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An Investigation into the Factors Affecting the Implementation of Agricultural Extension Program in Hintalo-Wajirat Wereda, South- Eastern Tigray, Ethiopia

By: Ataklti Solomon

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Approved by Board of Examiners

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Acronyms

AEP	Agricultural Extension Program
AESs	Agriculture Extension Service
AEW	Agricultural Extension Worker
CADU	Chilalo Agricultural Development Unit
CD	Community Development
CIPPs	Comprehensive Integrated Package Projects
CPR	Common Property Resource
CSA	Central Stastics Authority
EARO	Ethiopian Agricultural Research Organization
EMIP	Extension Management and Training Plot
FAO	Food and Agriculture Organization
FFS	Farmers Field School
GDP	Gross Demotic Products
IECAMA	Imperial Ethiopia College of Agriculture and Mechanical Arts
IMF	International Monetary Fund
IPM	Integrated Pest Management
M&E	Monitoring and Evaluation
MFI	Micro-Finance Institutions
MOA	Minister of Agriculture
MoARD	Minister of Agriculture and Rural Development
MoFED	Minister of Finance and Economic Development
MPP	Minimum Package Program
NEIP	National Extension Intervention Program
NFE	Non Formal Education
PADEPs	Peasant Agriculture Development Extension Projects
PADETES	Participatory Demonstration and Training Extension System
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
PSIP	Public Service Delivery Policy
SG	Sasakawa Global
SIDA	Swedish International Development Authority
SNP	Safety Net Program
T&V	Training and Visit
WADU	Wolayita Agricultural Development Unit
WBoA	Wereda Bureau of Agriculture

Abstract

Agriculture is the backbone of Ethiopian economy and 85% of Ethiopian population are living in rural areas based on agricultural economic activities. That is why the sector attracted the attention of the Government and NGOs in general and agricultural institutions in particular. As a result, agricultural extension program is one of the inputs for the development of the agricultural sector. However, agricultural extension program faced various challenges in Hintalo-Wajirat Wereda in its implementation process. Hence, the objective of this research is to explore the factors affecting the implementation of agricultural extension program in Hintalo-Wajirat Wereda. In doing this, exploratory and explanatory approaches with qualitative and quantitative methods are employed. However, the research has involved more of qualitative than quantitative method. Purposive and random sampling techniques are employed in order to select the study sites within Hintalo-Wajirat Wereda and study respondents respectively. To collect the required primary source of data, instruments of data collection which include questionnaire, interview, focus group discussion and practical site observation were used. Secondary source of data to strengthen the primary source of data was also carefully examined. In the study, it is revealed that lack of awareness, provision of education and training, absence of supervision and coordination, insufficient daily perdium, inadequate infrastructure, lack of credit service and expensive nature of the price of agricultural inputs were the major factors affecting the implementation of agricultural extension program in Hintalo-Wajirat Wereda. Based on the findings of the study, the research recommended that creating community awareness, providing educational and training facilities, supportive supervision and coordination, establishing sufficient infrastructural conditions, provision of sufficient allowance to agricultural extension workers and credit service to the rural households and increment of the price of agricultural inputs should be the focus of areas by the Governments and NGOs.

Chapter One

Introduction

1.1. Background of the Study

Ethiopia's economy is predominantly agrarian where Agriculture plays a key role in the social and economic development. The sector employs more than 83% of the population, accounts for 46.3% of the Nation's Gross Domestic Product (GDP) and is the source of over 90% of the export revenues (MoFED, 2006). Small holder agriculture is the dominant sub-sector of agriculture accounting for 95% of the total cultivated land and production (CSA, 2008).

The nature of agriculture that has been practiced in Ethiopia is similar to those Sub-Saharan Countries. It is not modernized, rather traditional in the way people practice it. However, governments of different regimes of the country were attempting to introduce different mechanisms that were significant for agricultural development. Among these mechanisms, agricultural extension system is one of the primary vehicles for diffusing technologies.

Agriculture in Ethiopia has been practiced for many centuries yet there had been no sources that indicate the exact historical evolution of agricultural extension practices. The historical evolution of agricultural extension practices were written by different authors in different ways. For instance, FAO in 2008 reviewed the history of agricultural extension in Ethiopia covering the period of 1900 to the present and can be classified into four major epochs. They are I) early modernization period 1900-1910, II) age of missed opportunities- 1910-1953, III) classical transfer of technology approaches- 1954-1974, IV) quasi-participatory extension approaches- 1975 to the present. This classification is based on: a) the time of introduction of each system, b) nature of the introduced extension system and c) the degree of community participation (FAO, 2008). Information as to the tasks accomplished in agricultural extension between the 1910 and 1930 is scarce. The first agricultural school was established in Ambo in 1931. It offered agricultural education to its students and demonstrated the potential effects of improved varieties and agricultural practices to the surrounding farmers (ibid).

As FAO stated the period 1954-1975 was characterized by development programs initiated to transfer products of modern science and technology from the West to the rest of the world. It is a development model that had been implemented by America through the Marshal Plan to restore the economies of war ravaged countries in Western Europe.

However, the economies, institutional policy and cultural situations of African countries were much different from those of Western Europe. Therefore, the blueprint provided for African smallholder farmers could not be copied and did not work (FAO, 2006).

This was what happened in Ethiopia following the introduction of the Transfer of Technology (ToT) models of extension. Policy situation such as the land tenure system, the feudal bureaucracy and the remoteness of many rural communities did not allow technologies such as fertilizers, improved crop varieties and exotic breeds to reach the vast majority of Ethiopian farmers (ibid). According to the explanation of FAO, in 1953 the Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA) was established. In1963 following the revision of the Ethiopian Constitution, 19 ministries including Ministry of Agriculture (MoA) was established in well organized manner with the mandate of providing Agricultural Extension Services (AESs) which leads to conventional extension approach (1963-1968).

A short-lived success story in agriculture was also the turning point of Comprehensive Integrated Package Projects (CIPPs) to develop peasant agriculture from 1968-1975. Under the umbrella of the CIPPs only Chilalo Agricultural Development Unit(CADU) and Wolayita Agricultural Development Unit(WADU) were fully implemented where as the others were either partially implemented or not started at all (FAO,2008). In addition to this, in 1971 the minimum-package program (MPP) a two phased program was launched; and the first phase MPP-1 served up to 1974.

The extension approaches introduced after MPP-1 have been categorized as quasi-participatory extension approach because they all had some participatory element at least in theory before being implemented. This quasi-participatory extension approach was characterized by different progress. The fundamental progress were the land reform and cooperative (human resource dimension) approach from 1975-1980, minimum-package program phase II from 1980-1985, the national program for food self sufficiency later modified as Training and Visit (T&V) extension approach from 1986-1989, the Peasant Agricultural Development Extension Projects (PADEPs) from 1989-1995 and the National Extension Intervention Program (NEIP) following the Extension Management and Training Plot (EMTP) approach of Sasakawa Global 2000(Ibid). The progress phase, however, could not take place as planned. Nevertheless, very lately the current five year development plan approved in 2006 i.e. Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) attempted to apply its plan.

This five year development plan was different from the other progress phases i.e. PASDEP has given agricultural marketing the highest priority. The last but not the least extension program is the Participatory Demonstration and Training Extension System (PADETES), (Ibid).

The above paragraphs show that some progress or developments of Agricultural Extension Programs have been achieved in Ethiopia. Tigray as one of the Regional States in Ethiopia it attempted to implement the progress phases. The region is predominantly dominated by smallholder farmers which creates good opportunity for the implementation of the progress phases. The study area of Hintalo-Wajirat Wereda is located in the south-eastern part of the region. Hintalo-Wajirat Wereda is one of the Weredas in the Regional State which practices Agricultural Extension Program. The total land holding of Hintalo-Wajirat Wereda under different land using system is estimated to be 623,906 hectares. Most of the land holding is used for cultivation purposes which require effective implementation of Agricultural Extension Program. Therefore, this research attempted to assess the factors affecting the implementation of Agricultural Extension Program in the Wereda. The study looks into the problems encountered in practicing the program in particular and the implementation progress in general.

1.2. Statement of the Problem

The first justification that attracted the researcher to do this study stems from the existing food insufficiency and insecurity in Hintalo-Wajirat Wereda. Thus, the practical driving force to this research is related to the alarming prevalence of poverty in the Wereda and the occurrences of drought and famine happening repeatedly year after year in the Wereda (WBoA, unpublished data).

The second driving force that encouraged the researcher to do this thesis is the ineffective implementation of agricultural extension program at the household level in Hintalo-Wajirat Wereda. Here, the researcher's opinion is that efficient implementation of the agricultural extension program will help to attain food security at the household level.

The third reason that attracted the researcher to conduct this paper is concerned with the little attention given to the agricultural extension program by researchers in the study area though the program has great contribution for the improvement of the agricultural productivity. However, different studies were conducted which focused on the impacts, performance and challenges of the extension program and responses of farmers on the extension package. For instance, a study conducted by Kiors in 2007 in Rayaazebo in Tigray region attempted to draw attention by presenting the farmers' responses towards the agricultural extension package.

In addition, a research conducted in Kilti Aweloalo Wereda in the same region also assessed the impact of the extension package on alleviating food insecurity and on the income of beneficiaries (Tsegue, 2006). Moreover, a study conducted in Benshangul-Gumuz region focused on the performance and challenges of the agricultural extension program in the study area. However, the above researchers did not consider the factors affecting the implementation of the program during its first period of implementation and from 2005-2010 in the studied Weredas.

Therefore, this research will focus on the investigation of the factors affecting the implementation of the agricultural extension program in Hintalo-Wajirat Wereda in Tigray Regional State from 2005-2010 G. C.

1.3. Objective of the Study

1.3.1. General Objective

The general objective of the study is to explore the factors affecting the implementation of agricultural extension program in Hintalo-Wajirat Wereda.

1.3.2. Specific Objectives

1. To assess the overall achievements of the program from 2005-2010
2. To describe the nature, intensity, perceptions of agricultural extension program and its effect
3. To identify the main factors affecting the implementation of agricultural extension program
4. To suggest solutions for the factors affecting the implementation process

1.4. Research Questions

1. Does lack of awareness affect the overall achievement of agricultural extension program in the Wereda?
2. What are the nature, intensity, perception of agricultural extension program and its effect in the study area?
3. Does lack of credit service to farmers affect food security of the Wereda residents?
4. What are the major contributions of credit service for implementation process?

1.5. Significance of the Study

This investigation could serve as a guideline and benchmark for individuals who work on the enhancement of agricultural productivity, especially, on its challenges. It may also assist those agents who are working against poverty. The study will also help to familiarize agrarian societies about the importance of extension program in their agricultural productivity.

In addition, it also helps to familiarize policy makers with the result of agricultural extension program and attaining food security. This will enable them to design better and effective policy measures for the program and promote enabling environment for the community.

The academic contribution of this in-depth study is that it provides new knowledge and solutions for the problems or challenges affecting the agricultural extension program. This study will have a contribution in understanding the factors affecting the implementation of agricultural extension program. It will also serve as a spring board for further investigators in the agricultural extension program in general and the factors affecting the implementation process in particular.

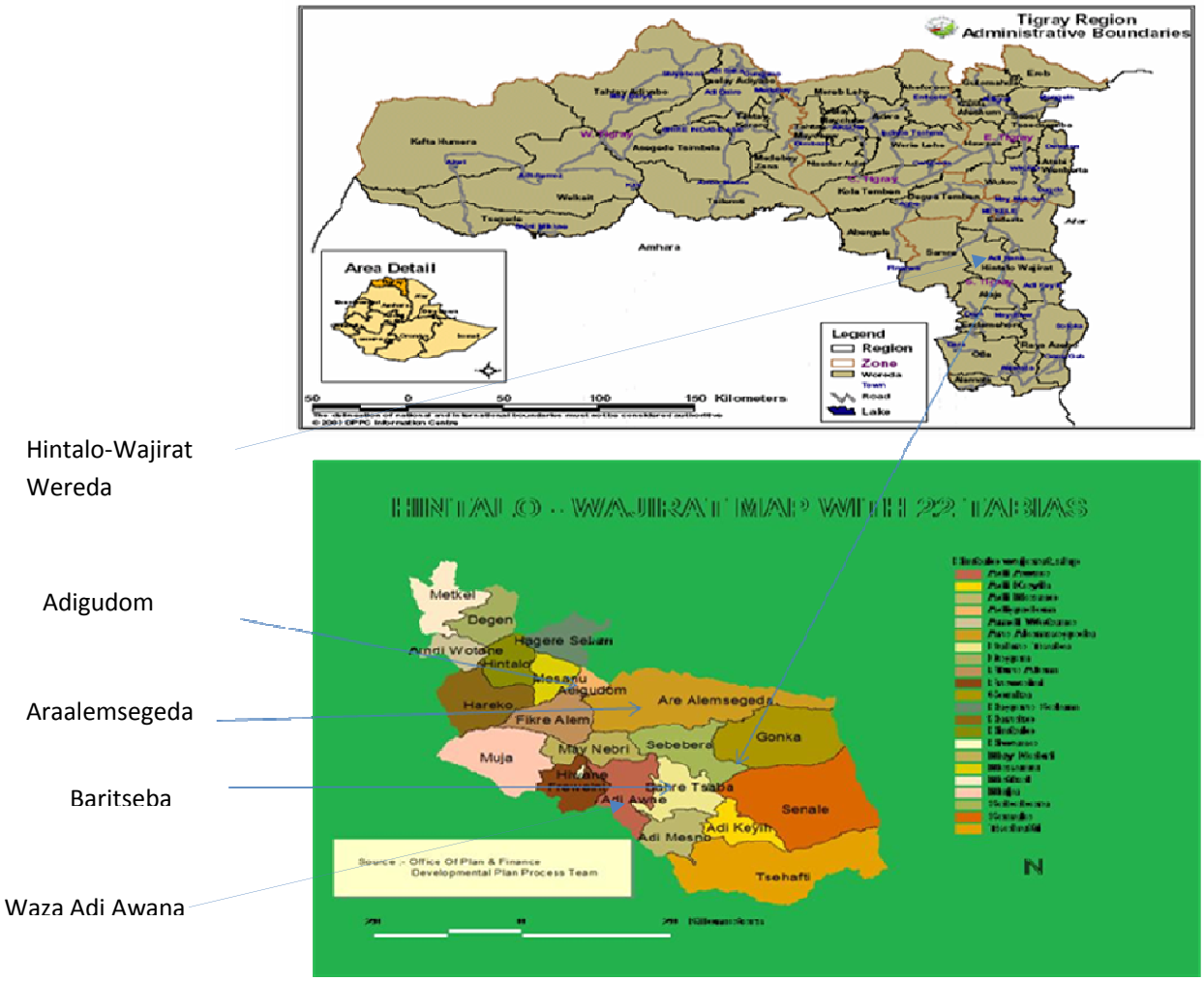
1.6. Scope and Delimitation of the Study

1.6.1 Description of Study Area

The study area, Hintalo-Wajirat Wereda, is located in south eastern part of Tigray. Adigudom town is the capital of the Wereda. It is 37 km south of Mekelle city. The total area of the Wereda is approximate 193,309 hectares (Yrga, 2010). The Wereda comprises of 22 Kebelles. According to the CSA (2007/8), the total population is estimated to be 152,219. Out of this, males constitute about 75,262 (49.4%) and that of females about 76,957 (50.6%).

Out of the total population, 11,928 (7.8%) of them live in town and the remaining 140,291(92.2%) live in the rural areas of the Wereda (Merresa, 2010).

Figure 1 Map of the Study Area



Source: Finance and Economic Development of Hintalo-Wajirat Wereda, 2010

1.7. Research Methodology

1.7.1. Approaches and Orientations of the Study

The factors affecting the implementation of agricultural extension program which result increasing food insufficiency and food insecurity demand a multidisciplinary approach to overcome the food insufficiency and food insecurity through identifying the factors affecting the implementation of agricultural extension program.

The research has used exploratory (what and how it is going on) and explanatory (why it is happening) approaches. To reduce the limitation of a single method, both qualitative and quantitative methods were used. However, the researcher has inclined more to use the qualitative approach to explain the factors affecting the implementation of agricultural extension program.

1.7.2. Source, Type of Data and Instruments of the Study

Both primary and secondary information were taken into consideration. Primary sources were captured via interview (structured and semi-structured interviews, and key informants interview), questionnaire, focus group discussion and practical observation. The researcher's direct contact with the informants had been consolidated and supported by certain photograph or images.

Secondary sources were also gathered based on documents, survey of related literatures, electronic data-bases, and analysis of reports and discussion on agricultural extension program. In Addition to the literature on agricultural extension program, institutional sources such as, Regional and Wereda statistics, Agriculture and Social Welfare statistics from the Federal, Regional and Local level of administration were taken into consideration. The secondary sources were also reinforced through careful examination and investigation of both published and unpublished documents.

1.7.3. Sampling Technique and Size

Both purposive and random sampling techniques were employed as a representative for the whole sample framework. The first sampling technique was purposive to select four 'Kebelles' out of 22. In doing this, the study area was first classified into various agro ecological zones i.e. 'Dega', 'WeinaDega' and 'Kola'. Thus, 4.6%, 9.1% and 4.6% respectively from 'Dega', 'WeinaDega' and 'Kola' were selected. Therefore, purposively four 'Kebelles' were selected from the three agro ecological zones or 18% of the total 'Kebelles'. Hintalo-Wajirat Wereda has similar population settlement, rainfall and temperature distributions and economic base. Hence, the research has used different criteria in selecting the four 'Kebelles'. These were food security, food insecurity, number of population and the settlement nature of the population.

Accordingly, two 'Kebelles' are selected from each food secured and food insecure areas. As a result, 'Bahretseba' Kebelle from 'Dega' is selected as food secured area, 'Araalemsegeda' and 'Wazaadiawana' Kebelles from 'Weina Dega' are selected as food insecure and secured respectively, the last Kebelle is selected from the 'Kola' agro ecological zone i.e 'Adigudom' as food insecure.

Another criteria to select these four 'Kebelles' for the study was based on the number of population and their settlement pattern. The researcher believes that high number of the population and scattered settlement negatively affects the effective implementation of agricultural extension program in Hintalo-wajirat wereda.

Accordingly, ‘Adigudom’ in the ‘Kola’ agro ecological zone has high number of population and less density in terms of their settlement. In addition, ‘Araalemsegeda’ in the ‘WeinaDega’ agro ecological zone has also high number of population and highly scattered settlement of population. Contrary to this, ’Bahretseba’ in the ‘Dega’ agro ecological zone has relatively less number and density of population settlement. The last study site ‘Wazaadiawana’ in the ‘WeinaDega’ has also high number of population and density settlement. The 22 ‘Kebelles’ which grouped into various agro ecological zones are shown in the table below.

Table 1: The 22 Kebelles in Hintalo-Wajirat Wereda and their Agro Ecological Zones.

	Name of ‘Kebelles’	**Agro Ecological Zone**			**Status of their food sufficiency**	
SN		‘Dega’	‘Weina Dega’	‘Kola’	Food secured	Food insecure
1	Adimesno	✓			✓	
2	**Bahretseba**	✓			✓	
3	Amdiweyane		✓			✓
4	**Araalemsegeda**		✓			✓
5	Dejen		✓			✓
6	Freweni		✓		✓	
7	Fikrealem		✓			✓
8	Hagreselam		✓		✓	
9	Hareko		✓			✓
10	Hintalo		✓		✓	
11	Hiwane		✓		✓	
12	Mainebri		✓			✓
13	Mesanu		✓			✓
14	Metkel		✓			✓
15	Muja		✓			✓
16	**Wazaadiwana**		✓		✓	
17	**Adigudom**			✓		✓
18	Adikeyh			✓		✓
19	Gonka			✓		✓
20	Sebebera			✓		✓
21	Senaele			✓		✓
22	Tsehafti			✓		✓

Source: Finance and Economic Development of Hintalo-Wajirat Wereda, February 2011

The second sampling technique is random sampling which employed to find the respondents at household level and from extension agents (workers) in the purposively selected 'Kebelles'. Therefore, 2% of the total households from each 'Kebelle' are taken as representative respondents. The main reason for selecting only 2% is the homogeneity nature of the population, lack of budget and time. From 77 agricultural extension workers of the Wereda, 23% (18) Agricultural Extension Workers had been taken through random sampling. That is 100% of the extension workers from the purposively selected Kebelles are considered for the study. The total number of respondents was 154. Out of these 136 were sampled household beneficiaries of the AEP and 18 respondents were agricultural extension workers. It is shown in the table below.

