

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**THE ROLE OF RURAL COMMUNITY TRAINING IN AGRICULTURAL
PRODUCTION AND HOUSEHOLD FOOD SECURITY
*THE EXPERIENCE OF AGRI-SERVICE ETHIOPIA (NGO)
IN BALE ZONE***

BY: TEMESGEN AKLILU WORKU



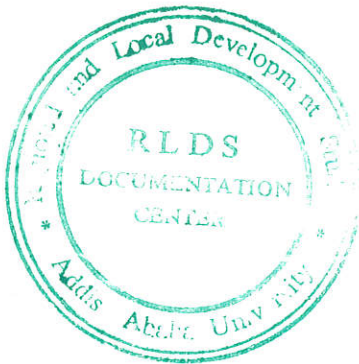
*Community training in skill promotion training program of poultry production
(Photo: Courtesy of ASE, 2001)*

JUNE 2001
ADDIS ABABA, ETHIOPIA

**THEROLE OF RURAL COMMUNITY TRAININGIN
AGRICULTURAL PRODUCTION AND HOUSEHOLD FOOD
SECURITY:**

*The experience of Agri-Service Ethiopia (NGO) in Bale zone
Oromia regional state*

**A Thesis presented to the school of Graduate Studies,
Addis Ababa University.**



In partial fulfillment of the requirement for the degree of Master of Arts in Regional and
Local Development Studies

BY
TEMESGEN AKLILU WORKU

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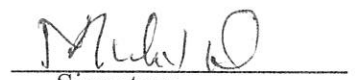
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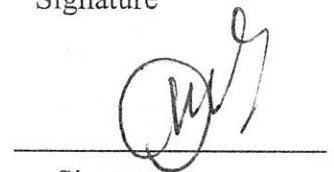
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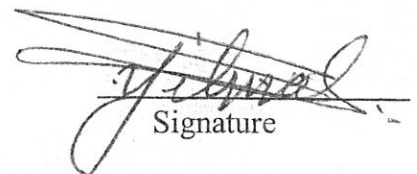
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Acknowledgement

First and for most my gratitude and appreciation is to Dr. Mulat Demeke, my academic advisor for his heartfelt encouragement and initiating me to write on such a vast, complex topic, but interesting and current issues. He is always with me from research proposal up to the final thesis work with constructive, precious comments and correcting all the necessary work of my thesis.

My acknowledgement is also to Agri-service Ethiopia local NGO for its generous and genuine support in terms of finance, providing secondary data and logistic support in the field survey of the study. I am particularly grateful to Ato Getachew Worku, Ato Seid, Ato Amanuel, Ato Haile Kefene, Ato Girma Sida, Ato H/Silassie, Ato Negesso and other staffs.

I am very grateful to the following organization for their provision of secondary data: Agricultural Bureau of Oromia at regional, zonal and woreda level, planning and economic development department of Bale zone, labour and social affairs department of Bale zone, EARO, DPPC head office.

And I am thankful to Addis Ababa city Administration and my organization-Transport and communication bureau of Addis Ababa for sponsoring my education. I want to express my appreciation to department of RLDS and its all staff for all of their committed facilitation in my research writing and for the last two years stay in the department.

I am indebted to my brother Ato Ayen Tamirat (Abagada Korme) for his unlimited and continuous cooperation, during my hardship time, from the beginning of research up to the binding of the paper. I am glad to express my thanks to Ato Workneh Tiku, Girmay Kelelom(PCtown), Ato Bekele Hundie and Ato Negussie Teferra for their professional and skillful support and Eshetu Bekele for editing the paper. I am also grateful to my executive secretary- W/ro Yamrot Ageze for typing and coordinated support in the thesis writing.

Finally but not the least, I want to appreciate heartfelt support of my family especially my wife W/ro Taitu Kitata, my brother Dr. Alemayehu Aklilu, Ato Tomas Dega and all other my parent, brothers and sisters, and genuine friends- Ato Gizachew Abate, and Ato Umar- staff of road transport department of Bale zone.

Researcher

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Acronyms

ABW	African Boll Worm
ADLI	Agricultural Development Led Industrialization
AOTP	Action Oriented Training Program
ASE	Agri - Service Ethiopia
CA	Credit Animators
CADU	Chilalo Agricultural Development Unit
CBO	Community Based Organization
DA	Development Agent
DC	Development Center
DPPC	Disaster Prevention and Preparedness Commission.
EPID	Extension and Project Implementation Department
FAO	Food and Agricultural Organization
FSWC	Forestry Soil Water Conservation
GART	General Awareness Raising Training
GDP	Gross Domestic Product
GRO	Grass Root Organization
Ha	Hectare
IDCI	International Development Cooperation Institute
IRDp	Integrated Rural Development Program
Kcl	Kilo Calorie
KG	Kilo Gram
LDCs	Less Developing Countries
MEDaC	Ministry of Economic and Development and Cooperation
MT	Metric Tone
NCP	Natural Crop Protection
NGDO	Non-Governmental Development Organization
NGOs	Non-Governmental Organization
PA	Peasant Association
PADETES	Participatory Demonstration and Training Extension System.
PEACE	Poverty Eradication And Community Empowerment
Qt	Quintal
RPO	Regional Project Office
RRC	Relief and Rehabilitation Commission
SNNPRS	Southern Nation and Nationality People Regional State
SPT	Skill Promotion Training
SSA	Sub Saharan African
T&V	Training and Visiting
UN	United Nation
VLDP	Village Level Development Partner
WADU	Walaita Agricultural Development Unit.

Abstracts

This paper comprises all rounded analysis of literature and empirical results of the impact of community training on household food security. The study is based on Bale zone three woredas-Gassera Gololcha, Ginir and Goro. These *woredas* are preferred because Agri-service Ethiopia, local NGO, has been providing rural community training for selected farmers through its integrated rural development program since 1987. Highland area of Bale is taken as potential area for agricultural production. Despite its potentiality, Bale zone is not thoroughly studied to maximize its potential. As a result small-scale farmers are less access to modern technology and methods of farming to change their life style. Consequently, this study focused to deal with the role of community training on participant household agricultural production and food security. Comparing approach of participant and non-participant farmers is applied to indicate the differences between the two groups of farmers. Primary data collection is undertaken in January 2001 from the *woredas*, *Kebeles* and villages equally fifty percent from participant households of Agri-service Ethiopia and non-participants.

Discussion and analysis of the finding is made both qualitatively and econometrically. The basic data analysis of age, sex, educational status, ethnic group, religion of household head and family size was made. Agricultural production activities of-cereals and pulses (main crop), garden, tree crops and livestock production, input utilization and finally consumption pattern of two groups of household is thoroughly investigated. In addition to these, based on their main crop production, those households food secure and insecure are distinguished. The factors that determine the status of household to be food self-sufficient are also econometrically measured.

The results of the study indicate that the impact of community training provided for farmers is with less (insignificant) impacts on the main crop production compared to non-trained farmers. The role of training is reflected on natural resource conservation, garden and tree crops, input utilization rate and production of poultry and bee-keeping production and quality of livestock. Crop damage that faced participant farmers is one cause that reduced the positive impact of community training.

Empirical analysis indicated that 32.7 percent of participant farmers and 25.7 percent of non-participants are found to be food insecure at 2100 Kcal minimum calorie requirement using main crops production. The status household food self-sufficiency is highly negatively correlated with family size; crop loss (damage) occurred and improved seed used. The status of food security is also strongly positively correlated with cultivated land, asset sold by household and fertilizer input used.

Finally, therefore, the strategy to apply family planning in rural households and supplying disease and pest controlling improved seeds, which help to reduce the risk of crop damage. Since cultivated land size is one of main determinants to attain food self-sufficiency farmers with small size of lands should benefited with access to non-farm activities for diversification. Farmers should be oriented to keep and improve the natural quality (fertility) of their cultivated land

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Food is the source of energy for the maintenance of life. Throughout history the primary concern of all civilizations has been to produce adequate supplies of food. The years 1945 to 1952 were characterized by the problem of food insecurity in Europe. And in 1960s the Asians were taken as the highest risk area and extremely vulnerable. Between 1960-62 23 to 30 million Chinese died as a result of famine. But soon, the Green revolutions, land reform and poverty reduction measures in most developing countries enabled the reduction of chronically underfed persons from 36 percent in 1970, to 20 percent in 1990. Children under age 5 undernourished reduced globally from 42 percent in 1975 to 32 percent in 1990s. This improvement in food and nutrition was rapid in Asia and Latin America than in Sub-Saharan Africa. Presently, more than 150 million children under five are underweight and more than 200 million are stunted globally.¹

The world summit for social development and Rome world food summit of 1996 aimed its targets to reduce world poverty and under nutrition and to attain food security by 2015 (FAO, 2000:2001). The latest indications of world food situation show a slight increase in magnitude compared to 1999. According to Bulletin of FAO September 2000, No.4, cereal crops production up to September 2000 was estimated to be 1881 million tones. This figure is 6 million tones, or 0.3 percent, above the revised estimate for 1999.

¹ : FAO, 2000, The state of food and agriculture: Lessons from the past 50 years Rome, Italy

At this level, output would be 9 million tones below the expected utilization in 2000/01, causing cereal stocks to be drawn down by 6.5 percent to their lowest level since 1996/97. As a result, the ratio of global cereal stocks in 2000/01 to trend utilization the following year is set to slip slightly below the 17-18 percent range that the FAO considers the minimum necessary to safeguard world food security with the bulk of the 2000 cereal harvests now underway or already completed, the over all global situation is unlikely to change significantly for the year.²

Despite this slight increase of cereal crop production globally, there are about 36 countries of developing world as of end-August 2000 that are facing serious food insecurity. Out of these countries the larger share is found to be Sub-Saharan Africa. Kenya with a population of 3.3 million, Eritrea with 1.5 million, Ethiopia with 10.3million, Somalia with 750,000 people, and in Sudan, Tanzania and Uganda with total people of 3.7 million need food help. Almost all of them are found in Eastern Africa. The problem is complex, having social, economic and technological aspects. In this region (LDCs), population growth outpaces food supply, per capita income is low, and investment is found at low stage and misallocated or redirected from agricultural sector, despite the domination of agrarian economy.

The world food crisis also results from crop failures, inefficient food supply systems, maldistribution of food among the society, and geographic and climatic restrain. Around 1998, more than 800 million of the people of less-developing countries do not have enough food to meet their nutritional needs.

² : FAO, Sept. 2000, No 4, Food outlook Journal, P:3, Rome Italy.

