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Assessment of Agricultural Growth Program: the case of farming households in *Gedeo Zone, Gedeb wereda,* SNNPR.

By

MELKAMU GEZAHEGN MEKONEN

June, 2016

Addis Ababa, Ethiopia

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of farming households in *Gedeo Zone, Gedebwereda,*
SNNPR.**

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Degree of Master of Arts in Sociology**

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Glossary of Local Terms

Kebele is the lowest administrative division managed by the administrative division *wereda*.

Wereda is the lowest administrative division in today’s administrative system constituting two or more *kebeles*.

Timade is a measure of farmland size by local people which is equated with a quarter of a hectare.

Abbreviations

AGP: Agricultural Growth Program VIII

CIG: Common Interest Groups

CIMMYT: Centro Internacional de Mejoramiento de Maiz y Trigo (International Maize and Wheat Improvement Center)

DAFF: Department Of Agriculture, Forest and Fisheries

FTC: Farmers Training Center

FY: Five Year

FYGTP: Five Years Growth and Transformation Plan

GAFSP: Global Agricultural and Food Security Program

GDP: Gross Domestic Product

GoE: Government of Ethiopia

GTP: Growth and Transformation Plan

MoARD: Ministry of Agriculture and Rural Development

MoFED: Ministry of Finance and Economic Development

PDO: Project Development Objective

RSB: Roundtable on Sustainable Biomaterials

SNNP: Southern Nations Nationalities and People

SSI: Small-Scale Irrigation

ToT: Training of Trainers IX

Abstract

The Agricultural Growth Program (AGP) is one of the development programs which are funded by the World Bank with the aim of improving production and productivity of small holder farming households with special emphasis for women and youth.

It is, therefore, timely to investigate the services provided by the AGP in Gedeb wereda, Gedeo zone, SNNPR. The aim of the study was to explore the types of services provided by AGP, to investigate the variations among farming households in accessing the services provided by the program and to investigate the challenges faced by the farmers in their efforts to make use of the services provided by the program. The study employed a mixed method. Survey was used to gather data from 149 randomly selected heads of farming households in the study area. In addition, in-depth interviews were conducted with 6 purposively selected farming households and key informant interviews were conducted with purposively selected kebele agricultural extension workers and AGP focal person in the study area. The study shows that there are variations in the level of access to AGP services by farmers in accordance with their socio-demographic and economic characteristics. As a result, the younger the age of respondents, the more they access the services from the program and vice versa. In addition, level of education had statistically significant effect on the tendency of farmers to access the services from the program; the higher the educational level of respondents, the more they access the services from the program. Farm land size also found to be significantly correlated with access to AGP services; the larger the farmland size, the more farming households access the services from the program. In addition to the above mentioned socio-demographic factors attitude of farmers found to be significantly correlated with the level of access to the services; the higher the level of access to the services provided by the program, the higher attitudinal score by the farmer. Different from the other variables, gender difference among farming households was found to be insignificant to the

level of access to AGP services. The majority of respondents also raised different factors as a challenge that constrained them not to properly access the services from the program. **Abstract**

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CHAPTER ONE

INTRODUCTION

1.1. Background of the study

According to Astbaha and Tessema(2013) agriculture is the backbone of the Ethiopian economy. On average, crop production makes up to 60 percent of the sector's outputs, whereas livestock accounts for 27 percent. The sector is dominated by small-scale farmers who practice rain-fed mixed farming by employing traditional technology, adopting a low input and low output production system and these farmers are responsible for more than 90 percent of the total agricultural output. Increased smallholder productivity and value-added in the agricultural sector are core elements of the Ethiopian Government's approach to poverty reduction (Guushet al.2013).

One of the major visions of the GoE is "...to build an economy which has a modern and productive agricultural sector with enhanced technology ..." (GTP 2010: 7). The major aim of the GTP is to achieve the Millennium Development Goals by 2015 and middle-income status for Ethiopia by 2020-23. GTP aims at growth rates of 11.2% per annum or higher during the plan period. In the last three years (2003-2005 FY) of GTP implementation period, the economy has registered robust growth. In this period, the GDP annual average growth rate was 10%. Agriculture, Industry and Service sectors have 7%, 16.9%, and 11% annual average growth rates, respectively (World Bank 2015).

To achieve the goals and objectives of these strategies, the Government of Ethiopia (GoE) has followed a "developmental state" model with a strong role for the government in many aspects of

the economy, in which the World Bank and other development partners are expected to have an active role. As a forerunner of this partnership, several projects and programs have been developed and being implemented. The Agricultural Growth Project (AGP) is one of these development programs among others, which have been designed to be consistent with the aforementioned government development policies, and strategies and is under implementation starting from 2011 with very promising results and will be completed in September 2015. AGP-I was developed in parallel with the GTP considering most of the areas of interventions indicated on the plan and is performing to fulfill the objectives of the agricultural sector activities of the GTP (World Bank 2015).

According to GTP (2010:10), the existing agricultural strategy will be further informed by the Agriculture Growth Program and lessons drawn from implementation of the past development plans. Fundamentals of the strategy include the shift to produce high value crops, a special focus on high-potential areas and facilitating the commercialization of agriculture. The commercialization of smallholder farming will continue to be the major source of agricultural growth.

1.2.Statement of the Problem

Attempts were made to reveal the implementation of Agricultural Growth Program in Ethiopia in a macro level analysis. The social assessment reported by World Bank (2015) focused on how the social characteristics of communities likely to be impacted by AGP including determining the nature and characteristics of underserved groups in the AGP-II intervention areas, with special emphasis on their unique identity, language, other cultural characteristics, geographical location,

social institutions and organization and establish that the project will not negatively impact the way of life of these people.

An inquiry conducted by Guushet *al.*(2013) focused only on the impact of AGP. The business enabling environment assessment reported by USAID (2012) investigates three critical areas for agricultural businesses in Ethiopia; access to finance, dealing with licenses and trading across borders.

Since AGP is new and it is implemented for only five years (2011-2015) (World Bank 2010), few researches have been conducted in Ethiopia. This creates a gap in the academic literature. To fill the obvious gap in the academic literature, therefore, this research is directed at searching for explanations about what types of services are provided by Agricultural Growth Program and the variations among the farmers in their effort to make use of the services. Furthermore, the previous studies only relied on the quantitative approach of collecting data (Survey); this study triangulated the quantitative and qualitative approaches.

1.3.Objectives of the study

1.3.1.General objective

The general objective of the study is to assess the services provided by Agricultural Growth Program and the extent that the farmers make use of the services.

1.3.2. Specific objectives

The followings are the specific objectives of the study.

- To assess the services provided by Agricultural Growth Program to the farming households in the study area
- To explore the difference in the extent of service provision to the farmers by AGP across agro-ecologically different areas
- To investigate the variations among farming households in accessing the services of AGP
- To investigate the challenges faced by farmers in their efforts to make use of the services provided by the program

1.4. Scope of the Study

Although a study with a wide area coverage and a much larger number of respondents would have provided much deeper and useful information concerning AGP's services to farmers' and related issues, the study is limited to the study of the research problem in *Gedeb wereda* only.

1.5. Significance of the Study

Comprehensive understanding of the services provided by AGP and the extent that farming households make use of the services provided by the program and the challenges they face in line with accessing the services from the program is crucial in designing future research and development strategies mainly related with the issue under study.

This study will help policy makers to develop evidence for future research, extension, and development programs aimed at benefiting smallholder farmers. Policy makers will benefit from the research output, since they require micro-level information to formulate policies and

strategies so that their effort would be appropriate in meeting smallholder farmers need in particular and to bring change in agricultural practice in general.

It is hoped that the findings of the study will be very helpful for further studies, agricultural experts, development planners and ultimately the small holder farming households in the area of the services provided by AGP.

1.6. Limitation of the study

This study was focused on the services provided by AGP and the extent that farming households make use of the services in *GedebWoreda*. Therefore, its scope is limited in terms of coverage and depth owing to financial and time constraints. The study was carried out by surveying a sample of smallholder farming households including both male and female headed households. Nevertheless, the result of this study can also be used as a reference for other similar areas.

1.7. Organization of the paper

This research paper is organized into five chapters. The first chapter introduces the background, statement of the problem, objectives, scope, significance and limitation of the study. Chapter two reviews the relevant literature that is related to the subject under study. Chapter three deals with research method which consists of sampling techniques and sample size determination, data collection instruments, data types and data sources, methods of data analysis and interpretation and description of the study area. Quantitative and qualitative data were analyzed and discussed under chapter four. Finally, chapter five presents summary of the major findings and conclusion of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. The Contribution of Agriculture in Ethiopia

According to World Bank (2010:1) report agriculture is Ethiopia's most important sector. Agriculture is crucial for the country's food security and the sector is the largest contributor to overall economic growth and poverty reduction. It accounts for about 47 percent of national GDP, almost 90 percent of the foreign exchange earnings, and 85 percent of employment. The livelihood of about 90 percent of the poor is fully or partly dependent on agriculture.

Agriculture is Ethiopia's most important sector, crucial for the country's food security and the livelihoods of nearly 85% of its people, but also the engine for the country's Agriculture Development Led Industrialization (ADLI) strategy. The sector is the largest contributor to the overall economy and is fundamental to Ethiopia's overall development (Agricultural Transformation Agency 2014 : 3).

Despite the dominance of traditional smallholder farmers in the sector, a new type of dynamism has begun to emerge. Over the past decade, productivity and production have consistently grown at near double-digit rates. Increased engagement with mid and large-scale private sector partners has also brought new technologies and improved market linkages (Agricultural Transformation Agency 2014: 3).

In the Ethiopian context, agriculture is proving to be the most complex sector to understand. On the one hand, it contributes the largest share to GDP, export trade and earnings, and employs 84% of the population. On the other hand, despite such socio-economic importance, the performance

of the sector is very low due to many natural and manmade factors. As a result, Ethiopia is characterized by large food self-sufficiency gap at national level and food insecurity at household level (Amdissa 2006: 1).

2.2. Smallholder Farmers

The term smallholder refers to farmers' limited resource endowments relative to other farmers in the sector (FAO 2004 as cited in Wubshet 2014:8). According to African Development Bank (2010 as cited in Wubshet 2014: 8), smallholder farming is often referred to as family farming, subsistence farming and low-income farming. Smallholder farming is the backbone of African agriculture and food security. Of the two-thirds of sub-Saharan Africa's population that resides in the rural areas, the majority can be considered as smallholder farmers. Their importance derives from their prevalence, their role in agricultural and economic development and the concentration of poverty in rural areas.

Even though their potential is often not brought forward, smallholder farmers are the drivers of many economies in Africa. 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'. 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 (DAFF 2012: 1).

Smallholder family farmers are people working in any area of agriculture who derive a significant portion of their income from farming, involve members of the family in managing the farm and rely predominantly on family labor. These farms vary in size, ranging from 0.25

hectares to 10 hectares depending on region, crop and availability of land. Family farms are a global phenomenon. In fact, family farming is the dominant model of agriculture, and its prevalence across areas with diverse levels of development, farm size, capital/land/labor ratios, crops and products, and ecology suggests that family farming offers specific comparative advantages (IFAD 2014:2).

The World Bank's Rural Development Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank 2003 as cited in Wubshet 2014:8). According to African Development Bank (2010 as cited in Wubshet 2014:8), smallholder farmers in Ethiopia have on an average less than 1 hectare of land per household.

2.3. The Contribution of Smallholding Farming for Food Security and Poverty Reduction

Smallholders become increasingly significant for global agricultural value chains. Smallholders, whose output supports a population of roughly 2.2 billion people, manage about 85% of the world's farms. Agriculture is a source of livelihood for an estimated 86% of rural people worldwide, comprising 2.5 billion people and provides jobs for 1.3 billion smallholders and landless workers (EPFL 2013: 5).

Smallholder family farmers produce four fifths of the developing world's food. These women and men are key contributors to global food security, custodians of vital natural resources and biodiversity, and central to climate change mitigation and adaptation. Despite this reality, they remain with a largely untapped resource, and are disproportionately represented among the

world's poor people. The potential economic and social returns to investing in them are enormous (IFAD 2014:2).

According to a report by Diao (2010:15), given that 85% of Ethiopians live in the rural area and more than 90% of the poor are in the rural, agricultural growth directly transfers into poverty reduction if the growth is significant. While the income generation role of agricultural growth is important for poverty reduction, as many poor in rural Ethiopia either mainly produce for own consumption need or are the net buyers of cereals, the direct consumption effect of agricultural growth is equally important in poverty reduction in the country.

The eradication of poverty in Ethiopia, where smallholder farming is the dominant livelihood activity and the source of vulnerability to poverty and food insecurity, is an overriding objective of the incumbent government (FDRE 1996, 2004, 2012; MoFED 2006; Brown & Teshome 2007 as cited in Degye *et al.* 2012: 57).

Achieving agricultural growth and development and thereby improving rural household welfare requires increased efforts to provide yield-enhancing resources. Agricultural technology can contribute to increased food production and increased agricultural and rural incomes (better access to food), and entails positive spillovers to other sectors and contributes to economy-wide growth. Agricultural productivity growth is also vital for stimulating growth in other sectors of the economy (Moreno & Sunding 2003; Kidane *et al.* 2006 as cited in Degye *et al.* 2012: 57).