Table 2: Selected 'Kebelles', Households and Agricultural Extension Workers for the Study.

SN	Name of 'Kebelles'	Agro ecology Zone	Total No. of Households in the 'Kebelles'	2% of the Households	Total No. of Agricultural Extension Workers	100 % of the Agricultural Extension Workers
1	Adigudom	'Kola'	1821	37	8	8
2	Araalemsegeda	'WeinaDega'	1806	36	4	4
3	Bahretseba	'Dega'	1787	36	2	2
4	Wazaadiwana	'WeinaDega'	1364	27	4	4
	Total		**6778**	**136**	**18**	**18**

Source: Own survey, December 2010

Out of the total number of respondents for the study, 39 were used for focus group discussion (FGD), 91 to fill out questionnaires and 24 for interview. To avoid any biases in the discussion process, the researcher has taken both male and female participants. In addition, Key informants interview, focus group discussion and direct observations were also included in the study. All these research instruments were conducted systemically and seriously. The instruments are briefly explained here under.

a) Questionnaires

To capture perceptions of certain respondents, two types of questionnaires were prepared. The first type of questionnaire was containing 31 questions which were prepared for rural households. The questionnaires were per-tested to ascertain the validity of questions before final administration was conducted.

The first type of questionnaire was administered on 84 rural households, 21 from each of selected Kebelles. Out of 84 questionnaires 81 or 96.4% was collected from the respondents. The second type of questionnaire which was prepared for the agricultural extension workers contained 24 questions. Seven (7) questionnaires for each agricultural extension workers of the Kebelles were administered. From these total seven questionnaires six of it or 85.7% was collected. Totally, out of these 91 distributed questionnaires among both rural household and extension workers 87 or 95.6% were collected. Overall, what had been answered by the respondents was elaborated in the third chapter of the paper.

b) Interview

Interview was the second means to gather information regarding the factors affecting the implementation of Agricultural Extension Program in Hintalo-Wajirat Wereda. Structured type of interview was prepared for both rural households and agricultural extension workers. In doing this, two different kinds of interviews were prepared for the rural households and agricultural extension workers. The interview contained five questions for 24 respondents. Out of these 24 respondents, 20 (83.3%) and 4 (16.7%) of them were from the rural households and agricultural extension workers respectively. 100% interview was conducted with both rural households and agricultural extension workers.

c) Focus Group Discussion

To support the information captured from both questionnaire and interview, focus group discussion was also conducted. First of all, critical issues related to agricultural extension program was raised and the respondents discussed on the issues. The total participants in the focus group discussion were 39 both from rural households and agricultural extension workers. Out of these 39 participants 32 or 82% of them were from the rural households; where as 7 or 18% of them were from agricultural extension workers.

The 32 rural household participants were divided equally to the four (4) selected Kebelles (eight participants in each Kebelle). These eight participants had one group. The seven (7) participants of the agricultural extension workers had also one group. Therefore the focus group discussion had five groups. Like the interview, 100% of the respondents participated in the focus group discussion in different times and places.

d) Key Informant Interviews

To cross-check the information gathered from questionnaire, interview and focus group discussion; conducting another interview with key informants was necessary. Because, in the same issues rural households, extension workers, agricultural experts in Federal, Regional, Zonal, Wereda and Kebelle level have been different perceptions in different things in general and in agricultural extension program in particular. Semi-structured interviews were prepared for different officials at various levels. Although it was difficult to have easy access to their offices, the necessary information was gathered. The total participants for the key informant interviews were two in number and give their explanation upon different issues. Five semi-structured interview questions were also prepared for two officials. The interviews were conducted with (i) the agricultural and rural development vice head and the process owner for agricultural research and extension service of Hintalo-Wajirat Wereda and (ii) with the process owner for agricultural research and extension service core process of the Regional State of Tigray.

1.8. Limitation of the Study

It is obvious that a given research has its own limitations. In this research the researcher faced limitation of adequate related literatures on agricultural extension program, adequate budget and time in general and less availability and interest of respondents in particular.

1.9. Organization of the Study

This research was organized in four chapters. The first chapter introduces the introductory part of the study. The second chapter includes literature review, which examines the theoretical and conceptual frameworks and the overall historical development of the agricultural extension program and the food security trend in a multifaceted perspective. The third chapter articulates the findings of the study regarding the factors affecting the agricultural extension program implementation in Hintalo-Wajirat Wereda. The last chapter deals with conclusions and recommendations on the factors affecting the implementation of agricultural extension program.

Chapter Two

Review of Related Literature

2.1. Concepts and Dimensions of Agricultural Extension Program

2.1.1. Conceptualization of Agricultural Extension Program

There are many definitions, philosophies, and approaches to agricultural extension, and the views of what extension is all about have changed over time. Agricultural extension is a difficult concept to define precisely. This means that, it has different meanings at different times, in different places, to different peoples. Among the definitions attempted by various think tanks some of them are mentioned here under.

'Extension as a suffix term has meant better homes and farms, which to feed, clothe the people, strengthen the nation, and better organized and functioning communities' (Brunner and Yang, 1949). Another definition of extension was provided by Savile who defined as 'a plan that designed to advise the farmers in order to improving their farming techniques which would assist them to implement a benevolent government's plan for the country's economy development' (Savile, 1965).

In addition to this, Cuba College of agriculture (1995) defined extension as 'customer driven service to agricultural producers, processors, marketers and associated businesses; which are resource-oriented groups and state agencies'. Under this, the definition of the term is not limited only to the above mentioned scholars. Other think tanks also defined it in similar fashions. For instance, Buford (1990) pointed out that 'agricultural extension depends to a large extent on information exchange between and among farmers on the one hand, and a broad range of other actors on the other hand'. 'Extension, along with education and research is typically seen as both public and private services, which respond to the needs of farmers and rural people for knowledge that can help to improve their productivity, incomes and welfare, and to manage the natural resources, in a sustainable way. It also brings information and new technologies to the agrarian communities in order to improve their production, incomes and standards of living' (Deribe, 2007).

In addition to this, according to Davis (2008), 'extension originally was conceived as a service to "extend" research-based knowledge to the rural sector to improve the lives of farmers'. Furthermore, he assumed that 'extension has variety components such as technology transfer, broader rural development goals, management skills, and non-formal education' (ibid).

Nonetheless, the general definition that most scholars agreed upon as a working definition is that, 'agriculture extension is the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills, and technologies to improve their livelihoods and well-being'(Davis,2008). This study also acknowledges this comprehensive conception, and operational blue print for the entry study on the factors affecting agricultural extension program.

2.1.2. The Evolution of Agricultural Extension Program

Initially, the dissemination and use of improved agricultural technology and management practices can be traced back thousands of years in different parts of the world, including China, Mesopotamia, Egypt, and in the Americas. Agricultural extension has been contributing a lot to the dissemination, applying of latest agricultural technology and exercising the management skills. The well organized and government-funded extension and advisory systems can be traced back to Ireland and the United Kingdom during the middle of the nineteenth century. During the potato famine in Ireland (1845–1851), agricultural advisors helped Irish potato farmers to diversify their agricultural products into different food crops. Various European and North American governments observed this development, and attempted to practice more through "travelling instructors" which started in the second half of the nineteenth century by many countries (Swanson and Rajalahti, 2010).

The term extension itself however was first used to describe adult education programs organized by Oxford and Cambridge universities in England in 1867; these educational programs helped extend the work of universities beyond the campus and into the neighbouring communities. The term was later formally adopted in the United States in conjunction with the land grant universities that were originally established as teaching institutions during the 1860s. The United States and Canada still use the term extension services to describe their non-formal education programs, while many European countries still use the term as advisory *services* to describe their respective extension programs and activities (ibid*).*

Research activities on agricultural extension were added in the curriculum during 1887. As a result of this, well organized and advanced extension activities were started in the 1890s and then in 1914 it considered as part of each university's official mandate. During the early twentieth century, the United Kingdom announced that Ministry of Agriculture has the responsibility for agricultural extension activities. These activities were then officially called *advisory services* (Birner et al., 2006).

Later, in most developing countries, the terminology used to establish public agricultural extension or advisory institutions was commonly recommended by the donor agency that helped to create these public agricultural extension or advisory systems. For example, the U.S. Agency for International Development (USAID) played an active role in establishing agricultural universities as well as research and extension systems in many developing countries during the 1960s and 1970s; therefore, many of these public agricultural extension systems still carry the "extension" program title. On the other hand, most ministries of agriculture, worldwide, administer their public extension systems; therefore, an increasing number of countries, especially in Sub-Saharan Africa, now use the term *advisory service* extensively (Jones and Garforth, 1997).

2.1.3. Scopes and Dimensions of Agricultural Extension Program

The dimensions of agricultural extension program as indicated by different scholars had been highly restricted to some of its goals. Therefore, agricultural extension program vastly emphasised on its fundamental goals which include the transferring of knowledge from researcher to farmers, advising farmers in their decision making and educating farmers on how to make better decisions, enabling farmers to clarify their own goals and possibilities, and stimulating desirable agricultural developments (Ban and Hawkins, 1996). However, the scope of agricultural extension program is not restricting to what had been already mentioned above. Beyond transferring research-based knowledge, advising and educating farmers, it covers the participation of farmers in doing research, helping farmers in applying the result of the research and new technologies, providing farmers with agricultural inputs, supervising extension workers, enabling farmers to be good in managing their products, and assessing the overall performance of farmers.

But, the supervisors, extension workers and farmers do not precisely know the goals of agricultural extension. That is why, the terms *extension* and *advisory services* used somewhat interchangeably and become confusing concepts. In addition to this, agricultural extension program is highly focused on the farmers' needs rather than farmers being ''targets'' of extension. Participatory extension should be based on the farmers being acknowledged, and farmers should be involved in planning and implementation of agricultural extensions programs. Pragmatically, the extension becomes more responsive to the needs of different clients in the community (women, youth, female-headed households as well as adult males). The participatory approach is, therefore, considered as essential, if extension is to be more client-oriented (Dejene, 2006; as cited in Kiros, 2007).

Thereby, concerning the scopes of agricultural extension program the following framework gives a useful perspective on the different approaches being pursued by different countries and donors in organizing and implementing effective extension systems. This framework puts side by side all these different terms or approaches by reviewing *how* the delivery of educational programs and information/communication services takes place and *why* it takes place. In this extent, the options are whether extension workers want to convince farmers what to do (i.e., persuasive methods) or whether they seek to inform and educate farmers about different market opportunities, technical options, and/or management strategies, and then let them decide which option would work best for them. The classifications also illustrate different combinations that help to describe and highlight important differences between these different dimensions or paradigms in organizing agricultural extension and advisory services (Swanson, 2008). Out of the variety dimensions or models of agricultural extension practices, that help to consolidate the program include:

a) Technology Transfer - this extension model was prevalent during colonial times and re-emerged with intensity during the 1970s and 1980s when the Training and Visit (T&V) system was established in many Asian and Sub-Saharan African countries. This "top-down" model primarily delivers specific recommendations from research; especially for the staple food crops to all categories farmers (large, medium, and small).

This approach generally uses persuasive methods for telling farmers which varieties and production practices they should use to increase their agricultural productivity and thereby maintain national food security for both the rural and urban populations in the country (Swanson, 2008). The primary goal of this extension model is to increase food production, which helps reduce food costs.

b) Advisory Services - under this model, both public extension workers and private-sector firms, in responding to specific farmer inquiries about particular production problems, still commonly use the term advisory services. In most cases, farmers are "advised" to use a specific practice or technology to solve an identified problem or production constraint. Public extension organizations should also have validated information available from research about the effectiveness of different inputs or methods in solving specific problems so that inquiring farmers receive objective and valid information. Most input supply firms use persuasive advisory techniques when recommending specific technical inputs to farmers who want to solve a particular problem and/or maintain their productivity. Although most firms use persuasive methods to sell more products and increase their profit, an alternative private-sector model is also considered to support out plans when export firms failed to ensure that specific production inputs and practices (L. Gum and C. Blank, 1990).

c) Non-formal Education(NFE) -In earlier days of extension in Europe and North America, this paradigm dominated when universities gave training to rural people who could not afford or did not have access to formal training in different types of vocational and technical agriculture training. This approach continues to be used in most extension systems, but the focus is shifting more toward training farmers how to utilize specific management skills and/or technical knowledge to increase their production efficiency and to utilize specific management practices, such as integrated pest management (IPM), as taught through Farmer Field Schools (FFS). Both NFE and facilitation extension (as described next) commonly help farmers with similar resources and interests to organize into different types of self-help groups, particularly if they want to learn how to diversify or intensify their farming systems, especially in pursuing new, high-value crops or other products(Ibid).

d) Facilitation Extension-This approach has evolved over time from participatory extension methods used 20–30 years ago and now focuses on getting farmers with common interests to work more closely together to achieve both individual and common objectives. An important difference is that front-line extension agents primarily work as "knowledge brokers" that is *facilitating* the teaching–learning process among all classes of farmers (including women) and rural young people.

Moreover, under this extension model, the field staffs first work with different groups of farmers first to identify their specific needs and interests. Once their specific needs and interests have been determined, then the next step is to identify the best sources of expertise (e.g., innovative farmers who are already producing and marketing specific products, subject matter specialists, researchers, private-sector technicians, rural bank representatives) that can help these different groups address specific issues and/or opportunities. For example, most changes in farming systems that can be readily adopted by small-scale men and women farmers that have already been devised by innovative farmers in other communities or districts (Abeje, 2009).

These innovative farmers have already worked out the necessary practices to successful production and market of new crops or products. In short, innovative farmers are frequently the starting point for extension workers who want to *facilitate* the intensification and diversification of farming systems to increase farm household income. In many cases, these innovative farmers, if properly approached, can be encouraged to become the leaders of these new producer groups, which will both enhance their reputation within the community as well as increase profits for all members by expanding their supply of high-value products to larger urban markets (Anandajayasekeram, 2008).

Under this model of extension program, some farmers become interested in pursuing specific new market opportunities, and then both research and extension will need to work in close collaboration with these innovative farmers in advising the "start-up" farmers on the most applicable practices and technologies. In the process, these front-line extension staff will have to facilitate the training of these farmers during the first year or two in producing new crops, livestock, or other enterprises. When small-scale farmers become interested in pursuing these types of new economic opportunities, they are ready to engage in an active learning process.

Therefore, this innovative, market-driven extension approach works best where men and/or women farmers are already interested in intensifying and/or diversifying their respective farming systems with the goal of increasing farm household income. This facilitation approach can also be used to train members of landless households; especially rural women, how they may be able to use Common Property Resources (CPR) to start new enterprises and thereby increase their household income (Hailu, 2002).

2.2. Roles, Opportunities and Challenges of Agricultural Extension Program in Ethiopia

2.2.1. The Roles of Agricultural Extension Program

Agricultural extension program has many roles such as creating awareness on supervisors, extension workers and farmers, in increasing the farmers' capacity while producing the desired products, ensuring national economy growth and bringing higher standard of life among the community of the nation. Particularly, the four extension models or paradigms that are discussed earlier have important roles to achieve different agricultural development objectives. However, to increase farm income and improve rural livelihoods among the rural poor, it will be necessary for most public extension organizations to transform toward greater use of facilitators and NFE extension methods. In particular, small-scale men and women farmers, including the landless, can begin organizing into community or farmer groups and then learn the necessary technical, management, and marketing skills, which are necessary to help them progressively diversify their practice into higher-value crop, livestock, or other enterprises that will increase their farm household income. At the same time, as the agricultural sector develops (i.e., becomes increasingly commercialized), technology transfer and advisory services tend to be increasingly privatized. Therefore, in the process, it is important to build strong public–private partnerships that will further enhance agricultural productivity growth, as well as to increase the incomes and improve the livelihoods of small-scale and landless farm households (Edmonds, 1998).

For instance, in Ethiopian agricultural development history, agricultural extension had become apparent around 1996 that without integrating farmers into the market, sustained growth in the agriculture sector would not be realized.

Perhaps as a result, the government policy on agricultural development has recently started to emphasize the transformation of subsistence agriculture into market orientation as a basis for long-term development of the agricultural sector (Davis, 2008). This also reflects how much agricultural productivity remains weak and insufficient, when there is no strong networked partnership between private and public sectors.

To change the subsistence agriculture into market orientation different stakeholders should be involved. These include different governmental agencies (formerly the main actors in extension), non-governmental organizations (NGOs), producer organizations and other farmer organizations, and the private sector which include input suppliers, purchasers of agricultural products, training organizations, and media groups (Itana Ayana, 1985).

What ever the case, according to Minister of Agriculture and Rural Development (MoARD) (1998), the following are some of the main roles of agricultural extension program to:

I. Improve the standard of living of the society through improving productivity;
II. Empower farmers to actively participate in the development process;
III. Increase the level of food self-sufficiency;
IV. Increase the supply of industrial and export crops; and
V. Ensure the rehabilitation and conservation of the natural resource base of agriculture.

In addition, agricultural extension program tried to be realized through the core elements that are SDPRP and PASDEP in order to improve research and extension packages for farmers, expanding irrigation (mostly through the food security program), a major farmer-training exercise, and fertilizer reform in most of the developing countries. Governments in developing countries are strongly committed to private sector development of agricultural markets. They have endeavoured to create enabling environment for the private sector through increasing domestic credit and subsequently ensuring functioning credit markets (MoFED, 2007).

The on-going land certification in Ethiopia has also helped to improve security of land tenure and transport linkages.

The major achievements of agricultural extension program in Ethiopia can be summarized as follows:

I. Production of food grains increment;
II. Increment of some stable and market-oriented productivities like coffee;
III. Enhancing way of utilizations of fertilizer;
IV. Expanding farming households adoptive and improved extension packages;
V. Introducing new irrigation works to benefit households;
VI. Encouraging demands of improved seeds for sales (MoFED, 2005).

2.2.2. The Opportunities of Agricultural Extension Program

There are a number of opportunities for the development of agricultural extension program in general and for increasing of productivity in particular, so as to bring an enabling environment for a community to have luxuries life, in certain state attempted different activities which had many opportunities (EARO, 1998). Some of the many opportunities include the appearance of good agricultural policy, the intensive expansion of education, the existence of media, willingness of the farmers to participate in agricultural productivities and the presence of well trained and committed supervisors and extension workers.

The opportunities are used to disseminate information to the intended target audience through different mechanisms such as radio, printed materials, audiovisuals, person to person communication, agricultural affairs, seminars, workshops, training, farm visits, field days, etc. Institutions like farmers' associations; traditional social organizations and youth clubs are also used as important channels of communication as integral opportunities for sustainable productivity. Retired professionals, other volunteers and professional societies are encouraged to play an active role in rural development. Unlike the top-down extension method that has been exercised by different regimes in many states, bottom-up approach is designed to ensure farmers participation (Davis, 2006). The farmers are also involved at all stages of activities, from planning to evaluation. In the implementation of the extension program, the role of the government is mainly to assist in: -

a. Timely delivery of production inputs;
b. The provision of credit;
c. The delivery of extension and training services;
d. Deploying development agents at the village level; and
e. Facilitating logistics (MoARD, 1998).

2.2.3. The Challenges of Agricultural Extension Program

There are several challenges which the agricultural extension program faced in many levels with different approaches such as the promotion of inappropriate technology, inappropriate criteria for making research and recruiting extension staff (i.e. not based on scientific publications and professions), poor research and extension linkages and lack of 'real' participation of framers (Belay, 2003).

According to the new strategy, the responsibility of the Ministry of Agriculture and Rural Development at the federal level is to formulate agricultural policies, design packages, organize and conduct training activities to upgrade the knowledge and skill of all partners in agricultural development, coordinate interregional activities, render policy advice and technical backstop. Nevertheless, this top-down approach is also considered as the main factor that hinder the execution of the agricultural extension program at country level. These challenges mainly occurred in the regional states during the planning, execution, monitoring and evaluation process of extension programs. Because, the powers and duties of planning, implementing, monitoring and evaluating of the agricultural extension program has been under the regional agricultural bureaus next to the federal government(Ibid).