The situation in (SSA) Africa is becoming worse. By 2020, the continent will face a shortage of 250 million tones of food (Getachew et al (ed) 1998:4). The situation in 1990s had been declining in terms of food security compared to the earlier period of 1950 to 1990. In the past, in Africa perceptual food production has declined by about 20 percent from 1960 to 1984 (UN, 1984: 2). Most sub Saharan countries are characterized by the persistence of food shortage for decades. Out of these countries, Ethiopia has been strongly attacked by prolonged food insecurity, particularly after early 1970s. According to MEDaC-1999, food insecurity in the country is expressed as follows:

Food insecurity in Ethiopia currently covers a large area and a significant number of people. As evidenced from different sources, the size of the food insecure people has varied between 40 percent and 50 percent over the last decades. It is highly correlated to decline in food production....Per capita food production is very slow compared to population growth...It showed average decline of 2 percent per year from 1979/80_1995/96. That is per capita production in 1979/80 was 200KG, where as, this amount reduced to 150KG during early and mid 1990s.³

One of the main reasons for such a prolonged problem is high dependency of agricultural sector on rain-fed agricultural system. This dependency on natural rain created instability in agricultural production because the rainy season is unreliable and is influenced by global climatic condition. Consequently, the farming and harvesting agricultural production became unreliable and decreasing.

³ : MEDaC, Sept., 1999, Survey of the Ethiopian Economy: A review of post reform Development (1992/93-1997/98), pp: 196-198, Addis Ababa, Ethiopia.

To change this striking problem of the country, different national and agricultural policies and strategies have been sketched and implemented. One of these strategies is giving great concern to agricultural research, training and extension programs. Accordingly, in Ethiopia agricultural research was started in the 1950s. When agricultural education institutions like Ambo and Jimma agricultural colleges were established. Agricultural training (both community and extension workers training) has also started with the set up of CADU, WADU and others' package programs in 1960s. Similarly, extension service programs that mainly include comprehensive and minimum packages programs have commenced in 1960s and 1970s. Agricultural research, training and extension service is a modern approach to agricultural sector to increase productivity using modern inputs, technology, chemicals and so on. It converts and upgrades traditional ways of farming and non-farming. Experiences of different developing countries show that to be self-sufficient in terms of food, they introduced research, training and extension. Through this activity, India, China and other Asian countries could feed their society even though the outcomes and success could vary from country to country.

It is well known that agricultural research, training and extension (or generally extension) is part and parcel of integrated rural development program (IRDP), which also includes marketing, input supply, credit, rural road construction, water supply, rural electrification, small scale irrigation, and sometimes, social infrastructures like primary school and health centers. According to World Bank, the result of this program had been disappointing between 1960s and mid 1980s in Sub Saharan Africa. The main problems were: lack of coordination among program staffs, the program itself had been working in closed manner, and after the project completed, no follow up from the program office (Venkatesan and Kampen, 1998).

In the history of African agriculture, four types of extension approaches have been implemented in different sub-regions of the continent. These are mainly and originally exercised by former colonizers and later by World Bank and FAO. These approaches are: commodity driven approach, training and visit approach, farmers' participatory extension methodology, and farming systems perspective on extension. These approaches are inter-dependent and sometimes overlap. Out of these, the most currently used approach is training and visiting approach of World Bank. According to Benor, Special Adviser to the Vice presidents of Africa Region in the World Bank (1998)

Extension is now, regarded as an important tool for increasing farmers' knowledge, agricultural production and income. The challenge in Africa ...initially, both research and extension were very weak. National research programs were often isolated from extension and from farmers. Extension services in the ministries of agriculture often lacked focus, good management, and linkages with research. A long way has been gone in addressing these challenges. There is now continuous training for farmers and staffs, and the focus is now on responding to the demands of rural people. New and existing evolutionary trends have been emerging more recently: the informal sector is increasingly active and gradually starting to take responsibility for the delivery of agricultural services. More and more African countries are introducing political and administrative decentralization, which allows for decentralization of extension. These and other changes make extension more accountable to the beneficiaries. In many countries, the stage is set to look beyond extension and to address the entire rural development agenda.⁴

In Ethiopia, CADU, WADU and other package programs of the extension package have been implemented at various level of successfulness. The former extension packages did not hit their target i.e. they didn't reach the interest of small-scale farmers.

⁴: V. Vinikatesan Jacob Kampen, (1998) Evolution of Agricultural services in Sub Saharan Countries, World Bank.

Hence establishing a new institution, EPID (Extension and project Implementation Departments) was reconsidered in 1971 to address the minimum and small-scale packages. During the Derg regime, taking Farmers association as a core for implementation was made after land reform in the form of minimum package programs. As Venkatesan and Kampen have quoted that similar to most Sub-Saharan African countries, one of the extension packages programs- Training and Visiting-was implemented in Ethiopia in 1985 through some modification. The program was not participatory; it was top-down structure as a result of government structure, and the extension works were not efficient.

The present government has also been applying the training and visit (T&V) approach and participatory demonstration and training extension system since 1995. The system was imitated from Sasakawa Global 2000 (SG 2000). From table 1.1 we understand that between the years 1996/97 and 2001/2001, harvesting seasons of course, the progress (changes), which are expressed in percentage in number of packages, was observed. Table 1.1 depicts that due consideration has been given to the extension package. The national reports indicated that the total number of farmers participated in the package in 2000/2001 is about 3.8 million for production, natural resource conservation and development. The table also shows that the main concern is on the food crop production, which constitutes about 76 % of the total package programs between (1996/97-2000/2001).

Table 1.1: Number of participant farmers in agricultural extension packages implemented (1996-2001)

Type of extension package	Production year					
	1996/97 (1)	1997/98 (2)	1999/2000 (3)	2000/2001 (4)	Difference between 1996/97- 2000/2001(5)	% change since 1996/97- (6)=5/1*100
Food crop production package	584343	2122025	2803788	2986768	2402425	411
Additional economic important crop	22504	275156	390242	387160	364656	1620
Animal package development	21511	45064	66812	77071	55560	258
Post harvest	141	216	973	1240	1099	779
Natural resource conservation	9361	544087	545843	341518	332157	3548
Total	637860	2986548	3807658	3793757	3155897	497

Source: 1991 and 1993 E.C. Ministry of agriculture: Agricultural Extension Department Report

It will be informative to show the level of productivity that is obtained using traditional methods and extension packages. The variances of productivity in different regional states can be easily observed in a more understandable ways from the productivity level per hectare for maize, wheat, teff (cereal crop common to Ethiopia), barley and sorghum. The higher productivity for maize was recorded in Amhara regional State i.e. 48 Qt/ha; the average is 40.8 for all regions (table 1.2). Concerning wheat the highest productivity was recorded in SNNPRS, i.e.28Qt/ha, the average is 25.5Qt/ha.

As for the production of teff, using participatory demonstration, the highest productivity was in Amhara Regional State with the production of 20 Qt/ha, the average yield of the regions is (16.5Qt/ha. Concerning sorghum production's productivity level the highest yield was recorded 24Qt/ha in Tigray, and the average is found to be 21Qt/ha. Barley is another type of main crop on which the survey was undertaken. According to this, the maximum yield (23Qt/ha) was recorded SNNPRS in modern extension demonstration. The average of the regions is found to be 19.3Qt/ha. When we compare the traditional way of farming with participatory demonstration production, the traditional farming is almost half or less than half of the demonstration in all types of crops.

Table 1.2: Comparison of extension demonstration and traditional according to the regional average

Number	Types of extension package	unit	Amhara		Tigray		Oromia		SNNPRS		Average	
			Extension demonstration	Traditional	Demonstration	Traditional	Demonstration	Traditional	Demonstration	Traditional	Demonstration	Traditional
1	Maize	Qt/ha	48	25	31	13	41	15	43	13	40.8	16.5
2	Wheat	Qt/ha	26	12	23	10	25	12	28	14	25.5	12
3	Teff	Qt/ha	20	9	16	8	16	7	14	9	16.5	8.3
4	Sorghum	Qt/ha	20	6	24	10	19	14			21	10
5	Barley	Qt/ha	21	9	12	6	21	11	23	13	19.3	9.8

Source: The national agricultural extension package performance report of National extension department of Ministry of Agricultural, 2001

1.2: Statement of the problem:

Ethiopian government issued a national economic policy with the strategy of agricultural-development-led-industrialization (ADLI). The strategy focuses on upgrading the poor performance of the small-scale farmers and traditional farming. Introducing agricultural extension packages into the rural society has been given greater attention since 1996. This objective was seriously considered to enable the farmers to be food self-sufficient and food secure. Farmers were trained or provided some modern ways of farming. It is assumed to be one mechanism that makes farmers more productive on areas where high potential of agricultural production prevailed and to upgrade rural societies and areas where their production activities were in problems.

Different countries' experiences show that rural community training enables farmers to be more productive and food self-sufficient. But the degree of effectiveness of non-formal education for farmers depends on the cultural, environmental, social and economical changes (modernity) of the community. As Schultz indicated in journal of development planning No 19,1989,edited by K. Griffin, and J. Knight, the value of education is likely to be greater in modern environment. In traditional environment modern technology and practices are changing slowly. This implies that the training has less impact in a shorter period than longer one.

Agri-Service Ethiopia has been providing various types of community training for about 8777 household heads found in the three woredas of Bale. As a main principle, ASE has widely involved in providing training. On the other hand, other non-participant farmers of ASE have favour or dis-favour or to get any access to modern agricultural practices.

The non-participants show their initiation to improve their living standards by traditional practice or any modern practices imitated. Likewise the training practices that are provided for farmers by ASE made them more productive and food secured or not, compared to non-participants of ASE? This issue is measured in areas (*woredas*) in Bale where ASE has been involved. Identifying, analyzing and understanding the issue of impact of community training on rural households requires research and the result obtained is proposed to help the national, regional and local, households, organizations or individuals to adjust or improve their prior steps undertaken. Therefore, this paper has been proposed on the basis of this issue.

1.3 Research Question

The core of the study is to deal with the impact of rural community training (non-formal education) on the productivity and food security of rural household. Next to the central issue, analyzing with the effect of the role that is played by Agri-Service Ethiopia in improving the food and household living standard is given due consideration

In order to achieve the above objectives, the major questions that arise in the research include what role Agri -Service Ethiopia has played in attaining rural household food security? What is the impact and relationship of community training to attain food security? What is the household's level of production and Consumption?