2.4. Agricultural Growth Program Project

According to the Agricultural Growth Project report (2010:1), higher productivity and increased commercialization of the agricultural sector is not just fundamental to poverty reduction and

food security, but can also contribute to meeting a number of other key development challenges that Ethiopia faces. For example, Ethiopia's high population growth requires increased agricultural production to ensure food security. If this is achieved with full involvement of and benefits for women, this can have significant impacts on household nutritional status and contribute to reduced birth rates.

Increased agricultural productivity and commercialization – and in particular the increase in related upstream and downstream economic activities that are part of this development – can also provide some employment opportunities for the many “landless youth” in Ethiopia as well as creating export growth. Similarly, the big environmental challenges that Ethiopia faces due to degradation of productive land and increasing climate variability can only be addressed through higher productivity of crop and livestock production in those areas where it can be done sustainably (Agricultural Growth Project 2010).

2.5. Objectives of Agricultural Growth Program

The Project Development Objective (PDO) of the proposed project (AGP) is to increase agricultural productivity and market access for key crop and livestock products in targeted *woredas* with focused attention to women and youth (World Bank 2010: 2).

Increased smallholder productivity and value-added in the agricultural sector are core elements of the Ethiopian Government's approach to poverty reduction. The Agricultural Growth Program (AGP) is a component of this broad effort that was commenced in 2011. The AGP, as proposed, is a five-year program which has as the primary objective “to increase agricultural productivity and market access for key crop and livestock products in targeted *woredas* with increased

participation of women and youth”. The AGP focused on agricultural productivity growth; targeted on 83 *woredas* in Amhara, Oromiya, SNNP, and Tigray—*woredas* deemed to possess high agricultural growth potential that can be realized with appropriate interventions; identify key commodities based on a variety of considerations—from current share in production and potential marketability to possibilities for spatial spill-over effects; and emphasize greater participation of women and young people (World Bank 2010: 2).

AGP (2013:60) reported that the AGP has two main components. Agricultural Production and Commercialization constitutes the first component and its objectives are: “to strengthen the capacity of farmer organizations and their service providers to scale up best practices and adopt improved technologies in production and processing, and to strengthen marketing and processing of selected commodities through engagement with private sector stakeholders”. The second component, Small-scale Rural Infrastructure Development and Management, will “support the construction, rehabilitation and/or improvement, and management of small-scale rural infrastructure to improve productivity, and to further develop and increase the efficiency of key value chains through improved access to markets.” focused attention to women and youth.

2.6. The Services Provided by Agricultural Growth Program

According to MoFED and MoARD(2010: 5), AGP in Ethiopia is a major component of the FYGTP. The AGP aims to achieve a greater balance between targeted support to the poorest rural households and support to more dynamic households and enterprises in areas with high potential. The AGP focuses on scaling up investments and technologies with a proven track

record in the country. The program also identifies market opportunities and stimulates linkages of agro-enterprises and cooperatives with domestic, regional, and international markets.

The AGP, furthermore, expands the rural road network and support investment in watershed management and small-scale water management and irrigation systems (depending on local communities' priorities), which will significantly reduce the variability in agricultural production and will enable smallholders to take advantage of new and more profitable opportunities. The AGP also promotes well-coordinated donor support for agriculture, more systematic monitoring and evaluation, and greater effectiveness in the policy dialogue (MoFED and MoARD2010: 5). The sub-sections that follow explain the specific services provided by AGP.

2.6.1.Strengthening Agricultural and Rural Development Partners Linkages Advisory Councils(ARDPLACs)

The ARDPLACs are multi-stakeholder rural councils chaired by the MoARD and the respective line agency at the regional, zonal, and *woreda* level. Their objective is promoting a participatory approach to service delivery and agricultural development by facilitating interaction of relevant stakeholders. The project, adopting a modified version of current guidelines, extends the ARDPLACs to all AGP *woredas* by expanding membership to include all key rural development stakeholders, including civil society and the private sector (AGP 2010:10).

2.6.2.Strengthening of key public advisory services

The services strengthened includesupporting for farmer training centers (FTCs), provision of training and mobility for development agents as well as subject matter specialists, and access to improved information technology. These activities are already supported under existing initiatives, including those of the GoE, and the additional resources available under AGP will

bring the level of service up to the standard required to support accelerated innovation and growth (AGP 2010:10).

2.6.3. Scaling up best practices

According to AGP (2010: pp 10-11), the specific activities to be supported include identification of best practices and preparation of sub-project proposals. The extension services, in consultation with key stakeholders, identify improved technologies and management practices that respond to women, men, and youth farmers. The improved technologies for production show adequate profitability and employ integrated approaches to nutrient, pest/disease, water, and land management. In addition community-based crop and forage seed producer groups producing improved seeds receive particular attention from extension agents and advisers.

2.6.4. Implementation support for scaling up best practices

Specific activities to be supported include extension support. The strengthened extension service provides training at all level for group members, participating farmers to plan and manage on farm demonstrations of best practices, and operate demonstration sites. The extension service will also help to link interested groups with work to strengthen value-chains (AGP 2010:11).

2.6.5. Market and Agribusiness Development

Under the AGP, selected value chains are supported under a USAID Grant through establishment of an innovation and demonstration fund, private sector capacity building and technical assistance, public sector capacity development for service provision, promotion of linkages to credit, including a credit guarantee scheme, and sectoral analysis of constraints and value-chain analysis. The AGP support this process within AGP *woredas* through seed sector support to the development of cooperative sector seed multiplication of crop and forage seeds, mainly to meet

the demand for seed of improved varieties of self-pollinated crops already released for cultivation(AGP 2010:11).

2.6.6. Capacity Building

While there are numerous definitions of capacity and capacity building, the definitions utilized for the AGP are as follows. Baser & Morgan (2008) defined capacity as to the combination of individual competencies, collective capabilities, assets and relationships that enables a human system to operate and carry out its functions. Capacity building is the process of enhancing capacity i.e. it is a form of change which focuses on improvement. It concentrates on strengthening the capability, and ultimately performance, of the government and its partners to deliver programs at different levels (from federal to community levels). The expected result is an increase or an improvement in program management and administration, technical competency, service delivery, coordination and communication compared to the situation prior to the intervention (Agricultural Growth Program 2010:7).

Capacity at different levels needs to be in place. The levels are individual capacity – sufficient competent (qualified and experienced) people in place within the implementing partners, organizational capacity – collective human resource competency, combined with efficient internal structures, systems and processes, a supportive working environment and management capacity within the implementing partners, and finally enabling environment – appropriate external policies and systems in place to enable the implementing partners to carry out their functions, including higher-level commitment to the program (Agricultural Growth Program 2010:7).

Each level (individual, organizational, enabling environment) is inter-linked, and sufficient capacity needs to be in place at each level in order for a program to be successfully delivered. These various levels of capacity can be addressed by the following three components such as Physical capacity – the equipment and facilities required to implement AGP. This includes transportation; office space, furniture and supplies; and means of communication (computer, internet, telephone, fax etc); the human resource capacity –deals with the number of people in place to work on AGP implementation and their skills and knowledge in the required areas; and finally the system capacity deals with – the existence of systems and processes and internal structures to support the implementation of AGP, e.g. M&E system, Financial Management system, Human Resource Management system, and cross sectoral networking and coordination (Agricultural Growth Program 2010:7).

2.6.7.Small Scale Market Infrastructure Development and Management

Agricultural development is essential for economic growth, rural development, and poverty alleviation in low-income developing countries. Productivity increase in agriculture is an effective driver of economic growth and poverty reduction both within and outside agricultural sectors. Such productivity increase depends on good rural infrastructure, well-functioning domestic markets, appropriate institutions, and access to appropriate technology. While the state of rural infrastructure varies widely among developing countries, most lower-income developing countries suffer severe rural infrastructure deficiencies (Anderson and Shimokawa 2010: 2).

Poor infrastructure continues to impede agricultural activities in Ethiopia. A body of literature indicates that, inadequate infrastructure and social service development such as road, transportation, communication, electrification, education and health services, and agricultural

extension services would be the major challenges to sustain the growth of agricultural production and thereby ensure households food security. Thus, infrastructural constraints such as inaccessibility to roads, absence of irrigation facilities, absence of rural credit, inadequate extension services, poor storage facilities, low price of agricultural output, and inadequate veterinary services are reflected on household's food insecurity (Degefa 2002 as cited in Wubshet 2014: 15).

According to Anderson and Shimokawa (2010: 2), deficiencies in transportation, energy, telecommunication, and related infrastructure translate into poorly functioning domestic markets with little spatial and temporal integration, low price transmission, and weak international competitiveness.

According to AGP (2010: 13), in AGP *woredas*, the project will strengthen rural market infrastructure to enhance the performance of input and output markets and linkages to agro-processing. The sub-component will finance construction and/or maintenance of small-scale feeder roads, footbridges, and roadside drainage; development and management of market centers; and institutional development and capacity building at the *woreda*, *kebele*, and community levels.

2.6.8. Small-scale Agricultural Water Development and Management

Civilization of human being and socio-economic development are strongly associated with the capacity to manage and utilize water for beneficial purposes such as agriculture, power production, clean water supply; and cope with the negative externalities of impact of water such as flood, drought, contaminations, etc. Water is closely linked with hunger, poverty and health (Seleshi 2011:19).

Agriculture is the only way out of poverty for the rural people of Africa. Soil nutrient loss and lack of access to safe and reliable water are the chief biophysical factors limiting small farm production and therefore critical to any poverty reduction strategy for the rural poor. Ethiopia is strongly challenged with water management, and unable to enhance the positive role of water and mitigate the negative externalities, and as such no time in its history able to manage water fully and effectively to accelerate its development. The current situation is encouraging and excellent start particularly since 2003 (Seleshi 2011:19).

Traditional small-scale irrigation development in Ethiopia has a history of antiquity; while modern irrigation development was started only in the 1950s' by the commercial irrigated farms established in the Awash Valley through the joint venture of the then Government of Ethiopia and a foreign company. However, the irrigation sub-sector has not yet well developed and thus is not contributing its share to the overall economic development of the country as required. Hence, the Federal Democratic Republic of Ethiopia has given top priority to the irrigation sub-sector in the overall development plans of the country with the ultimate objective of enhancing agricultural production and productivity in general and crop production in particular thereby improving the food security situation (Ministry of Agriculture 2011:9).

The overall objective of the Small-Scale Irrigation (SSI) capacity building strategy is to undertake infrastructural, institutional and human resource capacity building which will help the country to optimize the efficient use of water resources with improved land management of smallholder irrigated agriculture development and contribute to improve food security and alleviate poverty. This capacity building strategy is a 15 years road map that guides the government and its development partners address the capacity constraints in order to improve

efficiency of smallholders irrigated agriculture. It is aligned with the country's development policies, strategies and the recently launched GTP (Ministry of Agriculture 2011: 9).

According to AGP (2010: 12) investments under this component include development and management of SSI infrastructure; and implementation of soil and water conservation practices.

The GAFSP support to the AGP will ensure the provision of irrigation water and related services on about 4,500 hectares (of which about 3,200 hectares are under SSI schemes and the remaining 1,300 hectares are under micro-irrigation technologies) and the implementation of soil and water conservation practices over an additional area of 18,500 hectares.

Rehabilitation and/or improvement of traditional SSI, establishment of new SSI schemes, including micro-dams, gravity and pump diversions, and groundwater development (shallow wells) are envisaged to be financed by AGP. In addition, implementation of agricultural water management and capacity building to assist service providers to render appropriate and timely services to farmers, including assistance to beneficiaries to whom responsibility for operations and maintenance is delegated. The AGP supports the provision of start-up spare parts and hand tools that are important for operations and maintenance by the community (AGP 2010:17).

2.6.9. Introduction of New Technologies and Practices

For most of the world's poorest countries, and especially those in Africa, agriculture continues to offer the leading source of employment and to contribute large fractions of national income. In many of these countries, however, agricultural productivity is extremely low. Clearly, increasing agricultural productivity is critical to economic growth and development. One important way to

increase agricultural productivity is through the introduction of improved agricultural technologies and management systems (Doss 2006: 3).

There is no more distinctive feature of agriculture than its dynamic nature and its practices change continually. Farmers build on their own experience and that of their neighbors to refine the way they manage their crops. Changes in natural conditions, resource availability, and market development also present challenges and opportunities to which farmers respond (CIMMYT 1993:9).

In addition, farmers learn about new technologies from various organizations, programs, and projects dedicated to research, extension, or rural development. These organizations develop and promote new varieties, inputs, and management practices. It is essential that such organizations be able to follow the results of their efforts and understand how the technologies they promote fit into the complex pattern of agricultural change in which all farmers participate (CIMMYT 1993:9).

There are a number of factors that influence the extent of adoption of technology such as characteristics or attributes of technology; the adopters or clientele, which is the object of change; the change agent (extension worker, professional, etc.); and the socioeconomic, biological, and physical environment in which the technology take place (Chi and Yamada 2002:95).

Farmers have been seen as major constraint in development process (Cruz 1987 as cited in Chi and Yamada 2002: 95). They are innovators or laggards. Socio-psychological trait of farmers is

important. The age, education attainment, income, family size, tenure status, credit use, value system, and beliefs were positively related to adoption (Chi and Yamada 2002: 95).

The personal characteristics of extension worker such as credibility have good relationship with farmers, intelligence, emphatic ability, and sincerity, and resourcefulness, ability to communicate with farmers, persuasiveness, and development orientation (Chi and Yamad 2002: 96).