The different regimes of Ethiopia introduced various systems that acknowledge package approach as a means for enhancing the desired change in agricultural development. In the past regimes, the supervisors, extension workers and farmers were not well aware about the outcome of the program in the life of each community. That is why, different intervention strategies were involved in the various package approaches which were geared towards three different farming systems, namely: reliable moisture, moisture stress, and nomadic pastoralist areas. Distinction can also be made among areas being exposed for the first time to extension, where extension messages should be simple focused at improving cultural practices (crops, livestock); areas where there is already minimal extension and where improved agricultural practices combined with the use of purchased inputs can be allocated; and finally areas which are already involved in large-scale production, where moderate or high input technology may be appropriate. Even though, supporting services and means of communication may also vary accordingly, the absence of the aforementioned opportunities would remain as complicating challenges of agricultural extension program in most communities (MoARD, 1998).

Linkage among researchers, extension agents and farmers play a vital role in the agricultural development process. This linkage helps the extension services to transfer farmers' problems to the researchers; and researcher's solutions to the farmers and extension workers. For many reasons, this has not been working well in many African countries, including Ethiopia. Poor extension research links are among the factors that hinder the level of technological adoption and productivity (EARO, 1998).

Agricultural extension program intends to combine technology transfer and human resources development, and promote the participation of farmers in the research process (Ibid). However, these principles are not followed in the previous and current extension systems. The present agricultural extension system acknowledges the participation of stakeholders in the package implementation process, which plays a significant role. However, in practice there is no participation of the stakeholders which can be explained as critical challenge for the implementation of agricultural extension program (Abeje, 2009).

Most of agricultural extension approaches in the previous governmental system was limited either to technology transfer or human resource development. In contrast to this, the new approach which is adopted by the current government i.e Participatory Demonstration and Training Extension System (PADETES) gives equal emphasis to human resource development (organization, mobilization and empowerment) along with its effort in promoting appropriate technologies to the users. Generally, smallholder peasants who are agrarian remain a pillar for poverty reduction and economic growth in country with good agricultural extension experience. However, the sector still may suffer from a set of constraints that result in both low and erratic agricultural growth. To reduce such constraints, reversing the situation through appropriate policy measures and well articulated development interventions are central to the improvement of agricultural productivity. The assumption is that rural and agriculture centred development strategy could serve as a means of ensuring rapid economic growth, enhancing benefits to the people, eliminating the country's food aid dependency, and promoting the development of the market oriented economy(Belay,2003).

2.3. Agricultural Extension Program - Global and Regional Views

2.3.1. The Global Understanding of Agricultural Extension Program

As it was already noted, farmers correctly view extension as a form of assistance to help improve their know-how, efficiency, productivity, profitability, and contribution to the good of their family, community, and society.

At the same time, politicians, planners, and policy makers in many countries of the world view extension as a policy instrument to increase agricultural production, to achieve national food security and help to alleviate rural poverty. In addition, some economists view extension as a policy instrument that will contribute to human capital development and economic growth. Therefore, resources allocated to extension are viewed as an economic investment, which must produce competitive economic returns (FAO, 1997).

The important global change which affects agricultural extension program either positively or negatively is the shift from a more linear technology transfer model toward a more holistic approach, in understanding how and where farmers get their information and technologies. For example, at global level, the current move toward an agricultural innovation systems approach arises through an interactive, inclusive process relying on multiple sources and actors (World Bank, 2006). Especially as long as the goal is to intensify and diversify farming systems, both innovative farmers and extension should play a significant joint role in working together to introduce new market-driven crop and/or livestock systems to small-scale men and women farmers. Therefore, extension, in effect, serves as a facilitator or knowledge broker, this transition has also implications for the technical, professional, and entrepreneurial skills that extension agents will need to be effective in this new role (Assefa, 1995).

At its broad extent or global spectrum, agricultural extension enhances and accelerates the spread of useful know-how and technologies. These activities are expected to lead to increased and sustained productivity, increased income and well-being of farm people, and to the promotion of national food security and economic growth. These objectives are to be achieved through non-formal education and training programs and two-way technology transfer and feedback systems. Extension has also an important contribution to agricultural and rural development; especially in these developing countries (Taye et al., 2008).

According to Nagel, J.V. (1997), on the behalf of FAO global consultation on agricultural extension has stated that farm people who receive non-formal education through extension programs generally increase their productivity and efficiency (Maalouf et al., 1991; as cited in kiros, 2007). Moreover, agricultural extension work is a significant social innovation, an important force in agricultural change, which has been created and recreated, adopted and developed over along time, in increasing the quality, capability and performance of farmers in agriculture which are the fundamental indicators of agricultural sector's efficiency, productivity, development and sustainability (Ibid).

2.3.2. The African View in Agricultural Extension Program

The traditional view of agricultural extension in Africa was very much focused on increasing production, improving yields, training farmers, and transferring technology. Today's understanding of extension goes beyond technology transfer to facilitation; beyond training to learning, and includes assisting farmer groups to form, dealing with marketing issues, and partnering with a broad range of service providers and other agencies.

Thus, many people are now using the phrase, "agricultural advisory services," instead of extension which can imply a top-down approach and may ignore multiple sources of knowledge (Davis, 2008). Whereas, the other manifestations of agricultural extension are not as such odd in African context, while compare and contrast with the extents of the program at its global arena.

2.3.2.1. Opportunities and Challenges Raised by Globalization in Africa

Although Globalization offers opportunities for growth and development in all parts of the world, the hopes and promises attached to rapid liberalisation of trade and finance have not so far been fulfilled in many developing countries, and particularly so in Africa. Africa faces many difficulties, both internal and external, in their efforts to develop their agriculture and to achieve their objectives of poverty reduction through improving food security and increasing export earnings through introducing the agricultural extension program from the western or developed nations.

The Internal difficulties Africa encountered includes low productivity, inflexible production and trade structures, low skill capacity, low life expectancy and educational attainments, poor infrastructure, and deficient institutional and policy frameworks. At the same time, with the growing integration of markets due to Globalization and liberalisation, their economies face a more fiercely competitive external trading environment. They continue to export a limited range of primary commodities that are highly vulnerable to instability in supply, demand and a decline in terms of trade. Besides price volatility, agriculture in Africa is susceptible to weather conditions which determine the level of harvest and, therefore, with each country's domestic supply often varying along with the weather. That is why, the nations of African rapidly characterized by deficit than surplus situation. In addition, their external debt remains large. Their inability to compete in world markets, as well as in their home markets, is also reflected in their rising food import bills (Edmonds, 1998).

2.3.2.2. The Status of Agriculture in Africa

Agriculture in Africa has remained largely underdeveloped, despite its importance. Agriculture is the backbone of the African nations. It served as the source of the gross domestic product (GDP), employment which employs more people than any other sector, foreign exchange, supplies the bulk of basic food and provides subsistence and other income to more than half of the African population. The strong forward and backward linkages within the rural sector and with other sectors of the economy provide added stimulus for growth and income generation. In contrast, slow per capita and food production growth and sharp annual fluctuations in output remain major and chronic problems for the African nation which considered as the major causes of their rising poverty and food insecurity (Davis, 2006).

2.3.2.3. Domestic Resource Potentials of African Nations

African nations have abundant resource potential to expand agriculture. However, there are a number of factors affecting agricultural production. The most fundamental factor influencing the agricultural production potential of a country in Africa is the availability of arable land. Land is the essential prior resource needed for crop, animal and forestry production. Africa has widely diverse agro-ecological situations, with varying availability and quality of arable land and varying climatic conditions. Prospects for agricultural development necessarily hinge on these considerations. To enable a classification of countries in terms of their potential for agricultural production, a ranking on the basis of land resource availability and constraints was undertaken by FAO in 1997.

The ranking is broadly indicative of a country's relative land resource potential. Three types of countries can be distinguished: i) those with a relatively large land balance, where extensive agricultural expansion may still be possible, ii) those which are close to the limit of exploiting actual arable land and iii) those which have exploited almost all their arable land and can probably not expand much more. Thus grouped, the countries can respectively be considered as having a high, medium and low agricultural potential (Ibid).

2.3.2.4. African Nations' Experience in Agricultural Productivity

The African nations experienced significant gains in agricultural production. However, the contribution of increases in productivity to agricultural growth has been limited. Horizontal expansion, i.e. bringing more land under cultivation, remains the dominant source of growth. Given the increasing pressure on agricultural resources, however, faster agricultural growth, particularly in countries with limited scope for land expansion, will require continuing increases in agricultural productivity from its present relatively low level.

Available evidence shows that the potential productivity gains are considerable. However, in comparison to other developing countries, the agricultural value added per worker in Africa appears to be relatively low, suggesting that there is much room for improvement (IMF, 2006).

Moreover, much of the agricultural sector in Africa consists mostly of informal micro and small enterprises, which face limitations of small market size, poor business conditions and lack of regional integration, pointing to a need for a more effective policy for their development.

There is a growing concern that the expansion and intensification of agriculture in African nations may lead to degradation of the natural resource base (soil, water, vegetation and biodiversity) and consequently to a decrease in agricultural production. However, agricultural intensification increasing the productivity of land already under cultivation and should not be a threat to the degradation of the natural resource. In fact, properly managed intensification is needed to meet agricultural production needs and reduce the pressure of agricultural expansion in fragile and marginal areas (Greenwich University, 2008). The lack of sound management practices and of access to appropriate technology and inputs for agriculture, rather than intensification, is the most serious cause of environmental degradation.

2.4. Historical Evolution of Agricultural Extension Program in Ethiopia

Agricultural extension activities in good manner had been flourished fifty years ago. In the last fifty years a range of extension approaches has been used. These approaches were differing in the three successive regimes i.e during emperor Hailesellasie, Derg, and the current government. The agricultural extension approaches used by these three different regimes were various according to the political, social, economical, cultural and ideology they run. Thus, accordingly the research attempts to present here under separately in brief manner.

2.4.1. Agricultural Extension Program during Emperor Haileselassie

In Ethiopia, agricultural Extension service is said to be operational since 1930s. However, a formal extension was started only after the establishment of the Alemaya College of Agriculture. Extension is underway in the country for over 70 years. Over this period, several development as well as extension approaches were employed side by side (Belay, 1989). The program of community Development (CD) was initiated as a strategy for stimulating population efforts to identify and tackling problems of a given community through self-help projects in 1958–62 as five year plan.

The program of community development was concerned with almost all areas of development, using extension concepts as the communication strategy. Its particular emphasis was in agriculture, rural artisan's development, in social infrastructure and welfare activities. The approach was completely assumed small farmers as poor decision-makers who required out side assistance in planning local development projects. This program under different name continued as a five year plan from 1967–74(Habtemariam**,** 1996).

The first, Comprehensive integrated package project was that of Chilalo Agricultural Development Unit (CADU). This is the long-standing major project in the country which was started in the Chilalo Awaraja of Arssi region in 1967. It was established with the assistance of the Swedish International Development Authority (SIDA) and World Bank. Its major objectives were to improve the living standard of the peasant population through increasing production and promoting rural infrastructure.

The extension method employed by CADU was the "Model farmer" approach. But the model farmer's approach to extension was criticized both from outside and with in CADU it self. Empirical Studies concluded that the approach was only partly successful and that it was not the most efficient way of disseminating knowledge (Waktola, 1975). One of the main reasons for implementing the comprehensive package projects was to use the experiences in these projects to establish similar ones in other areas. However, because of high financial costs and shortages of skilled manpower, it was realized that it would not be possible to implement such project throughout the whole country. As a result of that, the initial plan to reach 90% of the farming population with in 15 to 20 years through large-scale intensive package projects became unattainable. Then, all these conditions forced policy makers to change the idea of comprehensive projects and to look for others less expensive rural development approaches (Assefa, 1995).

As a result, it pave away for the establishment of the second comprehensive integrated package project that initiated in Wollayta province in 1970 under the Wollayta Agricultural Development Unit (WADU). Through understanding the weakness of CADU'S model farmer approach, WADU avoided the "model farmers" approach and instead demonstrated technologies on peasants' farms that were relatively resource poor. Technology transfer under WADU'S approach has been found to be more effective than that of CADU. WADU'S performance has been found to be more efficient than CADU both in terms of numbers of farmers reached and in rising of agricultural productivity with in a short period of time.

As early as the 1970's, it was apparent that it would not be feasible to implement the comprehensive integrated package projects through the whole country (Waktola, 1975).

Hence, the minimum package program-I (MPP-I) was initiated in Ethiopia with a claim to address the problems of the lower income bracket farmers and also with greater reliance on people's participation. The MPP-I was designed to cover large areas so that as many farmers as possible could be reached for extension, input supply, credit provision and marketing services. Thus, under Ministry of Agriculture, the Extension Project Implementation Department (EPID) was created in 1971 to provide peasant farmers production and to carry out the minimum package program-I which started in 1970. Under this program, the basic unit of development was the areas that MPP-I reached.

These were contained about 10,000 farm families. MPP- I adopted CADU's and WADU's grain technology and also applied its extension methodology. Although the minimum package concept worked well in the limited areas of its operation under MPP- I (1971-74), certain shortcomings like inadequacy of manpower at the Woreda level and little or no in service training for the extension staff became apparent as the program was extended to more farmers (Tesfaye, 1996).

2.4.2. Agricultural Extension Program during the Derg Regime

After the 1974 revolution the Derg came into power. As a result of this, the agricultural policy of monarchical system of government changed based on the political, social, economical, cultural and ideology of the military regime. Therefore, the MPP-I program terminated in 1974. At the same time, there was a plan to under take MPP-I under the name of MPP- II which was implemented starting from 1980/81 after efforts were done to adapt it with the new socio- economic and political system of the country. The main objective of the project was institution building and strengthening of infrastructure while of the same time extending the use and availability of inputs to the small holder farmers. The overall objectives of the MPP-II were more or less similar to that of MPP-I (Haramaya University, 2009). The MPP-II included the promotion of cooperative development, expansion of applied researches and demonstration and seed multiplication responsibilities. The MPP-II had covered around 440 sub districts (Woredas) in 14 regions where as only 280 Woredas enclosed under MPP-I. MPP-II was also dropped "the model farmer" approach and instead peasant associations were used as extension channels. The model farmer approach was criticized because of its tendency to enrich those farmers serving as models and widening the income gap between them and the laggards. The project was operated in 440 districts or Woredas out of the 580 districts of the country.

The components of the project were an agricultural extension package, a cooperative marketing package and supporting services. Farmers associations and cooperatives were the focal points of implementation (Abeje, 2009).

Similar to any other programs in the country, the MPP-II was followed the societal path of development in the agriculture. Due to that, the contribution of the program to increase productivity and food production has been minimal. Similar to MPP-I, the program has not properly served farmers living far away from the district capital.

Generally, the performance of MPP-II was poor and the transfer of new technologies has been constrained by the lack of transport facilities, inadequate financial resources and trained extension agents, weak linkages between research and extension and limited capacity to multiply research products to be distributed to farmers. After the termination of MPP-II in 1985, the national program for food self-sufficiency Extension approach was used as strategy later modified to Training and visit (T& V). In addition to this, Peasant Agricultural Development Project (PADEP) was initiated to promote agricultural development in the dominant small holder sector. The programs were designed on the basis of experiences gained from the past two MPPs (Hailu, 2002).

Peasant Agricultural Development Extension Projects (PADEP) is basically a shift from nation wide to regional programs based on the resource capability of the different regions. For the first time, the existences of regional differences were considered under this program. A regional approach to rural development was emphasized. Location specific, regionally demarcated projects were designed. PADEP was consisted of 8 separate “zonal development” projects, each projects being based upon specific resource potential, constraints and needs of a particular zone (Assefa, 1995). The most important aspect of PADEP has been that of decentralization; in which zonal offices were given greater autonomy in planning and budgeting. The sponsoring agency, the MOA was also recognized and staffs have been transferred to zone offices. But, PADEP was operated in the potential areas of the country.

Intensity of extension in non- potential areas was limited at the pace of the extension service as it was under MPP- II. Contact farmers are instrumental in technology transfer, where as the extension service is based at service cooperative level; which encompasses both peasant associations and producers cooperatives at the time where the cooperatives were at peak in the rural areas (Tesfaye, 1996).

According to Assefa (1995), although the MPPs and other programs were successful in achieving the growth objectives to certain degree, the equity objectives were not met. Since it did not employ extension strategies substantially different from the comprehensive projects, it was impossible to achieve in offering a low cost package to a large number of farmers. In addition to that, there was an either inadequate or totally lacking logistical support for the basic organizational unit of the MPPs and other programs.

There was also a very low participation of tenants in the credit program of the MPPs and other programs. The location of MPPs and other programs areas were also others major drawbacks. Particularly, MPPs areas were limited to only 3 to 5km on either side of the main road. As a result of such a policy, farmers living far away from the main road were not able to benefit from the operation of the MPPs. In addition, more than 50% of the annual fertilizer sales were only in Shewa region. Therefore, the regional impact of the MPPs and other programs were limited and unsatisfactory.

2.4.3. Agricultural Extension Program, Post 1991-EPRDF Regime

As the new government of EPRDF came to power in 1991, there have been a number of reformations in all sectors of developments in general and in agricultural sector in particular. this was so because, the government was drawing some lessons from the past experience and has formulated an "Agricultural Development– Led Industrialization (ADLI)" Strategy, taking agriculture as the development base focusing on raising the productivity of the small scale farmers as key actors.

Within ADLI there has been Formulated a new system of agricultural extension, termed "Participatory Demonstration and Training Extension System (PADETES)". As the name implies, the system is based on demonstrating and training farmers on proven technologies in participant manner. The system which had been developed after a critical evaluation of the past extension approaches has also given enough room to accommodate present changes in extension philosophy involving the utilizing subsystem i.e. research, education and extension as part of the knowledge system(Belay,2003). The system that has been developed after a critical assessment of past extension system, including the recent effort by the Sasakawa Global 2000 project has become operational since 1995. The assessment carried out enabled to identifying the merit and demerit of each approach and as a result, the new extension system is benefiting from the strong extension management principle of the Training and Visit (T& V) system and merged with the most practicable technology diffusion experience of the SG 2000 project approach.

The training and visit extension system is well known for its fixed development agent to farmer ratio, scheduled visit to farmers plots, continuous training of staff, and strong research and extension linkage. Nevertheless, the T and V system is also highly criticized for its top- down approach, poor use of group and mass communication methods and small-size adoption plots (Tesfaye, 1996).

2.5. Agricultural Extension Program in Tigray: A Regional Experience

In addition to the Ethiopian Federal Government, the Regional Government of Tigray also intends to articulate plans to phase out the regional agricultural extension program in a manner to be phased out with strengthening in parallel the capacity of cooperatives and the private sector to cover these services. In addition, there was a major institutional reorganization of the Ministries of Agriculture and Rural Development in the year under review. This, together with the on-going implementation of the Public Service Delivery Policy (PSIP) at the Ministry and related agencies is anticipated to yield improvement in critical services, although it is too early to judge results yet. Despite good information on inputs in the system, there is little way of measuring the effectiveness of these interventions in increasing farmers' output and incomes.

The regional government work had been focused on strengthening monitoring and evaluation (M&E) systems to better capture the impact on farmers, although it needs to be realized that measuring these effects is always difficult in any countries. Because, there are many factors that affect agricultural outcomes apart from government programs, including weather and the behaviour of farmers (MoFED, 2005).

It is clear that the process of agricultural transformation remains a significant challenge in the regional state of Tigray. The government is addressing this not just through its agricultural and food security programs, but also through major investments in education and in rural infrastructure, especially roads and encouraging the development of robust private markets.

2.5.1. Components of Agricultural Extension Program in Tigray Regional State

Agricultural extension program has many components in Federal and Regional Government levels. Therefore, the regional state of Tigray has the following main components of agricultural extension program:

***a) Public Spending*:** high amount of budget to consolidate agricultural extension program was recorded for agriculture and food security in the past years. As is evident this information does not capture the broad rural development sector as it may fall in other related sectors and sub sectors.