1. 4. Objectives of the study

More than eighty five percent of Ethiopian population is a rural society. This society, almost all, depends on small-scale traditional and backward agricultural system, which couldn't bring about changes in the country. To overcome this Ethiopian problem, the government and non-governmental organizations have been operating using different strategies. One of these strategies is community training of farmer households. This study will examine the attempts made by an NGO named Agri-Service Ethiopia to bring about food security for specified project household participants. The overall objective is to assess the impact and significance of community training on agricultural production and food security. The specific objectives of the study are to:

1. Compare and contrast the production performance of beneficiary and non-beneficiary farmers
2. Compare and contrast the food security situation of participants and non-participant farmers.
3. Establish the extent to which training has improved the production performance and food security of farmers.
4. Draw implications for policy makers and actors of rural development

1.5. The research methodology

Data Types, Sources and Methods

Primary and secondary sources were used to generate data concerning the identified attributes.

a. Primary data: The data were collected mainly with the help of structured and semi-structured questionnaires designed for specific area of Bale zone in three *woredas*, where Agri-Service Ethiopia was involved. Additionally, different field observation was made. The paper was designed to include 200 sample households as a whole. The sample size was 100 from beneficiaries and 100 households from non-beneficiaries from nearby areas. The two groups of farmers are proportionally distributed for 3 *woredas* in which Agri-Service Ethiopia was involved. These *Woredas* are *Gassera-Gololcha*, *Ginir*, and *Goro*. The largest share (or 60 %) involvement program of ASE was in *Gassera- Gololcha*. The second *woreda* is *Ginir* in which 2598 households or 30% of the total participants of ASE program are found. The other *woreda* is *Goro*. This *woreda* is where only 903 (or 10 %) households were participants of the program of ASE.

Proportionally the numbers of villages (*kebeles*) included in *Gassera-Gololcha* were 18. In *Ginir* the *Kebeles* were 7 and in *Goro*, their number was 4. A total of 29 *kebeles* were under the program of ASE integrated rural development program. For this survey, we distributed 66% for *Gassera-Gololcha*, a total of 132 households or 9 *kebeles*. The share given for *Ginir* was 2 villages (*kebeles*) and 50 households or 25%. Lastly *Goro* *woreda* shared 1 village or 18 households or 9% of 200 total sample households. The proportional share of participants and non-beneficiary from the households is fifty percent each.

Kebeles were proportionally and randomly selected from each woredas. Similarly, the households under the program of ASE were also randomly selected. And the non-participant farmers were also interviewed and included in the sample survey from nearby but different village areas of the kebeles. And simple random sampling technique was used to identify farmers in terms of their income. Eight enumerators who had adequate experiences from previous works undertook the data collection.

b. Secondary Data: Different valuable information documents are found as the following organization were topped:

1. Zone and Woreda Agricultural office of *Bale* zone.
2. Regional Agricultural Bureau of *Oromia*
3. Disaster prevention and Preparedness of the Nation and *Oromia*.
4. Head Office of Agri-Service Ethiopia.

Processing of Information, Methods of data analysis and Arriving at Conclusion. After all valuable quantitative and qualitative information from all sources were obtained, it was edited, coded, and tabulated. Descriptive analysis and empirical modeling is used to make the necessary analysis and interpretation.

1. **Descriptive analysis:** It includes tabulation, ratio, percentage, and measurements of central tendency like mean, and variability like standard deviation, mean and percentage comparison.
2. **Empirical model:** Out of the alternatives Logit model is used. Logit model is one of non-linear probability models. The model is preferred because of the values representing probability of an events to occur can not be out of the normal (0,1) range.

A non-linear probability model includes the *probit* and the *logit* models. The *logit* model follows cumulative logistic distribution. Its advantage is easiness for meaningful interpretation and it is also converts the probability result that is between (0,1) to odds ratio, which has meaningful interpretation over real number line. In the empirical model the following independent variables are hypothesized to be related to the dependent variable, which is whether the household is being food secured or not. The independent variables are:

1. AGE: Age of household held.
2. SEXHH: Sex of head of household, if the head is male SEXHH =1 and 0 otherwise.
3. FSIZE: Total family size of the household
4. RELIGN: Indicates religion of head of household. If Muslim religion, RELIGN=1, and 0, if orthodox Christian.
5. EDUCDMY: Indicates educational status of head of household. If the education status of the head is Formal education, EDUCDMY=1, and 0 otherwise.
6. CULTLND: Cultivated land size of the main crops of the household
7. ASSETD: If the household sold any of the assets
8. OXEN: Number of oxen owned by household
9. LNDQLTYD: Land quality cultivated. If *Lem* and *Lemteuf*, LNDQLTYD= 1, and 0 otherwise
10. IMPSEEDQ: Quantity of improved seeds used (Qt)
11. LOSPRC: Ratio of crop loss and total production.
12. FERTLIZE: Quantity of fertilizer used (kg)
13. AGRISE: Indicates if the farmer is participant of ASE. If Beneficiary of ASE=1 and 0 otherwise

1.6: Organization of the paper: This paper contains six chapters. The first deals with introduction and background of the topic. The second chapter is about literature review. The third chapter discusses about the role of ASE and NGOs. Chapter four and five concentrate on the study area and the finding of survey. The final chapter is about conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1: The dimension of food security

Food security can be short term or long term. It can be classified at national, regional, local or household level. To achieve this goal, policy makers in developing countries increasingly recognized and implemented that an explicit food policy implementation through a strategy of coordinated programs, a view shared by a donor and non-governmental agencies that work with them. (Gittinger et al, 1987)

Globally the food production can meet the demand of it. But the problem is on the distribution of food products between countries and within a country. For instance between 1950-1990, world calorie supply was above its demand but during this period, more than 100 million people were affected by famine. But this does not mean that a country with food deficit is always food insecure, because the country can allocate its foreign exchange earning to buy food items to feed its citizen.

A new awareness of the problems involved in achieving general economic development and in promoting better nutrition has led to greater emphasis on the relationships between nutrition and the low level of productivity that characterizes the under developed countries. This is a two-way relationship; low levels of productivity limit the quality and quantity of food supplies, and inadequate diets often contribute to poor performance by workers in agriculture and industry (FAO; 1978:2).

The ability of farmers to make use of highly productive inputs depends on a number of factors;

1. Local research and experimentation are required to evolve techniques appropriate to local conditions
2. The farm population has to have a cash income
3. Social constraints must be overcome.

The concept of food and nutrition is considered, as issues of human right from its original concept of basic need approach. Concerning this new approach, two meetings of international encounter on the right to food and development have been held in Oslo and Geneva in June and August 2000. According to these meetings a new momentum and dynamic for change of the concepts of food and nutrition has been developed. Accordingly the two concepts, i.e. basic needs and human rights, language reflect perceptions, conceptions attitudes and the pattern of likely decisions and actions. The shift of approach should be clarified by changes in words and language. For comparing purpose, the two approaches have been presented in table 2.1

Table 2.1. Comparison of two approaches related to food

Basic needs	Human rights
<p>Needs are met or satisfied</p> <p>Needs do not imply duties or obligations although they may generate promises</p> <p>Needs are not necessarily universal</p> <p>Basic needs can be met by goal or outcome strategies</p> <p>Needs can be ranked in a hierarchy of priorities</p> <p>Needs can be met through charity and benevolence.</p> <p>It is gratifying to state "80 percent of all children have had their needs met to be vaccinated."</p> <p>It is an excuse to state that the "government does not yet have the political will to enforce legislation to iodize all salt."</p>	<p>Rights are realized (respected, protected, and fulfilled).</p> <p>Rights always imply corrective duties or obligation.</p> <p>Human rights are always universal</p> <p>Human rights can be realized only by attention to both outcome and process.</p> <p>Human rights are indivisible because they are interdependent. There is nothing like 'basic rights'.</p> <p>'Charity is obscene in a human right perspective'. (I.kant).</p> <p>In human rights approach, this means that 20% of all children have not had their right to be vaccinated realized.</p> <p>This means that the government has chosen not to carry out its duty and has instead chosen not to enforce legislation to iodize all salt.</p>

Source: Acc/SCN., Adapted from UN systems forum on Nutrition bulletin called Nutrition and Agriculture, No20, July 2000, P:6).

As peter Timer indicated in Mann and Stone (ed.), 1986, historically, most food policy has actually been agricultural policy. The latter mainly focuses on increasing agricultural outputs of some commodities like rice, wheat or corn.

This limited approach of policy concentration couldn't bring about adequate nutritional status for larger parts of people of developing countries, because there is weak linkage between agricultural output increment and the target of combating hunger. Government policies have failed to understand the negative impact of hunger and famine on national food systems.

Food system includes the interaction and interrelation that prevail between agricultural crops produced on the farm, marketing for the food purpose, and consumer usage for nutritional and esthetic and social needs. Food consumption decisions are influenced by level of individual household incomes, social and cultural context, and price of commodities available in the market. Farm producer households allocate their resources to food and cash crops based on understanding of resource allocation, their accessibility to productive inputs, prices of their output and general outlook towards improving the welfare of households.

Food is an increasingly urgent political-economic issue for developing countries. It is politically related and sensitive. Even though the impact of reformed food policy may bring about good results in the long run, any losses in the short run affect the political group interest.

Decision-making processes mostly concentrate on improving the production by neglecting consumption, distribution and nutritional part. The food policy of any nation should consider at least these points. The weaknesses of most national policies arise because of lack of connection of macro policy designers and micro level situation of the economy.

Most individuals involved in macro policy-making are narrowly disciplined and trained; isolation forms of individuals and institutions specialized in one sphere creates such problems in food policy preparation.

It is obvious that the majority of the population of developing countries are taking part in food production for subsistence consumption and marketing of surplus one to urban area. Despite this crucial importance of the activity, only limited countries have formulated or tried to formulate their national food policy (C.mann, 1986). Where food supplies are limited and poverty prevails, people suffer from chronic starvation, and malnutrition, which serve to reinforce their poverty. Some of the approaches that help to overcome world food problem are: increasing agricultural productivity through applying the output of science and technology, which includes using of fertilizer, chemicals, appropriate technological inputs, training, modern farming methods, improved seeds, etc, and seeking new food sources and products, especially those rich in protein.

2.1.1. Global situation

It is since the crisis of oil price of 1970s that most governments of developing countries became conscious to consider /relate/production, consumption and nutritional issues in their national policies. National policy governs three main elements, which react each other within a nation and internationally. These components are: at micro perspective on behavior of producers and consumers of food, on macro stage, the influence of monetary and fiscal policies on their behavior, the commercial aspect of trade that includes the role of market and price nationally and internationally.