The biophysical environment influences the adoption. The conditions of the farm include its location, availability of resources and other facilities such as roads, markets, transportation, pests, rainfall distribution, soil type, water, services, and electricity. For instance, farmers whose farms were irrigated were the earliest adopters of new rice varieties, while those without water were the late adopters. The innovation diffuses slowly if product price is low (Chi and Yamad 2002: 96).

2.7.Agricultural Extension Models and Approaches

Extension has traditionally been defined as the delivery of information and technologies to farmers. This leads to the technology transfer model of extension, seen by many as the main purpose of agricultural extension (Moris 1991 as cited in Ponniah *et.al* 2008).

According to Purcell and Anderson (1997) cited in Ponniah *et al.* 2008, this is based on the idea that 'modern' knowledge and information is transferred through extension agents to recipient farmers. Swanson *et al.* (1997 cited in Ponniah *et al.* 2008) defined agricultural 'extension, as extending relevant agricultural information to people.

The World Bank defines extension as ‘the process of helping farmers to become aware of and adopt improved technology from any source to enhance their production efficiency, income and welfare.

2.7.1.PADETES (Participatory Demonstration and Training Extension System) approach

PADETES was developed after a critical evaluation of the past extension approaches and the experience of SG 2000. In 1995, the EPRDF government took the initiative to run the programme on its own and launched the participatory demonstration and training extension system (PADETES) as the national agricultural extension system. Its major objectives include increasing production and productivity of small-scale farmers through research-generated information and technologies; empowering farmers to participate actively in the development process; increasing the level of food self-sufficiency; increasing the supply of industrial and export crops and ensuring the rehabilitation and conservation of the natural resource base of the country (Task Force on Agricultural Extension1994).

The system gives special consideration to the package approach to agricultural development. Initially PADETES promoted cereal production. According to government officials, an important element of the PADETES approach is the promotion of the active participation of rural communities in problem identification, analysis, planning, implementation and evaluation (Kassa2003: 16).

2.7.2.T&V (Training and Visit) model

Launched in Turkey in the early 1970s and then spread to India and throughout Africa under World Bank sponsorship in the late 1970s and early 1980s, this model has proven to be financially unsustainable (Ponniahet *al.* 2008: 98).

Whichever impact is reached serves ‘only a few favored farmers in favored areas rather than the bulk of the farming community’. When first introduced, T&V seemed to be strikingly original and promising because it combined a set of rather convincing simple elements in a plausible way. Rather than trying to reach all farmers directly and thus pre-programming constant failure, the system concentrates on *contact farmers* expected to pass information on to fellow farmers with similar problems. To ensure regular field contacts, facilitate supervision and communication, and set clear and attainable objectives, fixed *visits at regular intervals* are prescribed. Similarly, regular sessions for extension workers to receive *training* and discuss administrative matters are held. Thus costly refresher courses are avoided, knowledge may be enhanced step-by-step, and up-to-date information can be fed in to the system. (Ponniahet *al.* 2008: 98)

2.7.3.NGO (international and local) model

This is a model that spread rapidly in the 1990s as many NGOs shifted gears and moved from being providers of food and humanitarian assistance to become agents of development. The NGOs established food and community development projects in many African countries in the 1990s that were primarily financed by bi-lateral donors. For example, in Mozambique in 2005, the NGOs employed 840 extensionists as compared with 770 public extension workers (Eicher 2007 as cited in Ponniahet *al.* 2008: 100).

2.7.4. Innovative linkage model

Historically, extension has mainly involved technology transfer, with the village extension worker transferring knowledge from research stations to farmers by using individual, group, and mass media methods. Most recently, extension has been asked to play a ‘technology development role’ by linking research with community group needs and helping to facilitate appropriate technology development. (Ponniahet *al.* 2008: 101).

2.7.5. Technology transfer model

According to Ponniah et.al(2008 : 93) in practice, extension organizations everywhere pursue the overall goals of technology transfer and human resource development, though the emphasis will differ. Within each organization there is a mix of objectives, and within countries there is often a mix of organizational patterns.

The conventional provider of extension, the state, has typically used top–down, transfer of technology (TOT) methods for extending new technologies. Top–down methods characterized the United States extension model, which was instituted by many colonial governments in Africa. In the TOT approach, technologies are generated at research stations and diffused to farmers using the extension service (Put, 1998). Not only technologies but also intangibles such as power, prestige and skills are located at these centralized stations (Put, 1998). Technologies are spread vertically in this top–down approach. The TOT approach is often biased toward better-endowed farmers whose fields and infrastructure are more like those of the research stations (Chambers and Ghildyal 1985, as cited in Ponniah 2008:93).

2.8.Factors affecting clients access to extension services

According to Ponniah *et al.* (2008: 64), the following are the major factors that affect farmers access to extension services from extension service providers both in the public and private (profit and nonprofit organizations).

Gender: It is generally assumed that men and women have different levels of access to agricultural extension services from which they benefit in different ways.

Farming system: The private sector in extension will focus on conventional, input intensive agriculture where information is linked to inputs. Sustainable agriculture, which is recognized as knowledge intensive and requiring an approach to local learning which highlights local rather than external knowledge, is less likely to receive attention from commercial providers. Sustainable agriculture therefore requires much more than the adoption of new technology—it requires an entire paradigm shift, which can only be achieved on the basis of incremental learning (Röling and Jiggins 1994 as cited in Ponniah *et al.* 2008: 64).

Wealth status: The wealth category of a farmer may affect his or her access to, and benefit from, extension services.

Land ownership and farm size: The prevailing land ownership system and size of land owned by the farmer may affect farmers' access to, and benefit from extension services.

Membership of farmer group/community organization: Many extension service providers both in the public and private (profit and nonprofit organizations) sectors have institutionalized the group approach for the delivery of extension services. As well as offering the opportunity for greater efficiency, effectiveness and equity of provision and access, farmers' groups and

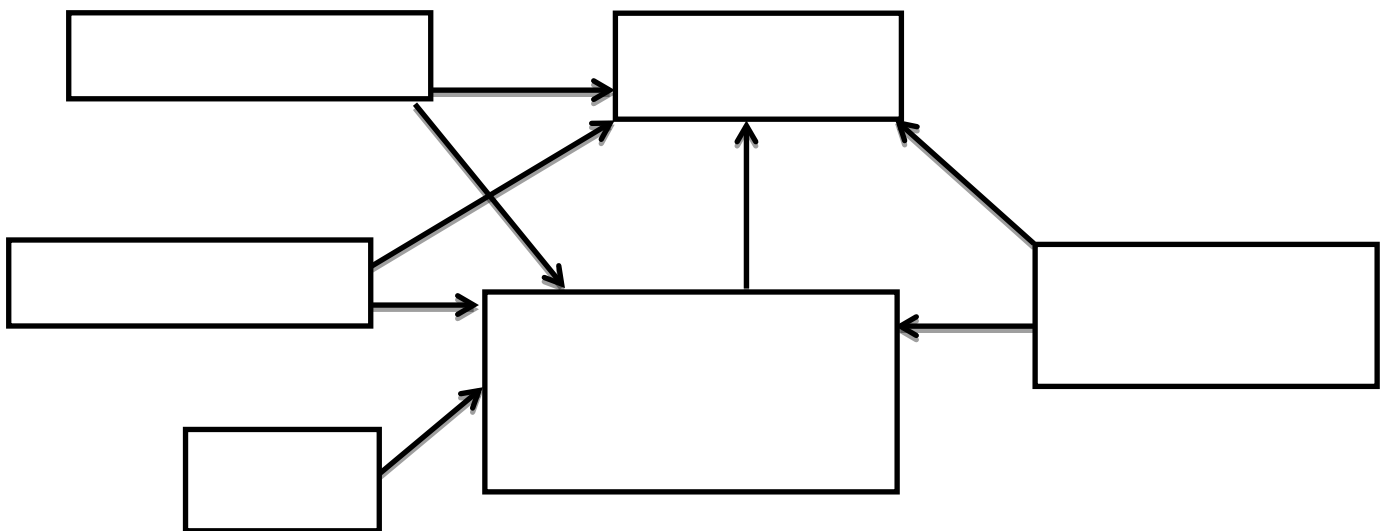
organizations can be a vehicle through which farmers can pay a contribution for services, become actively involved in the planning and management of extension, and act as a voice for their members in ‘pulling down’ services which meet their needs.

Other factors: Other factors such as cultural constraints, education, age, access to credit and risk taking ability may affect farmers’ access to and benefit from extension services.

2.9. Conceptual Framework

The following conceptual framework is set up to analyze and understand the relationship between the various factors which determine the extent that farmers make use of the services provided by AGP.

Figure-1: Conceptual Framework



Source: Own developed(2016)

It is hypothesized that multiple factors are responsible to influence the extent that farming households make use of (access) the services provided by AGP. The socio-demographic characteristics of farming households such as (Household heads' age, and Household characteristics (Male or Female headed) and other factors such as farm land size is considered important in determining the extent farmers make use of the services provided by AGP. The extent that farmers make use of the services provided by AGP is supposed to shape and influence farmers' attitude towards AGP. It is based on the above assumptions that the data gathered from survey respondents, interviewees and key informants are analyzed and inferences are made.

CHAPTER THREE

RESEARCH METHODS

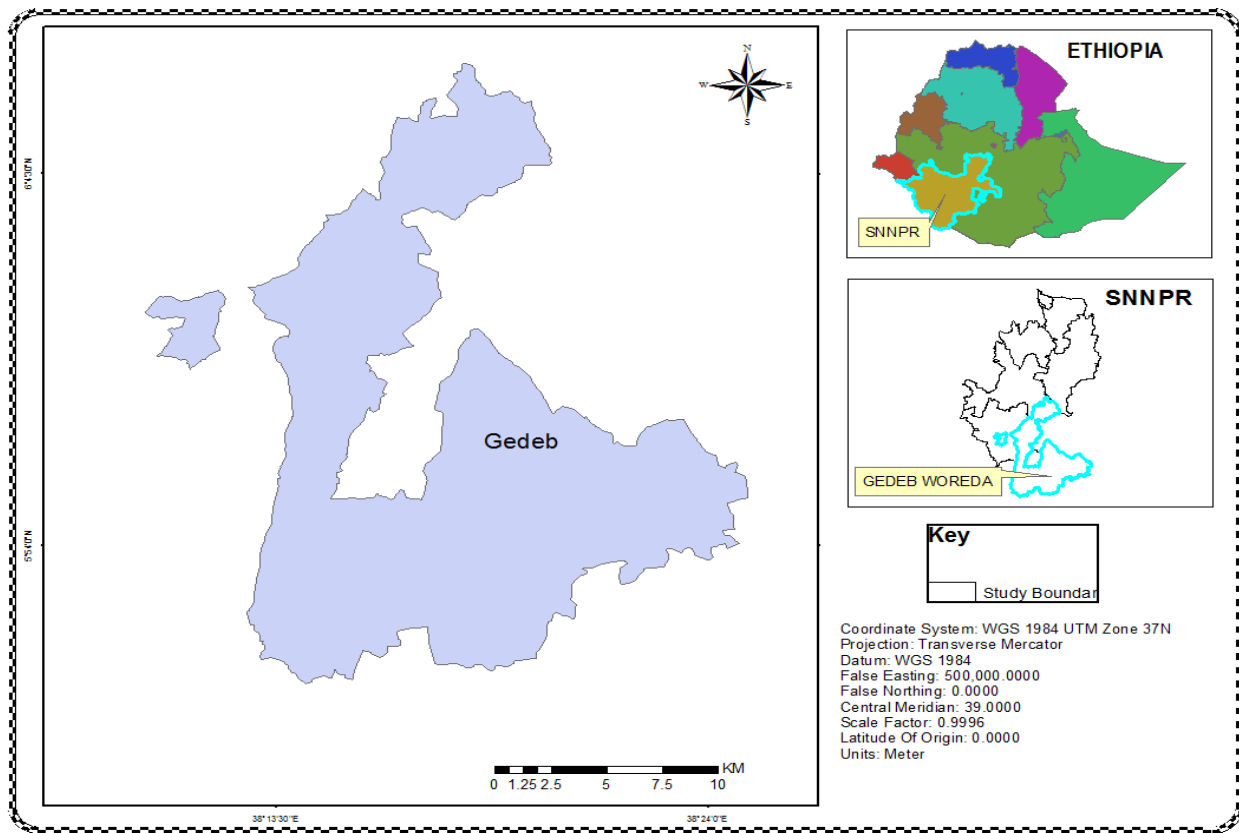
3.1. Introduction

In this chapter, the researcher begins with discussing the background information of the study area and the program under study and then goes on to the detail research approaches and methods such as research design, sampling techniques, data collection tools and methods of data analysis employed in this study. Furthermore, it provides the detail of procedures of data collection, challenges encountered in the course of data collection.

3.2. Description of the Study Area

3.2.1. Geographical setting

Figure-2: Location of *Gedebwereda*



As can be seen from the figure (map) above, *Gedebwereda* is located in Gedeo zone of SNNPR, 160 km from the capital of SNNPR - *Hawssa* and 74 kilometers from *Dilla* which is the administrative seat of Gedeo zone. The area of the *wereda* is estimated to be 30,909 hectare. It consists of 16 *kebeles*. The *wereda* is bordered by *Kercha wereda* of Oromia regional state in the south, *Tore wereda* of Oromia regional state in west, *Dintu Ambela wereda* of Oromia Regional state in the north-east, *Kochore wereda* in the north-west and *Yirgachefe wereda* in the north (*Gedeb wereda* AGP Bureau 2007).