Note that it is difficult to clearly track spending, which falls under multiple levels of government (for example much is spent out of block grants), different program instruments, and under a wide variety of agencies and sub-sectors. As indicated there is an obvious need for improving the M&E system of Agriculture and Rural Development. A public expenditure review/analysis focused on rural development (including the coverage and scope of rural development), including food security expenditure is a recent phenomena in the regional state of Tigray (Mitiku, 1995).

***b) Rural Finance Strategy*:** The need for fostering and enhancing micro-finance institutions was highlighted in the Rural Development Strategy. That is why, during the past years the federal government adopted a Micro-Finance Strategy, aimed at strengthening the legal and institutional framework for MFIs, and building their capacity.

Despite these developments, however, efforts have to be geared in a coordinated manner to strengthen MFIs and rural credit and saving institutions with regard to their legal and institutional arrangement as well as building their capacities. Among other elements the strategy includes:

1. Establishment of a separate division in the National Bank of Ethiopia to supervise, regulate and license MFIs, to ensure their soundness and development;
2. A Strategic Plan has been developed for MFIs, coordinated by Development Bank of Ethiopia and run by Program Management Committees from various institutional stakeholders, to oversee and coordinate activities related to MFIs development. The program activities broadly involve two major categories, namely:

(i) Extension of credit to micro and rural financial institutions and equity participation;

(ii) Capacity building for all stakeholders (MoFED, 2007).

In the past years, the regional state of Tigray also established some micro-finance institutions based on the federal government micro-finance institution's legal and institutional framework which operating throughout the region by serving some clients.

***c) Food Security and Safety nets*:** A major development in the past years has been the launch of the new Coalition for Food Security. At the root of the program, transforming Ethiopia away from reliance food aid to a more sustained combination of productive solutions to food insecurity, combined with a systematic safety net program for the poorest. The program is aimed at addressing the immediate needs of over 5 million chronically food insecure households on a continuous basis. A significant achievement in the past years has been the development of the Productive Safety Nets Program. The plan represents a major shift from relief aid to a combination of productive safety net transfers (for example by employment of the poor on labour-intensive works), and unconditional transfers to those such as the elderly, disabled, or orphans who are unable to work.

It also represents a significant shift from food to cash transfers, and embodies an emphasis on promoting productive behaviour. A document outlining the main features of the plan was developed in July, and a sub-budget line for the safety net program has been included in the federal budget. Based on the federal plan, the regional state of Tigray has the responsibility to implement productive safety net program within its own jurisdiction (Ibid).

d) The Food Security Program: A significant departure was made in the food security budget line during the past years budget allocation. The food security budget from treasury was also shows an increment both in Federal and Regional Government of Tigray. The budget are released as grants to the Region and then *weredas* to support a combination of measures, including irrigation and water harvesting, promoting 'food security packages' aimed at diversifying income through small-scale agricultural and commercial activities, promotion of seeds and marketing for higher-valued crops, and voluntary resettlement from food insecure areas to more productive ones(Mitiku, 1995). Different Regions have tried different strategies, with some relying more on the productivity packages and irrigation, and others more on resettlement. These were also true in the regional state of Tigray.

e) The Monitoring and Evaluation (M&E) stage*:* this is designed since the process of Developing Agriculture and Rural development programs. With respect to different agricultural and rural development programs, the social and environmental risks need to be carefully managed to avoid the hardship of the programs. Social and environmental risk mitigation guidelines should be developed, and further work is needed to make them operational according to the guidelines.

The guidelines should also universally apply. All these components of agricultural extension program interlinked each other. Particularly, the two programs i.e. the Food Security Program primarily targets on community assets, while the Safety Net Nrogram (SNP) primarily targets on household assets are complementary. They are also connected through targeting approaches (people who benefit from one program would also have access to the other), and through a combined M&E system, which is integrated. A major challenge for these all components of agricultural extension program are the implementation capacity at local level as the programs rolls out. A final issue is that the level of budgetary support for the new coalition for food security remains lower than expected, and further dialogue is needed with donors to follow up on their commitments. Generally, regarding the speed of implementation, tracking finances and spending still requires additional effort (MoFED, 2007).

2.5.2. Nature and Extent of Agricultural Extension Program in Hintalo-Wajirat Wereda

The agricultural commodity development plan in the study area identified more than twenty high value marketable agricultural commodities, and to apply them under the diversification-based specialized farming system to improve the livelihood of farmers and significantly contribute to the export economy. Growth in agricultural incomes should not only be measured once in a year rather frequently and the data should become available for the next year assessment. However the large increase in output has also certainly increased consumption of most rural households in the past years. Therefore, this research wants to study and analyzed the application of the factors affecting agricultural extension program on production practices in Hintalo-Wajirat Wereda in Tigray regional state.

Chapter Three

Data Analysis and Discussion

This chapter deals with the analysis and interpretation of data which was collected from respondents using different data collection tools such as questionnaires, focus group discussion and key informant interview. Through these tools, different ideas, perceptions, attitudes and knowledge concerning the factors affecting the implementation of agricultural extension program were gathered. The chapter primarily analysed the socio-demographic characteristics, perception of respondents about agricultural extension program (AEP), access and training for agricultural extension workers (AEWs) and farmers. In the final section of this chapter, the major benefits and challenges of AEP is discussed in detail.

3.1. Data on Rural Households – Analysis and Discussion

3.1.1. Socio-demographic Data on the Sampled Rural Households

The rural household's socio-demographic characteristics were looked at to see the connections in the search for the factors affecting the implementation of agricultural extension program in Hintalo-Wajirat Wereda. These characteristics were age, sex, educational level and religion of the rural households.

Table 3: Socio-demographic Data of the Sampled Rural Households

S.N	Questions Raised	Response	Frequency	Percent
1	Age	**18-30**	**31**	**38.3**
		31-59	**46**	**56.8**
		>59	**4**	**4.9**
2	Sex	**Male**	**63**	**77.8**
		Female	**18**	**22.2**
3	Educational level	**Illiterate**	**14**	**17.3**
		Read and write	**30**	**37**
		Primary school completed	**19**	**23.5**
		Secondary school completed	**14**	**17.3**
		Above secondary school	**4**	**4.9**
4	Religion	**Ethiopian orthodox**	**76**	**93.8**
		Catholic	**-**	**-**
		Protestant	**-**	**-**
		Moslem	**5**	**6.2**
		Others	**-**	**-**

Source: own survey, February 2011

A) Age

The age of the sampled rural households in Hintalo-Wajirat Wereda ranges from 20-63 years. The age groups were categorized into three; the first 20-30 years, the second 31-59 years and the third age group was greater than or equal to 60 years. Therefore, out of 81 respondents who completed filling the questionnaire 31(38.3%) of them were aged 20-30 years while 46 (56.8%) of them were aged 31-59 years. The rest 4 (4.9%) of the rural household respondents were aged sixty and above. Around 95.1% of the rural households were found at productive age. The age category as a whole was productive and helpful for the effective implementation of AEP.

B) Sex

This socio-demographic data had also its own significance for the effective implementation of Agricultural Extension Program in the study Wereda because it demands the involvements of both sex for the success of its implementation. Out of 81 sampled household respondents, 63 (77.8%) and 18 (22.2%) of them were male and female respectively. This implies that there had been women participation in agriculture. Women participation obviously affects agricultural development in general and AEP in particular. But, one can see that the number of men is still greater than women, and this in turn may lead to the conclusion that there still exists the dominance of males over females in the agricultural economic participation in Hintalo-Wajirat Wereda.

C) Educational level

Out of 81 sampled household respondents 30 (37%) of them could read and write. Nineteen of the respondents (23.5%) have completed primary school while 14 (17.3%) of them have completed secondary school. Fourteen of them (17.3%) were having no educational background. Those with certificate and diploma were 3 (3.7%) and 1(1%) of the total respondents respectively. This level of education in Hintalo-Wajirat Wereda shows us that rural households are ready to engage in training or in technology transfer in implementing agricultural extension program.

D) Religion

Ethiopian Orthodox Tewahedo believers are in great majority in Hintalo-Wajirat Wereda and out of the total respondents, 76 (93.8%) of them were Ethiopian Orthodox Tewahedo followers. Only 5 (6.2%) of the respondents were Moslems. This figure shows that AEP could face some challenges in its implementation because the followers of Ethiopian Orthodox Tewahedo may not engage in farming activities because of religious holydays which accounts about 12 (40%) days of each month.

3.1.2. Understanding of Rural Household to AEP and their Roles in Its Implementation

It is obvious that rural households have different levels of understandings and roles on the implementation process of Agriculture Extension Program (AEP). Concerning the rural household respondents' level of understanding, out of the total respondents, merely 22(27.2%) and 38(46.9%) of them had high and medium level of sympathetic about AEP. The rest 21(25.9%) respondents had low level of understanding on the program. The respondents also declared that the agricultural extension workers did not well explain what agricultural extension program is for the rural households. In support of this, out of 81 respondents, 44 (54.3%) of them mentioned that the agricultural extension workers had failed to explain the major ideas of the AEP to the farmers whereas 37 (45.7%) of them agreed that agricultural extension workers explained the core essences of AEP to the rural households. This indicates that the majority of the farmer respondents failed to understand the core values of program because of lack of orientation.

According to the Rural Development Policy and Strategies of Ethiopia, the government is trying to increase the income and the productivity level of farmers through the implementation of AEP. However, the government is doing this with out giving due attention to the efforts in creating awareness and familiarizing farmers with agricultural skills of AEP. This is shown in the study that out of 81 respondents, 38(46.9%) of the them agreed that the government gave priority in increasing income and productivity capacity than creating awareness and familiarizing agricultural skill that greatly helps farmers to understand how to increase income and productivity level. Contrary to this, 35 (43.2%) and 30 (37%) of the respondents had opposed the above argument and stated that the government was giving priority for familiarizing the farmers with the agricultural skills and the creation of awareness in implementation of Agricultural Extension Program respectively. These show that creating awareness and familiarizing the farmers with the agricultural skills had been given little attention. That is why; the rural households did not play a significant role in the implementation process of AEP in the study Wereda. Therefore, the government should fulfil its role in improving productivity through expanding basic ideas of agricultural skills and creating awareness for the farmers about the AEP in Hintalo-Wajirat Wereda.

Beside this, the report of the farmer respondents on the roles that the government was playing in implementing the AEP shows that out of 81 respondents, 69(85%) of them ensured that the government had playing significant role in improving agricultural productivity of the farmers through the implementation of the program. However, the rest 12(15%) respondents said that government was not performing its roles as it is expected in improving the farmer's productivity.

Table 4: Rural Households understanding on AEP and their role in the implementation of the Program

S.N	Questions Raised	Response	Frequency	Percent
1	Level of understanding about AEP	**Low**	**21**	**25.9**
		Medium	**38**	**46.9**
		High	**22**	**27.2**
		Nil	**-**	**-**
2	Weather AEWs are explained AEP to farmers or not	**Yes**	**37**	**45.7**
		No	**44**	**54.3**
3	*Priorities given to the roles of AEP	**Increasing farmers awareness**	**30**	**37**
		Increasing productivities and income	**38**	**46.9**
		Familiarize farmers with agricultural skills	**35**	**43.2**
4	Government's role in improving productivities	**Excellent**	**15**	**18.5**
		Very good	**38**	**46.9**
		Good	**16**	**19.8**
		Slightly good	**12**	**14.8**
		Insignificant	**-**	**-**
5	Provision of necessary information	**Low**	**8**	**9.9**
		Medium	**43**	**53.1**
		High	**28**	**34.6**
		Nil	**2**	**2.5**
6	Interactions among farmers	**Low**	**10**	**12.4**
		Medium	**42**	**51.9**
		High	**29**	**35.8**
		Nil	**-**	**-**
7	Provision of ideas from farmers	**Yes**	**73**	**90.1**
		No	**8**	**9.9**

*Indicates multiple responses are possible

Source: Own survey, February 2011

According to the overwhelming number of farmer respondents (87.7%), the agricultural extension workers did not provide the necessary information as it is expected from them. With this regards, out of 81 respondents 43(53.1%) and 28 (34.6%) of the respondents agreed that extension workers provide the necessary information in low and medium manner respectively. The rest 8 (9.9%) and 2 (2.5%) respondents explained that agricultural extension workers provide the necessary information in high manner and not at all respectively. However, Swason and Rajalahti (2010) stressed in Agriculture and Rural Development Discussion Paper that there should be a strong commitment from the agriculture extension agents in transferring the knowledge of extension to the beneficiaries. Therefore, the researcher believes that there should be a mechanism of correctly implement the core principles of agricultural extension program in the study Wereda in particular and regional state in general.

With regards to the roles of the rural household farmers in promoting better idea sharing with agricultural extension workers about the concept of AEP, most of the farmer respondents or 73 (90.1%) of them stated that they had a conducive interaction to exchange new agricultural ideas while the rest 8 (9.9%) mentioned that there was weak interaction between the agricultural extension workers and farmers hence, they failed to share the concepts of AEP with the workers. This, as the researcher opinion, would facilitate the proper implementation of the program in the study area.

In addition to this, the report of the household survey indicated that there was a good interaction among the farmers themselves with regards to the implementation of the program of agricultural extension. The data showed that out of the total respondents, 42 (51.9%) of them explained that they had medium interaction among each other. They indicated that farmers interact with each other in borrowing of agricultural equipment and particularly in doing agricultural activities collaboratively which is locally called 'ofera'. The rest 29 (35.8%) and 10 (12.4%) of the respondents also explained that farmers had practiced high and low interaction among themselves respectively.

3.1.3. Access and Training on Agricultural Extension Program for Rural Households

As it is acknowledged in many literatures that the availability of sufficient credit services to rural farmers in improving agricultural productivity are significant. In the study it is also revealed that 75 (92.6%) of the respondents indicated their agreement that the availability of credit services in improving agricultural productivity in the study Wereda was significant. However, the rest 6 (7.4%) of respondents explained that credit service availability was low. In line with this, 70 (86.5%) of the respondents declared that credit service played a pivotal role in improving agricultural productivity in Hintalo-Wajirat Wereda while the rest 9 (11.1%) and 2 (2.5%) respondents slightly agreed and disagreed in the role of credit service in promoting better agricultural productivity respectively. Beside this, the survey indicated that the rural households had access of credit service from financial institutions. Out of 81 respondents, 69 (85.2%) of them agreed that they had access of credit services. On the other hand, 12 (14.8%) respondents explained that they had no access of credit service from any financial institutions. With regard to refunding the money that the farmers borrow from financial institutions, out of the total respondents, majority or 45 (55.6%) of the respondents indicated that they refunded the money they borrowed without any delay and the rest 36 (44.4%) of the respondents explained that they did not return the money on time. According to the farmer respondents, the reasons that they failed to return the money were numerous.

Among them, backward and traditional perception of farmers in the use of the credit services, absence of coordination between the farmers and financial institutions, the repetition of famine and droughts, extravagant nature of some farmers and usage of the money for other purpose than for the objective intended were the major reasons.

As the AEP had the objectives of introducing new agricultural skills on raw planting and irrigation, rearing animals, proper usage of fertilizer and pesticides, introducing, adopting and producing exotic seeds and at large increasing productivity, there should have been sufficient number of agricultural extension workers to achieve its objectives. However, when the number of the agricultural extension workers in one 'Kebelles' was considered they were not more than three. This was supported by the household survey of the study that out of 81 respondents 57 (70.4%) of them indicated their disagreement with the number of extension workers available in their 'Kebelles' and stated that the available extension workers were not sufficient to properly run the activities of AEP. Furthermore, as it is indicated in the study that out of the total respondents, 53 (65.4%) of them strongly agreed that Kebelles that had more agricultural extension workers had better served than those areas that had less extension workers. The rest 25 (30.9%) and 3 (3.7%) respondents agreed and slightly agreed with the above ideas respectively.

In the provision of agricultural inputs and credit service in kind and cash, the rural households had different assumptions. With this regards, out of 81 respondents, 65 (80.3%) of them believed that the provision of agricultural inputs in kind for the farmers is better than the credit service in cash to buy agricultural inputs. The rest 16 (19.7%) of the respondents disagreed with the above argument and stated that agricultural inputs given in kind is better than the credit service in cash. Both respondents provide their own reasons for their responses. The reasons for those who believed that agricultural inputs in kind is better than the credit service in cash was that the provision of agricultural inputs can easily improve the life of the farmers. In addition this, to achieve the Ethiopian agricultural strategy i.e. agricultural development-led industrialization (ADLI), it is better to provide agricultural inputs in kinds. This helps to have sufficient quality agricultural inputs, to decrease the interest rate of the provided credits, to avoid the inefficiency of the provision of credit service on time and to save the time of the farmers in borrowing and returning the money from and to credit associations. It also helps to avoid the wrong usage of the borrowed money and habits of extravagancy, the easy nature of returning the price of agricultural inputs than credit money and to engage directly into practice.

On the other hand, some of the respondents did not believe in the idea that agricultural inputs in kind are better than credit service in cash. The reasons provided here were indicated that farmers need sufficient credit services for different reasons. Among them, since there were weak supplies of agricultural inputs and provision of low quality or damaged agricultural inputs for the farmers, they need financial credits to buy quality agricultural inputs in fair price. The farmers were also more responsible to refund the credit they borrowed than agricultural inputs they took in kind. Concerning the access of training to the farmers in the FTCs, out of 81 respondents, 22 (27.2%) of them had had trainings concerning the application of agricultural technologies in their Kebelles' FTCs. Contrary to this, the majority or 59 (72.8%) of the respondents stated that they had never had any training related to the application of the concepts of AEP especially on the application of new agricultural technologies. This implies that most of the farmers faced difficulties in using the new agricultural skills and ideas. This as the researcher believed posed a challenge in the implementation of the program in the study area. Therefore, there should be a solution for these difficulties that the farmers were facing by the joint efforts of all stakeholders of the program especially the federal, regional, zonal, woreda and Kebelles' agricultural extension experts and NGOs engaged in agricultural activities.

Table 5: Access and Trainings on AEP for the Rural Households

S.N	Questions Raised	Response	Frequency	Percent
1	Credit service availability	**Low**	**6**	**7.4**
		Medium	**34**	**42**
		High	**41**	**50.6**
		Nil	**-**	**-**
2	The number of AEW availability in one 'Tabiya' to run the AEP activities	**Yes**	**24**	**29.6**
		No	**57**	**70.4**
3	Areas that have more AEW and less AEW	**Strongly agree**	**53**	**65.4**
		Agree	**25**	**30.9**
		Slightly agree	**3**	**3.7**
		Disagree	**-**	**-**
4	Credit service in improving productivities	**Strongly agree**	**51**	**63**
		Agree	**19**	**23.5**
		Slightly agree	**9**	**11.1**
		Disagree	**2**	**2.5**
5	Access of credit from finanicial institutions	**Yes**	**69**	**85.2**
		No	**12**	**14.8**
6	Returning of credit	**Yes**	**45**	**55.6**
		No	**36**	**44.4**
7	Believe of farmers in the better of providing agricultural inputs and credit	**Yes**	**65**	**80.3**
		No	**16**	**19.7**
8	Weather farmers ever taken trainings from FTCs	**Yes**	**22**	**27.2**
		No	**59**	**72.8**
9	Weather farmers ever faced difficulty in using new agricultural skills and ideas	**Yes**	**52**	**64.2**
		No	**29**	**35.8**

Source: Own survey, February 2011

3.1.4. Benefits and Challenges of Agricultural Extension Program for Rural Households

Agricultural extension program had money benefits in Tigray regional state in general and Hintalo-Wajirat Wereda in particular. The farmers were motivated to apply the ideas of the program because of the persistent persuasion of agricultural extension workers on one hand and through own motivation on the other hand. Beside these, observing the benefits of the packages of the program and having the encouragement from government, farmers were also practicing the packages of AEP in the study area. In support of this, the data report showed that out of the total respondents 9 (11.1%) of them became a member of agricultural extension package through their own personal motivation where as 47 (58%) of them became member of the package through the agricultural extension workers persuasion mechanism to be the beneficiary of AEP. In addition to this, 15 (18.5%) of the respondents became member of the agricultural extension package by the encouragement of the government organs while 10 (12.4%) became members of the agricultural extension package by observing the benefit of the package from their neighbourhood.

