension projects in improving your productivity?						
Excellent	2	34	13	10	59	45
very good	35	8	18	6	67	51
Good	2	0	0	3	5	4
Not good	0	0	0	0	0	0
Insignificant	0	0	0	0	0	0
Total	39	42	31	19	131	100
How many extension workers (DAs) are working in your Kebelle?						
2	0	0	0	12	12	11
3	27	42	22	3	94	80
4	0	0	9	2	11	9
Total	27	42	31	17	117	100

Is the number of extension workers (DAs) available in your Kebelle enough to run the activities of Agricultural Extension Program?						
yes	37	21	16	17	91	72
no	2	21	10	2	35	28
Total	39	42	26	19	126	100
To what extent extension workers (DAs) provide the necessary information?						
low	1	0	0	0	1	1
medium	0	4	0	12	16	12
high	38	38	31	6	113	87
Total	39	42	31	18	130	100
What level is the interaction of yours with Extension Agents?						
low	0	0	0	2	2	1
medium	0	0	0	9	9	7
high	39	42	31	8	120	92
Total	39	42	31	19	131	131
Do you agree that areas that have agricultural extension activities are better than those areas that do not have?						
strongly agree	30	38	11	3	82	63
agree	9	4	20	16	49	37
Slightly agree	0	0	0	0	0	0
disagree	0	0	0	0	0	0
Total	39	42	31	19	131	100

From the above table 4.3.3 Results of the study show that, 99 percent of households' respondents had an explanation about the benefits about agricultural extension project from their DAs .Therefore almost all the respondents had a better knowledge regarding such projects and some of them explained well about SEADE project. They had also good contact with their FTC's DAs, 92% of the respondents had high interaction with the extension and 87% of the sample respondents believed they have been provided essential agricultural information from DAs. Regarding the role of the agricultural extension project, 51 percent of the respondents had very good increase in their productivity; the remaining 45% and 4% responded the project had such excellent and good role in improving productivity, respectively.63 percent of the households agree that areas that have agricultural extension activities are better than those areas that do not have practiced, the remaining 37 percent do not agree.

4.4 Access to technologies, inputs, credit, markets and training

According to sampled respondent's response, household farmers did have an access credit service from Microfinance Institution so called OMO Microfinance. Accordingly, the table 4.4.1 below depicts that about 41 percent of the sampled respondents strongly agreed their access to credit service increased their agricultural productivity and 41 percent also agreed the importance of the service, the remaining 5 percent of the sampled respondents slightly agreed credit service help to improve their productivity.

4.4.1 HH Access to Credit service Vs productivity						
Responses	FTC_KEBELE				Total	%
	Burdana Denber	Zizenchona Teredo	Arektshleko	Yesherebna Tatera		
strongly agree	12	32	7	3	54	41
agree	27	10	18	16	71	54
slightly agree	0	0	6	0	6	5
Disagree	0	0	0	0	0	0
Total	39	42	31	19	131	100

Regarding the transportation service to and from market areas about 91 percent of sampled respondents had access to transportation service whereas the remaining 9 percent did not access to transportation services. As indicated in table 4.4.3, the majority of sampled respondents use all types of transportation and on foot to go to the market areas. Accordingly, about 45, 26 and 21 percent of respondents used all types, on foot and car mode of transportation respectively. The remaining 8 percent were used car, Bajaj and on animal back for the transportation purpose.

From table 4.4.2 below 95 percent of respondents have accesses to feeder roads that connect to the near market areas whereas only 5 percent of respondents that were from Yesherebna Tatera did not have access to feeder roads. Not only accessibility but also the sampled 73 percent of respondents responded that the existing feeder road is of good qualities for transportation,19 percent and 8% of respondents reacted very good and poor quality road they have, respectively (see table 4.4.2).

Sampled respondents' market access is very abundant to exchange their agricultural products as well as to buy other products from the market and therefore 94 percent of the sampled respondents' accessed market while 6 percent did not access convenient agricultural markets. Similarly, it takes an average of 9 km long from households' home to market center and an average of 3km to FTC center (see table 4.1.8).

Table 4.4.2 Sample kebeles respondents access Road

		FTC_KEBELE				Total	percent
		Burdana Denber	Zizenchona Teredo	Arektshleko	Yesherebna Tatera		
Is there any feeder road that connects your kebele to the market area?	yes	39	42	29	11	121	95%
	no	0	0	0	7	7	5%
Total		39	42	29	18	128	100%
Road status	POOR	0	0	0	10	10	8%
	GOOD	35	30	20	8	93	73%
	VERY GOOD	4	12	9	0	25	19%
Total		39	42	29	18	128	100%

Table 4.4.3.Sample kebeles respondents access to transport service

Access to transport service?	yes	39	42	29	7	117	91%
	no	0	0	0	11	11	9%
Total		39	42	29	18	128	100%
What are the types of transportation you use to go to Market?	On foot	0	15	0	18	33	26%
	Car	0	27	0	0	27	21%
	Animal ,car, Bajaj	2	0	8	0	10	8%
	ALL	37	0	21	0	58	45%
Total		39	42	29	18	128	100%