The altitude of *Gedebwereda* ranges from 1950m up to 2650m, the annual rain fall ranges from 1290 - 1800mm. And the temperature ranges from 16-21. The land use system of the *wereda* is mostly mixed farming system. Most of the land was cultivated by annual crops of 12,756 hectare, perennial crops of 16,372 hectare and the pasture land coverage is 244 hectare. The potential for cultivable land is 402 hectare; the area covered by forest and shrubs is 386 hectare uncultivable land is 83 hectare and 457 hectare occupied by other service (*Gedeb wereda* AGP Bureau 2007).

Agro-ecologically, *Worqa Sakaro kebele* is located at a distance of 9 kilometers from *Gedeb* town, and is found in the *Woynadega* zone. The other *kebele*, *Hallo Hartume*, is located at a distance of 5.5 kilometers from *Gedeb* town, and is found in the *Dega* agro-ecological zone. The total numbers of households living in these *kebeles* are 1759 (*Gedeb wereda* AGP Bureau).

3.2.2. Population and economy

The population of *Gedebwereda* is estimated to be 155,397 (91.1 % of the population live in rural areas and the rest 8.9 % live in towns) (*Gedeb wereda* Agricultural Bureau).

The *wereda* has diverse climatic conditions that make it conducive for different agricultural activities. The main economic stay of the population of *Gedeb Woreda* is agriculture with mixed farming system at subsistence level, producing both crop and livestock. The main source of income of the study area is obtained from sale of crop. The major crops grown in the area are coffee, *enset* (false banana), maize, barely & other pulses like bean and peas (*Gedeb wereda* AGP Bureau 2007).

3.2.3. AGP in *Gedeb wereda*

The AGP was launched in 2011 with the aim of increasing agricultural production of the *wereda* giving serious attention to women and youth. The program main concern lies on low income earning families by backing up their effort in the organized manner based on their interest (*Gedeb wereda* AGP bureau). This inquiry was conducted based on the services used by farmers in the year 2007 E.C.

3.3. Data Collection Methods

3.3.1. Secondary Data Collection

Relevant secondary data regarding the study area, that is, the list of households was obtained from the respective *wereda* bureaus. The agro-ecological and demographic profiles of the study area were also obtained. Reports made by AGP officials in the study area also used as inputs for the study.

Furthermore, the researcher reviewed published documents in relation to the main theme of the study, which is, the services provided by AGP to farmers. Several written documents including journals, articles, books and other archival documents were properly reviewed. The review of these documents was used in identifying the gaps in previous researches on the subject under study and in the selection of appropriate research framework and tools for the study.

3.3.2.Primary sources of data

Here, a combination of both quantitative (survey) and qualitative (key informant interviews and in depth interview) was used to collect firsthand information from selected farmer respondents, *kebele* agricultural extension workers and AGP officials.

3.4. Quantitative data collection

For the purpose of collecting quantitative data, survey research method was employed as a major type of data collection method for collecting valid and reliable data from sample farmer respondents.

3.4.1.Survey Research

As one of the most popular and advantageous methods of social research, survey research method was employed in order to obtain the necessary information (quantitative data) from sample respondents of the study population.

3.4.1.1. Survey Design

A cross-sectional survey design was employed so as to obtain information about the present situation which is related to the issue under study. To substantiate the present situations of

farmers, respondents were asked to recall data about their past experiences in relation to AGP services.

3.4.1.2. Survey Sampling

For the purpose of achieving the objectives of the study, two stage random sampling was used to select sample respondents. This sampling is basically used to deal with large number of people being the unit of analysis. The first stage of sampling constituted purposive sampling of two *kebeles* out of the total 16 in *Gedebwereda* for their agro-ecological difference (*Woynadega* and *Dega*). Then, in the second stage of sampling, the researcher randomly selected 149 farming households from 1759 households (*Hallo Hartume* and *Worqa Sakaro kebeles*). Of the total 149 respondents, 82 (69 males and 13 females) of them were selected from *Worqa Sakaro kebele* and the rest 67 (53 males and 14 females) of them were from *Hallo Hartume kebele*. The sample size was determined by the sample size calculator (<http://www.raosoft.com/samplesize.html>) with 95 % confidence interval and 5 % degree of freedom. In doing so, the list of farming households (sampling frame) was obtained from the AGP bureau in *Gedeb wereda*.

3.4.1.3. Survey Instrument

A self-administered structured questionnaire was used to gather data related to the issue under study from the sample farmer respondents with four enumerators. The questionnaire included both close and open-ended questions to obtain detailed information. For the purpose of measuring the attitudes of farmers towards AGP, Likert scale was also used.

3.4.1.4 Operationalization and definition of terms

A) Operationalization

The following table shows the identification of variables from concepts, and those of indicators to the variables. It also shows the level at which the variables are measured.

Table-1 Operationalization and Measurement of Key Variables

Concept	Variable	Indicators	Level and Unit of Measurement
Socio-demographic characteristics	Age	Length of time (year) that the households head has been alive	Scale Age in completed years
	Household characteristics	Whether a household is headed by male or female	Nominal Male or Female headed household
Attitude	Attitude towards the program	Likert scale to measuring the attitude of farmers towards the program	Scale Likert scale scores
Farm Land size	Land size	The size of land that a household holds for farming	Scale Land size in Hectare
The extent that the farmers make use of the services provided by AGP	The extent that the farmers make use of the services provided by AGP	Access to Agricultural inputs, adoption of new agricultural practices, and attendance in farmers training	Scale The number of services accessed by farming households

B) Concepts and operational definition of terms

Small holding farmers: farmers with limited resource endowments with less than two hectare land holding and dependent on family members' labor (World Bank 2003 as cited in Wubshet 2014:8).

Rural infrastructure: refers to road, market centers and small scale irrigation.

Agricultural inputs: Inputs used by farmers such as fertilizer and improved seeds.

Improved practices: new agricultural practices (row planting and irrigation) introduced to farmers and believed to increase productivity.

Adoption: farmers' tendency to apply new technologies and improved agricultural practices.

3.5. Qualitative data collection

For the purpose of collecting qualitative data, among a number of qualitative methods, key-informant interview, in-depth interview and observation have been employed for this study.

3.5.1. Key informant interview and in-depth interview

Three key informant interviews were conducted with the AGP focal person and two Agricultural Extension Workers from each *kebele*. In addition six in depth interviews were conducted with six farming households from the two kebeles. The results of the key informant interviews were analyzed and used to supplement (or refute) responses that were gathered from the survey.

3.5.2. Field observation

Field observation was necessarily used to gather primary information and one of the most common methods for qualitative data collection. Accordingly, the study area was observed before and during the study period. Prior to collecting data, the study areas were visited to know the types of services farming households access from the program, FTCs and demonstration sites of the AGP in which farmers access different services and physical characteristics like topography including agro-ecology of the study area. In addition, infrastructural facilities such as roads, market centers, irrigation facilities and bridges constructed by the program in the study area were also observed.

3.6. Methodological Triangulation

As can be already anticipated from a look at the various methods of data collection which are employed in the research, the data collected for the study was analyzed quantitatively and qualitatively in combination so as to validate and substantiate the data which were collected from

different sources. The study employed a methodological triangulation which can be briefly summarized in the form of the following table.

Table-2 Methodological Triangulation

Specific Objectives	Units of Analysis	Data Sources	Methods of Data Collection
To assess the services provided by Agricultural Growth Program	Agricultural Growth Program	a) Sample survey respondents b) Key informants	a) Survey b) Key informant interview c) Field observation
To explore the variations in the extent of the farmers in making use of the services provided by AGP across agro-ecologically different settings	Farming households	Sample survey respondents	a) Survey b) Field observation
To investigate the variations among farming households in accessing the services from the program	Farming households	Sample survey respondents	Survey
To investigate the challenges that farming households face in their efforts to make use of the services provided by the program	Farming households	a) Sample survey respondents b) Members of in depth interview	a) Survey b) In-depth interview

3.7. Primary Data Analysis and Interpretation

The quantitative data that will be collected using the survey instrument (questionnaire) will be analyzed using descriptive statistics (frequency, percentages and mean distribution). In addition, the statistical analysis tool SPSS (Version 20) will be utilized for advanced inferential analysis. Furthermore, the qualitative data that will be obtained through key informant interviews and in depth interview will be presented alongside the quantitative data gathered through survey.

3.8. Ethical Considerations

Since Yeraswork (2010) has clearly pointed out that ‘research must be regulated by ethical norms and values’, the researcher has been directed by the following obligatory Ethical guidelines while conducting the study.

- Every information was collected from the respondents and key informants with their consent and willingness
- Every information obtained from the sources was kept confidential
- The data were analyzed and interpreted without naming any of the respondents and informants
- Limitations and failures that the study faces were honestly explained
- The different assumptions and theories that are utilized from other books, journals and researches were properly cited and duly acknowledged

CHAPTER FOUR

FINDINGS: DATA PRESENTATION AND ANALYSIS

4.1. Introduction

This chapter presents background characteristics of the respondents and analyzes information related to Agricultural Growth Program in *Gedebwereda*. The background characteristics of respondents and information pertaining Agricultural Growth Program in *Gedebwereda* and related issues are based on primary data collected through the household survey and interviews.

4.2. Description of Farmer Respondents

The 149 sampled respondents are household heads of *Worqa Sakaro* and *Hallo Hartumekebeles* in *Gedeb wereda*. The sections that follow describe sample respondents' socio-demographic and economic characteristics, age, educational status, household size and their farm land size with their respective *kebeles*.

4.2.1. Socio-demographic characteristics of respondents

In the proceeding sections, respondents' household heads gender, age of respondents, household size, farmland size and educational status will be analyzed so as to be able to consider the direct or indirect influence of respondents' socio-demographic status on accessing AGP's services.

a) Gender of Household head

Among the 82 sample respondents of *Worqa Sakaro kebele*, 69 (84 %) of them are male headed and 13 (15.9 %) of them are female headed households. And, from 67 respondents of *Hallo Hartume*, 53 (79.1 %) of them are male headed households, and the rest 14 (20.9 %) are female

headed. It is important to observe whether accessing AGP’s services varies by gender of respondents.

b) Age of respondents

Asked to state their age, the respondents gave their age in terms of actual age then categorized at ten years interval for analysis as shown below.

Table-3: Respondents by age group in *Hallo Hartume and WorqaSakaro kebele*

Age Group	<i>Hallo Hartume</i>		<i>WorqaSakaro</i>	
	No.	%	No.	%
20-29	0	0.0	3	3.7
30-39	26	38.8	19	23.2
40-49	32	47.8	46	56.1
50-59	5	7.4	8	9.7
60 and above	4	6.0	6	7.3
Total	67	100	82	100

As shown in Table 3, most of the respondents (56.1 %) in *WorqaSakarokebele* fall under the age group of 40-49. 23.2 % of the respondents are between 30-39 years of age and 3.7 % of them are under 30. The 50-59 age group constitutes 9.7 % of the respondents, and the rest 7.3% of the respondents aged 60 and above. The age difference ranges from 28 (the lowest) to 67 (the highest).

As shown by Table 3, most of the respondents (47.8% and 38.8 %) in *Hallo Hartumekebele* fall under the age group of 40-49 and 30-39 respectively. 7.4 % of the respondents aged between 50-59 and 6 % of respondents aged 60 and above, with no respondents who aged under 30. The age

difference ranges from 32 (the lowest) to 63 (the highest). It is hypothesized that age difference among the respondents may result in difference in accessing of AGP's services.

c) Farmland size

According to agricultural extension workers, working in the *wereda*, what the farmers called one *Timade* is equal to 0.25 hectare. After collecting the data regarding the land holding size per household in *Timade* (the local unit of measurement for a land size), it was converted in to the standard measure of land size (Hectare).

Table-4: farmland size in *Hallo Hartume kebele*

Farm land size (in hectare)	<i>Hallo Hartume</i>		<i>Worka Sakaro</i>	
	No.	%	No.	%
0.5 – 1	17	25.37	24	29.26
1.25 – 1.5	34	50.75	38	46.34
1.75 – 2	15	22.38	16	19.5
2.25 – 2.75	1	1.5	4	4.8
Total	67	100	82	100

As shown in Table-4: In *Hallo Hartume Kebele* the majority (50.7% and 25.37 %) of respondents hold a farmland size in hectare between 1.25-1.5 and 0.5-1 respectively. The rest 22.38 % respondents hold 1.75-2 hectare of land. There is one respondent holding a farm land size 2.25,

which comprised 1.5% of the total respondents in the kebele. The average farm land size in *Hallo Hartume kebele* is 1.34 hectare with a minimum of 0.75 and maximum of 2.25.

As shown in the same Table-4 the majority (46.34% and 29.26 %) of respondents in *worka sakaro* kebele, hold a farmland size in hectare between 1.5-1.75 and 0.5 - 1 respectively. The other 19.5% of the respondents hold 1.75 – 2, and the rest 4.8% hold 2.25 - 2.75 hectare of land. The average farm land size in *Worqa Sakaro kebele* is 1.25 hectare with a minimum of 0.5 and maximum of 2.75.

d) Educational status of respondents

The following table shows the educational status of farmer respondents in both *kebeles*.

Table-5: Educational status of respondents

Level of Education	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%	No.	%
Illiterate	17	20.7	15	22.4
Can read and write	36	43.9	31	46.2
Grade 1-4	13	15.9	15	22.4
Grade 5-8	16	19.5	6	9
Total	82	100	67	100

As shown in Table-5, all of the respondents have primary or below level of education. The majority can read and write only, showing the very low level of education among the respondents. Education is a vital variable while adopting improved agricultural services

provided by AGP. Farmers' ability to access the services and consume information on improved farm technologies depends on level of education. This is explored in section 4.4.3.