Beside this, 28 (34.6%) of farmer respondents indicated that there were rewards for better accomplishments of farmers in the implementation of AEP packages while the majority or 53 (65.4%) showed the absence of rewards in the study Wereda. However, as it is discussed in many literatures, absence of sufficient rewarding activities could be one factor that affects the implementation of AEP. Therefore, as rewards the rural households get from the implementation of AEP played a significant role in enhancing farmers' productivity and enable them to do more, there should be sufficient rewards for better works of the farmers.

There had been many challenges that rural households faced in the efforts to implement the AEP in proper manner. One of the challenges was the availability of the extension workers on duty when the farmers need their help. In support of this, out of the total respondents, 64 (79%) them declared that they could not find extension workers on duty on regular working days. This fact as the researcher believes, could pose a challenge on the farmers in order to get the right knowledge at the right time and place. Therefore the Wereda agricultural office and the Kebelles administration office should work jointly in order to control the regular activities of the agricultural extension agents.

There had been many reasons given by the rural households for the absence of extension workers on their duty in working days. Some of them were frequent meetings, frequent movements of workers for personal enjoyment to towns, enrolment of the workers in private colleges for further education and absence of supervisors (as described in the interview the researcher had with the Wereda Agriculture Office Head).

When the approaches used by the agricultural extension workers in the dissemination of agricultural knowledge and skills of AEP to the farmers was considered, the majority of respondents 56 (69.2%) stated that the way of transmitting the knowledge to the farmers were fruitful. However, the remaining 30.8% of the respondents indicated that the approaches used by the agricultural extension workers to equip farmers with the required knowledge and skills were not sufficient and hence ineffective. In addition to this, the survey report further indicated that lack of agricultural inputs, few numbers of agricultural extension workers and lack of credit services were identified as the major challenges of the implementation of the AEP in the study Wereda. In support of this, 34 (42%) of the respondent explained that weak access to agriculture inputs was the most difficult challenges of the respondents in the implementation of AEP. The second problem that the 32(39.5%) of the respondent indicated was lack of sufficient number of agricultural extension workers in the study Wereda. Beside these, 29(35.8%) and 23(28.4%) of the respondent stated that lack of credit services and weak approaches of the agricultural extension workers in transferring the concepts of AEP to the rural farmers were the bottlenecks of the AEP implementation in the study area respectively.

In conclusion, the report of the study indicated that absence of provision of seeds, alarming increase of the price of modern fertilizers, absence of provision of motor pumps in credit to the farmers, lack of supervision and monitoring activities on the farm lands, inadequate agricultural extension experts, absence of regular provision of pesticides, absence of forest protection and conservation activities, lack of commitments from the political leaders in handling the agricultural activities, bad weather conditions and the weak community acceptance for the application of new agricultural technologies were the challenges of AEP in the study area. The Kebelles' FTCs in Hintalo-Wajirat Wereda had also been located between 0.5 and 15 kilometres in average from the home of the farmers. Hence, the location of FTCs might affect the farmers who were located far from these training centres. This in turn exposed them to suffer from extra costs to get the access to the FTCs.

With this regards, the researcher believes that these challenges, problems and bottlenecks identified in the study area could severely limit the achievements of the AEP. Therefore, the researcher stressed the need to devise urgent remedies in order to mitigate these challenges for the success of the program in the study Wereda.

Table 6: Benefits and Challenges of AEP for Rural Households

S .N	Questions Raised	Response	Frequency	Percent
1	Nature of membership in extension package	**Own motivation**	**9**	**11.1**
		AEW persuasion	**47**	**58**
		Observing its benefits	**10**	**12.4**
		Forcing by the government organs	**15**	**18.5**
2	Weather farmers ever taken rewards for encouragement	**Yes**	**28**	**34.6**
		No	**53**	**65.4**
3	Availability of AEW when farmers wants them	**Yes**	**17**	**21**
		No	**64**	**79**
4	Approaches of AEW in the dissemination of agricultural skills and knowledge	**Excellent**	**5**	**6.2**
		Very good	**10**	**12.4**
		Good	**41**	**50.6**
		Slightly good	**25**	**30.9**
		insignificant	**-**	**-**
5	Severity of the factors affecting AEP	**Lack of AEW**	**32**	**39.5**
		Lack of access in agricultural inputs	**34**	**42**
		Weak approach of AEW	**23**	**28.4**
		Lack of credit	**29**	**35.8**
6	Government intervention in agriculture	**Low**	**43**	**53.1**
		Medium	**30**	**37**
		High	**8**	**10**
	Weather condition	**Bad**	**47**	**58**
		Medium	**27**	**33.3**
		Good	**7**	**8.6**
	Awareness of farmers in using agricultural technology	**Less**	**45**	**55.6**
		Medium	**23**	**28.4**
		High	**13**	**16.1**
	AEW in farming area	**Less**	**44**	**54.3**
		Medium	**20**	**24.7**
		High	**17**	**21**
7	Weather fertilizer affects the quality of farming land in long run or not	**Yes**	**56**	**69.1**
		No	**25**	**30.9**

Source: own survey, February 2011

In relation to this, the study had also examined the level of productivity of the farmers within the time framework of the study covered. As it is indicated in the survey, the factors affecting the implementation of Agricultural Extension Program led to different level of productivity in the last six years in the study Wereda.

For instance, 52 (64.2%) of the respondents said that there was high production level in 2010 where as 19 (23.5%) of the respondents explain that in 2010 there was medium production level. The rest 10 (12.4%) of the respondents explained that 2010 had low production level.

Out of the total respondents, 67 (82.7%) and 69 (85.2%) of them asserted that 2005 and 2006 had low production level respectively while 6 (7.4%) and 9 (11.1%) of the respondents asserted that there was high level of production in the same years respectively. The rest 8 (9.9%) and 3 (3.7%) of the respondents indicated that 2005 and 2006 had average level of production respectively. In addition to these, 62 (76.5%), 65 (80.3%) and 67 (82.7%) of the respondents stated that there was average level of production in the years of 2007, 2008 and 2009 respectively. On the other hand, 11 (13.6%), 13 (16%) and 10 (12.4%) of the respondents asserted that there was low level of production in the same years respectively. The rest 8 (9.9%), 3 (3.7%) and 4 (4.9%) of the respondents indicated that there was high level of production in the years of 2007, 2008 and 2009 respectively.

Table 7: Amount of production in the last six years

S.N	Questions Raised		Response on production level	Frequency	Percent
1.	Time of Production	2005	**High**	**6**	**7.4**
			Medium	**8**	**9.9**
			Low	**67**	**82.7**
		2006	**High**	**9**	**11.1**
			Medium	**3**	**3.7**
			Low	**69**	**85.2**
		2007	**High**	**8**	**9.9**
			Medium	**62**	**76.5**
			Low	**11**	**13.6**
		2008	**High**	**3**	**3.7**
			Medium	**65**	**80.3**
			Low	**13**	**16**
		2009	**High**	**4**	**4.9**
			Medium	**67**	**82.7**
			Low	**10**	**12.4**
		2010	**High**	**52**	**64.2**
			Medium	**19**	**23.5**
			Low	**10**	**12.4**

Source: own survey, February 2011

3.2. Data on Agricultural Extension Workers – Analysis and Discussion

3.2.1. Socio-demographic Data on the Sampled Agricultural Extension Workers

The study has also tried to analyse the socio-demographic nature of agricultural extension workers in the study area. This was done because the researcher believed that socio-demographic nature of respondents had an impact on the proper implementation of agricultural extension program. Therefore, the researcher assessed the extension worker's socio-demographic nature such as age, sex, religion and educational level. These socio-demographic natures of the agricultural extension workers were elaborated as follows.

A) Age

Among seven respondents who were required to fill the distributed questionnaire, six of them responded and their age ranged between 26 to 32 years. According to Habtemariam, (1996), age of the agricultural extension workers could have both positive and negative implication on implementation of agricultural extension program.

With this regards, the researcher believed that since agricultural extension workers involved in the study were young they might be energetic, committed and change-based that could be a major cornerstone for the success of the program. On the other hand, they might not also be available at the place they were assigned because of the great interest of the young people for enjoyment at the towns. Therefore, the study mentioned that this could be one factor that can both positively and negatively affect the effective implementation of AEP in Hintalo-Wajirat Wereda.

B) Sex

According to the study report, the AEP implementation in the Wereda had unequal involvement of male and female agricultural extension workers. In support of this, out of six respondents, five (83.3%) of them were male while the rest one (16.7%) was female workers. This unequal gender representation in the implementation of the AEP could limit the achievements of the program in the study Wereda.

C) Educational level

Out of the six respondents who filled the questionnaire, all (100%) of them were diploma holders. The existence of diploma graduates in rural 'Kebeles' may be considered as an advantage. However, these diploma graduates as it was described in the community focus group discussion lacked capacity and, therefore, they were required to take continuous training to build their capacity.

In addition to this, since these diploma graduates want to up-grade their educational level, they usually move to towns where there is access to higher education. Therefore, the AEP in Hintalo-Wajirat Wereda should provide educational scholarship for the agricultural extension workers to up-grade their educational level. If this is not created in the right time, it may urge the workers to migrate to towns and in turn increase the attrition rate of the agricultural extension workers. As a result of this, the implementation of the AEP may face limitations in the study Wereda.

D) Religion

Out of the six respondents who filled the questionnaire, all (100%) of them were followers of Ethiopian Orthodox Church. Generally, the socio-demographic nature of the extension workers could be demonstrated in following table.

Table 8: Socio-demographic nature of the Agricultural Extension Workers

S.N	Socio-demographic Nature		Total	Frequency	Percent
1	**Age**	**19-25**			
		26-32	**6**	**6**	**100**
		33-39			
2	**Sex**	**Male**	**5**	**5**	**83.3**
		Female	**1**	**1**	**16.7**
3	**Educational level**	**Certificate**	**-**	**-**	**-**
		Diploma	**6**	**6**	**100**
		Degree	**-**	**-**	**-**
4	**Religion**	**Orthodox**	**6**	**6**	**100**
		Catholic	**-**	**-**	**-**
		Protestant	**-**	**-**	**-**
		Muslim	**-**	**-**	**-**
		Others	**-**	**-**	**-**

Source: Own survey, February 2011

3.2.2. Roles and Perceptions of Agricultural Extension Workers on AEP

According to the study conducted by Hailu (2002) in Assosa and Bambasi Weredas of the Benishangul Gumuz Regional State, it was discovered that agricultural extension workers had different roles and perceptions on AEP implementation. Similar to this finding, it was found in this study that there was a visible difference between and among the agricultural extension workers working in Hintalo-Wajirat Wereda. Due to this fact the Wereda Agricultural office was attempting to establish uniform roles and perceptions among the workers through providing on-job training.

With this regards, the study findings illustrated that the level of satisfaction of the extension workers on the training was remarkable and out of the total respondents, 66.7% and 33.3% of the agricultural extension workers showed that they had medium and high level of satisfaction from the training they got respectively. In addition to this, the majority (66.7%) of agricultural extension workers further mentioned that they were dissatisfied with weak ability of farmers in acceptance and application of new agricultural technologies of the AEP.

Beside this, 83% of the agricultural extension workers said that the role of agricultural expertise at all level i.e at Federal, Regional, Zonal, and Wereda level in the implementation of AEP was increasing from time to time while only one (16.6%) of the respondents reject the above idea.

Table 9: Roles and Perceptions of Agricultural Extension Workers on AEP

S.N	Questions Raised	Response	Frequency	Percent
1	Level of satisfaction from training	**Low**	**-**	**-**
		Medium	**4**	**66.7**
		High	**2**	**33.3**
2	Ability of farmers to apply technological and new ideas and knowledge of agriculture	**Low**	**4**	**66.7**
		Medium	**2**	**33.3**
		High	**-**	**-**
3	Roles of agricultural expertise at all level i.e. Federal, Regional, Zonal and Kebelles	**Increased**	**5**	**83.3**
		Decreased	**1**	**16.7**

Source: Own survey, February 2011

3.2.3. Access and Training on AEP for Agricultural Extension Workers

Regarding to the access of agricultural inputs and credit services to farmers, all (100%) of the agricultural extension workers participated in the study suggested that providing agricultural inputs was better than the supply of credits for the farmer households. According to the respondents, farmers were interested to use the money gained from credit associations to cover their personal expenses than to allocate the money for the intended purposes i.e. purchasing quality agricultural inputs such as fertilizer, exotic seed, water pumping motors and others.

In addition to this, the study findings has also illustrated that out of the total respondents, 66.7% of them had transportation facilities in order to perform their day to day activities regularly. However, the remaining 33.3% of the respondents indicated the absence of transportation facilities. This gap as the respondents' opinion could cause different problems on their routine activities. According to them, some of the problems were wasting of agricultural inputs in the stores of the Wereda agricultural office due to absence of transportation means; delayed supply of agricultural inputs for the farmers and finally, the agricultural extension workers were forced to supervise and monitor the activities of farmers on their foot.

Table 10: Access and Training on AEP for Agricultural Extension Workers

S.N	Questions Raised	Response	Frequency	Percent
1	Comparing of agricultural inputs and credit service	**Agricultural input**	**6**	**100**
		Credit service	**-**	**-**
2	Access of transport	**Yes**	**4**	**66.7**
		No	**2**	**33.3**

Source: Own survey, February 2011

3.2.4. Benefits and Challenges of AEP for Agricultural Extension Workers

According to the reports of the study, the acceptance level of agricultural extension workers in the eyes of the farmer was showing improvement. With this regards, 83% of the respondents said that the farmers were accepting the agricultural extension workers averagely. Similarly, one (16.7%) of the respondents stated that farmers had begun to recognize the activities of the agricultural extension workers highly. However, as it was explained in the key informant interview with the agricultural extension workers it was revealed that there were times that the farmers reject to obey rules of the AEP implementation in their Wereda.

Such irregular actions of farmers' were handled and controlled by the agricultural extension workers through different mechanisms. Among these mechanisms, providing training and convincing farmers to fully accept the concepts of AEP, bringing farmers into practice and creating the opportunity of peer teaching among each other, showing best practices of agriculture and reporting farmers' disobediences to the political chief of the 'Kebelles' in order to convince them were the major.

When the level of recognition of creative farmers by the agricultural extension workers was considered, it had a promising nature. Out of total respondents, 83.3% of agricultural extension workers were averagely appreciating the good deeds of farmers while the remaining 16.7% of the respondents were highly appreciating the creative works of farmers in the study Wereda. This fact illustrates that the agricultural extension workers were developing the culture of appreciation for creative farmers in the study Wereda.

As Tesfaye (1996) illustrated in his article on the review of agricultural extension approaches and strategies in Ethiopia, agricultural extension workers should obtain sufficient benefits such as access to mini- hotel, daily perdium, means of transportation and reward for fruitful workers so that the workers could perform their duties effectively and efficiently. However, this study showed that five (83.3%) of the respondents did not have any benefits described in the above in Hintalo-Wajirat Wereda. This fact as the researcher's opinion could limit the proper implementation of the AEP in the study Wereda.

According to the study finding, the other major problem of the AEP was related with the program formulation, implementation and evaluation process. With this regards, out of the total respondents who filled the questionnaire, 33.3% of them agreed that AEP had challenges which emanate from program formulation. As these respondents argued, the program had failed to give due attention to the capacity level of the program implementers in its formulation stage. Beside this, lack of skilled manpower, small amount of budget allocated to the Wereda Agricultural Office, lack of awareness among farmers, enforcement on farmers to use new agricultural inputs than convincing them, absence of doing things according to their plan, lack of trainings for agricultural experts engaged in evaluation process and generally, depressed working environment were associated challenges in the implementation and evaluation stages of the AEP in Hintalo-Wajirat Wereda. This, as the researcher believes, implies that the agricultural extension workers as well as the beneficiaries of the program/ farmers were facing difficulties in implementation process of the AEP in the study area.

The respondents further indicated that there should have been proper remedies such as providing sufficient training to farmers, extension workers and other agricultural experts on AEP, sharing of best practices and experience among farmers, creating complete awareness about AEP on farmers and mobilizing the population as a whole into developmental activities in order to mitigate the aforementioned challenges.

Moreover, they stressed the following measures to be taken to properly implement the program in the study Wereda; expanding infrastructures facilities, provision of sufficient daily perdium to agricultural extension workers, prioritizing agricultural activities than politics, creating the sense of accountability, responsibility, impartiality and transparency among the agricultural extension workers.

In summary, the researcher stressed that proper involvements of all stakeholders including the agricultural extension workers and farmer households in all stages of the AEP (formulation, implementation and evaluation) is mandatory in order to meet the objectives of AEP in the study Wereda.

Table 11: Benefits and Challenges of AEP for Agricultural Extension Workers

S.N	Questions Raised	Response	Frequency	Percent
1	Access of mini-hotel, transport, reward and perdium	**Yes**	**5**	**83.3**
		No	**1**	**16.7**
2	Improvement in the quality of life among the farmers	**Strongly agree**	**-**	**-**
		Agree	**5**	**83.3**
		Slightly agree	**-**	**-**
		Disagree	**1**	**16.7**
3	Participation of farmers in training	**Excellent**	**-**	**-**
		Very good	**-**	**-**
		Good	**5**	**83.3**
		Slightly good	**-**	**-**
		Insignificant	**1**	**16.7**
4	Satisfaction of AEW by their salary	**Satisfied**	**4**	**66.7**
		Dissatisfied	**2**	**33.3**
5	Level of acceptance of AEW on the Farmers	**Low**	**-**	**-**
		Medium	**5**	**83.3**
		High	**1**	**16.7**
		Nil	**-**	**-**
6	Rejections the AEW ever faced	**Yes**	**5**	**83.3**
		No	**1**	**16.7**
7	Appreciation to the creative farmers	**Low**	**-**	**-**
		Medium	**5**	**83.3**
		High	**1**	**16**
		Nil	**-**	**-**
8	Challenges of AEP during policy Formulation	**Yes**	**2**	**33.3**
		No	**4**	**66.7**
9	Challenges stemmed from government Organs	**Yes**	**4**	**66.7**
		No	**2**	**33.3**

Source: Own survey, February 2011

3.3. Rural Households and Agricultural Extension Workers (AEW) Interview Analysis

3.3.1. Rural Household Interview Analysis

A) Opinions about the Way Farmers Became Models

During the interview session, different interviewees explained their opinion on the way they became a model farmer in their 'Kebelles'. The criteria for farmers to be model farmers were many. Among them, demanding agricultural inputs from agriculture offices and NGOs, devotion of their time in agricultural activities, having behavioural change in agricultural productivity, accepting the policies and strategies of agricultural sector, and helping other farmers to be as effective as model farmers in their farming activities were core. In addition to these, model farmers were expected to plough unutilized lands in rent, work together in farming activities with peer farmers, expand irrigational activities in dry seasons, introduce new agricultural technologies, and use credits services. This implies that farmers were considered as model farmers if they fulfil the above conditions. With this regards, a 56 years old community participant interviewee who got an award of becoming a model farmer in the study Wereda explained that:

> *'I became a model farmer by taking or demanding the agricultural inputs provided through government and NGOs, accepting the policies and strategies of agriculture, making others active in agricultural activities and conserving water and using it.'*

In addition to this, others also explained that they became model farmers in the same way. For example, a female interviewee from the rural households asserted that:

> *'First the government recruiting me as model farmer because I was demanding every supplies provided by the government like foreign animals, exotic seeds, fertilizers and credits to run the agricultural activities. Then, I was considered as model farmer. After that I am attempting to expand my farming activities by renting idle lands from others, increasing the fertilizers I used in the farming activities and by selling animals and seeds I planted in the farm lands.'*

Similarly, as the model farmers' interviewee explanation showed there were many farmers who were not considered as model farmers. They stated that there were many reasons that made other farmers not to be model farmers. According to the interviewees, the reasons were absences of behavioural change, possessing many farming lands beyond their capacity and absences of practicing government's agricultural policies and strategies,. Furthermore, absences of work motivation, weak cooperation between husband and wife, absences of using fertilizers to the farming lands, absences of interest in agricultural inputs provided by the concerned bodies, absences of good nature of agricultural lands, absences of good ploughing culture, absences of wide farming land, absences of using pesticides and man made system of avoiding weeds, absences of using fertilizer effectively, absences of following agricultural seasons and ploughing with out program are major factors that hindered farmers to be a model farmers.