Table 4.4.4.Sample kebeles' respondents access to Market

Access to convenient markets?	yes	39	42	31	10	122	94%
	no	0	0	0	8	8	6%
Distance market center from home (in Km)?	Average	4.2051	14.2143	8.3966	11.1667	9	
	Minimum	2.00	13.00	5.00	1.00	1	
	Maximum	7.00	17.00	10.00	16.00	17	
Distance FTC from home (in km)?	Average	2.0526	2.8810	2.8333	2.2941	3	
	Minimum	.50	2.00	.20	1.00	0.20	
	Maximum	4.00	4.00	5.00	8.00	8.00	

Agricultural Extension contact has a direct influence on the agricultural practice of smallholder farmers. When there is contact with agricultural extension agent, the greater are the possibilities of farmers being better in agricultural practice and to adopt agricultural innovations use modern agricultural technologies and improved seed and other agricultural inputs (wubshet,2014).Table 4.4.5 shows 80 percent of respondents had a chance to be trained and got familiar with new agricultural technology from FTC centers and only 20 percent did not have. Regarding the difficulties with the new agricultural technology, 73 percent of the sampled respondents had faced difficulty using and applying technological skills and ideas in their agricultural practice, but 23 percent found it easier to use and apply the modern agricultural technology.

According to data collected from sample household shows the main constraints of smallholder farmers in adopting new agricultural technologies were primarily related with lack of education and fragmented land of households. Accordingly the table 4.4.6 below depicts that about 34.4 percent of the sampled household were constrained by lack of education and 21.4 percent were by fragmented land not enough to adopt new agricultural technologies. Lack of interest, information and credit service facility are also the constraints accounted 13.7 percent, 10.7 percent and 6.1 percent respectively to adopt new agricultural technologies for the sampled respondent household of the study area.

Table 4.4.5.Sample kebeles' respondents Access to training

		Sampled FTC_KEBELE				Total	%
		Burdana Denber	Zizenchona Teredo	Arektshleko	Yesherebna Tatera		
Training taken in agricultural technology?	yes	26	38	23	18	105	80%
	no	13	4	8	1	26	20%
Total		39	42	31	19	131	100%

Table 4.4.6.HH respondents new agricultural technology difficulties

Have you ever faced any difficulty in using the new agricultural skills and ideas?	yes	37	42	4	13	96	73%
	no	2	0	27	6	35	27%
Total		39	42	31	19	131	100

Table 4.4.7.Availability of extension workers to HH

Are extension workers available at any time when you want them?	yes	33	42	31	17	123	94%
	no	6	0	0	2	8	6%

	Total	39	42	31	19	131	100
Table 4.4.8.Approach of extension workers in providing extension service							
How do you assess the approach of extension?	Excellent	2	26	13	10	51	39%
	very good	25	16	18	8	67	51%
	Good	12	0	0	1	13	10%
	Slightly good	0	0	0	0	0	0
	Insignificant	0	0	0	0	0	0
Total		39	42	31	19	131	100
Table 4.4.9 HH constraints to adopt new agricultural technologies							
Constraints to adopt new agricultural technologies in your agricultural practice?	1.Lack of credit service	0	6	2	0	8	6.1%
	2.fragmented farmland	24	4	0	0	28	21.
	3.Lack of education	6	10	29	0	45	34.
	4.Lack of information	7	7	0	0	14	10.
	5.Lack of interest	2	0	0	16	18	13.
	6.2&3	0	4	0	1	5	3.8%
	7.1 & 5	0	0	0	2	2	1.5%
	8.1&2	0	6	0	0	6	4.6%
	9.2&3	0	5	0	0	5	3.8%
Total		39	42	31	19	131	100%

The Survey also explored major users of agricultural inputs like improved seed, organic fertilizer, chemical fertilizer, and Herbicides, insecticides and pesticides inputs on their farm land of sampled Kebeles. In terms of the proportion of households' agricultural input users, the percentage ranged 97.7 percents of respondents have used and only 2.3 percent did not applied the agricultural inputs on their farm land. Organic fertilizer was most widely applied by farm households (97.7%), followed by improved seeds (90.1%) and chemical fertilizer (90.8%). Herbicides, insecticides and pesticides inputs user were accounted the least (64.9%) from the sample households.