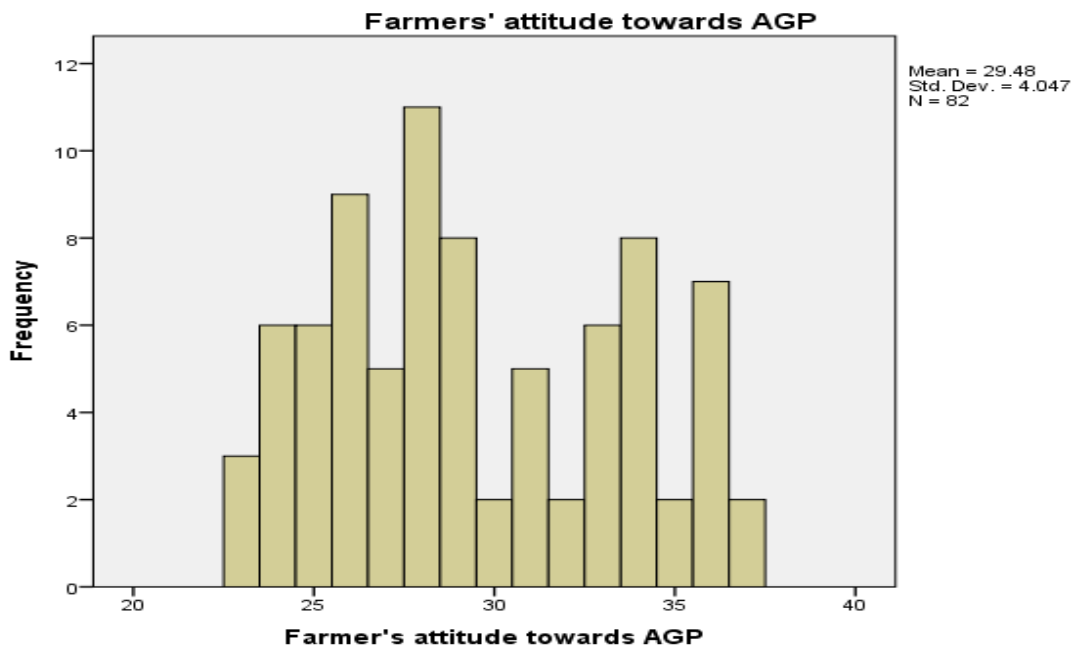
4.3. Farming Households' Attitude Regarding AGP

In order to obtain a clear picture of farmers' attitude towards AGP, a Likert scale was employed in which the sample respondents were asked to indicate their level of agreement to 10 critical statements (Strongly agree, Agree, Disagree, and Strongly disagree).

The major issues covered are: helpfulness and usefulness of AGP to improve agricultural production, the adoption of new agricultural practices introduced by AGP, the essentiality of AGP services for farmers well-being, the intention of AGP in helping and supporting farmers, and provision of AGP's services equally for all farming households.

The following Histogram (Figure 3) shows the distribution of farmers' attitude regarding AGP as measured by the Likert scale scores in *Worqa Sakaro kebele*.

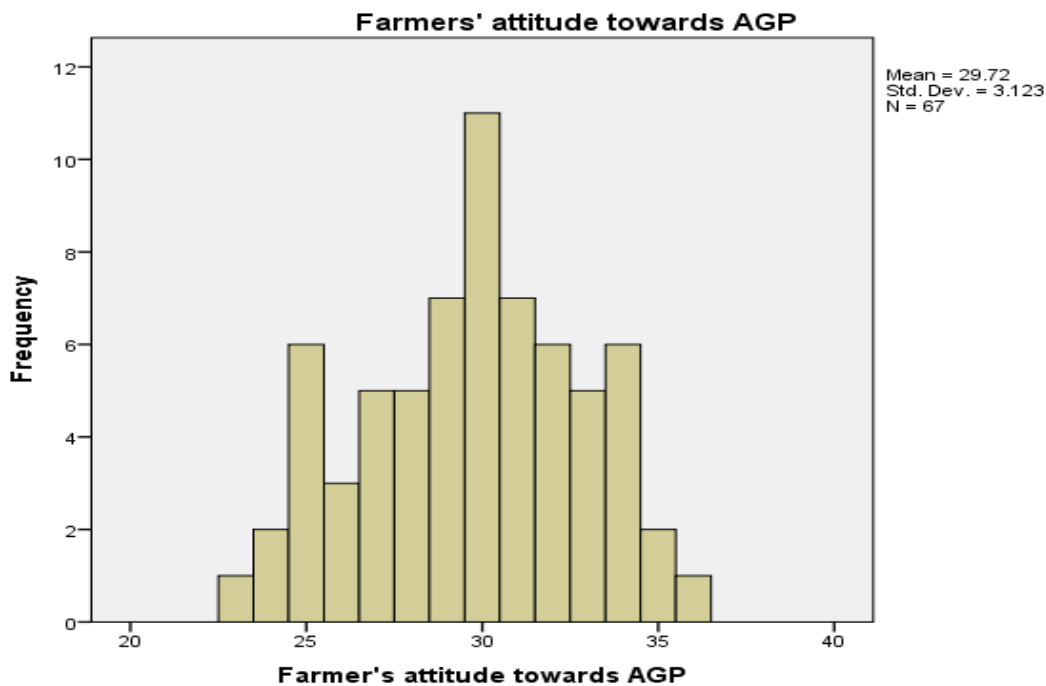
Figure-3: Respondents' attitude towards AGP in *Worqa Sakaro kebele*



The sampling distribution has a mean of 29.48 and a standard deviation of 4.04. The possible highest and lowest scores are 40 and 10 respectively, and 37 and 23 are the highest and the lowest scores observed. On the one hand, the range between the highest and the lowest scores observed implies that residents have a differential attitude regarding AGP with multiple factors affecting its variation among farmers. On the other hand, the mean score indicates that most of the farmers have favorable attitude towards AGP in *Worqa Sakaro kebele*.

The following Histogram (Figure 4) shows the distribution of farmers' attitude regarding AGP as measured by the Likert scale scores in *Hallo Hartume kebele*.

Figure-4: Respondents' attitude towards AGP in *Hallo Hartume kebele*



The sampling distribution has a mean of 29.72, and a standard deviation of 3.12. The possible highest and lowest scores are 40 and 10 respectively, and 36 and 23 are the highest and the lowest scores observed. Similar to the case in *Worqa Sakaro kebele*, the range between the

highest and the lowest scores observed implies that residents hold varying opinions regarding AGP with multiple factors affecting its variation among farmers. And, the mean score indicates that most of the farmers have favorable attitude towards AGP in *Hallo Hartume kebele*.

As can be seen from the conceptual framework (see Figure 1), respondents' attitude towards AGP is expected to be influenced by demographic and socio-economic characteristics of farmers. Hence, it is essential to see the attitudinal difference among respondents so as to answer the question – why do differences exist among farmers? The sections below discuss the attitudinal difference with regard to farmers' demographic and socio-economic variables.

4.3.1. Gender and farmers' attitude towards AGP

According to the survey data collected from the sample respondents, female respondents have a slightly higher mean score (Mean= 30.23) than male respondents (Mean= 29.33) regarding their attitude towards AGP in *Worqa Sakaro kebele*. The average mean difference is 0.9.

Using the appropriate statistical test (Independent Sample t-test), however, the mean difference between male and female respondents' attitude is not statistically significant (sig. (2-tailed) = 0.467). Therefore, there is no meaningful difference between male and female respondents' attitude towards AGP.

In case of *Hallo Hartume kebele*, female respondents have a slightly higher mean score (Mean= 30.21) than male respondents (Mean= 29.58) regarding their attitude towards AGP. The average mean difference is 0.63. Using the appropriate statistical test (Independent Sample t-test), however, the mean difference between male and female respondents' attitude is not statistically

significant (sig. (2-tailed) = 0.507). Therefore, there is no meaningful difference between male and female respondents' attitude towards AGP.

Having the above analysis regarding the relationship between gender of respondents and their attitude towards AGP, both *kebeles* are similar in that respondents' gender was found to be insignificant in affecting farmers' attitude towards AGP.

4.3.2. Age and farmers' attitude towards AGP

It is anticipated that age difference among farmers is expected to result in attitudinal difference towards AGP. As age and attitude, in this study, are measured in the highest level of measurement (Scale), Pearson coefficient correlation is found to be the appropriate statistical tool to see whether age and attitude are significantly correlated.

Table-6: Correlation between farmers' age and their attitude towards AGP in Worqa Sakaro kebele

Farmers' attitude towards AGP	
Pearson Correlation	- 0.636
Sig. (2-tailed)	0.000
No.	82

As Table-6 shows, there is a moderate negative relationship ($r = - 0.636$ and sig. (2-tailed) = 0.000) between farmers' age and their attitude towards AGP in *Worqa Sakaro kebele*. The negative relationship depicts that farmers' attitude varies with respect to their age. The older the

age of a farmer, the less likely that he/she has relatively favorable attitude towards AGP. In contrast, farmers' with relatively younger age considered AGP as important program for them.

Table-7: Correlation between farmers' age and their attitude towards AGP in *Hallo Hartume kebele*

Farmers' attitude towards AGP	
Pearson Correlation	- 0.487
Sig. (2-tailed)	0.000
No.	67

Similar to the case in *Worqa Sakaro kebele*, there is a moderate inverse relationship ($r = - 0.487$ and sig. (2-tailed) = 0.000) between farmers' age and their attitude towards AGP. The inverse relationship depicts that as a farmer gets older, the less likely he/she has relatively favorable attitude towards AGP. In contrast, farmers' with relatively younger age have a relatively favorable attitude towards AGP.

Though having a different agro-ecology, the two selected *kebeles* are similar in that both are characterized by the inverse and significant relationship of the farmers' age living in the *kebeles* and their attitude towards AGP.

4.3.3. Farmers' educational attainment and their attitude towards AGP

The educational status of farmers was classified into six categories: Illiterate, Read and write, Attended grade 1-4, Attended grade 5-8, Attended grade 9-10 and attended vocational training. In order to check whether educational attainment of farmers result in a differing attitudinal level

towards AGP, analysis of variance (ANOVA) is found to be an appropriate statistical tool. The result of the test is presented in the following tables.

Table-8: Analysis of Variance of attitude towards AGP by educational attainment in *Worqa Sakaro kebele*

Level of Education	No.	Mean
Illiterate	17	27.47
Can read and write	36	28.53
Grade 1-4	13	31.08
Grade 5-8	16	32.44
Total	82	29.48

$F = 6.781$, sig. (2-tailed) = 0.000

Since the samples are drawn independently, the mean differences of these educational categories are compared using a one-way ANOVA. Farmers' educational attainment has statistically significant effect ($F = 6.781$ and sig. (2-tailed) = 0.000) on their attitude towards AGP. The test shows that the more a farmer has a relatively higher educational attainment, the more he/she has favorable attitude towards AGP. In other words, those who are less educated and illiterate often tend to have unfavorable attitude towards AGP as compared to the educated ones.

Table-9 presents the relationship between farmers' educational attainment and their attitude towards AGP in *Hallo Hartume kebele* using Analysis of Variance (ANOVA).

Table-9: Analysis of Variance of attitude towards AGP by educational attainment in *Hallo Hartume kebele*

Level of Education	No.	Mean
Illiterate	15	27.73
Can read and write	31	29.94
Grade 1-4	15	30.73
Grade 5-8	6	31.00
Total	82	29.72

F = 3.233, sig. (2-tailed) = 0.028

The mean differences of farmers' educational attainment are compared using a one-way ANOVA. Analogous to the situation in *Worqa Sakaro kebele*, farmers' educational attainment has statistically significant effect (F = 3.233 and sig. (2-tailed) = 0.028) on their attitude towards AGP. The test shows that farming households who attained grade 5-8 have a relatively higher Mean score attitude towards AGP than the rest of the educational categories. In other words, those who have no formal education have lesser mean score attitude towards AGP. It can be said, thus, that the two agro-ecologically different *kebeles* are alike regarding the effect of educational attainment on attitude towards AGP.

4.3.4. Farmers' level of access to AGP's services and their attitude towards the program

It is anticipated that the extent that farmers access to AGP services might influence their attitude towards the program. In order to test whether these two variables are correlated, Pearson

coefficient correlation is found to be the appropriate statistical tool. The following table shows the SPSS generated test of the correlation between the two variables in *Worqa Sakaro kebele*.

Table-10 Correlation between farmers’ level of access to AGP’s services and their attitude towards AGP in *Worqa Sakaro kebele*

		Farmers’ attitude towards AGP
Farmers’ extent of access of AGP’s services	Pearson Correlation	0.889
	Sig. (2-tailed)	0.000
	No.	82

According to the above results, there is a very strong positive ($r = 0.889$ and sig. (2-tailed) = 0.000) relationship between the extent that farmers access AGP’s services and their attitude towards the program in *Worqa Sakaro kebele*. The positive relationship depicts that the more farmers access AGP’s services, the more they develop favorable attitude towards the program. On the contrary, the less they access AGP’s services, the unfavorable attitude they hold towards the program.

The following table (Table-11) presents the correlation between farmers’ level of access for AGP’s services and their attitude towards the program in *Hallo Hartume kebele*.