According to Mann and Huddleston (1986), food policy and nutritional status are correlated in three spheres. These are ability of households to acquire food, household food acquisition behavior and intra-household allocation of food. Food issues are politically sensitive and related.

The main eventual need of food policy is to get adequate nutrition for the population of a nation. This should be attained indirectly through creating employment so that the poor get incomes then increase his demand for more. It should not be directly by providing food for poor or subsidizing it, because it has no positive effect in the long run, that is it creates the attitude of dependency in the mind of the society. Currently about 150 million children suffer from chronic under-nutrition (UN ACC/SCN, 2000:17). In southern Africa, one in two persons is food insecure and one out of four preschool children are malnourished (Haddad, (ed) 1997).

Any shock, policy shifts, changes in behavior and adjustment made burden is loaded on the poor of the world. Because the poor has low purchasing power and these changes or adjustments give little attention to serve the poor and children. During analyzing food system of a country or a community, considering the role of livestock in farming systems and the role of labor division in relation to women is very important, because the livestock supplements crop agriculture by providing a source of cash income, draft power, status, and occasionally of supplementary food. Concerning the role of women, women play a significant role in food production system. For instance, traditional labor division of Sub Saharan African countries indicates women are responsible for food and subsistence crops, while men are for cash crops. This implies that women are closely related to food production. Additionally children in rural community of Asian and African countries also have their own role in sharing activities. Children participate in manual works like, preparation of fields, transplanting, weeding harvesting and processing; women and children, together, also take care for gardens, small livestock around their living compound. But despite these significant roles of women and children, they are discriminated during distribution of benefits; as a result they are common sufferers of malnutrition.

The food security problems facing a country demonstrate the need for informed policy making. It is obvious that food security is achieved, when food is available, there is food access for all citizens, and when there is food utilization. Food availability indicates producing sufficient food so that it generates incomes for small-scale farmers without affecting natural environment. It also shows the marketability of food in the market by consumers' capacity to afford, while food access depicts the owning capacity of income to afford buying food.

If a household has no income to buy food, it means that the family has no entitlement. Food utilization, on the other hand, is so to say individual capacity to consume food for the purpose of growth, nutrition, and health. According to world food summit, food security can be expressed as a state in which all people have physical and economic access (purchasing power) to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. It is considered as human right. But it needs economic access, which includes monetary, land, credit, education and health. Food security for the poor can be attained either by increasing income of the poor or by reducing price of food products.

But experiences of most developing countries indicate that as market liberalization takes place, the poor becomes more affected because governments do not undertake strong compensation measurements. Adequate food concept is not only related to minimum package of calories, proteins and other nutrients, but also related to quantity and quality of food for individual dietary needs that free from adverse substance and are acceptable in a culture. The issue of food insecurity problem in less-developing countries shown in Table 2.2 indicates this situation.

Table 2.2. Prevalence of Food-insecure Persons in Developing Country Regions

Sub region	% of food insecure population		Number of food insecure persons (millions)
	1979-81	1995 -97	1995 - 97
Central Africa	36	48	36
East Africa	35	42	78
South Africa	32	44	35
West Africa	40	16	31
Northeast and North Africa	9	9	33
East Asia	29	14	177
South Asia	38	23	284
South East Asia	27	13	68
Caribbean	19	31	9
Central America	20	17	6
South America	14	10	33
All Developing regions	29	18	792

Source: UNACC/SCN Bulletin of No 20, July 2000, p: 18.

Countries are using different mechanism to overcome food insecurity and generate additional foreign exchange income. One of these mechanisms is using genetically modified crops. In spite of the fact that many criticism and questions have been arising concerning Genetically Modified (GM) food products, globally many countries have extensively used and produce different kinds of food and other products like corn (maize), potato, soybeans, papaya, canola (rape seed), squash and cotton.

Above all, United State of America produces different crops on 29 million hectare of land currently, which share more than (60%) of global hectare of lands under genetically modified farming, i.e. 40 million hectare. The other countries next to USA are Argentina (6.7 million ha), Canada (4.0 million ha), China (300,000 ha), Australia and South Africa (200,000 ha each). This extended activities are mainly for the purpose of food production and commercial. It enables them to be surplus agricultural food producing countries and even exporters of these surpluses. (UN ACC/SCN, 2000).

2.1.2 Food Security Situation and its Potential in Sub Saharan Africa

As far back to 1974, the world food conference optimistically declared that no child should go to bed hungry. But still there are hundreds of millions of world people who are still poor and hungry (.Nana Sinkam). According to Mathew Okai (1993) the main constraints that limited agricultural and food output in Africa is the prevalence of 'nexus' among population, agriculture and environment. Environmental natural resources are declining resulting in the decrease of output despite a rapid increase of population. The labor force in rural society is excess but constrained with seasonal demand of it.

The experiences of Sub Saharan African countries indicated that there was self-sufficiency in food before 1970s and there was acceptable growth pace of food relative to population growth rate. Shortly the gap created between agricultural food output growth and population growth rate have caused food crisis and insecurity (FAO, staff paper No 5).

The per capita food and agricultural production recorded in 1970s declined in a rate of 0.9 and 1.1 percent. Part of the decline was accounted for by 0.3 percent

increase in the rate of the population growth and the balance of 0.8 and 1.0 percent was due to the decline in the per capita food and agricultural production respectively. In the 1980s there was a significant recovery in production with increases in per capita food and agricultural production over the preceding decade averaging 1.0 and 1.2 percent per annum respectively⁵

Between 1960s and 1970s all sub Saharan African countries faced a loss of 1.0 percent of per capita Gross Domestic production annually which resulted because of decline of 0.6 percentage of gross domestic production and an increase of 0.3 percent of population growth (Ibid: 74). One of the main reasons for the crisis was the world boom of oil (petroleum) price, which threatened their endeavor to bring about economic growth and development after their independence from colonization. The second reason was the withdrawal of active labor force (16-34 aged young group) from agricultural rural to urban because of the conception of social changes in relation to urbanization. The labor force in agriculture in Sub Saharan Africa in 1960s was 37 percent. This percentage share has decreased to 27 percent in 1990s that shows an increase in higher dependency rate in the economy.

The following table shows the situations that prevailed in Sub Saharan Africa in terms of agriculture and food production since 1960s. It shows that the rate that of food self-sufficiency in the sub-region fell in serious problem and paradox.

⁵ . FAO, staff papers number 5, Food and Agriculture in Africa ECA/FAO Agricultural Division, PP 73-74

Table 2.3. Growth rates of selected indicators and internal factors of production in sub Saharan Countries

Description	Average annual growth (%)			Increase (+) or decrease (-)	
	1960/70	1970-80	1980-89	70/80-60/70	80/89-70/80
1. GDP/capita	1.4	0.4	-0.5	-1.0	-0.9
2. Food production per capita	0.2	-0.9	0.1	1.1	+1.0
3. Agricultural production per capita	0.2	-1.1	0.1	1.3	+1.2
4. Real GDP	3.8	3.2	2.7	0.6	-0.5
5. Total food production	2.5	1.7	3.2	0.8	+1.5
6. Total Agricultural production	2.5	1.4	3.2	0.9	+1.8
7. Population	2.5	2.8	3.1	+0.3	+0.3
8. Land under cultivation	1.7	0.8	0.5	-0.9	-0.3
9. Labour force in agriculture	1.2	1.4	1.7	+0.2	+0.3
10. Cultivated land/head of labor force	-0.2	-0.7	1.7	-0.5	-1.0
11. Land productivity	1.5	1.0	2.7	+0.6	+1.8
12. Labor productivity in food prod.	1.3	0.3	1.5	-1.0	+1.2
13. Labour productivity in agri. prod.	1.3	0.0	1.5	-1.3	+1.5

Source: FAO, staff paper No 5, pp74-78 table 2 and 3.

Agricultural sector of Sub Saharan Africa has been affected by some policy constraints like: under-pricing agriculture primarily through price control and direct export tax and indirect tax due to the maintenance of overvalued currency exchange rates. These resulted in less provision of adequate basis on economic well being of agrarian community. To overcome such policy constraints, most agrarian society engage in another alternative of non- agricultural activities. The Sub Saharan land base for agriculture is very narrow. Out of a total of 2 million kilometer square only 0.75 million km² is suitable for agriculture.

But on the other hand, the growth of population in the region is creating pressure on the land. In absolute term, the agrarian population has been increasing at an annual growth rate of about 2.2 percent. The available agricultural land in SSA per-head of agricultural labour forces declined from 1.00 hectare in 1960s to 0.55 hectare in 1989. Even the declining rate is faster in areas of highest population density. In high land areas of Burundi, Ethiopia, Kenya, Uganda, Rwanda, land fragmentation has resulted in distribution of small plots of land among members of small-scale farmers. In general, land, as a basic factor of production, is not a major constraint because only about 20 percent of agricultural land is under cultivation. But there are some countries that are able to cultivate 80 percent of their agricultural land because of increased life expectancy and high fertility rate. The increased population densities have led to reduction of fallow period of land. (Okai, 1993).

The encroachment of desertification is another factor that reduced the land for cultivation. Land degradation and the soil nutrients' depletion finally reduce agricultural out puts. FAO's studies indicated that the annual loss of micronutrients like nitrogen (N) phosphorus (p), potassium (k) in 1983 amounted to -4.3, -1.2 and -3.5 million metric tons, and it was estimated to be -5.9-1.6 and -5.3 million tons of these nutrient loss respectively, in last 2000.

Prof. Nana Sinkam has mentioned the irony of food and agricultural development strategy, which holds two contradictory situations, i.e. food insecurity in the continent and availability of excess (potential) land and natural resources, which can feed three times of the present population. The continent could exploit only 195 million hectares of land currently.

But this amount is only 26 percent of the regions potential arable land. The author indicated that unlike other regions of developing countries, the continent has been experiencing non-increasing yield but expanding of cultivated land, and no technological revolution. The features of sub Saharan Africa agriculture is characterized by large-scale unskilled manual labour, poor technology, low yields, little investment, scarcity of inputs like fertilizer and seeds, inadequate supporting service like agricultural research, extension, credit and marketing.