Table 4.4.10.Sample kebeles' respondents Agricultural inputs users and types							
			FTC_KEBELE				**Total**
			Burdana Denber	**Zizenchona Teredo**	**Arektshleko**	**Yesherebna Tatera**	
Have you used Agricultural inputs on your farm land?	**yes**	**Count**	**39**	**42**	**31**	**16**	**128**
		% of Total	**29.8%**	**32.1%**	**23.7%**	**12.2%**	**97.7%**
	no	**Count**	**0**	**0**	**0**	**3**	**3**
		% of Total	**0.0%**	**0.0%**	**0.0%**	**2.3%**	**2.3%**

Total		Count	39	42	31	19	131
		% of Total	29.8%	32.1%	23.7%	14.5%	100.0%
Chemical fertilizer inputs user	yes	Count	39	42	31	7	119
		% of Total	29.8%	32.1%	23.7%	5.3%	90.8%
	no	Count	0	0	0	12	12
		% of Total	0.0%	0.0%	0.0%	9.2%	9.2%
Total		Count	39	42	31	19	131
		% of Total	29.8%	32.1%	23.7%	14.5%	100.0%
Organic fertilizer inputs user	yes	Count	39	42	31	15	127
		% of Total	30.0%	32.3%	23.8%	11.5%	97.7%
	no	Count	0	0	0	3	3
		% of Total	0.0%	0.0%	0.0%	2.3%	2.3%
Total		Count	39	42	31	18	130
		% of Total	30.0%	32.3%	23.8%	13.8%	100.0%
Improved seeds user	yes	Count	39	42	31	6	118
		% of Total	29.8%	32.1%	23.7%	4.6%	90.1%
	no	Count	0	0	0	13	13
		% of Total	0.0%	0.0%	0.0%	9.9%	9.9%
Herbicides, insecticides and pesticides inputs user	yes	Count	39	42	0	4	85
		% of Total	29.8%	32.1%	0.0%	3.1%	64.9%
	no	Count	0	0	31	15	46
		% of Total	0.0%	0.0%	23.7%	11.5%	35.1%

Accordingly constraints to use the agricultural inputs were identified as major development gaps among sample respondents in Arekitsheleko and Yesherebna Teter kebeles (see table 4.4.11), these were: shortage of capital (28%), high cost of agricultural inputs (28%), lack of access (16%) and non-organic fertilizers side effects (28%).

Table 4.4.11.Factors affecting agricultural inputs

			FTC_KEBELE		Total
			Arektshleko	Yesherebna Tatera	
What are the factors that hinder you from using inputs?	shortage/lack of capital	Count	0	7	7
		% of Total	0.0%	28.0%	28.0%
	High cost of agricultural inputs	Count	0	7	7
		% of Total	0.0%	28.0%	28.0%
	Lack of access	Count	4	0	4
		% of Total	16.0%	0.0%	16.0%
	non organic fertilizers side effects	Count	7	0	7
		% of Total	28.0%	0.0%	28.0%
Total		Count	11	14	25
		% of Total	44.0%	56.0%	100.0%

4.5 Issues concerning benefit and challenge of SAEDE project

The goal of Project entitled, "Strengthening Agricultural Extension Delivery in Ethiopia (SAEDE) was to improve the productivity and income of smallholder farmers by strengthening the frontline extension service delivery system at selected Farmer Training Centers (FTCs). SAA focused mainly on: establishing need based innovative agricultural technologies (crop, livestock, Natural resource management and postharvest and agro-processing technologies); train DAs and SMSs on established enterprises and improve extension management system; and, strengthen public private partnership for market access. The farmers in the Gumer woreda have received various trainings like improved ways of crop and livestock production, planting methods, honey production, improved livestock management, improved poultry management, organic farming and the like. Most respondents reported they have taken informal consultation and field days training during the project session from DAs of FTCs .They acquired new skills from technical support and applied it on their farming land.

Survey data revealed that 92 percent of sample respondents responded SEAD project was useful and relevant to their agricultural activity needs through the training given facilitated by SG-2000 with the extension agents and 91 percent and 90 percent of them agreed they have increased in their agricultural productivity and household income, respectively (See tables 4.5.1, 4.5.2 &4.5.3.)

Table 4.5.1-SAEDE/SG-2000 project relevance to households

		FTC_KEBELE				Total	%
		Burdana Denber	Zizenchona Teredo	Arektshleko	Yesherebna Tatera		
Were the technologies, training and advice given by SG-2000 and extension agents useful to you and relevance to your problems?	yes	39	36	31	13	119	92%
	no	0	0	0	3	3	2%
	I DON'T KNOW	0	6	0	2	8	6%
Total		39	42	31	18	130	100%

Table 4.5.2-SAEDE/SG-2000 project Vs agricultural productivity							
Have your agricultural productivity increased because of participating in SAEDE/SG-2000 project?	yes	39	42	31	6	118	91%
	no	0	0	0	12	12	9%
Total		39	42	31	18	130	100%
Table 4.5.3-SAEDE/SG-2000 project Vs household income							
Have your income increased because of participating in SAEDE/SG-2000 project?	yes	39	42	29	5	115	90%
	no	0	0	0	13	13	10%
Total		39	42	29	18	128	100%

Source: own survey, June 2016

As per the sampled respondents, Shortage of farm inputs, land shortage among FTCs and shortage of credit were the first three constraints that hindered the SEADE project involving training services (See table 4.5.4).