In addition these, absences of irrigation schemes in dry seasons, single marital status, weak understanding of farmers in agricultural technologies, absences of education, having traditional attitude, fearing of credit, repetitive famine and drought were also the factors that halted the farmers not to be a model farmers.

With this regards, one of the 46 years old male interviewee explained that:

'Many farmers had backward and traditional attitudes; as a result of this they possess many lands beyond their capacity and even they fail to use fertilizers and they lack time to avoid weeds and plough the land properly.'

In addition to this, one female interviewee explained that:

'The reasons that did not make farmers model are lack of coordination between husband and wife, weak attention for women's role through their husbands and absences of motivation for work.'

B) The Balance between Effort and Gain

To gain agricultural products from a farm land one farmer is expected to uplift his/ her efforts. One of the mechanisms to uplift one farmer's efforts is related to the gain that the farmer could get from farming lands. Therefore, efforts and gains have direct corresponding relationships. This means that when there is high effort, there will be high gains and vice versa. Nevertheless, the rural households of Hintalo-Wajirat Wereda had different perceptions in the relationship of efforts and gains. Some of the rural households explained that the efforts they made for agricultural activity had proportional balance with their gains while some of them disagree with this idea. In other words, some of the farmers explained that the efforts they made were greater/ lesser than the gains they got. For instance, according to the one male 21 years interviewee explanation:

> *'When there is good weather conditions, the efforts and gains are balanced but when there are bad weather condition the efforts are greater than the gains. For instance, in 2010 there was good weather condition; as result of this I got 1,100 kg from the size of 50m x 50m or 2500 meter square farm land and out of this I may use only 400kg for carrying out the farming activities or for labour while 700kg was considered as profit.*

In addition to this, the rural households have also explained that when they conducted their agricultural activities based on farm schedule, their gains were usually greater than their efforts. For instance, according to one interviewee's explanation:

> *'If every agricultural activity is performed on their own seasons, it is obvious that gains are greater than efforts. And I usually conduct every agricultural activity in its own season therefore, my gains became 5 folds better than my efforts.*

Other interviewee explained that effort and gain may not balance. For instance, male 35 age interviewee explained that:

> '*My effort and gain was not balance particularly when I fail to take the agricultural inputs like honey comb and fertilizers that provided by government. My effort usually becomes greater than my gain. Other male 49 age interviewee says that effort is greater than gain because of the nature of the land. He says: My effort and gain was not balance. Effort was greater than gain. The reason behind to this was the nature of the land that I have. The farming land positioned in Slope Mountains and the soil is easily vulnerable to flood. Even when we use fertilizer in such farming land the floods taken away the fertilizer as it is'.*

Another male 37 age interviewee also shared the above idea and explained that:

'When the price of our product is decreased and when we carried out the collection of the product through expensive price of labour, it is obvious that the effort is greater than the gain.'

Regarding the rural households' agricultural income or gain in the last six years i.e 2005-2010 in each year, there had been differences in the amount of product. This was mainly because of the difference in the efforts they made in addition to the weather conditions and other problems such as the access of agricultural inputs, lack of knowledge in both sides i.e. the farmers and the agricultural experts basically those working with the farmers together. Therefore, during the interview session the interviewee had different perceptions in the amount of products in the last six years.

One male 37 age interviewee for example explained that:

> *'During the last six years some of the years had been good amount of products where as some of the years had less amount of product. In addition to this, 2010 year was a special year for us when we compared it with rest production years i.e this year had been greatest amount of product than 2005, 2006, 2007, 2008 and 2009. However, the years in their amount of product not that much complained.'*

Contrary to this, another female 43 age interviewee explained that:

> *'We were extremely harmed by the repetitive drought particularly in the last six years. We and our animal could survive through the support of government and other NGOs. During these years, animals were mainly harmed than the people. In addition to the support given by government and NGOs for the survival of animals, 'beles' (local plant) also play a pivotal role. However, 2010 had a good amount of production both for the people and animals. All in all, when we compare the past six years i.e 2005, 2006, 2007, 2008, 2009 and 2010 based on the amount of productions, it showed an increment in all years. One reason for such increment was the effort we expense for agricultural activities particularly through conserving water and soil by stone and dry weed (locally called' golefa') avoided from farming land.'*

According to other interviewee explanation other reasons for the increment of products in the last six years seriously was the decrement of prices of agricultural inputs in general and the increment of the price of fertilizer in particular.

With this regards, one male 56 age farmer explained that:

> *'Our product had been decreasing from year to year. This was because of the increment in the price of fertilizer in addition to the effort we made. However, 2010 was a good production year. For example, in this year I sowed 13 'shember' (local measurement for seeds) or 19.5kg seeds and I collect 800kg .That was why, I became free of support and I could able to deposit 100,000.00 birr.'*

Even though weather conditions affect the agricultural activities of farmers, their production shows an increment according to the interviewee explanation. The major reasons for the increment of productions was high demanding of agricultural inputs like fertilizer, compose, increasing access of agricultural experts, technical assistance in addition to the efforts the farmers yields. Almost all interviewee agreed that 2005, 2006, 2007, had very low amount of production where as 2008 and 2009 had medium and they explained that 2010 had high production amount.

C) Suggestions given by Model Farmers to Other Farmers Engaged in Small Agricultural Activities

Suggestion is obviously helpful to increase result of activities in terms of quantity and quality. Accordingly, Hintalo-Wajirat Wereda's rural households suggested many solutions for the factors that affect agricultural activities in general and AEP in particular. Some of the suggestions given were:

One male 39 age interviewee explained that:

> *'I advising to the ordinary farmers that they have try to like me to be model farmers or beyond me through using agricultural inputs provided by governments and accepting the policies and strategies of government. Particularly, I advise them to use fertilizers, to adopting foreign animals locally called 'begayt' reproducing bees and feeding the animals by controlling them.'*

Other male 47 age interviewee explained that:

> *'My suggestion is particularly to those farmers who possess large farming land beyond their capacity and I advise them to decrease the size of land they plough and they should use fertilizers, avoid weeds on time, sow periodically and collect it periodically from farming land.'*

In addition to this, female 43 age interviewee explained that:

'Those who seat in holydays, they should to respect the holydays by engaging in different activities. Farmers are expected to increase the working days than the holydays. In addition to this, I advise the farmers to work together particularly husbands, wives and their children.'

3.3.2. Agricultural Extension Workers (AEWs) Interview Analysis

A) Roles of AEW for the Successful Implementation of AEP and the Challenges they face

As the AEW indicated they themselves play a vital role in the successful implementation of AEP in Hintalo-Wajirat Wereda. Some of the roles they play were transferring technical support to the farmers, changing awareness of farmers, motivating or initiating the farmers, introducing farmers with the provided new agricultural inputs, encouraging to the creative farmers, guiding the farmers how to utilize the products they produce and organizing farmers to help each other.

To do the above roles they need incentives as a means for encouragement. However, one female interviewee indicated that:

'I did many things in preventing and protecting the environment particularly in 2010 through different mechanisms such as conservation of soil and water through gabions, constructing dams and weal but still I did not get any incentives that made me to do more.'

In addition to the above idea other interviewee also express in the same fashion. For instance, the role of AEW in Hintalo- Wajirat Wereda also hindered by the disparities appeared among the farmers in terms of knowledge, attitude, and experience. One interviewee 26 age who had the position of chief of agricultural and rural development of the kebelles and the head of resource livestock explained that:

'There are disparities in the use of the program in terms of attitude, knowledge and experience among the farmers. Such disparities may consider as advantage and disadvantage.'

To clarify more, the disparities in the use of the program in terms of attitude, knowledge and experience among the farmers may help the AEW in reducing the overload burden lay in the shoulder of them because those who have good attitude, knowledge and experience could share to other farmers what they have. Contrary to this, such disparities also negatively affect both the AEP in general and the role of AEW in particular because those who have low attitude, knowledge and experience may not demand what will be provided through the government or NGOs particularly the new agricultural ideas and skills.

That means those farmers who have low level of attitude; knowledge and experience may not accept the policies and strategies of agriculture relative to those who have high level of attitude, knowledge and experience.

According to the explanation of the AEW, such difficulties are attempted to solve through different mechanisms such as providing training, creating the opportunity of peer teaching among the farmers each other, convincing the conservative farmers to narrow the gap existing among the farmers in terms of attitude, knowledge and experience. According to another female interviewee explanation:

'The high level of disparities in terms of attitude, knowledge and experience leads to the farmers to use the agricultural inputs improperly. For instance, if one farmer took 100 kg fertilizer he/ she use only half of it or 50 kg and sale the rest 50 kg fertilizer.'

B) Kinds of Packages Farmers could more successful

The farmers participated in different package programs. Out of these package programs, irrigation activities, natural resource conservation, demanding agricultural inputs such as fertilizer, exotic seeds, foreign animals and motor pump were made the farmers more successful in agricultural activities. Particularly the farmers were good in demanding the agricultural inputs. But, they have difficulty in its practice. For instance, one interviewee explained:

'According to 28 years male interviewee the farmers have not problem in demanding what has been important to their agricultural activities rather they had a great problem in the application of the new technologies.'

Having the above notion in mind, the trainings provided for the rural households through the governments and NGOs did not change the difficulty of applying new agricultural technologies into ground because they are not enough. As the interviewees explanation such difficulty may be solved through frequently provision of trainings both for the farmers and AEW, accepting the ideas of farmers, protesting the new agricultural technologies when it came before testing any where, providing qualified and enough number of AEW and providing rewards to those who practicing the new agricultural technologies in well manner.

C) Major Factors Affecting the Implementation of AEP

There were many challenges that affect AEP implementation in Hintalo-Wajirat Wereda. Some of the challenges according to the interview of AEW were forcing the farmers and AEW to do what they do not believe it, providing new agricultural technologies without trying it, weak awareness of the farmers, and lack of AEW capacity in convincing the farmers and delaying of agricultural inputs.

Absence of observing the work of AEW in the 'Kebelles' in the same eye was also additional challenges that affects the implementation of AEP.

For instance, according to the explanation of 27 years female interviewee:

'Those AEW who was working in semi-town did not get any perdium. This was because of being they live and work in the capital of the Wereda. However, other AEW who live and work in semi-town they get perdium. Even, those who work around the capital of the Wereda but live in the capital of the Wereda get perdium.'

In addition to this, according to the interviewee, the facility of the infrastructure and office equipments were also considered as basic challenges for the effective implementation of AEP. For instance, the existence of health care centres, educational compounds, pure water and electricity supply in general and transport facility and daily perdium in particular are not promising.

3.4. Focus Group Discussion Analysis with Rural Households, Agricultural Extension Workers and Agricultural and Rural Development Officials

3.4.1. Focus Group Discussion Analysis with Rural Households

A) The Disadvantage of Less Agricultural Extension Workers in Hintalo-Wajirat Wereda

Based on the idea of the discussants the numbers of AEW in one 'Kebelles' were not proportional with the total number of the households. For instance, the Wereda has 22 'Kebelles', out of these 'Kebelles' Sebbera has minimum total households where as Hagereselam has maximum total households. However, the numbers of AEW in the 'Kebelles' are the same i.e three AEW for both the minimum total households and to the maximum total households. In addition to the imbalance number of AEW in the 'Kebelles', both 'Kebelles' have not enough AEW.

As a result, the AEW do not reach when the farmers need them. That means few number of AEW in one 'Kebelles' have disadvantage for the farmers. Some of the disadvantages of less AEW were absence of repetitive supervision of the work of the farmers through the AEW and being they are few they tried to overact over the farmers.

This disadvantage also produced other challenges such as boring of the AEW, absence of answering the question of the farmers, the farmers lacks optional workers that lead them to the wrong application of the new agricultural technologies, less amount of product because of the wrong application of the new agricultural technologies, and the AEW lacks time for their work and enjoyment or refreshment with their family. Lack of time for refreshment also leads to social disorder.

As a result of social disorder, the political, economical and cultural aspects of the farmers are disordered. This results a negative consequence in the AEP. Even though, less AEW had a disadvantage for the farmers agricultural activities the farmers do not become passive to improve their agricultural productions. That means they tried their best to overcome the challenges they face and to improve their agricultural production. To resist the above challenges the discussants explained some remedies when they discussed the issue rose in discussion i.e. what is expected of farmers to improve agricultural productivities.

Among the remedies they suggested or among the attempts the farmers made some of them were increasing well trained manpower in terms of quantity and quality in particular in addition to the efforts the farmers made, ploughing of the land repetitively if possible five and above times, using traditional and modern fertilizers, avoiding weeds effectively and on time, conserving water and soil, training to build the capacity of the farmers and the agricultural experts, avoiding lack of water by constructing water containers, trying to use traditional compose than modern fertilizer, attempting to use fertilizers during the availability of excess water in the unfertile land, attempting to working with the AEW together or having an exchange of ideas between agricultural experts and farmers and accomplishing every agricultural activities based on schedule. Especially, increasing well trained manpower in terms of quantity and quality is important to change the overall living conditions of the farmers and to transform them to a better stage economically, politically, and socially. Furthermore, thy said that farmers should be continuously consulted to take agricultural inputs and to apply them in the right way.

They also said that commitment of the higher officials is important to the effective implementation of what is written on the paper. To conducting the above things which expected from farmers, the farmers need supports from government and NGOs.

Therefore, farmers had been much anticipation from government and NGOs. Some of the anticipations of farmers from government and NGOs were provision of credit in cash and kind, decreasing the interest rate of the credits, providing support during serious famine and drought, waiting for the credit return still the price of the seeds became good, providing quality agricultural inputs on time, providing the agricultural products at 'Kebelles' level than Wereda, giving technical support in using ground water and modern technologies, providing machines that helps to agricultural activities, expanding and having common water tanker, providing pesticides particularly for the seed disease, increasing the amount of allowed credit and providing repetitive training for the farmers. These were some of the basic things which the farmers anticipated from government and NGOs.

Currently, according to the discussants, they get only little support. Particularly the discussants explained that they face lack of pesticides that results serious of seeds' disease. It is obvious that, they are sowing many seeds like wheat, sorghum, teff and others. From these seeds the seeds' disease affects teff seriously. So, they sow teff but, they do not use it for food because of the disease. The discussants also explained that absence of providing agricultural inputs on time was also considered as serious problem. Agricultural inputs that provided after the right time, they are liability rather than support according to them.

B) Reasons for Diminishing or Increment of Productivities from Year to Year

It is obvious that there had been reasons that diminishing and increasing the agricultural productivities from year to year. In the discussion session, the discussants was discussed the issues by categorizing into two i.e. reasons for diminishing and reasons for increasing of agricultural productivities. The discussants first discussed many reasons that diminish agricultural productions. According to the discussants, some of the reasons were the occurrence of repetitive famine and drought particularly the occurrence of shortage of water after July, excess and less amount of water, fear of credit, the disorder of nature, ploughing of the land improperly, absence of using fertilizer, absence of giving emphasis to the natural compose, absence of protecting farming land from natural and man made disaster, absence of changing seeds within one farming land, absence of avoiding weeds on time, absence of following the government's agricultural policies and strategies, absence of accepting what is said by the agricultural experts, absence of providing enough credit and absence of technical and professional support.

The above mentioned problems were not the only factors or reasons that diminish agricultural productions. In addition to, the discussants also considered the long distance of FTCs as challenges or reasons that diminish the agricultural production. They commonly agreed that the long distance of FTCs brings sense of tiredness and hampers smooth interaction between farmers and experts. For instance, to take the pesticides avoid weeds and tablets treat the animals affected by the disease one farmer is expected to go to the FTCs. So, when they bring the pesticides and tablets to avoid the weeds and to treat animals it takes time. As a result of this, the agricultural farmland is exposed to weeds and the animals, too, are exposed to disease. However, in Adigudem 'Kebelle' the discussants revealed that their FTC located at centre place for all the residence of the 'Kebelles'. Therefore, for Adigudem 'Kebelles' the long distance of FTC is not a reason for diminishing agricultural production.

Contrary to this, some of the reasons that helped to increase agricultural production were getting enough amount of water, enough access of agricultural inputs and credit, demanding agricultural inputs effectively, protecting the environment from natural and man made disasters, ploughing of farming land properly and effectively, requesting of any jargons for clarification, generally the discussants explained that the presence of the above mentioned as reasons for the diminishing of agricultural production helps to increasing agricultural production.

C) Solutions for the Factors Affecting Agricultural Productivities

As there had been factors that affect the implementations of AEP, there had been factors that affect agricultural productivities. Here, the discussants said that there are solutions for challenges they face. Some of the solutions suggested by the discussants were planting of plants, working according to the guidelines, protecting high deforestations, covering of mountains through different types of plants that resulted in conservation of water and soil, protecting and preserving what are already planted, preparing channel before the rainfall rains or using water effectively, diversifying the agricultural seeds and activities, digging ground water, creating coordination between government and farmers, using ground waters effectively and taking lessons from the past mistakes.

The discussants explained that they see television and radio that there are places that lack water. However, with great effort they are able to use their ground water and conserve the rainfall. As a result, they become productive. For instance, according to the discussants explanation Wajirat was always in displacement, after they tried to use the water by conserving, they avoid the displacement from one place to other places. Another example according to the discussant was Raya Azobo. Raya Azobo obviously lacks water but, by using different mechanisms they attempted to use the ground water and by now their massive farm land is covered by onions. Another solution suggested by the discussants was using water pump, using persuasion mechanism than forcing in applying new agricultural technologies and avoiding over grazing of farming land. According to the discussants, particularly if they avoid over grazing, the farm land have the possibility of getting natural fertilizers.

3.4.2. Focus Group Discussion Analysis with Agricultural Extension Workers

A) Availability of Supervisors in Farming Area

After a long discussion of the discussants concerning the availability of the supervisors in farming area, they agreed that supervisors are not available in the farming areas; they simply expect the reports. This had also its own negative consequences in the effective implementation of AEP.

For instance, if the supervisor could not able to observe the practical things happening in the farming area, they may receive a false report. In addition to this, when the supervisors could not able to observe the activities being conducted in the farming area, they could not share their knowledge. According to the discussants, the supervisors do not appear even once a year in the farming area. The discussant considered this as one factor that affect the implementation of agricultural policies and strategies in general and AEP in particular

B) Comparison between Provision of Agricultural Inputs and Credit Service

The discussants believe that agricultural inputs and credit service are very essential for the enhancement of agricultural productivities. However, the degree of their significance is different. Regarding the provision of agricultural inputs in kind and credit service in cash to the farmers; the AEW agreed that it is better to provide farmers with the agricultural inputs in kind than credit service. The basic reason the discussant provide is that they may use the money for other purposes ignoring the intended objective. Many farmers use it for drinking and to buy irrelevant goods.

For instance, one farmer may take 8000 birr to buy foreign cow but he/she may buy by 600 birr domestic cow. However, the provision of both agricultural inputs and credit service in Hintalo-Wajirat Wereda was not as such prevalent comparing with the number of farmers according to the AEW discussants explanation. When the discussants discussed, they mentioned that AEP had many major challenges. Some of the major challenges mentioned by the AEW discussants were absence of providing of quality agricultural inputs on time, absence of educational opportunity, absence of daily perdium, weak organizational structure, weak level of awareness on the farmers, absence of providing trainings that build farmers' and agricultural extension workers' capacity and presence of many political meetings.

For instance, those AEW found in the 'Kebelles' level should be accountable to the Wereda's agricultural and rural development office or experts. But, in practice, the AEW was accountable to the political chiefs of the 'Kebelles'. The political chiefs command the agricultural experts to exercise political activities out of their profession.

The AEW was also forced to practice the political activities because they had fear of expelling from their work. When the AEW focus in their profession, the political chiefs by create group and mobilize the people against the experts and they defame the name of the experts. As a result of this, the experts are demoralized and this negatively affects the AEP in general and his /her professions in particular. In addition to this, the AEW discussant explained that they are forced to work all rounded activities out of their profession.