In relation to food security situation, some characteristics of Africa are with degree of variability in import bills, which is higher compared to domestic production. Consequently countries are facing foreign exchange constraints. These factors widened the gap in food requirement in the region. Many countries are forced to rely on food import and aid. In 1981, African countries imported food valued US \$ 14 Billion. This figure was US\$ 10 billion in 1987. The situation emanated increased vulnerable groups facing food insecurity and dependent on food aid. Almost 50 percent of African food import is covered by food aid, according to Prof. Nana-Sinkam. The following table shows the percentage share of food aid in import of cereals in some selected Sub Saharan Africa in 1980s.

Table 2.4: Share of food aid in imported cereals, 1980s

Country	Percentage
Ethiopia	97
Kenya	56
Sudan	100
Somalia	52
Ghana	30
Tanzania	43
Mozambique	84

Source: Food policy, Vol.3, August 1989, P.211 as indicated in staff paper no 4 of Food and Agriculture in Africa.

The magnitude of malnourished people of any nation indicates the graveness of food insecurity in a country. Accordingly, the situations in 1988 of sub Saharan African countries indicate that almost half of the population of some countries was malnourished.

World Bank report of 1988 indicated that the population of Ethiopia, (46% or 14.7million), Zaire or Democratic Republic of Congo (42 percent or 12 million), Uganda (46 % or 6.1million), Mozambique (49% or 5.9 million) Zambia (48% or 2.7 million), Chad (54 percent or 2.4million and Somalia (50% or 2.3million) were malnourished. According to FAO as noted by Okai, in 1987, 101 million people of Africa were mal-nourished. This figure has increased to 168 million in 1992. Sub- Saharan Africa region is the only region in which mal-nourishment is increasing. The rate of malnutrition per annum is 15 million. Professor S.C. Nana Sinkam has noted that by the year 2010 malnourished sub Saharan population will reach 300 million with the present rate of population growth, limited technologies and land utilization.

In addition to the causes indicated above, the problem of entitlement and availability influence the household food entitlement because women and small-scale farmers are key role players in agriculture and food production of these countries. Pricing, fiscal, monetary, trade, institutional and land policies are the major factors that determine the situation of food security of any nation. In most cases, most sub Saharan African countries make an effort to attain food security of their nation around determination on control of food prices, application of food subsidies, stabilizing food supplies, balancing domestic food demand, raising the income of vulnerable or disadvantaged groups and strengthening interstate cooperation in food trade.

2.1.3 Ethiopian food security situation

Similar to other Sub-Saharan African countries, the agricultural sector of Ethiopia plays a key role in social economic aspects of the country. It accounts for about 52 percent of GDP, provides employment for about 85 percent of the population and generates 90 percent of foreign exchange earning. It is also the major source of raw materials for domestic industry. It was before 45 years that Ethiopia had been exporting 90,000 tons of cereal production annually to its neighboring east Africa and Arab countries. Cereal production has remained flat or declining since 1970.

The experience of Ethiopia indicates that there is a wide food gap between demand and supply. The factors are adverse effects of climatic changes, decline in landholding of household farmers, soil and natural resource degradation, and reduction of yields per hectare as a result of backward farming systems. Generally the problems are induced through national policies issued in the past. Except in 1996, Ethiopia has been experiencing food deficiency. The magnitude of the deficit is, historically around 25 percent of the demand for food. Because of the chronic problem of routine food insecurity at national level the government designed the emergency food security reserve strategy that helps to cover the shortfall of food production in the country (Getachew, 1998).

The problem of food insecurity in Ethiopia is becoming a day-to-day unfortunate news in the country and internationally. USAID-Sponsored bulletin, called-FEWS (Famine Early Warning System), issued on January 31/2000 the following news:

Ethiopia may cross a dangerous and life threatening threshold before midyear.

Over the past months, difficult food security conditions in much of *Tigray* and

Amhara, Belg (Secondary) season agricultural areas in Oromia, and much of the pastoral zones of Somali, Oromia and SNNP regions have been well documented. Government and donors have initiated comprehensive emergency food relief actions to address these problems. These operations have been largely successful in providing people with an amount of food sufficient to keep most in their home areas. However, sparse rains insufficient water and fodder conditions and poor harvests in many parts of the country will increase the number of extremely food insecure in Ethiopia to approximately 8 million people during peak months of 2000, up from 5.8 million in October 1999. Even with the recent about-average *Meher* (main) season grain harvest, which is estimated by DPPC and donors at 10.7 million MT, the emergency food aid import requirement for these food-insecure populations may reach as much as 800,000 MT for the year.⁶

Up to now governments have taken ad hoc measures despite the deepening problem of chronic food shortage. All-rounded strategies and policies should be taken on demography, food policies and other socioeconomic situations. In Ethiopia, since 1970s, per-capita food supply was declining. Yet, Ethiopia accounts about one percent of the world population and 7.8 percent of Africa's population. And annually the growth rate has reached 3.1 percent in 1990s. This situation imposes greater pressure on food requirement from time to time. Population has been increasing mainly due to rapid decrease in mortality and increase in fertility. This situation created additional food requirement and finally affected the nutrition and health status of the society.

⁶ USAID, January 31, 2000. FEWS (Famine Early Warning System) Bulletin.

Total Fertility rate of Ethiopian population has increased from 5.8 in 1965 to 7.5 in 1990. The magnitude is very high in rural part of the country, which is 8.08 children per woman. In urban areas the adjusted total fertility rate is 6.33.

Bale Zone has the highest fertility rate, i.e. 9.8 in the country (*Debebe and Sisay, 1994: 205*). On the other hand, infant mortality rate is still higher in Bale Zone. It is 145 per 1000 infants (*Ibid*). Life expectancy is considered to be one of the least compared to other African countries, which is about 48. The population dependency ratio of the country is 103 percent; this indicates high burden on economically active age of the population. So this resulted in a decline of per capita of food production from year to year. It has also created a continuous dependency of the country on imported food through food aid and commercial import.

In Ethiopia, low agricultural sector performance and repeated drought occurrence of higher population growth has created severe food insecurity. Every year there has been a 1.1 percent decrease of local agricultural production (or 1.6% of cereal production) and a decrease of 4.3 percent in terms of per capita food production. Similarly the decline of land cultivated also reached 0.1 hectare per capita from 0.3 hectare. A sharp decline of per capita food production was seen in 1984/85 (114 kg per head of population) and 122kg per head in 1991-92. Table 2.5 indicates the situation between 1970/80-year and 1991/92. Energy (calories) intake of the population daily consumption declined from 1953 calories to 1667 between year 1965 and 1989. The average food calories intake for an individual person as recommended, is 2100 calories/day. Therefore, the deficit of calories per person per annum ranges from 60 to 80kg equivalent.

Table 2.5: Per capita food production and availability in 000s metric tones

Year	Domestic Supply	Net Cereal Imports	Total availability	Population	Per capita Production (Kg/person)	Per capita availability (kg/person)
79/80	7366	144	7509	36.4	202.3	106.3
80/81	6560	324	6884	37.6	174.5	183.1
81/82	6352	269	6621	38.8	163.7	170.6
82/83	7601	332	7933	40.1	189.6	197.8
83/84	6372	172	6544	41.5	153.5	157.7
84/85	4894	957	5851	42.8	114.3	136.7
85/86	5422	855	6277	44.3	122.4	141.7
86/87	6498	537	7036	45.7	142.2	153.9
87/88	6862	982	7844	47.2	145.4	166.2
88/89	6839	373	7212	48.6	140.7	148.4
89/90	7011	436	7447	50.2	139.7	148.3
90/91	7348	774	8122	51.7	142.1	157.1
91/92	6468	1010	7478	53.4	121.1	140.0

Source: Adopted from Debebe H/w. and Sisay Worku, 1994:208 table 1.

Except some year's positive growth rate of agricultural sector (like in 1982/83, 1985/86, 1986/87 and 1995/96) in which the country has shown more than 10 percent growth rate change, there was a declining trend or insignificant change yearly. For instance in 1984/85 and 1997/98, the agricultural sector growth rate has dropped by 20.9% and 10.3% respectively (Befekadu and Berhanu, 1999/2000: 156).

Food insecure people in Ethiopia were mostly those living in marginal areas, poor nomads, war affected refuges and urban poor. According to MOPED-1992, study the number of poor in the country reached 27 million, out of which most of them are food insecure.

Ethiopian agro-climatic condition is classified into Dega, Woyina dega, and Kolla. According to this climatic frame, the utilized land of the country is estimated to be 27.9 million hectares. Based on climatic and cultivable land area the country's farmer follows (uses) five farming systems. They are high land mixed farming system, low land mixed agriculture, pastoral system, shifting cultivation and commercial agriculture.

High land mixed farming system comprises the area above 1500 meter above sea level (asl) or *Dega and Woyina dega* that are around 45 percent of total land area and 75 percent of the population. Mixed farming is the dominant activity. Barley, wheat and teff are the dominant cereals, which are mainly used for home consumption. Oxen power is dominant means of farming method in this classification.

At national level, the country has been threatened many times by strong food insecurity problems. The causes can be poor performance of the sector because of traditional way of farming, fluctuations in the rain pattern, diminishing farm size, and lack of tenure security (structural constraints). To change this trend of food insecurity and unstable agricultural sector, governments have tried to create a situation that increases productivity through agricultural extension packages.

2.2. The role of rural community training and extension

2.2.1. Global situation

Agricultural training and education can be provided at the following levels. Namely, at University level education, intermediate level training with special reference to the preparation of agricultural technicians, including field staffs for the extension services, vocational and farmer training as an integral part of the extension services, in-service training and refresh courses for staff at all levels and for general system of school education. (FAO, 1967).

The ultimate aim of most agricultural research and extension services is to increase agricultural productivity. The principal agent through which this essential aim may be achieved is a farmer. Thus a positive and progressive attitude by the farmer, to change, innovation, adoption of new crops, improved techniques and better animal husbandry is absolutely basic to progress (FAO, 1967. 46). Strictly speaking, most extension activities taking place is considered as educational or training in nature. The purpose is to change farmer's mind to adapt new ideas, concepts and encourage participating with free will so that efficiency and productivity take place duly.

Much extension work is of an informal character involving meetings with groups, contacts with individuals, demonstrations, and other activities designed to interest and encourage farmers, and indeed, all sections of the rural community in ways and means of agricultural improvement. By the term farmer training, it is more formal, and often connected with an institution, and usually implied. The two principal forms which such training can takeover are (1) training of young people to enable them to enter farming, and (2) training of actual farmers with the object of assisting them to improve their farming systems or some particular part of their farming enterprise ⁷

7 . FAO, 1967, Agricultural education and training in Ethiopia, P: 46, Rome, Italy

Rural society, to be sustainable in food, requires goods and services, mainly, technology, information, inputs (seeds, fertilizer, pesticides), labor, farming power as well as instruments, infrastructures, marketing and credits. All these are included under agricultural services. One of these services is the provision of training for rural community. Related to rural community training, in East Africa around late 1960s, there were about 60 Farmer training centers having all facilities like residential and catering. There were facilities that can accommodate farmers, farmer's wife, youth leaders, etc. The training has proved to have significant value in areas of gaining momentum and ideas, new crops, livestock projects and new technologies and techniques.