Table 4.5.4.Major constraints of HHs to participate in SAEDE project FTCs

	Factors	Households considered the factors as constraint		Severity
		Frequency	Percent	rank
a)	shortage of farm inputs supply	43	71.7	Most sever
b)	land shortage among FTCs	41	40.6	Second sever
c)	Lack of credit	46	46.5	Third Sever
d)	P/FTCs lack clear structure of accountability	23	37.1	Fourth Sever
e)	P/FTCs don't provide the required support	22	32.8	Fifth sever
f)	Lack of extension workers	22	32.4	Sixth sever
g)	weak approach of extension workers	33	55	Least sever

Source: own survey, June 2016

Survey of opinion of HHs on severity of list of potential constraints in crop production shows that erratic rainfall was the most sever constraint on average, followed by Shortage of land and Low soil fertility in crop production. Others in the top seven were High cost of inputs/lack of money, Lack of credit, Lack of input supplier and Lack of improved seed (see table 4.5.5).

Table 4.5.5.Major constraints in crop production in sample kebeles

	Factors	Households considered the factors as constraint		Severity
		Frequency	Percent	rank
a)	Erratic rainfall	64	53.8	Most sever
b)	Shortage of land	40	37.4	Second sever
c)	Low soil fertility	44	34.4	Third Sever
d)	High cost of inputs/lack of money	21	24.4	Fourth Sever
e)	Lack of credit	33	33.3	Fifth sever
f)	Lack of input supplier	39	52	Sixth sever
g)	Lack of improved seed	42	45.7	Least sever

Source: own survey, June 2016

However, this does not mean the situation will remain stable as the ranks indicate here for a reason; the environment affecting crop production is dynamic and can change from time to time. Therefore, the results need to be understood with caution. Future interventions can also integrate components that can address even problem areas rated low as long as selected priority actions do fulfill strategic and optimization criteria. Other components that can be integrated with such response can also address the other top problems.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The agricultural sector plays a central role in the economic and social life of the nation and is a cornerstone of the economy. Smallholders are the backbone of the sector, our subsistence agriculture is almost entirely rainfed and yields are generally low, and when it faces extreme weather conditions, the situation could make a turn for the worse. On the other hand, feeding the ever growing population is a challenge. Thus assisting the sector with modern agricultural extension program is inevitability than an option. FTC based extension services are expected to change this and lead to agricultural growth. The SEADE project, jointly implemented by SAA and OA, funded by BMGF provided evidence that equipping and furnishing the FTCs, building the skill of extension staff and access to improved agricultural technologies to demonstrate at FTCs has strong change power for accelerating adoption and creation of demand for the technologies so as to increase production and productivity. The concluding points stated in this section are based on the findings made with sampled household farmers' respondents of the study area who were actively participated at the SEADE project.

The smallholder farmers in the study area have been depending on mixed farming system in producing crop and livestock rearing. They cultivate crops such as Barley, potato, enset, faba bean, and wheat as top five crops in terms of both the number of households cultivating and land size use. Most of the household respondents have additional incomes that supplement their farming source of income. The land covered by annual and perennial crops covered the largest share of cultivated land. Even most of them have small plot of land less than one hectares of land which is medium fertile land to be cultivated, most sampled respondent household professed as they are food secured. Those who do not meet their food requirements, they overcame the problem by engaging in non-agricultural activities.

The majority of the sampled respondents owned livestock for their own milk production; but only few respondents own draught animals for agricultural as a fact that most own small land not enough for grazing and to rear.

The households have been trained with new agricultural technology from FTC centers and explained about the benefits extension project by DAs, but most of the sampled respondents faced

difficulty using and applying technological skills and ideas in their agricultural practice. Though most believed they have been provided essential agricultural information, lack of education and fragmented land of households constrained them in adopting the new agricultural technologies. Half of the respondents reported the extension project played vital role to increase their productivity. The demonstrations made at FTC and practical training made FTC a knowledge center attracting voluntary visit by the farmers. This has changed farmers' attitude of considering FTC as a liability and contribute to ensuring community ownership of FTC.

In the study area most sampled smallholder farmers who participated in the extension project had an access to credit service from OMO microfinance institute; access to transportation service to and from market areas; access to feeder roads that connect to the near market areas, access to abundant local market to exchange their agricultural products as well as to buy other products and helped them to increase their agricultural productivity. They use all types of transportation and on foot to go to the market areas.

According to the study result the majority of smallholder farmers in the study area applied the agricultural inputs on their farm land; Organic fertilizer was most widely applied by farm households, followed by improved seeds and chemical fertilizer. Herbicides, insecticides and pesticides inputs user were accounted the least from the sample households. The data obtained in the study area showed that the main problem to use agricultural inputs were attached with shortage of capital, high cost of agricultural inputs, lack of access and non-organic fertilizers side effects.