Agricultural extension workers usually perform their duties without any on job-training. Fortunately, when the farmers asked any question to the AEW since he/ she did not specialized by that profession, they might not give clear and precise answer. This also resulted in suspicious of the farmers on the AEW and on the idea of AEW. During the discussion session the discussant also explained that opportunity of education and daily perdium as a serious problem or factor that affects AEP.

For example, there is an instruction that explained the Wereda agricultural and rural development should give educational opportunity to its workers per year. This instruction is being practiced in other Weredas while in Hintalo-Wajirat Wereda is not.

For instance, in Hintalo-Wajirat Wereda from 2005-2010, only two AEW get educational opportunity. According to the discussants, when agricultural experts get daily perdium quarterly weather they work or not where as the 'Kebelles' experts do not get any perdium. This in turn may affect the successful implementation of the program.

Nevertheless, based on the idea of the discussants, when they compare the package users or farmers, some of them were more successful in the effective utilization of agricultural products. The farmers of this time than before are able to avoid the extreme celebration of different ceremonies such as weeding, 'Teskar', children baptism, and other expenses for holydays. Next to this, the farmers were also good in using traditional fertilizer; this was because they observe the utility of traditional fertilizers from their surrounding and through the easy nature of creating compose in their home. The farmers are also slightly good in rearing animals. The farmers now tried to adopt the new style of rearing animals such as keeping the animals in home through providing modern foods such as 'Fagule', 'Furksa', residue of beer and 'Tela' and the crop aftermath'. But, according to the discussants explanation, some farmers are rigid in the application of new agricultural technology.

3.4.3. Focus Group Discussion Analysis with Agricultural and Rural Development Officials

A) Understanding of AEP in Hintalo-Wajirat Wereda

According to the discussants there has been less understanding of AEP in the farmers and even in the agricultural experts. Being the existence of less understanding of AEP in Hintalo-Wajirat Wereda, both farmers and agricultural experts had some problems in the effective implementation of AEP. Some of the problems appeared in the farmers and agricultural experts according to the discussants were lack of transparency in the 'Kebelles' leaders, dependency nature of the people, absence of becoming a model in demanding agricultural inputs and suspicious in the new agricultural technology.

Furthermore, absence of enough knowledge in the modern agriculture including in the 'Kebelles ' chiefs, saying of many things by the farmers in order to not familiarize with the agricultural technologies, carelessness nature in the farmers, saying I know what they do not know, absence of accepting the advise of the agricultural experts through the farmers, absence of demanding agricultural products, fearing for the price of agricultural inputs, absence of knowing the amount of fertilizers and pesticides that should used for a particular land.

In addition to this, the discussants explained that lack of infrastructure facility was considered as serious problem for the effective implementation of AEP. According to the discussants, even though there are motors and cars for transport, they are usually damaged because of the absence of quality roads and since the experts used the motors and car for their private business. For instance, out of 22 'Kebelles' 4 of them do not have road at all. Because of this, ambulance can not enter to the Kebelles which in turn facilitated the death of mothers and children during labour time.

B) Roles of Farmers, Governments and NGOs in Improving Agricultural Productivity

According to the discussants explanation farmers, governments and NGOs have played a vital role in improving agricultural productivity. According to the discussants governments and NGOs played a vital role in providing agricultural inputs like fertilizer, motor pump, chemicals (pesticides), agricultural experts, and good agricultural policies and strategies. The farmers on their part have played a significant role by taking the agricultural inputs provided by government and NGOs and by accepting the policies and strategies. According to the discussants, accepting the policies and strategies of agriculture means having possibility of good implementation process in the agriculture. However, the roles of farmers, governments and NGOs faced difficulties through the lack of access of the agricultural inputs including the credit service that facilitate their productivity and the lack of availability of AEW in the 'Kebelles'. The farmers have a great problem in the utilization of credit service. It is better that providing farmers with agricultural inputs like motor pump, pesticides, fertilizers, agricultural equipments and foreign animals rather than credit service to buy the whole agricultural inputs. But, the provision of agricultural inputs should be in credit not as gift because; the farmers became good workers in order to return their credit.

The other difficulty that challenged the roles of farmers, governments and NGOs was lack of AEW in the 'Kebelles'. According to the discussants, it is better nowadays the number of AEW in the 'Kebelles'. Each 'Kebelles' had at least three AEW. However, there had been shortage of AEW in the whole Wereda.

It is not proportional with the number of farmers. For instance, the office of agricultural and rural development of Hintalo-Wajirat Wereda required above 45 AEW but, it had only 16 AEW which brought burden and boring of the work in the AEWs. This resulted in migration of the AEW from their work place to other work places in order to seek better benefits and position. Other reasons for the migration of AEW to other work place are lack of educational facility in the Wereda, absence of good benefits to the agricultural experts. Generally, the AEW was migrating to seek better things in other work places.

C) Reasons for Diminishing/ Increasing of Productivity from Year to Year

There are many reasons for the diminishing or increasing of agricultural productivity from year to year. First, let see the reasons that diminishing agricultural productivities. The discussant explained many challenge that affecting agricultural productivity. Some of these challenges were repetitive of famine and drought because of the deforestation occurred in the Afar region, absence of preserving and protecting farming land, absence of ploughing farming land properly, absence of avoiding weeds on time, high number of population, deforestation of the forests for the purpose of constructing roads and home by the government and farmers, the nears of the Wereda to the rift valley, bad weather condition i.e. the rainfall starts late and stops earlier, salting and bad soil nature, flooding and winds. Particularly the location of the Wereda has vulnerable for the diminishing of agricultural productivities. Its location is called eastern hemisphere. This hemisphere is well known in the absence of forestations.

Generally, absence of agronomy practice and lack of understanding in the farmers about the importance of avoiding weeds i.e. the farmers did not understand that the existence of weeds reducing the product from 25-30%. According to the discussants, the reasons that increasing agricultural production were demanding of agricultural inputs, creating awareness both on the farmers and agricultural experts, conserving water and soil, preserving the environment by planting plants and accepting the policies and strategies of agriculture. However, according to the discussants, in Hintalo-Wajirat Wereda production did not increased that much or there had been no significant increment.

D) General Suggestions Concerning AEP

For the above mentioned AEP challenges the discussant suggested many solutions that improve the implementation of AEP. Some of the remedies were the existence of quality policies and strategies. The discussants suggested that the policies and strategies of agriculture should prepared by the federal government.

But, when the policy prepared it should be take into account every layers of the communities. Or the policy preparation should be based on the bottom-up approach of designing policy. That means when policy makers design the policies and strategies of agriculture, they should take into account the conditions that affect the policies and strategies in the implementation process.

By now, there are some difficulties that affect AEP such as lack of awareness on the farmers and agricultural experts and having many steps to take agricultural inputs. For these difficulties the discussants suggested solutions i.e. striving for changing the farmers and agricultural experts' attitude and minimizing the process to take agricultural inputs. The discussants explained that when some one wants to take credit from the Relief Society of Tigray (REST) there are many boring steps or process. According to the discussants such process should be eliminated.

3.5. Key Informants Interview Analysis

A) Interview with the Vice Head of Agricultural and Rural Development and Process Owner of Agricultural Research and Extension Service of Hintalo-Wajirat Wereda

i) The Role of Hintalo-Wajirat Wereda Agricultural and Rural Development Office in Increasing Agricultural Products

As office or organization, it plays a pivotal role in increasing agricultural production. According to the vice head of agricultural and rural development and process owner of coordinator of agricultural research and extension service interviewee explanation:

> *'Our office is conducting agricultural activities with the collaboration of farmers. As organization, it plays a vital role in increasing productivity, changing the awareness of farmers, creating opportunity to the farmers to familiarize with modern agricultural innovations, giving trainings concerning managerial skills, providing agricultural inputs like fertilizers, natural compose, technical support regarding how to apply new agricultural technologies, distributing the AEW to the 'Kebelles' levels in all branches like crop experts, irrigation experts, natural resource protection expert, livestock resource expert, and providing trainings to the AEW when new agricultural technologies arrive.'*

Concerning the practice of AEP in Hintalo-Wajirat Wereda in the last six years, it was some what good. According to the interviewee explanation:

> *'From 1998 or the renaissances period up to now to secure the farmers food security in particular and the whole people in general we executing household oriented package. The household oriented package particularly focused in irrigation, crop cultivation, reproducing animals including hens and bees. The household oriented package activities were conducted based on research. In doing this, first we registered the household's total assets, and then we asked after a year how much the farmer's assets increased without their cost or through reducing their cost from the total gain. Accordingly, out of 24000 rural households 42% of them assert food security at household level. After the introduction of BPR we attempted through relating all agricultural activities to conducting intensive agricultural program. Especially, through increasing the number of farmers became members in agricultural package, increasing agricultural inputs and restructuring the managerial arrangements.*

For instance, we have two groups that are expected to facilitate agricultural activities in terms of management. These are the first branch called network that consists five members. Out of these five members, one of them expected to be from the model farmers. The second branch was the development group that consisted of twenty five members. Therefore, one development group is made up of five network branch. We are doing in well manner even we prepared for the development and transformation plan starting from this year or 2010. The slogan of the development and transformation plan is by flooding agricultural product we should alleviate poverty. That was why, in 2010 from what we have or from 36, 107 hectare in the first round we irrigated 4420 hectare through irrigation.'

When the researcher asked the interviewee the question that how do you relate AEP with productivities. The interviewee explained that:

'The aim of agricultural and rural development is to eradicate poverty from our country. Eradication of poverty means increasing agricultural productions and having good management skill of using the products. AEP is also one of the means to achieve the aim of agricultural and rural development i.e eradicating poverty by increasing productivity. Therefore, it is the AEP that motivates farmers in using fertilizers that enable farmers to yield good amount of products, harvesting drought resistance seeds, and creating awareness on the farmers. All these also play a vital role in increasing agricultural production. Therefore, AEP have a direct relation with productivities. Particularly in this time, there is enough provision of agricultural inputs like fertilizer, exotic seeds, pesticides to avoid weeds and tablet for the treatment of animals that provided by the core process of the provision of agricultural inputs. The difficulty is absence of demanding the agricultural inputs on time.'

ii) Major Challenges Affecting the Implementation of AEP

As already mentioned, in all the analysis part in the paper, there had been many challenges that affect the implementation of AEP. The vice head of agricultural and rural development and the process owner of agricultural research and extension service explained that:

' The first and serious factor that affecting the implementation of AEP is lack of behavioural change that leads to extensive deforestation of forests, the traditional and backward outlook of the farmers possess for a long period of time, absence of capacity regarding how to use the new agricultural inputs and technologies, absence of well infrastructure that helps the agricultural experts to help the farmers closely, absence of supervising when new agricultural inputs and technologies were applied, absence of providing agricultural inputs and technologies what the farmers needs, high price of the agricultural inputs and technologies, and lack of agricultural experts in terms of their quality and quantity.'

According to the interviewee, these mentioned factors are not the only factors that affect the implementation of AEP rather they are the fundamental factors that seriously appeared in Hintalo-Wajirat Wereda.

iii) Sharing of Experience with Others Related to the Performance of AEP

Sharing experience is obviously helpful for the effective implementation of AEP. Particularly best practices should be shared. For instance, if one farmer required using fertilizer, it is better to see first the significance of fertilizers rather than using it without observing its contribution in the agricultural production.

Like other Weredas, Hintalo-Wajirat Wereda sharing experiences with others related to the performance of AEP. According to the vice head of agricultural and rural development and the process owner of agricultural research and extension service interviewee explanation:

> *'We shared experience with others regarding the performance of AEP. Such sharing experience was conducted at different level. The one and best sharing of experience was conducted within or at Wereda level. To get ride of poverty we make farmers to observe others best practices. There are many things that help us to facilitate sharing of experience such as the construction of FTCs, letters and meetings of model and ordinary farmers. We attempted to show our best practices to others and we expanded our best practices to other Weredas. Generally, we made sharing practices within our Wereda, out of our Wereda i.e with other Weredas of our regional state and with Weredas of others regional states. Most of the sharing experience was related to natural resource conservation, manufacturing of market oriented crops, good irrigational activities. The primary objective of sharing experience is to overcome our farmers from poverty and make them richer and investor. So, we have many farmers changed themselves from poorer to richer and from richer to investor.'*

B) Interview with the Process Owner for Agricultural Research and Extension Service Core Process of Tigray Regional State

i). Mechanisms of Measuring of the Woreda Agricultural Activities

There is a national and regional agricultural plan and policy. Next to the regional agricultural plan and policy there is Zonal, Wereda and 'Kebelles' agricultural plan and policy. The Regional, Zonal, Wereda and Kebelles agricultural plan and policy emanates from the federal government agricultural plan and policy. Their basic objective is that to increase the per capita of individuals to two and above US Dollar per day. The criteria for measuring activities of farmers are the farmers' total assets and the ecological nature of the region. According to the interviewee explanation, all layers of government have linkage and each layer has its own mechanism to control the activities of the layers under them in ordered to achieve the basic objective of the layers'. The interviewee explained that:

> *'As a region we have our own mechanism to control and observe of the Weredas agricultural activities. It is obvious that the Wereda has its own objective, plan, policy and budget. Therefore, we attempted to observe whether they are exercising their objective, plan, policy and budget or not. If they do not achieve the objective, plan, policy and budget we ask them the reasons that did not enable them to achieve their objective, plan, policy and why did not use their budget effectively. If it is because of shortage of agricultural inputs and other challenges, through the supervision and support system or by the general post command we attempt to fill the gap by providing agricultural equipments, logistics, or agricultural inputs. We also provide technical support commonly by the subject matter experts. Then after, if there is other problem beyond the experts, we get feedback from the Woreda and accordingly we provide trainings to the agricultural experts.'*

ii). Absence of Decentralization of Power as Factor that Affect AEP

There are three types of decentralization. These are political, administrative and fiscal decentralization. When the researcher asked to the interviewee that does you budgeted enough amount of budget that could facilitates AEP. The interviewee said:

> *'We have decentralization power. Therefore, being we have decentralized power, the Wereda has its own government, as a result of this; it has its own plan, budget and resource. The Wereda is only expected to claim when new projects are conducted in the Weredas and when the Federal Government have additional budget to build the capacity of the Weredas and to pilot the projects we directly send to the Wereda.'*

iii). Major Challenges that Affect AEP

As already mentioned in all the analysis there had been many challenges that affect the implementation of AEP. The process owner of agricultural research and extension service in the regional state mentioned many factors that affecting the implementation of AEP. Some of the factors according to the interviewee explanation were:

> *'There are many challenges that affect the implementation of AEP. Some of the challenges or factors that affect AEP were absence of FTCs construction, absence of enough infrastructure like educational, health care centres, transport, electricity, pure water, and telecommunication supply; absence of research centres, lack of technological adaptation, supply, implementation and utilization; lack of awareness and responsibility and initiation or commitment on the agricultural experts and farmers, problem of monitoring and evaluation, lack of capital during implementation and absence of best practices particularly best practices of farmers and research centres.'*

According to the interviewee to measure the competency of the Woreda's agricultural and rural development they face challenges which in long run negatively hampered the AEP. According to the interviewee explanation:

> *'We tried to measure the competency of the Wereda agricultural and rural development through two mechanisms. The first one was seasonal i.e per 3, 6, 9 and 12 months evaluation whether they achieving according to the plan they layout. That is how much was the beneficiary of the program and how many of them use technologies. So, through the supervision and support centres we measured whether the number of the beneficiary of AEP and technology users increased or not. The impact assessment by the financial and economic development office of the Wereda was also the second means of measurement for the competency of the Wereda in terms of AEP. Generally, at the federal, regional, zonal, Wereda, and Kebelles level different measuring mechanisms were applied.'*

iv). The Implementation of AEP in the Last Six Years

The implementations of AEP in different regional states have some sort of similarity. Tigray regional state also attempted to implement the AEP through using the households oriented package approach. According to the process owner of agricultural research and extension service of the regional state explanation:

> *'We tried to implement by using the households package approach including the provision of credit service, crop cultivation, irrigation development, livestock resource and natural resource conservation. That means the regional state attempted to implement the AEP by taking into account the above mentioned agricultural services for last six years. In addition to the above mentioned agricultural services we tried to implement the AEP through building or developing the capacity of agricultural experts and farmers, expanding and strengthening the FTCs, through providing long and short period trainings to all agricultural stakeholders, developing centres of agricultural researches, and expanding infrastructures in all Weredas. However, the AEP was implementing by giving more attention to crop cultivation. Therefore, out of the whole AEP 69-70 of it covers crop cultivation. In addition to this, the regional state gives serious attention to using traditional and modern fertilizers, agricultural technologies, protecting the seeds and animals from disease and providing quality and enough amount of agricultural inputs on time in order to have effective implementation of AEP.'*

According to the explanation of the interviewee nowadays there are some sort of improvement in the amount of production and other practices. For instance, the interviewee explained that:

> *'In last few years or before 2005 our production was estimated about 11.3 m quintal by now or 2010 it reaches or growth into 34 m quintal. We had 15,000 hectare land that irrigated by irrigation by now it reaches or growth into 100,000 hectare. In addition to this, there is an imaginable change in the protection, reforestations, and preservation of natural resource through mobilizing the community. In addition to this, there is a condition of avoiding the free (open) or over grazing of land. Animals by now are found in good condition in their feeding system and the water it drinks has quality which is never seen before. Hybrid and protecting the animals from disease was also another means that helps us to improve the implementation of AEP. Particularly, with reproducing and development of bees we are working seriously that helps us to the effective implementation of AEP. So, by now the amount of honey, milk and meat has been increasing alarmingly. Generally, because of the existence of good implementation of AEP based on 2004 research in the regional state showed that there had been 25% of the people beyond the poverty line where as 75% of the people were under poverty line. Contrary to this, by now 67.2% of the people were beyond poverty line while 32.8% of the people were under poverty line.'*

In conclusion, as it is explained in detail in the data presented above, different views and ideas were raised concerning the factors affecting the Agricultural Extension Program (AEP) by interviewees and focus group discussants. Beside this, participants involved in the study have also discussed the understanding of AEP by farmers and agricultural extension experts, roles of stakeholders in improving agricultural productivity through implementing the AEP, the way the farmers became model farmers, the balance between efforts and gains for the farmers in implementing the agricultural extension program, challenges of AEP and the suggestions how to improve the program of agricultural extension in Hintalo-Wajirat Wereda.

With regards to the understanding of farmers about the AEP, the study report showed that there are some improvements in the understanding of the program and implementing it accordingly among the farmers. However, the trend and speed of creating sufficient awareness among the farmers is not remarkable. Beside this, the agricultural extension officials admitted that there is a gap between the required knowledge of farmers about the AEP and the current understanding of the farmers. Therefore, they indicated that they were planning to flourish a conducive environment for creating a sufficient understanding of the program among the farmers. To this end, the researcher believed that absence of sufficient understanding about the AEP among the primary implementers i.e. the farmers could affect the proper implementation of the program. Therefore, he advocated that there should be a mechanism to create a better awareness among the farmers for successful implementation of the program in the study Wereda. Concerning the roles of the stakeholders in the implementation of AEP, respondents of the agricultural extension workers involved in the study indicated that they were deeply involved in the implementation of the program in the study Wereda. However, they also mentioned that different problems such as absence of incentives and weak community acceptance put pressure not to effectively perform the roles they were expected to fulfil. Beside this, the disparities among the farmers on the understanding of AEP made the efforts of some of agricultural extension workers weak in promoting the components of program. Therefore, these conditions as the researcher argues should be corrected in order to effectively implement the program in Hintalo-Wajirat Wereda.

Some of the model farmer respondents involved in the interview indicated that they became model farmers because they were implementing the packages of the AEP effectively. In contrary, some other model farmer participants argued that they became model farmers because they were accepting the agricultural inputs that the government provided through the agricultural office. With this regards, the agricultural extension experts of the Wereda argued that any farmers becomes model if and only if he/she demonstrates his/her efforts in increasing agricultural productivity through implementing the packages of the AEP and shows his/her examplinery agricultural works to other farmers.