Table-11: Correlation between farmers’ extent of access for AGP’s services and their attitude towards the program in *Hallo Hartume kebele*

		Farmers’ attitude towards AGP
Farmers’ extent of access of AGP’s services	Pearson Correlation	0.853
	Sig. (2-tailed)	0.000
	No.	67

Like the case in *Worqa Sakaro kebele*, there is a very strong positive ($r = 0.853$ and sig. (2-tailed) = 0.000) relationship between the extent that farmers’ access AGP’s services and their attitude towards the program in *Hallo Hartume kebele*. The correlation shows that farmers’ extent of access to the services of AGPs significantly affects their attitude towards the program. The relationship between the above two variables is found to be significant in both *kebeles*.

4.4. The Extent of Access to AGP’s Services by Farming Households

As mentioned in the introduction chapter, the central aim of this paper is to assess the extent that farming households access the services provided by the AGP. In doing so, farmer respondents were asked to indicate which services (Improved seeds, Chemical fertilizers, Farmers training and Water-pump generator) they have been accessing. Table-12 shows the extent that farmers access the different services of AGP in *Worqa Sakaro kebele*.

Table-12: Accessing AGP's services by farmers

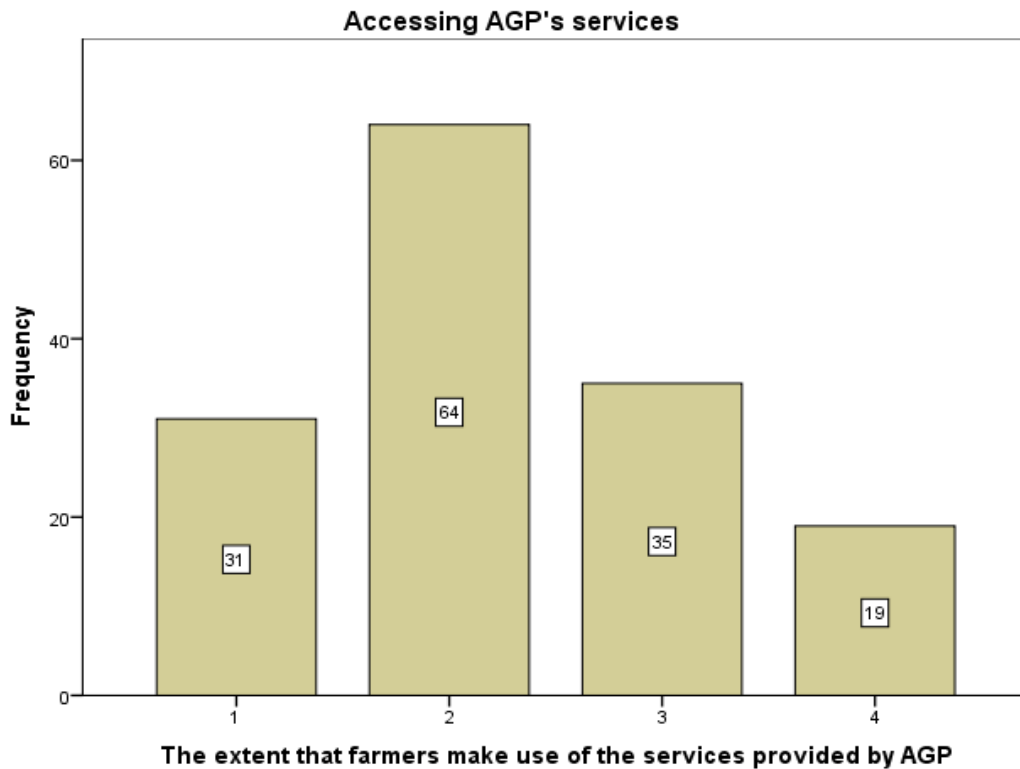
No. of services accessed	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%	No.	%
1	19	23.2	12	17.9
2	35	42.7	29	43.3
3	18	22	17	25.4
4	10	12.2	9	13.4
Total	82	100	67	100

Table-12 indicates the extent that farmers access the services provided by AGP vary in both *kebeles*. In *Worqa Sakaro kebele*, only 12.2 % of the farmers have full access to the services of AGP. 22 % of the farmers access three of the services provided by AGP. Most of the farmers (42.7 %) access two services from the AGP's services. And, 23.2 % of the farmers access only one of AGP's services. In *Worqa Sakaro kebele*, a farmer accesses 2.23 AGP's services on average.

In *Hallo Hartume kebele*, 13.4 % of the farmers accessed all the four AGP's services while 25.4 % of them access three of the services of AGP. The majority of the farmers (43.3 %) access two AGP's services. And, 17.9 % of the farmers access only one of the AGP's services. 2.34 are the average score of farmers accessing AGP's services in *Hallo Hartume kebele*, which means all the farmers in the *kebele* on average access more than to services from the program.

The mean score for *Gedeb wereda* is 2.28 and the standard difference among each farmer is 0.938. The following Bar chart (Figure-5) shows the diagrammatic presentation of the extent that farmers access the services of AGP in *Gedeb wereda*.

Figure-5: Accessing AGP's services in *Gedeb wereda*



In order to have a true picture of the specific services accessed by farmers, the following sub-sections describe each service with respect to the number of farmers accessing the service.

4.4.1. Improved Seeds

According to the information from the AGP focal person and kebele agricultural extension workers, one of the services provided by AGP is distributing improved seeds freely or without any payment to farmer in order for the farmers to have better productivity during the production

year 2006/2007. The major types of crops provided for farmers in the *wereda* are Teff, Barely, Wheat, Maize, Potato and Vegetables.

In *Worqa Sakaro kebele*, 81.7 % of the farmer respondents' access improved seeds through AGP. In *Hallo Hartume kebele*, 67.2 % of the farmer respondents' access improved seeds from AGP, which is less than the former *kebele*. Generally, 75.2 % of the farmer respondents accessed improved seeds from AGP in *Gedeb wereda*.

4.4.2. Chemical Fertilizers

According to the information from the AGP focal person of *Gedeb wereda* and kebele agricultural extension workers the program provides chemical fertilizer such as Urea and **DAP** for free unlike the government led agricultural extension program for farming households in the *wereda*. The amount of chemical fertilizer that farmers access from the program depends on the farmland size and productivity.

Chemical fertilizers are assumed to help farmers for improved productivity of their farmland. 59.8 % of the respondents received chemical fertilizers from AGP in *Worqa Sakaro kebele*, while 67.2 % of the respondents received chemical fertilizer in *Hallo Hartume kebele*, which is greater than the other *kebele*. Generally, 63.1 % of the respondents have accessed chemical fertilizer in *Gedeb wereda*.

4.4.3. Farmers Training

According to the information from the AGP focal person and kebele agricultural extension workers, training farmers in relation to introducing new technologies and best agricultural practices is one of the most supportive services provided by AGP to farming households.

The trainings include introducing new agricultural practices like how to apply the appropriate amount of chemical fertilizer on their farmland, how to prepare organic fertilizer by using compost and animal dung, the advantages and application of row planting, the advantages of irrigation, and how to operate water pump generator, for those who practice irrigation in their farmland.

Among the *Worqa Sakaro kebele* respondents, 64.6 % of them participated in training arranged by AGP. With regard to taking part in the training sessions, there is a difference in frequency among farmers in their presence in trainings organized by AGP. Some 35.4 % of the respondents 'Never' attended the trainings, 32.9 % of the respondents 'Sometimes' attended the trainings and the rest 31.7 % of them 'Always' attended the trainings organized by AGP.

In *Hallo Hartume kebele* 65.7 % of the respondents took training (25.4 % of the respondents 'Always' took part in the trainings and 40.3 % of them 'Sometimes' attended in the trainings), which is relatively equivalent to the former *kebele*. All in all, 65.1 % of the farmer respondents in *Gedeb wereda* took training which were organized by AGP.

4.4.4. Water-pump Generator

In explaining about the contribution of AGP regarding the provision of water pump generators, The AGP focal person said that the program provided water pump generators for those farming households who engage in irrigation. Water pump generators were provided to help farmers in their practice of small-scale irrigation. In addition, the program provided water pump generators for all FTCs in the *wereda* to be used as demonstration equipment in different sessions.

Water pump generator is provided to help farmers in their practice of small-scale irrigation. A small proportion (18.3 %) of the respondents has been given water pumping generator in *Worqa Sakaro kebele*. A relatively greater number of respondents, compared to *Worqa Sakaro kebele*, (35.8 %) accessed water pumping generator for their irrigation in *Hallo Hartume kebele*.

4.4.5. Small-Scale Irrigation

One of the services provided by AGP is to train and encourage farmers to irrigate for better agricultural productivity. Accordingly, 19.5 % and 35.8 % of the respondents apply small-scale irrigation in their farmland in *Worqa Sakaro and Hallo Hartume kebele* respectively. The application of small-scale irrigation in *Hallo Hartume kebeles* is relatively higher than *Worqa Sakarokebele*.

According to the AGP focal person, the program donates money and provides technical support for small scale rural infrastructural development and management. The AGP supports the construction, rehabilitation and/or improvement, and management of small-scale infrastructure (micro irrigation, rural roads and market place). This helped to improve productivity. Under this sub – project, the program engaged in the establishment of new small and micro irrigation. In this case the program introduces water harvesting micro technologies. All farming households who engaged in small scale irrigation received trainings on how to apply irrigation on their farm land. Surface, ground and rain water harvesting technologies were effectively introduced for farming households who engaged in SSI. For instance the program conducted awareness raising programs to the farmers and agricultural extension workers. As a result, the performance of micro irrigation technologies in the *wereda* is increased. In the study - year's progress, the total

irrigated area covers 222.25 ha of land. The total numbers of beneficiary households are 1528 among which female and youth beneficiaries account 169 and 956 respectively.

4.4.6. Factors that hinder farming households not to apply irrigation on their farm land

As identified in the questionnaire administered to farmers, respondents indicated the challenges that make irrigation difficult to practice on their farmland. The following table shows factors affecting the use of irrigation in both *kebeles*.

Table-13: Factors affecting small-scale irrigation

Factors	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%*	No.	%*
Unable to access water pumping generator	18	22	25	37.3
Lack of water resource for irrigation	42	51.2	17	25.4
Lack of awareness	7	8.5	2	3
Lack of technical skills	25	30.5	5	7.5

*The percentages are calculated out of the total number of each response which is larger or smaller than the total number of respondents

Provided with close-ended options, 51.2 % of the respondents in *Worqa Sakaro kebele* responded that lack of water resource for irrigation is the main reason for the difficulty of applying irrigation followed by lack of technical skills about irrigation (30.5 %). Whereas, in *Hallo Hartume kebele*, it is the inability of farmers to use water pump generator (37.3 %) which made the practice of irrigation difficult followed by lack of water resource for irrigation (25.4

%). Lack of awareness the purposes of irrigation is not significantly considered as a reason of difficulty in both *kebeles* (8.5 % and 3 % in *Worqa Sakaro and Hallo Hartume* respectively).

As mentioned above, AGP demonstrates and motivates farmers to apply small-scale irrigation in their farmland. It is, therefore, believed that the training organized by AGP might influence farmers' engagement in practicing irrigation. A non-parametric test (Chi-Square) is employed in analyzing the association between the trainings provided by AGP and farmers' engagement in small-scale irrigation, and is presented in the following cross-tab.

Table-14: Cross tabulation of farmers' engagement in irrigation by their participation in trainings organized by AGP in *Worqa Sakaro kebele*

Apply irrigation	Received training				Total	
	Trained		Not Trained			
	No.	%	No.	%	No.	%
Yes	15	28.3	1	3.4	16	19.5
No	38	71.7	28	96.6	66	80.5
Total	53	100	29	100	82	100

$$\chi^2 = 7.372, \text{ sig. (2-tailed)} = 0.007$$

Table-14 shows 28.3 % of the respondents who are engaged in irrigation have received trainings; while 71.7 % of them who did not received trainings did not apply irrigation on their farmland. Among the non-trained farmers, on the other hand, only 3.4 % of the respondents practice irrigation and the majority (96.6 %) did not practice irrigation in *Worqa Sakaro kebele*. The non-parametric test, Chi-square, depicts that there is a significant ($\chi^2 = 7.372, \text{ sig. (2-tailed)} = 0.007$)

relationship between being trained by AGP and practicing irrigation for better agricultural productivity.

Similarly, there is a statistically significant ($\chi^2 = 7.904$, sig. (2-tailed) = 0.005) relationship between farmers' engagement in irrigation and the training they took organized by AGP in *Hallo Hartume kebele*. Among the trained farmers 47.7 % of the respondents engaged themselves in irrigation, while 52.3 % of them did not apply irrigation in their farmland. Among the non-trained farmers, 13 % of the respondents practice irrigation and the majority (87 %) did not practice irrigation.

The following cross-tabulation presents farmers' engagement in irrigation and their participation in trainings organized by AGP in *Hallo Hartume kebele*.

Table-15: Cross tabulation of farmers' engagement in irrigation by their participation in trainings organized by AGP in *Hallo Hartume kebele*

Apply irrigation	Farmers training				Total	
	Trained		Not Trained			
	No.	%	No.	%	No.	%
Yes	21	47.7	3	13	24	35.8
No	23	52.3	20	87	43	64.2
Total	44	100	23	100	67	100

$\chi^2 = 7.904$, sig. (2-tailed) = 0.005

4.4.7. Row planting

According to the information by *kebele* agricultural extension workers and AGP focal person, among the major trainings provided in FTCs, row planting is the major one. The program mainly stresses on introducing and enhancing row planting, since it has been believed to increase the productivity of the farming households and essential for effective utilization of resources. Barely, wheat and *teff* are among the cereals row planting has been applied for.