Sample households responded SEAD project was useful and relevant to their agricultural activity needs and agreed that they have increased in their agricultural productivity and household income through the training and support given by FTC facilitated by SG-2000.They also pointed out shortage for farm inputs, land shortage among FTCs and limit of credit access were the first three constraints that hindered the SEADE project. Generally the study revealed that erratic rainfall followed by shortage of land and low soil fertility were the most underlying cause of low crop production and productivity in the study area.

5.2 Recommendations

In this section, brief recommendations for consideration in future agricultural extension projects are provided to improve roles of development partners to strengthen the agricultural extension delivery so as to improve productivity of smallholder of the study area.

I. Project period: the SEADE project lasted only for five years and most activities and support were stopped after the project phase out. Therefore, the agriculture officials at woreda level should draw valid lessons from the project organizers and accelerate the agricultural extension delivery sustainably by making FTCs effectively functional and ensuring farmers' ownership of FTCs.

II. DA incentives: high turnover of DAs was one of the challenges happened during the project period. In order to retain them, capacitating, motivating and attractive DA's incentive packages should be implemented by in the study woreda.

III. Households' shortage of supply and high cost of agricultural inputs: like chemical fertilizer, improved seed and agrochemicals; lack of credit access, lack of awareness on improved ways of crop and livestock production; prevalence of crop and livestock diseases. In order to alleviate the challenges of crop and livestock production and to increase productivity in the target sampled kebeles, intervention like timely provision of agricultural inputs like chemical fertilizer, improved seed, agro chemicals, modern beehives, dairy cows and improved feed with fair price, facilitation of credit service at kebele level, continuous follow-up and training by DAs on improved ways of crop and livestock production. Development partners can also play their role including market linkage both for farm inputs and products

IV. FTC capacity building: shortage of agricultural inputs, lack of awareness on extension methods, shortage of land for demonstration and lack of awareness on FTC management were major constraints observed in most of Project FTCs. To alleviate these challenges, interventions such as introduction of agricultural inputs (chemical fertilizer, improved seed, improved dairy cow breed, agricultural tools); subsidies the farmers who cannot afford the inputs by the or any development partners; trainings on extension methods and FTC management, and relevant trainings on human resource management in general and FTC

management in particular. The number of FTCs and DAs are so few to expand the extensional skills and knowledge particularly in remote areas that are far from FTCs; and for women that have time limitation to visit FTC for learning throughout each study kebele. Therefore, future projects should pursue with large scale number of FTCs and DAs.

V. Advancing productivity of smallholders: as modern pealing machine for *enset* harvesting and modern storage for potato and other cereal crops coupled with awareness creation program on the subject matters so as to increase productivity and market value of produces which in turn could reduce poverty and food insecurity, need to be implemented in the project areas. The practice of irrigation water use in the area was limited to manual application that has not necessitated the presence of active Water User Groups or any formal rule in water share. Under this scenario, attempts to promote low cost water harvest irrigation technologies such as construction of earth dams, river diversions, and hand pumps should be expanded and encouraged. On the research side, crop varieties and management practices for irrigated agriculture should be given due emphasis;

VI. Erratic rainfall, Scarcity of land and decline in soil fertility: these were reported by households as among the top constraints in crop production. High yielding varieties and related packages can be the immediate response to the land shortage and fertility loss problems. Other components that can be integrated with such response can also address the other top problems.

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APPENDIX I - Questionnaires to be filled by smallholder households

Introduction

Dear respondents,

You have been selected to participate in the study designed to collect information on the role of development partners on agricultural extension delivery in reference to some selected kebeles of Gumer woreda. As a result, I kindly ask you to share me your opinion and experiences. The main aim of this enquiry is to systematically and objectively secure pertinent data and there by investigate the critical factors affecting agricultural extension program. Thus, for the realization of this research your genuine response to the following questionnaire is highly appreciated and the researcher would like to confirm you that the information you provide will be kept confidential and be put in use only for academic purposes. Your answer should reflect only your perception and experience in the area of the subject. I kindly request you in responding to the questionnaires as promptly as possible. You are not expected to write your name on the questionnaire.

Thank you in advance for your kind cooperation.

Date----------

Enumerators' Code----------

A. SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Name of the kebele:_____
2. Marital status of the household head

A) Single B) Married C) Divorced D) Widow E) Separated

3. Farmer Characteristics

Age (Years)	Sex M=Male F=Female	Family size		Religion
		M	F	

4. What is the major occupation of the household?

A) Crop Production B) mixed farming C) livestock D) vegetable E) others

5. Do you have additional incomes that supplement your major occupation?

A) Yes A) No

6. What is the average annual household income in Birr from all sources?

A) Below 300 Birr B) 300-500 Birr C) 501-1000 Birr
D) 1001-1500 Birr E) 1501 and above

7. Do you have access to follow mass medias / Television, Radio, Newsletter, etc. /?

A) Exposed to Mass Media B) Not Exposed to Mass media

B. ACCESS TO LAND AND OTHER PRODUCTIVE RESOURCES

8. Do you have plots of land? A) Yes B) No

9. If your answer is "yes" to question No.8, What is the total size of the following land types that you use?

10.