When the balance between the efforts and gains of the farmers in the implementation of the AEP is taken, two major contrasting arguments were mentioned by the farmers. Some of the farmers indicated that the gains they were getting through implementing the program of extension outweighed the efforts they were exerting. But some of the other argued that the efforts they exercised in the implementation of the AEP overshadowed the gains they secured.

With this regards, the researcher believes that the AEP, if strictly implemented, could offer a better and improved gains to farmers with proportional efforts. Therefore, he argued that farmers in the study area must understand the core components of packages of the program and implement it with the proper helps of agricultural extension workers to get fruitful gains. The study respondents in the interview and focus group discussion mentioned that there were many challenges that hindered the proper implementation of the AEP in Hintalo-Wajirat Wereda.

Among these challenges, the pressure on the farmers and agricultural extension workers to do what they do not believe in it, provision of new agricultural technologies without consulting the farmers, weak awareness of the farmers about AEP, insufficient capacity of agricultural extension workers in convincing the farmers and irregular and untimely supply of agricultural inputs were the major.

In addition to these, insufficient supply of infrastructure facilities and office equipments was mentioned as basic challenges in the implementation of AEP in the study Wereda. The study respondents indicated for instance that the availability of health care centres, educational institutions, pure water and electricity supply in general and transport facility and daily perdium in particular were not promising. Absence of research centres, lack of technological adaptation, lack of awareness and responsibility and initiation or commitment on the part of agricultural experts, problem of monitoring and evaluation of the program, absence of sufficient capital during the implementation of the program and absence of best practices particularly best practices of farmers and research centres were also jeopardised the effective implementation of the program in Hintalo-Wajirat Wereda.

In order to mitigate the above indicated challenges and put the implementation of the AEP in its proper truck in the study area, the study participants stressed the following major suggestions. Working according to the guidelines of the AEP, creating better coordination between government and farmers, providing sufficient budget, convincing farmers to effectively apply new agricultural technologies, diversifying the agricultural activities and using fertilizers, avoiding weeds on time, sowing periodically and collect farm products on time from farming land were the major suggestions provided by the respondents. In addition to these, protecting deforestations, conserving water and soil, taking lessons from the past mistakes, uses of water pump and avoiding over grazing of farming land were recommended by the study participants to mitigate the challenges of AEP in the study area.

Creating better awareness among the farmers is a core as they should not celebrate holydays without works and should respect the holydays by engaging in different farming activities. Farmers are also expected to increase the working days than the holydays. In addition to this, the farmers should work together particularly husbands and wives in order to increase their agricultural productivity.

In summary, the researcher agreed that there are certain improvements in the agricultural activities in the study Wereda. However, the improvements are not as such remarkable. Therefore, certain investments in agriculture sector are advisable for better advancement of agricultural activities through drawing the attention of the stakeholders in the agricultural extension program in the study Wereda.

Chapter Four

Conclusions and Recommendations

4.1. Conclusions

The objective of this study was to investigate the factors affecting the agricultural extension program in Hintalo-Wajirat Wereda of Tigray Regional State. It has also tried to assess the roles of the farmers, agricultural experts, government bodies and NGOs in relation to the success of the program implementation. In addition to this, the paper has tried to investigate the benefits of agricultural extension program implementation i.e. its positive impact on the life of the rural community.

To gather relevant information, the researcher used different data collection tools such questionnaires, interviews, focus group discussion and direct site observations. The research respondents were agricultural extension workers, rural households (Program beneficiaries) and key informants who had direct or indirect involvement on the implementation of the program. These data collection tools were used to support one another and to triangulate the information gained from different respondents so that relevant and working conclusion is arrived at.

According to the findings of the study, the implementation of the agricultural extension program has brought promising results in the study Wereda. However, as the research findings has showed, insufficient and irregular provision of agriculture inputs, absence of qualified manpower that implement the program effectively, few number of agricultural extension workers, absence of motivational factors both for farmers and agricultural expertise and absence of credit services for farmers are the major factors that affected the implementation of the agricultural extension program in Hintalo-Wajirat Wereda.

Beside these, weak awareness about agricultural extension program both in the farmers and agricultural extension workers, absence of trainings both for the farmers and the agricultural expertise, absence of model Farmer Training Centres (FTCs) and research centres both in the Wereda and the regional state have also jeopardized the proper execution of the program.

Finally, absence of the involvements of farmers and agricultural extension workers during policy formulation, implementation and evaluation process of the program, repetitive famine and drought, rain-fed oriented farming practice and weak market-information and links for farmers are also the challenges that affected the program implementation in Hintalo-Wajirat Wereda.

4.2. Recommendations

The benefits of the agricultural extension program implementation in Hintalo- Wajirat Wereda as explained in the study and in the conclusion are encouraging. However, it is important to carefully examine the factors that affect the proper implementation of the program and identify possible remedies in timely manner so as to effectively and efficiently implement the program in the study Wereda as well as in the regional state. The recommendations addressed here, therefore, present options for policy implications and practical interventions by the stakeholders of the agricultural extension program in the region in general and the study Wereda in particular to improve the implementation of the program, and thereby increase communities' food sufficiency and security. Hence, based on the study findings, the following major recommendations are forwarded.

1. Mass-education and training to create awareness on agricultural extension program should be consolidated and expanded to grass roots levels, particularly through farmers' education and empowerments. In addition to this, even though the community knows the impacts of the factors that affect the agricultural extension program, they failed to explain the position of man made complicating factors like population growth in aggravating deforestation that in turn leads to the decrement of agricultural productivity. Hence, it is indispensable to raise the awareness of the local people by working together with agricultural development agencies, schools and farmer associations;

2. As mixed farming practices in the study Wereda (crop production and animal rearing) is the core means of economic activity, the concerned bodies (government organs, farmers and NGOs) should:

i. Modify livestock diversity, composition and numbers, especially by focusing on quality than quantity;
ii. Diversify livelihood activities by encouraging off-farm practices;
iii. Modify farming practices and sharing experiences of model farmers by providing different new technologies such as tractors, water pumps and other modern pesticide control mechanisms;
iv. Encourage local natural resource management more effectively by rewarding models farmers;

3. In order to promote better economic activities of the farmers; issues such as access to micro-finance and credit facilities and building social infrastructures should be a policy priority;

4. In order to increase the productivities of the farmers in the study area, concerned bodies (government organs, farmers and NGOs) should actively engage in expanding social infrastructure and providing enough and quality roads, electricity, telecommunication, fertilizers, exotic seeds, motor pumps, qualified manpower and efficient markets;

5. Efforts to support agricultural extension program adaptation, implementation, and evaluation should be based on the understandings of what people are doing on the real ground. Assessing the effectiveness of current coping strategies in minimizing poverty and maximizing the productivity of agricultural practices should also be done in on-going manner. In other words, strategies should be based on local vulnerability and knowledge, and should be community-led;

6. To ensure programs and project activities that promote resilience for agricultural extension program and increase adaptive capacity for the factors affecting the program, it is important to understand which livelihood resources are sensitive to environmental (especially rainfall variability) hazards and which resources are important for adaptation. To mitigate or reduce the impacts of rainfall variability on crop production, the Wereda has to introduce new adaptive (resistant) crops or seeds, conduct subsequent research and assign trained agricultural experts.

7. Ensuring a secure area free of poverty is impossible without dealing with the success of agricultural activities in the study Wereda, hence concerned agents should improve the agricultural extension program and rehabilitate the fertility of the land to have an improvements on agricultural productivity;

8. As long as deforestation and land degradation diminish both the current and future adaptive capacity, as well as livelihood option of the community, policies and strategies on agriculture in general and deforestation and land degradation in particular should be reshuffled and be the agenda of any community forums and discussions;

9. Since the role of religious institutions for agricultural productivity is basic and high in the study Wereda, the local government structures should work closely with religious institutions to encourage the communities to consolidate the culture of forest preservation that help for the agricultural productivity and increasing the working days of a given month in their surroundings;

10. Finally, the promotion of awareness creation, increasing local knowledge and behaviour among the farmers in the Tigray Regional state in general and the study Wereda in particular is essential to have healthy agricultural production and prosperous economy in the region. To advance this, therefore, the role of young population in increasing agricultural production and in promoting economic and social developments should be expanded.

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Appendix I

Addis Ababa University

School of Graduate Studies

Department of Public Management and Policy

Questionnaire prepared for Rural Household

Introduction

Dear respondents,

As a practical requirement of the program, I am now conducting a research entitled **Factors Affecting the Implementation of Agricultural Extension Program- the case of Hintalo-wejerat Woreda in South Eastern Zone of Tigray**. The main aim of this enquiry is to systematically and objectively secure pertinent data and there by investigate the critical factors affecting agricultural extension program. Thus, for the realization of this research your genuine response to the following questionnaires is highly appreciated and the researcher would like to confirm you that the information you provide will be kept confidential and be put in use only for academic purposes. Your answer should reflect only your perception and experience in the area of the subject. I kindly request you in responding to the questionnaires as promptly as possible.

Thank you in advance for your kind cooperation.

Date----------

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

A) General Information of the Respondents

1) Age_____

2) Sex

A) Male B) Female

3) Educational level

A) Illiterate

B) Read and write

C) Primary school completed

E) Secondary school completed

F) Beyond secondary school

4) Religion A) Moslem B) Ethiopian Orthodox Tewahedo C) Catholic D) Protestant E) others

B) Rural Households' understanding and roles

5) What is your level of understanding about Agricultural Extension Program?

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

6) Has the agricultural agents explained what Agricultural Extension Program is to you?

A) Yes B) No

7) Rank the following roles of Agricultural Extension Program? By putting 1, 2, 3… in the space provided?

A) To increase awareness of farmers_____ B) to increase productivity and income_____ C) To familiarize farmers with agricultural skills_____

8) What is the role of the government in improving your productivity through extension program?

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

9) To what extent credit service availability improving your agricultural productivity?

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

10) In which of the aspects Agricultural Extension Program plays a significant role?

A) Introducing new agricultural skills concerning raw planting and irrigation

B) Rearing animal C) in using fertilizer

D) In introducing and producing exotic seeds E) in using pesticides

F) Increase in productivity G) equal to all

11) How many extension workers are working in your Kebelles? _____

12) Is the number of extension workers available in your Kebelles enough to run the activities of Agricultural Extension Program?

A) Yes B) No

13) To what extent extension workers provide the necessary information?

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

14) What do you think regarding the interaction of yours with other farmers?

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

15) Do you agree that areas that have more extension workers are better than those areas that have less extension workers?

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

16) Have you ever suggest any new ideas that help to improve Agricultural Extension Program?

A) Yes B) No

17) Do you agree that credit service can help in improving your productivity?

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

C) Issues related to Access and Training on Agricultural Extension Program

18) Do you have access of credit services from Financial Institutions?

A) Yes B) No

18.1) If your answer is Yes for question number 18, do you return the money on its deadline? _____ .

18.2) If your answer is No for question number 18, why?

_____
_____
_____
_____.

19) Do you believe that providing agricultural inputs is better than credit service to buy agricultural inputs?

A) Yes B) No

19.1) Put your reason for any of your answer in question number 19?

_____
_____
_____
_____.

20) Have you ever taken any training in your tabiya's Farmer Training Centre on the way you apply agricultural technology?

A) Yes B) No

21) Have you ever faced any difficulty in using the new agricultural skills and ideas?

A) Yes B) No

21.1) If your answer is Yes for question number 21, who provides the solutions to you?

_____
_____
_____
_____.

21.2) If your answer is No for question number 21, why?

_____
_____
_____
_____.

22) Are extension workers available at any time when you want them?

A) Yes B) No

22.1) If your answer is No for question number 22, why?

_____
_____
_____
_____.

23) What is the approach of extension workers in the dissemination of agricultural skills or knowledge?

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

D) Issues concerning Benefit and Challenge of Agricultural Extension Program

24) Who helps you to be member in Agricultural Extension Package?

A) By yourself B) Through the extension workers' persuasion

D) Via observing the benefit of the packages C) By the force of government organs from your neighbourhoods

25) Have you ever taken any reward from government that encourage you to do more?

A) Yes B) No

26) What kind of problem have you encountered in agricultural activity? Rank the problems according their severity by putting 1, 2, 3, 4… in the box?

A) Lack of extension workers ☐ B) weak approach of extension workers ☐
C) Lack of credit ☐ D) lack of access in agricultural inputs ☐

26.1) If there are other reasons mentioned here under?

_____
_____
_____.

27) How were the following things in increasing agricultural products in the last five years? Tick in the space provided?

A) Intervention of government in agriculture High_____ Less_____

B) Weather conditions Good_____ Bad_____

C) Awareness of farmers in using technology High_____ Less_____

D) Extension workers in farming area More_____ Less_____

28) What is the level of productivity in the last five years? Put each year according to their amount of production?

A) High production years 1) _____ 2) ____ 3) _____ 4) _____ 5) _____

B) Average production years 1) _____ 2)____ 3)_____ 4)_____ 5)_____

C) Low production years 1) _____ 2) _____ 3) _____ 4) _____ 5) ____

29) What factors affect your farming activity?

1._____ 4._____

2._____ 5._____

3._____

30) Do you think that fertilizer would affect the quality of farming land in the long run?

A) Yes B) No

31) How far is the Tabiya's Farmer Training Centre from your home? Specify in kilometre

_____.

Appendix II

Addis Ababa University

School of Graduate Studies

Department of Public Management and Policy

Questionnaire prepared for Agricultural Extension Workers

Introduction

Dear respondents,

As a practical requirement of the program, I am now conducting a research entitled **Factors Affecting the Implementation of Agricultural Extension Program- the case of Hintalo-wejerat Woreda in South Eastern Zone of Tigray**. The main aim of this enquiry is to systematically and objectively secure pertinent data and there by investigate the critical factors affecting agricultural extension program. Thus, for the realization of this research your genuine response to the following questionnaires is highly appreciated and the researcher would like to confirm you that the information you provide will be kept confidential and be put in use only for academic purposes. Your answer should reflect only your perception and experience in the area of the subject. I kindly request you in responding to the questionnaires as promptly as possible.

Thank you in advance for your kind cooperation.

Date----------

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

A) General Information of the Respondents

1) Age_____

2) Sex

A) Male B) Female

3) Educational level

A) Primary school completed

B) Secondary school completed

C) If you are beyond secondary school tick in one of the following?

1) Certificate_____ 2) Diploma_____ 3) Degree_____

4) Religion- A) Moslem B) Ethiopian Orthodox Tewahedo C) Catholic D) Protestant E) others

B) Agricultural Extension Workers' Understanding and Roles

5) What is the level of your satisfaction regarding Agricultural Extension Program training?

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

6) What is the attitude of farmers in using technological skills and ideas related to agriculture?

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

7) What is the response or sense of the farmers towards your contribution or the program?

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

8) What do you think concerning the role of agricultural expertise at all levels (i.e. Federal, Regional, Zonal, Woreda and Tabiya)?

A) Increased from year to year B) Decreased from year to year

C) Issues related to Access and Training on Agricultural Extension Program

9) Do you think that farmers will be successful, if they are given agricultural inputs than credit?

A) Yes B) No

9.1) Explain your reason for any of your answer for question number 9?

_____
_____
_____.

10) Is the Tabiya you are assigned accessible to transport?

A) Yes B) No

10.1) If your answer is Yes for question number 10, what do think is the importance for your work?

_____
_____
_____.

10.2) If your answer is No for question number 10, how does it affect your work?

_____
_____
_____.

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

A) Yes B) No

D) Issues concerning Benefits and Challenges of Agricultural Extension Program

12) Rank the access obtained when you made a field trip by putting 1, 2, 3, 4… in the box?

A) Access of mini hotel ☐ B) access of transport ☐

C) Enough payment of perdium ☐ D) reward for encouragement ☐

13) What do think about the participation of the farmers on training related to Agricultural Extension Program?

A) Excellent B) very good C) good D) slightly good E) insignificant

14) Do you agree that there have been an improvement in the quality of life among the farmers?

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

15) Is the salary you are paid satisfactory?

A) Yes B) No

15.1) If your answer is Yes for question number 15, How do relate it with your work achievement and successfulness?

_____
_____
_____.

15.2) If your answer is No for question number 15, what is the effect for the work you are assigned?

_____
_____
_____.

16) What is the level of your acceptance in the farmers?

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

17) Have you ever faced any rejection from the farmers while delivering your tasks?

a) Yes b) No

17.1) If your answer is Yes, how have you handled and controlled it?

_____
_____
_____.

18) What do think the level of your appreciation to the creative farmers?

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

19) Are there any challenges related to the agricultural extension policy formulation?

A) Yes B) No

19.1) If your answer is Yes for question number 19, list some of the challenges?

_____
_____
_____.

20) Do you think that Agricultural Extension Program has trained the farmers?

A) Yes B) No

21) What do you think regarding the causes that affect Agricultural Extension Program in its implementation process?

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

22) From your experience, what do think the main factors affecting Agricultural Extension Program in its evaluation process?

_____
_____
_____.

23) Do you think that there are challenges, which are stemmed from government organs that affect your responsibility?

A) Yes B) No

23.1) If your answer is Yes for question number 23, list some of the challenges?

1._____ 4._____ 5._____

2._____ 3._____

24) What solutions do you suggest for the above factors that affect Agricultural Extension Program?_____
_____
_____.

Appendix III

Interview guiding questions

A. Interview for Model Farmers

1. How did you become a model in the activity you are engaged?

2. Why others did not become a model farmer?

3. What is the balance between your gain and your effort?

4. How can you explain the gain of agricultural products in the last five years?

5. What advice do you suggest to others that are engaged in small agricultural activity?

B. Interview for Model Extension Workers

1. What roles you play as a model extension expertise for the successful implementation of the program?

2. Did you get any incentives for your strives in the activity you are involved?

3. Which kind of package makes farmers more successful?

4. Are there any disparities in the use of the program in terms of attitude, knowledge and experience among the farmers?

5. What are the major factors affecting the implementation of Agricultural Extension Program?

C. Interview for Agricultural and Rural Development Heads

1. What is the role of your organization in increasing agricultural products?

2. How Agricultural Extension Program was/is practiced in your Woreda in the last five years?

3. How did you relate Agricultural Extension Program with productivity?

4. What are the major challenges affecting the implementation of Agricultural Extension Program?

5. Have you ever been sharing experience of others related to the performance of Agricultural Extension Program?

Appendix IV

Focus group discussion guiding questions

a. Issues for Focus Group Discussion with Household

1) The disadvantage of less extension workers.

2) What is expected of farmers to improve agricultural productivity?

3) The anticipation of farmers from government and NGOs.

4) Reasons for diminishing or increment of productivity from year to year.

5) Difficulty in long distance of Farmer Training Centre.

6) Solutions for the factors affecting agricultural productivity.

b. Issues for Focus Group Discussion with Agricultural Extension Workers

1) Availability of supervisors in your farming area

2) Compare and contrast the provision of agricultural inputs and credit services to enhance agricultural productivity.

3) What major challenges does agricultural extension have?

4) Compare and contrast some of the extension packages

-Rearing animal

-applying new technology

-Using traditional fertilizers

-effective utilization of agricultural products

5) Factors affecting Agricultural Extension Program.

6) Solutions for the factors affecting Agricultural Extension Program.

c. Issues for Focus Group Discussion with Agricultural and Rural Development Officials

1) Understanding of Agricultural Extension Program in Hintalo-Wejerat Woreda.

2) Facility of infrastructure service such as access to transport, education, health, and credit services.

3) Access of agricultural inputs and credit service that facilitate your productivity.

4) Roles of farmers, governments and NGOs in improving agricultural productivity.

5) Availability of extension workers.

6) Where Agricultural Extension Program's policy is formulated?

7) By who if it prepared Agricultural Extension Program will be better?

8) Major challenges of Agricultural Extension Program.

9) Reasons for the diminishing /increment of productivity from year to year.

10) General suggestion concerning Agricultural Extension Program.

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented in this or any other university and all sources of materials used for this thesis have been duly acknowledged.

Name _____

Signature _____

Date_____

Place **Addis Ababa University**

This thesis has been submitted for examination with my approval as university advisor.

Name of Advisor_____

Signature _____

Date _____