As described above in ‘Farmers Training’, farmers have been taught about row planting in the trainings organized by AGP. As a result, 65.9 % of the respondents practice row planting in their farm, and 34.1 % of them did not practice row planting in *Worqa Sakaro kebele*. On the other *kebele*, *Hallo Hartume*, 70.1 % of the respondents practice row planting, and nearly 30 % of them did not practice row planting on their farmland.

Table-16: Cross tabulation of farmers’ row planting practice by their participation in trainings organized by AGP in *Worqa Sakaro kebele*

Practicing row-planting	Farmers training				Total	
	Trained		Not Trained			
	No.	%	No.	%	No.	%
Yes	49	92.5	5	17.5	54	65.9
No	4	7.5	24	82.8	28	34.1
Total	53	100	29	100	82	100

$$\chi^2 = 47.152, \text{ sig. (2-tailed) } = 0.000$$

As shown in Table-16, 92.5 % of the trained farmers practice row planting, and 7.5 of the m did not practice row planting on their farm land. On the other side, 82.8 % of the non-trained respondent farmers did not practice row planting, and only 17.5 % of them practice row planting. The Chi-square test depicts that there is a statistically significant ($\chi^2 = 47.152$, sig. (2-tailed) = 0.000) relationship between attending training and row planting practice in *Worqa Sakaro kebele*. The following table presents a cross-tabulation of row planting practice and farmers training along with a non-parametric test used to test their relationship.

Table-17: Cross tabulation of farmers’ row planting practice by their participation in trainings organized by AGP in *Hallo Hartume kebele*

Practicing row-seeding	Farmers training				Total	
	Trained		Not Trained			
	No.	%	No.	%	No.	%
Yes	42	95.5	5	21.7	47	70.1
No	2	4.5	18	78.3	20	29.9
Total	44	100	23	100	67	100

$$\chi^2 = 39.196, \text{ sig. (2-tailed) } = 0.000$$

As Table-18 shows 95.5 % of the trained farmers’ practice row planting, and only 4.5 of them did not practice row planting on their farmland. On the other hand, 78.3 % of the non-trained respondent farmers did not practice row planting, and 21.7 % of them practice row planting. The non-parametric test (Chi-square) depicts that there is a statistically significant ($\chi^2 = 39.196$, sig. (2-tailed) = 0.000) relationship between training and row planting practice in *Hallo Hartume*

kebele. It can be said, therefore, that training organized by AGP influenced positively farmers to practice row planting on their farmland.

Those farmers who are not directly selected by the program, can access the above services by being a member of CIG. According to the information by AGP focal person of *Gedeb wereda*, the program in collaboration with agricultural extension workers organizes farmers' common interest groups (CIG) and strengthens the previously organized ones. Members within CIG are organized based on their common interest. Those groups organized for crop production get agricultural inputs such as chemical fertilizers and improved seeds; for those groups organized under animal husbandry, AGP provides milk cow, sheep and beehives. For instance, the AGP has established 16 community groups for seed production within 16 kebeles, and currently they are assisting these groups technically and financially. These groups engage in crop production and multiplication of improved seeds, the AGP buys seeds from these groups with fair price in order to distribute for other farming households within the *wereda*.

4.4.8. Experience sharing

According to the AGP focal person of *Gedeb wereda*, AGP arranges experience sharing among farmers. It is assumed that sharing experience from 'model' farmers motivate other farmers to adopt the successful and effective activities and ways of farming that the 'model' farmers experience and apply to be successful. Accordingly, respondents were asked whether they ever attended experience sharing sessions organized by AGP. The responses are presented in the following table.

Table-18: Farmers' participation in experience sharing sessions

Attending experience sharing sessions	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%	No.	%
Yes	46	56.1	42	62.7
No	36	43.9	25	37.3
Total	82	100	67	100

According to Table-18, more than half of the respondents (56.1 % *Worqa Sakaro* and 62.7 % from *Hallo Hartume*) attended experience sharing sessions organize by AGP. Having the above descriptive analysis in mind, Independent Sample T-test is used to check whether there is a statistically significant relationship between attending experience sharing and accessing more AGP's services. Table-19 shows, by applying the appropriate statistical tool- Independent Sample T-test, Mean difference among farmers who attended experience sharing sessions with their respective access to AGP's services.

Table-19: Farmers' participation in experience sharing sessions by their access of the services of AGP

Attending experience sharing sessions	<i>Kebele</i>					
	<i>Worqa Sakaro</i>			<i>Hallo Hartume</i>		
	No.	Mean	Sig (2-tailed)	No.	Mean	Sig (2-tailed)
Yes	46	2.57	0.000	42	2.55	0.019
No	36	1.81		25	2.00	

It can be stated that attending experience sharing sessions significantly affects accessing AGP's services in both *kebeles* (Sig (2-tailed)= 0.000 for *Worqa Sakaro* and Sig (2-tailed)= 0.019 for

Hallo Hartume). The Independent Sample T-test analysis shows that those farmers who attended experience sharing sessions are more likely to access AGP's service than the non-attendee farmers. In other words, the non-attending farmers are less likely to access AGP's service. It can be, therefore, said that attending experience sharing sessions encourages farmers to access more services from AGP.

In explaining about the contribution of AGP with regard to the introduction of new technologies and agricultural practices, the AGP focal person mentioned that the program provides innovative fund to strengthen Farmer's Training Center (FTC) - innovative centers, sets its own demonstration sites and arranges experience sharing programs to introduce new agricultural practices such as row planting, how to use the appropriate amount of chemical fertilizers and how to operate water pump generator for irrigation.

In general farming households are supported through trainings, experience sharing, demonstrations and other extension services in order to help them to adopt new agricultural practices and technologies that believed to enhance their productivity.

4.5. Variations among Farming Households in Accessing AGP's Services

It is assumed that farmers may differ in terms of accessing AGP's services. The variations are seen in terms of the socio-demographic and economic characteristics of farmer respondents (gender of household's head, age, level of Education and farmland size). The analyses are presented in the sub-sections below.

4.5.1. Household head's gender and their extent of access of the AGP services

According to the survey data collected from the farmer respondents, female respondents have a slightly higher mean score (Mean= 2.31) than male respondents (Mean= 2.22) regarding their access of AGP's services in *Worqa Sakaro kebele*. The average mean difference is 0.09. Likewise, female respondents in *Hallo Hartume kebele* have higher mean score (Mean= 2.36) than male respondents (Mean= 2.34). The average mean difference is 0.02.

Using the appropriate statistical test (Independent Sample t-test), however, the mean difference between male and female respondents' access is not statistically significant (Sig. (2-tailed) = 0.755 for *Worqa Sakaro* and Sig. (2-tailed) = 0.951 for *Hallo Hartume*). Therefore, there is no meaningful difference between male and female farming households regarding their access of the services of AGP.

4.5.2. Farmers' age and their extent of access of the services of AGP

As it is explained by AGP's focal person, one of the major criteria for providing the services of AGP is the age of farming households and the program prioritizes youth farming households in line with providing the necessary services.

Having the above explanation of AGP's focal person in mind, it is assumed that farmers' age might influence their tendency to access the services of AGP. As age and extent of access of AGP's services are measured in scale level of measurement, Pearson coefficient correlation is found to be the appropriate statistical tool to see whether age and extent of access of the services of AGP are significantly correlated. Table-21 presents the correlation between farmers' age and their extent of access of AGP's services in *Worqa Sakaro kebele*.

Table-20: Correlation between farmers’ age and their extent of access of AGP’s services in *Worqa Sakaro kebele*

	Farmers’ extent of access of AGP’s services
Pearson Correlation	- 0.567
Sig. (2-tailed)	0.000
No.	82

As shown in Table-20, there is a moderate negative relationship ($r = - 0.567$ and sig. (2-tailed) = 0.000) between farmers’ age and their extent of access of AGP’s services in *Worqa Sakaro kebele*. The negative relationship depicts that access of AGP’s service varies with respect to farmers’ age. The older the age of a farmer, the less he/she accesses AGP’s services. In contrast, farmers’ with relatively younger age are more likely to access AGP’s services.

Similar to the case in *Worqa Sakaro kebele*, there is a moderate negative relationship ($r = - 0.611$ and sig. (2-tailed) = 0.000) between farmers’ age and their extent of access of AGP’s services in *Hallo Hartume kebele*. It can be concluded, thus, that there is an inverse relationship between farmers’ age and the extent of access of the services of AGP in *Gedeb wereda*. The following table shows the correlation between farmers’ age and their access of the services of AGP.

Table-21: Correlation between farmers’ age and their extent of access of AGP’s services in

Hallo Hartume kebele

	Farmers’ extent of access of AGP’s services
Pearson Correlation	- 0.611
Sig. (2-tailed)	0.000
No.	67

Similar to the above finding from the survey sample respondents, the AGP focal person explained whether the program provides special emphasis for women-headed farming households and youth farming households. It is explained that the program gives priority for women groups and youths; to establish and strengthen common interest groups (CIG). While screening out the proposals, women and youth groups get the highest chance to be selected and supported. Based on the proposal by members of CIG, the AGP provides monetary fund and material support. For instance, those women and youths who engage in animal fattening get oxen and sheep; those who engage in milk production get milk cows; and those who engage in beekeeping get beehives from AGP for free.

4.5.3. Farmers’ educational status and their level of access of AGP’s services

It is assumed that a difference in level of education might affect farmers’ tendency to access services from AGP. In order to see whether educational level of respondents results in a differing extent of access of the services of AGP, analysis of variance (ANOVA) is found to be an appropriate statistical tool. The result of the test is presented in Table-22.

Table-22: Analysis of Variance of educational status of farmers by their extent of access of AGP's services

Level of Education	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	Mean	No.	Mean
Illiterate	17	1.65	15	1.73
Can read and write	36	2.14	31	2.23
Grade 1-4	13	2.54	15	2.87
Grade 5-8	16	2.81	6	3.17
Total	82	2.23	67	2.34

Respondents' educational status has statistically very significant effect ($F = 5.535$ and sig. (2-tailed) = 0.002 in *Worqa Sakaro* and $F = 6.941$ and sig. (2-tailed) = 0.000 in *Hallo Hartume kebele*) on their tendency to access AGP's services. The test shows that the more a respondent is educated, the more he/she accesses the services of AGP. In other words, those who are relatively less educated and illiterate access less services of AGP as compared to those with relatively higher grade farmers.

4.5.4. Farmland size and level of access of AGP's services

As it is explained by AGP's focal person, one of the most important and major criteria for providing the services of AGP is farmers' farmland size and their potential productivity. Thus, respondents were asked to provide their farmland size in the local measurement- *Timade*, and the provided size was converted into Hectare. And, the association between farmers' farmland size and their extent of access of AGP's services is tested using Pearson correlation, and the analyses are presented in Tables-23 and 24.

Table-23: Correlation between farmers’ extent of access of AGP’s services and their farmland size in *Worqa Sakaro kebele*

Farmers’ extent of access of AGP’s services	Farmland size	
	Pearson Correlation	0.775
	Sig. (2-tailed)	0.000
	No.	82

According to Table-23, there is a very strong positive ($r = 0.775$ and sig. (2-tailed) = 0.000) relationship between farmers’ farmland size and the extent that they access AGP’s services in *Worqa Sakaro kebele*. The positive relationship depicts that farmers with relatively large farm land size are more likely to access AGP’s services than those with smaller farmland size.

Table-25 also presents the correlation between farmers’ farmland size and the extent that they access AGP’s services in *Hallo Hartume kebele*.

Table-24: Correlation between farmers’ extent of access of AGP’s services and their farmland size in *Hallo Hartume kebele*

Farmers’ extent of access of AGP’s services	Farmland size	
	Pearson Correlation	0.454
	Sig. (2-tailed)	0.000
	No.	67

It can be seen from Table-24 that there is a moderate positive ($r = 0.454$ and sig. (2-tailed) = 0.000) relationship between farming households’ farmland size and the extent that they access AGP’s services in *Hallo Hartume kebele*. The correlation shows that farming households’ farmland size significantly affects their extent of access to the services of AGP. In speaking of

the correlation between farmland size and extent of access of AGP services, the relationship is found to be significant in both *kebeles*.

4.5 The Challenges that Farming Households Face in Their Efforts to Access AGP's Services

Farmers were asked whether there are challenges that hinder them not to properly utilize the services provided by AGP. Table-25 summarizes the responses given by respondent from both *kebeles*.

Table-25: Farmers' response to the existence of challenges that hinder the accessibility of AGP's services

Response	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%	No.	%
Yes	62	75.6	47	70.1
No	20	24.4	20	29.9
Total	82	100	67	100

In *Worqa Sakaro* and *Hallo Hartume kebeles* 75.6 % and 70.1 % of the respondents respectively believed that there are challenges that hinder them not to properly utilize AGP's services. Respondents of the two *kebeles* were similar in their rating of the possible challenges that hinder farmers not to utilize the services of AGP.