NO	Land Type	Size in Timad	Size in Hectares
1	Cultivated land		
2	Grazing land		
3	Forest land		
4	Others, specify		
Total			

11. What is the fertility status of your farm land?

A) Poor B) Medium C) Good

12. Do you have draught animals? a) Yes b) No
13. If your response is "yes" to question no 12, how many draught animals do you have?_____

C. FOOD SECURITY

1.

Major crop name	Area in ha	Production in qt	Productivity (qt/ha) *(calculable)*
Enset			
Barley			
Potato			
Faba bean			
Wheat			
Other specify___			

2. Do you meet all food requirements of your household members from your own agricultural production by the last 12 months?
   A) Yes B) No

3. If your answer for question no.2 is "No" how did you overcome the problem?

A) By engaging in non-agricultural activities C) By sharecropping with other farmers

B) By renting additional plot of land D) Other

4. Have you produced any surplus for sell? A) Yes B) No

5. If your answer for question 4 is "No" what are the reasons for not producing?

A) Due to low production from agriculture it is only consumed at home

B) Due to shortage of farm land it not sufficient to produce any surplus for market

C) Due to poor markets for agricultural production D. Other

6. According to your own self-assessment is your household food secure? A) Yes B) No

7. If you are food insecure in which month of the year do your household face food shortage (mention name of months)_____

8. Do you think that your current agricultural practice makes your household food self- sufficient? A) Yes B) No
9. Do you believe that the challenges faced on your agricultural practice are responsible for your food insecurity situation?
   A) Yes B) No

D. SMALLHOLDERS' UNDERSTANDING ABOUT AGRICULTURAL EXTENSION DELIVERY

1. What is your level of understanding about Agricultural Extension?
   A) Low B) Medium C) High D) Nil
2. Has any of Agricultural Extension Agents explained to you what Agricultural Extension Project (SAEDE) is? A) Yes B) No
3. What is the role of the agricultural extension projects in improving your productivity?

   A) Excellent B) Very good C) Good D) Slightly good E) Insignificant

4. How many extension workers (DAs) are working in your Kebelle? _____
5. Is the number of extension workers (DAs) available in your Kebelle enough to run the activities of Agricultural Extension Program?
   A) Yes B) No
6. To what extent extension workers (DAs) provide the necessary information?

   A) Low B) Medium C) High D) Nil

7. What level is the interaction of yours with Extension Agents?

   A) Low B) Medium C) High D) Nil
8. Do you agree that areas that have agricultural extension activities are better than those areas that do not have?

   A) Strongly agree B) Agree C) slightly agree D) Disagree

E. ACCESS TO TECHNOLOGIES, INPUTS, CREDIT , MARKETS AND TRAINING

1. Do you have access to credit services that facilitate your agricultural? A) Yes B) No
2. What are your sources of credit?

   A) Private money lenders B) Microfinance Institution C) Banks D) NGOs E) Others

3. Do you agree that credit service can help in improving your productivity?

   A) Strongly agree B) Agree C) slightly agree D) Disagree

4. To what extent credit service availability improving your agricultural productivity?
   A) Low B) Medium C) High D) Nil
5. Have you ever taken any training in your Keble's / Farmer Training Centre's on the way you apply agricultural technology?
   A) Yes B) No
6. Have you ever faced any difficulty in using the new agricultural skills and ideas?
   A) Yes B) No

7. Are extension workers available at any time when you want them? A) Yes B) No

8. How do you assess the approach of extension workers in providing extension service?

A) Excellent B) Very good C) Good D) Slightly good E) Insignificant

9. Have you used Agricultural inputs on your farm land? A) Yes B) No

10. If your answer is "yes" which one do you use?

No	Type of inputs	Yes	No
1	Chemical fertilizer		
2	Organic fertilizer		
3	Improved seeds		
4	Herbicides, insecticides and pesticides		
5	Others		

11. If your answer is No" what are the factors that hinder you from using?

A) shortage/lack of capital B) High cost of agricultural inputs

C) Lack of access D) other, specify_____

12. Do you apply organic fertilizers such as animal manure, crop residues and compost in your farmlands? A) Yes B) No

13. Do you apply farm inputs on your farmland as per the recommendation of agricultural experts?
A) Yes B) No

14. What are the constraints that hindered to adopt new agricultural technologies in your agricultural practice?

No	Constraints	Yes	No
1	Lack of credit service facility		
2	fragmented farmland		
3	Lack of education		
4	Lack of information about new technologies		
5	Lack of interest		

15. Is there any feeder road that connects your kebele to the market area? A) Yes B) No

16. If yes how well it is? A) Poor B) Good C) Very good

17. Do you have access to transport service? A) Yes B) No

18. What are the types of transportation you use to go to Market?
A) Animal B) On foot C) Motorcycle D) Car E) other specify_____