The experiences of different countries show that rural community training is used as one of the mechanisms to be food secure through participation. For instance in Kenya, the experience of training for rural community can be mentioned back to 1900 and 1934 - the commencement of short-term training by establishing training centers. In Kenya such approaches (systems) like individual visits, group methods, unified extension, farm management, integrated development, and specialized commodity extension program have been exercised. The experience of Senegal, having long-term rural community training has also started in 1960s. The activities of Indian green revolution after 1950s, the Philippine and IRRI practice of training for higher productivity of rice in 1964, and different approach of rural community training in Colombia that applied the "mobile unit" that had team of instructors and teaching materials in 1957 are some instances that are worth to mention.

The rural community training programs of different countries constitute not only farming packages but also non-farm activities such as artisan, (carpenter, blacksmith etc.) making clothes, constructing roads, maintaining of equipment, structures and water supply sources (Coombs and Ahmed, 1974).

Generally, when we come to rural community training, the agricultural service provisions were experienced, in most cases, by public sectors. According to the World Bank, because the private sector is weak in most Sub-Saharan African countries, agricultural services have been provided by public sector. But recently some countries have started initiating private and NGOs sector to be involved in the provision of the services. The governments of sub-Saharan Africa countries have large gap and constraints of resource to cover the whole service items. Though at the initial stage of provision, partial involvement of the government is necessary, the government has to withdraw step by step from service provision and replaced should be by private and other economic actors. The rural community trainings (non-formal educations) have been exercised and resulted in different successes. The rural community training can be taken as part and parcel of extension program as in the case of training and visiting approach adapted by World Bank.

Past experience of Kenya in relation to Training and Visit (T & V) approach is worth to mention. The approach was adopted in Kenya in 1982 having institutional development and increasing agricultural productivity as two objectives. When its impact and effect have been evaluated after two decades the result become debatable. It perceived to be high costly and financially not sustainable and less impact on productivity. Institutionally, the finding was weak management, non-existent of information systems, inadequate financial management and prolonged ineffectiveness.

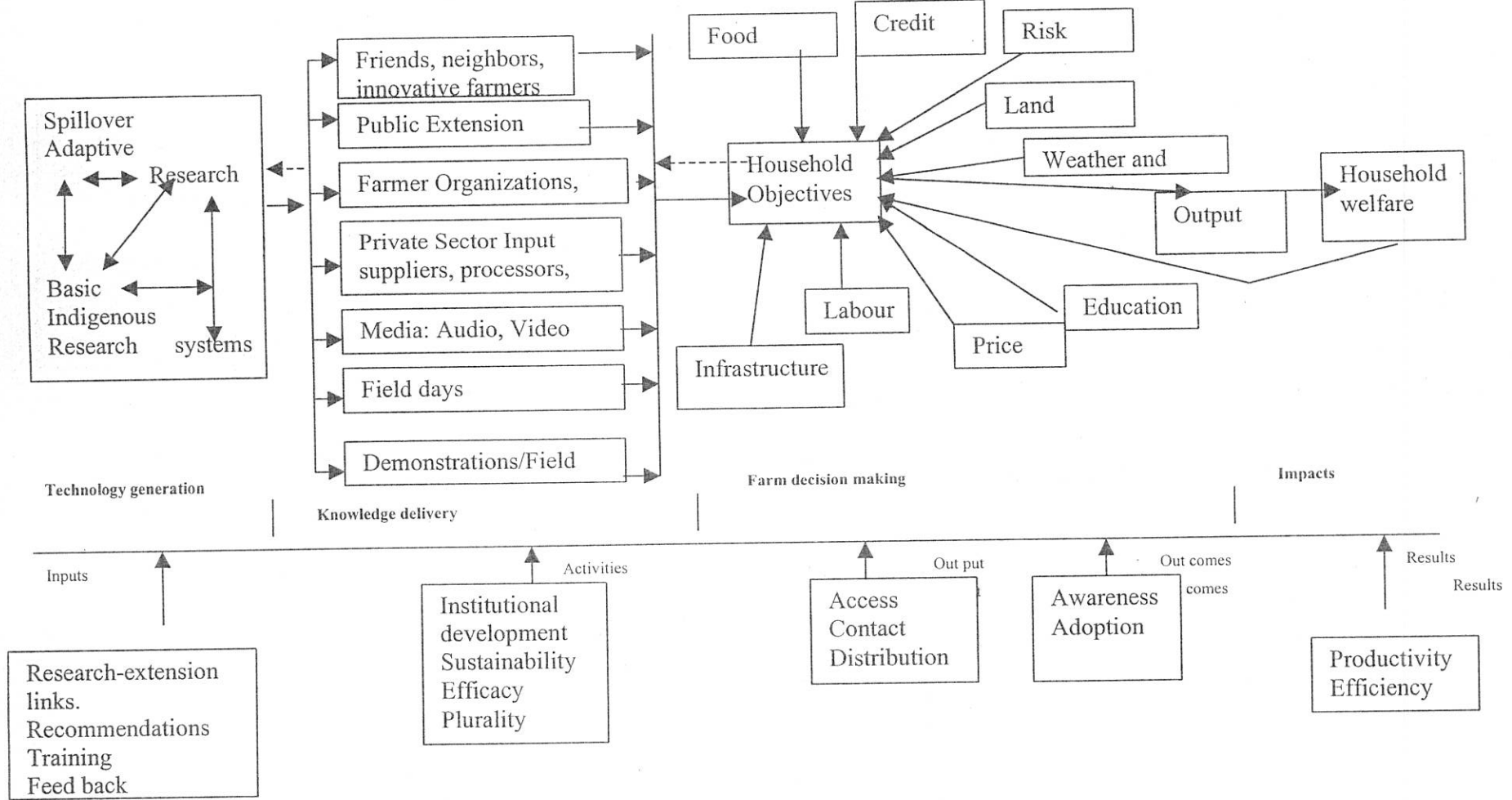
But on the other hand, there is a wide geographical coverage of the program, improved links between research and extension and increased number of staff through training. Kenyan experiences are also found to be disincentives for innovation of hierarchical structure disincentive for partnerships; efficiency and top-down extension system has been supply-driven and non-participatory (Gautam, 2000). In terms of budget allocation, government's share has been declining, and only dependent on donors fund. Almost 80 percent of expenditure is consumed in staff salaries. The education and messages dissemination technology was inadequate, costly and unwarranted. In some areas, Kenyan farmers do not want to meet extension agents because of inefficient and unproductiveness of the repetitive and ineffective bi-weekly or monthly visits. The focus of the extension services has remained on disseminating simple agronomic and maize related messages. No changes on pattern of awareness occurred. The extension program yielded some early benefits, but stayed for short period. Farmer's technical efficiency has improved but stayed at very low level.

But in India, concerning formal education related to agriculture, the country has greater experiences in establishing agricultural colleges and training centers since 1950s. This deep consideration for their agricultural extension helped the country to be food self-sufficient for a couple of decades. The impact of training and educated personnel from the colleges of the country helped the expansion of infiltration and intervention into the rural community through creating impact on their agricultural activities (Swamias indicated in FAO, 1977).

Community training is also considered as independent part of agricultural productivity improving approach. Here it is considered as a link between research and extension because it helps to disseminate the output of research and modern technology. But mostly it is considered as part and parcel of extension package (P. Coombs and M. Ahmed 1974).

Training of young men also take places for the purpose of making school leavers independent farmers and to equip them with more improved practice of farming so that they can influence the older ones to adopt and imitate the advanced ways of agricultural practices. The younger and school leavers have advantages of easy understanding and accepting of new ideas than conservative farm practitioners. The training for actual farmer and young school leavers can be successful if the land tenure situation is favorable and if the incentives and market facilities for agricultural produces, availability of credit and farm input supplies are prevailed. Figure 1 below indicates the environments in which the farmers can undertake decision-making and the factors that determine the level of productivity.

Figure 1: Stylized impact model for extension program



Source: (2000) OED (World Bank), P: 3, Fig 1.1.

Note: Broken line: Feed back from farmer' s to decision makers.

Solid Line: Delivery of time- bound "Message" by extension Workers from researcher to farmers.

This figure describes the role of farmer in extension program and factors and influencing environments around it. It shows the linkage that persists between extension input provider and mechanisms of information dissemination that help farmer to be more productive. The diagram also shows to what extent the farmer household can make decision in its partnership role with other bodies.

Rural community training is action education not just for academic purpose. Extension education and training compress farmers with different educational status, interest value. The training places are mostly not classrooms organized but farmers' field and demonstration plots that can be seen practically. The training and education objectives are all-rounded including socio-economic and cultural condition of farmers. Mostly the training and education are held at near place to villages of farmers and it should be need-assessment based.

In developing countries, training for agriculture and rural development cannot be left aside wholly as a government task. There are enormous potential resource alternatives, like the wider use and encouragement of farmers (Community Based Organization-CBO), and non-governmental organizations (NGOs). These agents work as supplementary and complementary initiatives to fill the gap of the tasks of governmental (Official) agents. This tendency help to make official institutions more responsive to the local and specific needs of the intended beneficiaries. Official organizations lack capacity and interest to appear to the small farmer as remote, alien and overly paternalistic, not truly concerned to assist and advise the rural poor or to serve their interest.

In relation to rural community training, the activity of women also gets attention from different countries. Out of millions underprivileged peoples of developing countries, many women of Africa are doubly underprivileged, because the opportunities for progress are usually concentrated in the hands of men. In traditional African both sexes have their labour division. Men hunt, defend his territory, cut trees, and clear the bush, while women should be near to the care of children, collect food as well as prepare, and other activities near their homesteads.

But through time, this equitable type of labor division has changed and created underestimation for unfair burden and important labor of women. To improve the unfortunates of African rural women, a joint effort program was initiated around the end of 1960 and beginning of 1970s, by UNECA, FAO, SIDA to establish the African Training and Research center for women (ATRCW). The training has been given for different African Countries comprising the disciplines like sociology, law, nutrition, population, home economies, appropriate technology, social development planning, education, social welfare, agricultural extension, communication and others. Based on these disciplines, the training for rural women has been adjusted to African context and provided duly.