Among the respondents who believe that there are challenges, 37 % from *Worqa Sakaro* and 36.1 % from *Hallo Hartume kebele* believed that unfamiliarity with the services of provided by AGP was reported to be a primary challenge followed by incompatibility of the services with farmers' needs (37 % in *Worqa Sakaro* 36.1 in *Hallo Hartume*). Lack of support from AGP personnel (29 % in *Worqa Sakaro* 25.5 in *Hallo Hartume*) was also reported as a challenge considerably. Unable to afford the price of agricultural inputs provided by AGP was reported as a lesser challenge- 3.2 % and 4.2 % in *Worqa Sakaro* in *Hallo Hartume kebele* respectively. The following is a tabular presentation of the possible challenges that hinder farmers not to fully utilize the services of AGP in *Gedeb wereda*.

Table-26: Challenges that hinder the accessibility of AGP's services

Challenges	<i>Kebele</i>			
	<i>Worqa Sakaro</i>		<i>Hallo Hartume</i>	
	No.	%*	No.	%*
Unfamiliarity with the services of AGP	33	53.2	27	57.4
Unable to afford the price of agricultural inputs	2	3.2	2	4.2
Incompatibility of the services with my farm needs	23	37	17	36.1
Lack of support from AGP personnel	18	29	12	25.5

Interviewees explained the challenges they faced in their effort to access AGP services. They raised different issues as a challenge. Among the interviewees, a 52 years old interviewee from *Worqa Sakaro kebele* complained that the criteria by AGP to provide services are partial, since it favors women and youth farmers.

Male interviewee aged 43 from *Hallo Hartume kebele* also mentioned that those model farmers who have been selected to be special beneficiaries by AGP in the previous years always enjoy the highest benefit from the services of the program. There is little attention to select new model farmers and special beneficiaries on behalf of AGP's experts and agricultural extension workers.

Male interviewee from *WorqaSakaro kebele* also explained that he has a limited contact with kebele agricultural extension workers and AGP experts. Once the AGP provides material and technical support there is no continuous follow up. This is due to the small number of agricultural extension workers and AGP experts within the kebele. There are only two agricultural extension workers available for one kebele.

A 39 years old male interviewee from *Hallo Hartume kebele* raised a challenge he faced as being a member of CIG and mentioned that when members in the CIG face problems like a difference in their interest, AGP intervention to solve the problems is very weak. As a result, most CIGs with such a problem are more likely to disintegrate.

A 36 years old female interviewee from *Worqa Sakaro kebele* while explaining whether she accesses AGP services based on her interest criticize the program by sharing her own experience, and explained what she experienced as a member of CIG and complained that their request to organize their CIG on beekeeping was rejected; because, there were no enough beehives at a time and said that this situation shows that there is no room for their business plan in the AGP. Male interviewee aged 44 from *WorqaSakaro kebele* also explained his resentment by criticizing the criteria of the program to provide different services. And said that instead of helping the aged and the poor, they mainly prefer and support the young and model farmers.

Another idea which is different from other interviewees regarding the variation in line with accessing AGP services raised by an interviewee from *Hallo Hartume kebele* is that personal relationship with AGP experts and agricultural extension workers also matters to access the services. In other words, those farmers who are relatives or friends with AGP personnel access more services than others.

Kebele agricultural extension workers while explaining the major challenges they faced while providing services to the farmers mentioned the following challenges. Among the major challenges raised by both agricultural extension workers with in their respective *kebeles* is related with disagreement among members of CIGs. After groups are organized, some farmers show a difference in their interest; and such kinds of groups are more likely to disintegrate and divide the assets provided by AGP, individually. Some CIGs also fail to document and report their cost and benefit. As a result, the program faces a problem to identify the effectiveness of groups to continue or quit the support.

HalloHartume extension worker also mentioned, farmers fail to cooperate with them while mobilizing them to engage in watershed management and soil conservation activities. Since such activities are conducted outside their farm land they fail to recognize the benefit they could get in general. As a result, it takes much time and effort to organize and mobilize them to engage them in such activities.

Hallo Hartume agricultural extension worker also mentioned that women trainees need special attention and follow up; since they are too busy with household activities and caring of children. So, sometimes, she went to their home to convince them how important the training is.

In addition, *Hallo Hartume* agricultural extension worker mentioned the challenges while organizing and forming CIGs and explained that farmers misunderstood the possibility of forming CIGs with mixed members from both genders, and even those who are aware of the possibility showed little interest. Specially, male farmers are always reluctant to form groups with female farming households.

Hallo Hartume and *Worqa Sakaro* agricultural extension workers were asked to respond the challenges they faced while providing services related to agriculture by AGP. Both the agricultural extension workers explained that especially aged farming households fail to cope with other farmers and they fail to attend the trainings on regular basis, and that kind of farmers are not eager and willing to adopt new agricultural practices and technologies. For instance, some farmers insist on applying the traditional sowing mechanism rather than adopting row planting, though planting of crops in a row is advantageous for proper utilization of fertilizer, distribution of the seed and weeding, and even it increases agricultural production and minimizes wastage. *Worqa Sakaro* kebele extension worker also explained that some farmers are also reluctant to apply new agricultural practices and inputs. For instance, some farmers are not willing to use chemical fertilizers in their farmland even those who use, apply small amount to save the fertilizer for another time.

4.6 Support to Government Led Agricultural Extension Program by AGP

While explaining the relationship that exists between their program and government led – agricultural extension program, the AGP focal person explained that AGP supports the agricultural extension program in many different ways. Under the AGP sub-project - institutional strength and development, the AGP in collaboration with the agricultural extension program

establishes and strengthens Agricultural and Rural Development Partnership Linkage Advisory Council (ARDPLAC) with the aim of addressing key issues related to enhancing production and productivity by facilitating the connection among stakeholders in problem identification, prioritization, assessing possible solutions and evaluation of its results.

The ARDPLAC in *Gedeb wereda* organized many workshops, review meetings, and field visits. Members of the ARDPLAC consist of researchers from *Dilla* University, *Gedeo* zone agricultural office extension workers, model farmers, and representatives of women and youth from each kebele.

While mentioning the relationship that exists between AGP and agricultural extension program, *Hallo Hartume kebele* extension worker explained that AGP supports FTCs by providing material and technical support. For example, the AGP provides stationery support, such as pen, notebook and even computers that could facilitate the trainings conducted in the center. The AGP also constructed fences to FTCs. They also provide motorbikes and pedal bikes that could facilitate the day to day activities of *kebele* agricultural extension workers.

Material and technical support to FTCs is also another support by the AGP to agricultural extension program. In order to improve the quality of trainings, the AGP provides training of trainers (ToT) for agricultural extension workers in the target area.

For those groups who engaged in crop production the AGP provides the two mainly used chemical fertilizers such as, DAP and Urea in the area and the program also provides improved seeds. For those who engage in livestock production the AGP provides artificially inseminated

sheep, oxen and cows for milk production. The AGP also provides beehives for those who engage in beekeeping.

Asked to respond the same question regarding the relationship with AGP and the *Hallo Hartumekebele* agricultural extension worker explained that the AGP provides trainings of trainers (ToT) for *kebele* agricultural extension workers. Taking the ToT, those agricultural extension workers train farming households within FTCs. In addition, they received trainings on how to apply new technologies and agricultural practices which helped them to transfer what they learned to trainees successfully.

The extension workers were also trained by AGP experts from *Hawassa* on watershed management, agroforestry, and water and soil conservation in *Gedeb wereda*. In addition, explained that the AGP establishes and strengthens ARDPLAC at *wereda* level and distributes through all *kebeles*.

4.7 Modes of Service Provision by AGP

There are different approaches and models adopted by private, government and non-government organization in order to provide different agricultural services to clients worldwide. But for this particular study it was found that the following models and approaches fit with the service provision of AGP. These models and approaches are PADETES (Participatory Demonstration and Training Extension System), T and V (Training and visit) model, NGO (international and local) model and Technology transfer model.

Regarding the mode of service delivery by AGP, it tends to adopt a mixed approaches and models. For example the AGP adopt T and V model, since the program provides trainings with

in FTCs and visit the farms of the farmers to evaluate the effectiveness of farming households. At the same time, the AGP also apply PADETES approach since the AGP conducts demonstrations and trainings with in its demonstration sites.

As an international NGO funded by World Bank, the AGP also apply the NGO model of service provision, which stresses on provision of different services with the aim of improving productivity and living condition of farming households in the long run, rather than providing food aid and humanitarian assistance. Finally, the AGP also apply Technology transfer model, in which the program stress on introducing new technologies and improved agricultural practices to the clients.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1. Summary of Major Findings

The main objective of this study is on the assessment of the services provided by Agricultural Growth Program and the level in which that farming households make use of the services. Both quantitative and qualitative approaches were employed.

The main issues investigated include: types of services provided by AGP; the variations in the extent of the farmers in making use of the services provided by AGP across agro-ecologically different settings; investigating the variations among farming households in accessing the services from the program and assessing the challenges faced by farmers in their efforts to make use of the services provided by the program. The study's summary is presented below.

5.1.1. Farmers' attitude towards AGP and their access to the services by the program

- Farmers' attitude regarding AGP was obtained by employing Likert Scale, and it is observed that (considering 40 the highest 10 lowest possible scores) the minimum score was 23 and the maximum score was 37. The two *kebeles* were approximately (29.48 in Worqa Sakaro and 29.72 in Hallo Hartume) equal in their mean scores.
- In terms of gender of the respondents, there were no significant relations observed on both *kebeles*. Nevertheless, age of respondents was found significantly affecting their attitude towards AGP.

- The extent of access to the services of AGP towards AGP was considered one of the factors that might affect their attitude, Pearson correlation test depicts that ($r= 0.889$ for *Worqa Sakaro* and $r= 0.853$ for *Hallo Hartume*) there is a strong correlation between the two variables.
- AGP provides improved seeds (75.2 % of the farmer respondents accessed improved seeds), chemical fertilizers (63.1 % of the respondents have accessed chemical fertilizer), training (65.1 % of the farmer respondents took training which were organized by AGP), and water pump generator (18.3 % of the respondents has been given water pumping generator in *Worqa Sakaro kebele*, and 35.8 % accessed water pumping generator in *Hallo Hartume kebele*).
- In *Worqa Sakaro and Hallo Hartume kebele* 19.5 % and 35.8 % of the respondents apply small-scale irrigation on their farmland respectively. In addition, the trainings provided by AGP influenced the farmers to apply irrigation in their farmland.
- In *Worqa Sakaro kebele* 65.9 % of the respondents practice row planting and 70.1 % of the respondents practice row planting in *Hallo Hartume kebele*. The application of row planting was also influenced by the trainings given to the farmers which are organized by AGP.
- In *Worqa Sakaro kebele* 56.1 % respondents and 62.7 % respondents from *Hallo Hartume kebele* attended the experience sharing sessions organize by AGP. Consequently, farmers who attended the experience sharing sessions are more likely to access AGP's service than the non-attending farmers.

5.1.2. Variations among farmers in accessing the services of AGP

- It is found that there is no significant difference between male and female respondents in their use of AGP's services in both *kebeles*. On the other hand, farmers' age was found to have an inverse moderate relationship ($r = -0.567$ in *Worqa Sakaro* and $r = -0.611$ in *Hallo Hartume*) with accessing the services provided by AGP.
- Respondents' educational status has statistically very significant effect ($F = 5.535$ in *Worqa Sakaro* and $F = 6.941$ in *Hallo Hartume kebele*) on their tendency to access AGP's services.
- Farmland size difference among farmers resulted in the differing accessing of the services of AGP. It was found that the more a farmer has a larger farmland, the more he/she accesses the services of AGP.
- 73.1 % of the farmer respondents believe that there are challenges that hinder farmers not to fully utilize the services provided by AGP. The main ones include: unfamiliarity with the services provided by AGP was reported to be a primary challenge followed by incompatibility of the services with farmers' farm needs. Lack of support from AGP personnel was also reported as a challenge. Unable to afford the price of agricultural inputs provided by AGP was identified as a lesser challenge.

5.2. Conclusion

AGP is available to all farmers in *Gedeb wereda*. Even though they can access the services of AGP, there is a variation among farming households due to their socio-demographic characteristics. There are certain criteria to select beneficiaries of the services provided by the program. Accordingly, farming households who have relatively large farm land, preferably, irrigable land, are visible for the services. It gives a special emphasis to women and youth to

avail them in the program. In addition, the study has found out that farmers' access to the services provided by AGP has a considerable effect on their attitude to the program.

On average, a farmer accesses 2.25 services provided by AGP. Thus, all the farmers who accessed the services of AGP have accessed more than half of the services provided by the program.

The findings of the survey, key informant interviews and in-depth interviews have indicated that there are different attributes of farming households that determine their access to AGP services. These are the socio-demographic and economic characteristics of farming households such as gender, farmland size, and level of education.

For example, access to AGP services varies with respect to farming households socio-demographic characters such as age, educational level and farm land size. In both *kebeles* the study found that as age of a farmer increases, the level of access to AGP services decreases and vice versa.

Similarly, as the educational level of a farming household increases, the level of access to AGP services increases. The study also found that as farm land size of farming household increases the extent that a farmer accesses the services from the program increases and this was found to be strongly correlated with access to AGP services in *WorqaSakaro* kebele but in *Hallo Hartume kebele* the correlation was found to be moderately correlated. The extent that farming households access AGP services found to affect the attitude of farmers in both agro ecologically different *kebeles*, the more a farmer accesses services from the program the higher attitudinal score he/she has towards the program. Different from the above farming households' characteristics, however,

there is no significant difference among male and female farmers in accessing the services of AGP; however, the program was meant to emphasize on the advantage of women.

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