19. Do you have access to convenient markets for your agricultural outputs and inputs?
A) Yes B) No

20. How far is the nearest market center from your home (in Km)? ____

F. ISSUES CONCERNING BENEFIT AND CHALLENGE OF SAEDE PROJECT

1. How far is the Kebele's Farmer Training Centre from your home? _____
2. Have you received any advice or trainings from the extension agents on SG 2000 improved agricultural technologies/practices? A) Yes B) NO

   2.1. If yes, What kind of support (training, advice, input/technology, etc.) you have received from EAs/SG 2000 on improved agricultural practices
   A) Formal training, B) informal consultation, C) field days,
   D) Provision of inputs/equipment E) market linkage/price information
   F) Other (specify)_____
   2.2. From the technical support have you learned new skills/ technologies? A)Yes, B)No
   2.3. Have you applied it in your farming? A)Yes, B)No
   2.4. If no, why? _____

3. Were the technologies, training and advice given by SG-2000 and extension agents useful to you and relevance to your problems?

A) Yes B) NO C) I don't know

4. Have your agricultural productivity increased because of participating in SAEDE/SG-2000 project?

A) Yes B) NO C) I don't know

5. Have your income increased because of participating in SAEDE/SG-2000 project?

A) Yes B) NO C) I don't know

6. What are the major problems you encountered participating in SAEDE project? Rank the problems according their severity by putting 1, 2, 3, 4… in the box?

a)	shortage of farm inputs supply	
b)	P/FTCs lack clear structure of accountability	
c)	P/FTCs don't provide the required support	
d)	land shortage among P/FTCs	
e)	weak approach of extension workers	
f)	Lack of credit	
g)	Lack of extension workers	

h) If there are other reasons, mention here under?_____

7. What factors affect your crop production activity? Rank the problems according their severity by putting 1, 2, 3, 4… in the box?

a)	High cost of inputs/lack of money	
b)	Erratic rainfall	
c)	Shortage of land	
d)	Lack of credit	
e)	Lack of input supplier	
f)	Low soil fertility	
g)	Lack of improved seed	

APPENDIX II -QUESTIONARIERS TO BE FILLED BY DAs/SMS /FTC-MC

Introduction

Dear respondents,

You have been selected to participate in the study designed to collect information on the role of development partners on agricultural extension delivery in reference to some selected kebeles of Gumer woreda. As a result, I kindly ask you to share me your opinion and experiences. The main aim of this enquiry is to systematically and objectively secure pertinent data and there by investigate the critical factors affecting agricultural extension program. Thus, for the realization of this research your genuine response to the following questionnaire is highly appreciated and the researcher would like to confirm you that the information you provide will be kept confidential and be put in use only for academic purposes. Your answer should reflect only your perception and experience in the area of the subject. I kindly request you in responding to the questionnaires as promptly as possible. You are not expected to write your name on the questionnaire.

Thank you in advance for your kind cooperation.

Date----------

Enumerators' Code----------

A. **General Information of the Respondents**

1. Age:____
2. Sex : A) Male B) Female
3. Marital Status :A) single B) Married C) Divorced) D)Widowed
4. Educational level A) Certificate B) Diploma C) Degree
5. Field of study you have completed? _____
6. Work experience as DA/SMS/ P/FTC-MC in year? _____

B. Agricultural Extension Workers' Understanding on SAEDE Project

7. Rank/prioritize the following roles of Agricultural Extension Project? By putting 1, 2, 3, 4... In the space provided?
   A) To train extension agents and farmers____
   B) To increase productivity and income___
   C) To promote innovative agricultural technologies____
   D) To build capacity of P/FTC-Management Committees (P/FTC-MC) _____
   E) To promote public private partnerships for market and credit access____

8. In which of the aspects the SAEDE project plays a significant role? [Multiple responses possible]

   A) Application of improved technologies/practices
   B) Increase in Production and productivity
   C) In profitability of crop and livestock activities
   D) In introducing and producing exotic seeds
   E) Access to inputs, credit and markets
   G) Equal to all

9. How are the roles of Agricultural Extension Development partners at Gumer Woreda?

   A) Increased from year to year B) remain the same C) decreased from year to year

10. What is the level of your satisfaction regarding SAEDE project?

    A) Low B) Medium C) High D) Nil

11. What is the attitude of farmers in using SAEDE technological skills and ideas related to agriculture?

    A) Low B) Medium C) High D) Nil

12. What is the response or sense of the farmers towards your contribution on SAEDE project?

    A) Excellent B) Very good C) Good
    D) Slightly good E) Not that much

C) Issues related to Access and Training on Agricultural Extension Project (SAEDE)

13. Do you think that farmers will be successful, if they are given Access to technologies, inputs, credit and markets?

A) Yes B) No

14. Is the FTC you are assigned accessible to transport?

A) Yes B) No

15. Are you satisfied with training; and improved extension service delivery given by SAEDE project?

A)Yes B)NO

16. Have you ever taken any training that improve your level of capacity and enable you to familiarize with the new agricultural skills and knowledge?