Some specific training issues included food production, preservation, storage and use, nutrition, health and sanitation, childcare development, and child spacing, housing and home improvement, home and money management, increasing the family income, textiles and clothing, traditional customs, family relations, consumer education, literacy and other vocational training for employment purpose. The training was applying the "learning by doing" approach. According to review or evaluation visits made to some countries to assess the impact of training provided, the feedbacks have indicated that 'they have provided information and skills for improvement in the quality of rural life' (Ritchie as shown in FAO, 1977).

The experiences of Sri-Lanka in involving rural women in rural community training around early 1980s are worth to mention. The training methodology combines a process of increasing women's consciousness of themselves and as a group along with providing specific technical materials. The evaluation held in 1982 of training has found to be more than expected.

Development officers had helped rural women setup 2000 income generating activities, whose net profit was US\$ 32000 per month, or an average of US\$16 per person. Moreover, the profits from these income-generating activities surpassed the cost of the training project in less than one year. In the following year, another 2000 activities were successfully started, and as a result the beneficiaries, as of June 1983, totaled over 22000 people. The project is found to have a positive impact on production, employment, participation, income, health, nutrition and rural self-sustenance (Svendsen et al as indicated in FAO, 1984; 64).

This dynamic change in Sri Lanka was achieved through women's bureau that was established under ministry of plan Implementation. The target of training program was mainly focused on managing health of rural household and income generating schemes. The training started by recruiting 100 field workers, mainly graduates, and they were made to be trained intensively tuned towards the objectives of the project. The women's bureau began discussing with NGOs mainly overseas Education Fund (OEF)-USA which has extensive experience in organizing and training aimed at assisting women gain the skills they need to change their own lives while contributing to the economic development of their communities (FAO, 1984:60). The training was conducted using four main principles. These were participatory learning (learning by doing), valuing ones own experience, expanding from the person outward and dynamic and evolving training. The main reasons for such success of the program were the creation of self-confidence of development officers. They learned and applied how to attract client (village target groups), they were able to prioritize problems and tasks, manage small-scale projects and create confidence in others.

Training for rural women should be based on actual socio-economic situations and the program should be flexible in design and approach. There should not be pre-determined moulds of training, which discourage participation and learning by doing. Similar experiences of Sri Lanka have been implemented in Nigeria, Jordan and Costa Rica and found to be successful in attaining income generating, health and nutrition for rural women. Agricultural education (extension education) for rural community has different characteristics from formal education. The former kind of training is based on voluntary involvement of the farmers; it is problem-solving mechanism (targeted).

In addition to agricultural farming, non-farm activities are also taken as alternative way of source of income and diversification of income and becoming familiarized to modern technology. Courtine mentioned in FAO, 1977, that the prevailing of competent service of craftsmen in the rural economy is an important base for improvement of the standard of living. It helps to incline rural communities toward changes. The actual situation of LDCs hinders the expansion of modern technology and techniques, because almost about 80 percent of rural community is found to be illiterate. Any vocational training for rural needs some form of solid technical knowledge and the reliable linguistic communication. Once this problem of communication is solved, non-farm activities in rural society needs training in multipurpose activities, so that a farmer can manage environment, business and workshop, which can support his life. Therefore, training provided for artisans should be many-sided so that the trainee can survive through diversifying his activities. The rural training of non-farm activities should be directed towards who are still young, receptive and strongly motivated, who want to improve their skills, family members of artisans and young school leavers had wanted to remain in rural. The problems in many countries' experiences show that the training incurs high cost.

To minimize such constraints on the side of rural non-farm training, development actors-government or any stakeholders should make prioritization for types of skill that relies on the need-based assessment of the community.

Any (rural) community training that is provided for targeted groups should answer the following questions: Do the products of training meet the need, which target groups are intended? Is the training being produced with an optimum degree of efficiency? Is it undertaken with sound selection at the beginning? Does minimum wastage take place during the training process with careful attention to minimum cost? The methods of training and educational approach should change according to problems and actual situation prevailed.

Because of the important role of agriculture in the economic development of many (developing) countries, the narrow base of education and wide spread illiteracy in these countries but the prevalence of rapid rate of technological change in agriculture, resulted to a strong case for the establishment of effective adult education systems for rural people engaged in agricultural extension services... Studies of agricultural development have proved that education is one of the crucial variables for achieving economic growth and human progress⁸

Staff quality and skills determine the successfulness of any extension agent activities. Extensions agents must be equipped with appropriate technical know-how that can be acceptable by farmers. The agent should be able to relate theory and practices through simple techniques of teaching. Development agents should also understand human behaviors that are related to customs, values, and characteristics of rural society.

⁸ Williams S.K. Taiwo, as indicated in (FAO,1977), Training for agriculture and rural development, Rome Italy.

Being able to have administrative and supervision capacity and experiences help to be successful. In many developing countries the training of farmers is becoming more and more a limiting factor in improving agriculture. This is because adequate preparation of well-trained manpower for an extension service is complex, costly and time consuming"⁹

Training for rural community in developing (poor) countries through part-time education, training in formal institution and face-to-face field (village) level training's incur high costs. To minimize such high costs, training through mass media like radio, paper publications and some times through television is more easier in terms of cost and management. The training through such media can be provided in the form of " distance education."

The agricultural education and training in many countries have got little attention from government official organizations and other stakeholders. According to Umali, (1972) noted by FAO, 1977, the reasons are inadequate understanding and consideration of the importance of extension education for agricultural development, insufficient recognition of the difference between extension education and general agricultural extension, and finally, absence of adult education institutions that can promote, manage and monitor the programs for farmers. Despite all these constraints related to agricultural extension, education in developing countries with its importance to bring about changes in production and life of rural subsistence farmers cannot be underestimated.

⁹ Leagans, J.p, 1964) training for an effective training policy, as noted in FAO, 1977: 92) , Italy.

Functionally, extension education and training have three roles to play for farmers. These are to encourage farmers to accept technological change, to disseminate among farmers of the results of research and carrying the farmer problem back to research organization and to help farmers to acquire managerial skill which will enable them to operate in business (rather than subsistence) economy by providing training and guidance in decision making.

In most developing countries, evaluations of agricultural extension programs are most neglected, because no sufficient evaluation mechanisms set down (FAO, 1977:92) The coordination and participation of beneficiaries (farmers) with service providers and agencies bring about sustainability in rural development. This pluralistic approach enables all efforts to be successful. Such rural development activities are undertaken not only by individual households and governments, but also through the intervention of Non-governmental organizations (NGOs), private companies, input suppliers and farmer organizations (Vincatesan and Kampen, 1998:3). NGOs have impacts on private initiatives at any point along the chain. NGOs can involve in the nature of long-term investment like human development, conservation or social and economic infrastructure construction (Webb and Braun (1994)).

Extension education (training) helps the farmers to participate effectively in the affairs of their local, regional and national issues. It has responsibility to the society as a whole to bring about changes in attitude and awareness of rural community so that individuals and groups role in a complex society and economy can grow. It develops people as individuals, leaders and cooperative members of the local community. Community training helps farmers to understand their problem by comparing and seeing the issues with their neighbors and local areas.

2.2.2. Rural Community Training and Extension Program in Ethiopia

Traditional farming practices dominate small-scale farms in the country. It shares 90-95 percent of cereals and oil seeds production and almost 98 percent of coffee production. These farmers also raise livestock in form of mixed farming. To improve this prolonged traditional farming and cattle raising, the extension program has been implemented. The packages include effective technology generation and transfer system for this dominant economic actor and partners at the grass roots level.

Historically, in Ethiopia training extension workers had started in Bakko (west Shoa Zone) area by Swedish mission in Ethiopia during 1960s... During the time, there were only 100 agricultural extension agents that instruct farmers and extension activities... These are located in the provinces at strategic points along the main roads. What training the farmer receives is done in the field, at demonstration plots and on organized field days, by these extension Agents¹⁰

These agents were assumed to serve 20 million rural population of the time. That is one extension agent to serve 25,000 families. But because of low density of population the efforts of agents are found to be impossible and ineffective. The standard ratio of one agent to rural farmer household of developing countries was 1:1000 farm families. The extension agents in Ethiopia during 1960s were working with very limited favorable conditions. The agents had to go to rural areas on foot or use mule and other pack animals. They faced a shortage of supply of seeds and had no support from their respective departments. The involving activities were introducing better varieties of seeds, line planting of arable crops and other improved cultural practices, introduction of vegetable and control of pests and diseases. Training concerning livestock had hardly been undertaken, except for some poultry productions (FAO, 1967.47)

¹⁰.FAO, 1967, Agricultural education and Training in Ethiopia: 47, Rome, Italy

Agricultural extension should be supported by research. Agricultural research in Ethiopia started in 1950. Since the establishment more than 250 improved crop varieties, animal breeds and farm equipment and related technological improvement have been developed (Befekadu and Berhanu, 1999/2000:184).

Related to agricultural research in Ethiopia, agricultural extension activities have been started since 1960s. Comprehensive and minimum package programs in the form of projects were implemented, in some promising ways and had greater potential agricultural output. CADU in Arsi, WADU in Walayta, are some to mention. But because of the misconception of the Derg regime on who would benefit from the program, the package programs had collapsed. Farmers associations, youth clubs, and other informal community based organizations were used as means of communication and dissemination channels. Since 1974, different extension programs, like peasant agricultural development program (PADEP), which concentrated on supply of inputs, strengthening of peasant cooperatives, and natural resources conservation were not effective. This program was carried out with the support of World Bank through T and V (Training and Visiting approach). The package program could not be successful because of the extension agents who were not actively involved in direct application of the program. The development agents were occupied with other administrative activities like tax collection, organizing of producers cooperative association, etc. (Mulugeta as indicated in Befekadu and Berhanu).

Majority of research output was obtained on barley and wheat. And the rest are horticultural and livestock. Despite all these efforts of research, the dissemination of improved seed utilization among the farmer was very limited. In 1996/97, only less than 2% of the farmers of the country used improved seeds. Agricultural research activities in Ethiopia have been constrained by many factors. The resource or budgetary shortage, inappropriate policies, institutional problem, and limited localities or agro-ecological condition to apply or use the result of research are some to mention.