A) Yes B) No

17. Have the project capacity buildings enabled you to apply diversified extension methods and approaches to effectively delivery extension advices, technologies and services to farmers?

A) Yes B) No

D) Issues concerning Benefits and Challenges of SAEDE project

18. What are the support, incentives, facilities, etc. you had from the SAEDE project?

Support_____
Facilities _____
Incentives_____

19. Do you agree that SAEDE project have made an improvement in the quality of agricultural Extension delivery in Gumer Woreda?

A) Strongly agree B) Agree C) slightly agree D) Disagree

20. What is the level of your acceptance in the farmers?

A) Low B) Medium C) High

21. Have you ever faced any rejection from the farmers while delivering your tasks?

a) Yes b) No

21.1. If your answer is Yes, how have you handled and controlled it?

_____

_____

22. Were there any challenges related to the SAEDE project?

A) Yes B) No

22.1. If your answer is Yes for question number 21, list some of challenges?

_____

_____

23. What solutions do you suggest for the above challenges that affect SAEDE project?

_____.
_____.
_____.
_____.
_____.

24. Do you think that the SAEDE project improved the income and food security of small-holder farmers in Gumer woreda?

A) Yes B) No

25. What are the causes that affect Agricultural Extension project in its implementation process?

1._____
2._____
3._____
4._____

26. What were the major problems in agricultural extension services delivery in last12months? List some of the problems.

1._ 4._ 5._

2._ 3._

.

Appendix III-Interview guides

Introduction

Dear respondents, these interview questions are prepared to collect information and conduct MPMP thesis on an **Assessing the role of Development partners on agricultural extension delivery: The case of Sasakawa Global 2000 Ethiopia in Gumer woreda.** The purpose of the study is to assess and analyze the role of the Agricultural Development partner's Agricultural Extension project impact on increasing productivity, Income and food security status of the smallholder farmer's in Gumer Woreda,SNNP,Ethiopia. In order to pursue the previously stated objectives, collecting relevant and genuine data is highly significant. In this regard interview guides are prepared to the respective respondents. Finally, I would like to promise you that all your responses will be kept confidential and used only for the purpose of this study.

List of Person Interviewed

Name: **Haddis Taddese**
Title: **Representative to Ethiopia and the African Union at the Bill & Melinda Gates Foundation**
Institute: ***Bill & Melinda Gates Foundation, Ethiopia Office***
Date: 2015

Name: ***Amsale Mengistu***
Title: ***Senior Program Officer, Agricultural Development, Global Development Program***
Institute: ***Bill & Melinda Gates Foundation, Ethiopia Office***
Date: 2015

Name: **Meron Semunegus**
Title: **Program Assistant – Ethiopia Office, Global Policy & Advocacy**
Institute: ***Bill & Melinda Gates Foundation, Ethiopia Office***
Date: 2015

Name: **Habtu Assefa Damtie (PH.D)**
Title: **Deputy Country Director / Project Coordinator**
Institute: SAA ETHIOPIA
Date: 2015

Name:Wondwosen Tsegaye Aselet
Title:Thematic Coordinator Monitoring, Evaluation, Learning and sharing (Theme 5)
Institute: SAA ETHIOPIA
Date: 2015

Name:Fikadu Chala
Title:Data Manager (Theme 5)
Institute: SAA ETHIOPIA
Date: 2015

List of interview Questions for BMGF-Ethiopia staff

1. What are the primarily focused areas you are investing in Ethiopia?
2. What programs are granted by BMG foundation in Ethiopia to raise agricultural productivity sustainably and inclusively?
3. How the Agricultural Development programs are linked with the country's poverty reduction plans and strategies?
4. Why your foundation is more interested to work on smallholder farmers in Ethiopia?
5. How you collaborate with development partners, including governments, NGOs, private organizations and other to maximize its collective impact on sustainable Agricultural productivity?
6. How would you evaluate the progress of SAEDE project granted by the foundation in Ethiopia?
7. What are the challenges on granting such developmental projects to enhance the productivity of smallholder farmers in Ethiopia?

List of interview Questions for SG-2000 Ethiopia staff

1. What are the Current Program Priorities, Activities and Partnerships SG-2000 working in Ethiopia?
2. What was the aim of SAEDE project that SG-2000 implemented in ten regions of Ethiopia?
3. Was the project relevant to government policies, priorities as well as to project donor (BMGF), partner (OA, MOA) and other relevant stakeholder's (farmers/pastoralist) priorities?
4. How SG-2000 did collaborate with government and project partners to strength the agricultural extension delivery?
5. What were SG-2000 roles implementing the SAEDE project?
6. What were the major challenges during implementing the project?

Did the project achieve its intended major outcomes (in terms of improving income and food security of small-holder farmers)?