To revive from a wide gap of food in Ethiopia, the present government has issued national policy that is led by agriculture-called ADLI (Agricultural Development Led Industrialization). The policy focuses on private sector role and small scale farming system. This system of farming has three components to attain its objective. The first stage comprises changing the situation of traditional practice of farming. The next stage includes infrastructure and facilities provision and finally improving the land holding system of farmers. Since 1994/95, a new kind of agricultural extension program called PADETES (participatory Demonstration and Training Extension system) has been launched under (ADLI) national strategy. The objective of PADETES is to relate research, training, demonstration of T & V approach with the approach of SG/2000 that diffuses technological result and experiences.

This new package comprises elements like fertilizer usage, improved seeds, chemicals usages and improvement in cultural practices of farming in major crops like teff, wheat, maize, barley, sorghum and the like. The package program was designed with active participation of farmers by providing a plot of land ranging 1/4 to 1/2 hectare.

On this plot the woreda agricultural experts and development agents (DA) show the required inputs usage. Farmers might require fulfilling a down payment of some percentage of cost of inputs. Accordingly, for instance, such plots have increased from 3200 to 600,000 in 1994/95 and 1996/97 respectively. Extension packages under this program (PADETES) include different agro-climatic and areas, crops, livestock, vegetables, and others. The package program's current concentration has been geared toward increasing production output rather than extension. The DAs were made to supervise and help 200 farmers and more. But the DAs faced different resource constraints and they are occupied with different activities like credit provision and repayment of it and tax collection.

The new extension package of the country has been constrained by price of fertilizer, the high need of moisture for new variety of seeds which can not resist the decreasing moisture in the country as a result of climatic change, the decreasing trend of farm plot (micro holding) and less incentive for farmers to use the inputs further.

The research outputs should be implemented on farmland of farmers through formal and informal relation of extension and research organization. Group diagnosis, joint responsibility, research agenda formulation, field days, package review meeting and trainings are some of additional mutual duties and activities are that undertaken by research and extension departments. The extension program is an integrated approach since the farmer is all in its nature. That is the farmer is cereal (crop) producer, raises livestock, and conserves its natural resource. Therefore, the development agents are also trained to attain the immediate need of farmers in all aspects. The extension program therefore, is *felt- need based approach*.

The extension intervention program is geared to increase productivity of small scale farmers by disseminating research output information and technologies that aimed at main crop items like teff, maize, wheat, sorghum, etc. Some elements of package program include: 1/4 -1/2 ha size demonstration plots, provision of credit and supply of inputs, practical field training, realizing research-extension linkage in practice, empowering front line extension staffs through training and supplying logistics.

The participatory Demonstration and Training Extension system (PADETES) indicates that the extension program includes demonstration of modern inputs, technology and farming practice for farmers through participatory methods. The training also involves mutual involvement of farmers. The extension program merges the T&V extension system of World Bank and the SG 2000 project practicable technology diffusion experiences. This program applied strong management principle in its implementation. The objectives of PADETES include attaining food self-sufficiency through increasing productivity and upgrading the participatory role of farmers in economic development efforts. Increasing the supply of agricultural output for export and industry is another objective. The conservation of natural resources through the role of small-scale farmers' participation is another goal of PADETES.

The training extension program is undertaken through the media of information disseminations like radio, printed materials, audiovisuals, person-to-person communication, agricultural fairs, seminars, workshops, training, farm visiting field days, etc.

CHAPTER THREE

THE EXPERIENCE OF AGRI-SERVICE ETHIOPIA IN INTEGRATED RURAL DEVELOPMENT PROGRAM

3.1. The definition of NGOs: NGOs are a voluntary agencies (organizations) established and governed by a group of private citizens for a stated philanthropic purpose, and supported by voluntary individual contributions. A number of them, partly and in some cases the whole, are financed by government but mostly they raise a bulk of their fund from the public. Most are concerned with development mainly agricultural, social, health education and the like in both urban and rural areas. Some of them are highly specialized in like leprosy, the blind, adult literacy, vocational and agricultural training.

NGOs are rich in diversity. Among development-oriented organizations, we can identify three distinctive orientations in programming strategies. The first is relief and welfare; the second is local self-reliance and finally sustainable systems development. These strategies co-exist in larger NGOs or in a single one. It is this strategic classification that helps them distribute according to generation.

The term NGO (Non Governmental Organization) is broad in its nature. It starts from local community initiated group of people to help themselves upto international donor agencies. NGOs are established based on different causes, interests and purposes. They vary according to time, place, origin and conditions. The history of NGOs started from First World War and expanded more during the Second World War and in 1960s and 1970s. Even though relief and welfare will continue to be one aspect of charity as some kinds of disasters occur in this world.

Non Governmental organizations (NGOs) or private voluntary organizations are considered and taken as one means and alternative to reach the poor directly and cheaply than governments have been able to accomplish on their own. Past experiences show that resource allocations were not reaching the poor because most money (capital) transfers from donors and local resource allocations have been used for various purposes, like for the patronage of power, and conversion to personal and non-productive activities. As a result the process of democratization/decentralization, which helps the access of the poor to the resources was minimal. Therefore to overcome or minimize such constraints, there is a growing interest of NGOs as alternative playing actors in capacity building, economic leadership and technical capabilities of the poor societies.

Currently, there is an agreement that the central development task of any actors should be developing the human and institutional will and capacity to put whatever resources available to sustainable productive and equitable use in the service of people. NGOs' role and influence, even at national level, is growing. Their interest in one way or another is working with government. Some NGOs focus on assisting government to achieve effective result in service delivery; some others also aim at establishing independent self-financing delivery systems that help the community to meet their needs by themselves, and supporting policy and institutional settings that promote self help efforts of the community. Policy setting reforms' (macro) initiatives of NGOs can be removing of subsidy from fertilizer supply in agricultural credit services facilities, so that the rural society develops independence and the free market environment will develop in the social and economic condition of a local, regional and national level. At micro level policy reforms can be achieved through facilitating social process than through legal proclamation. Here, the role of catalytic NGOs can be more influential than others.

This is the common potential interest of most NGOs. The NGOs like to involve in people centered development, which can be viewed as people-to-people process.

NGOs have constraints and limitations in their contribution toward making better world. Some of these are: inadequacy of the application of effective professional management techniques and acquisition of technical competence, lack of adequate basic management system and procedure. This implies that they are found at pre-bureaucratic stage, impaired efficiency due to increased budget, over-staffing and larger geographical spread and much technical failure when NGOs are starting to work as system catalyst.

NGOs or commonly called NGOs have some main characteristics. Some of these are:

1. They are established (formed by individuals for persons and organization bodies).
2. They take payment (fund) for activities (project and programs) they performed.
3. Although they are private, they are not profit making by purpose.
4. They undertake their duties under legal framework of any nation.
5. NGOs are people benefiting oriented through their projects and programs.
6. The main source of income is external, commonly from advanced countries
7. Undertaking activity through the principle of learning together with popular participation
8. The beneficiaries are popular sector that comprises the rural or urban poor at different level and nature of organization.

3.2. NGOs Experiences in Ethiopia.

Religious based voluntary organizations were the first type of non-governmental organization in Ethiopia. These were undertaking their missions and objectives in the form of Missionaries - catholic church, protestant and the like. In Ethiopia, the history of international NGOs has started to emerge after the drought and famine of 1973/74. They enter into the country through immediate relief and rehabilitation assistance. In Ethiopia, before the food insecurity and draught problem of 1973/74, there were only about 20 NGOs in the country. This figure has grown to 44 in 1984/85 famine. During the year 1984/85 about 15 were from North America, 21 from Europe and the rest were from Asia, mainly from Japan. Their number has grown to 80 in 1991/92 and reached 360 in the year 2001 working in development and relief activities. National government considers these NGOs as humanitarian private organizations that participate in development and relief activities based on their financial resources. They are co-partner to public activities (efforts). The new trend of NGOs is a shift from short-term relief activities to long-term development efforts. And the international NGOs are tending toward providing financial support for local NGOs instead of involving in operational project activities.

The institutional arrangement and coordinating system of these NGOs were not clearly defined and stable. Until recently there was no policy, rules, regulations and guideline to mobilize these NGOs from the government side. After 1995, the government has issued policy guidelines that help the registration of their NGOs, creating project agreement and controlling them.

NGOs in the country have mainly involved in social welfare, integrated program, health, education, waters and sanitation, agriculture, water, soil and forest conservation. Currently their involvement distribution is shown in the following table

Table 3.1: -NGOs Involvement Sphere

	Sector /Sphere/	No of NGOs
1	Social Welfare	106
2	Integrated program	61
3	Health	65
4	Education	55
5	Water and sanitation	22
6	Agriculture, water, soil conservation...	41
	Total	350

Source: DPPC, NGOs Desk, 2001, Interview)

Few NGOs have no preference of area. They operate wherever the need exists in the country. Others want to work in selected regions. People from those particular localities organize most local NGOs. Most NGOs are implementing while others are funding. Some of them are development oriented or/and relief oriented. Therefore, generally NGOs in Ethiopia can be classified as:

1. Project/program implementation
2. Funding projects and programs
3. Supporting/supplementing other projects or programs.

Government has modified its policy to redirect NGOs to development-based activities besides occasional relief aid needed and supplied. National government say the principle of aid should be development oriented that should be implemented at national wide.

The NGOs experiences in the country have some problems and constraints, which calls for a need for change. Some of these problems are

1. No even distribution of NGOs in regional states of the country. For instance, there is a large concentration of NGOs in Addis Ababa but a few in Afar, Somali and some peripheral regional states.
2. Their interest of involvement in operation program is overlaps.
3. In some areas, there is less impact socially and economically
4. They mostly undertake small-scale projects and programs.
5. Some NGOs create the concept of dependency syndrome in the minds of the community by staying more than expected and by agreeing to provide aid.
6. The overhead costs are mostly higher than 20% because of less control from corresponding government counter parts (at regional, local level), and the like. But still their contribution is very significant in filling the gap of government bodies.

3.3. The role of Agri-service Ethiopia in socio-economic activity

Agri-service Ethiopia was formally established in 1969 by adopting the implementation approach of francophone countries of West Africa and Latin America. It provided correspondence courses for farmers in *Wollaita* Area, by translating French into *Amharic* and then to local languages to give training in groups or on individual basis.

The training that was provided up to 1976 was limited to agricultural courses. But later on, after 1976, some other courses like socio-economic, hygiene and home economics were added. The training program was provided as a component of correspondence education and lastly face-to-face training was started. Action oriented training program was introduced in 1986/87 as a new approach. This approach is a bottom-up approach in which the problems and issues are discussed with grass-root community farmers, consisting 10-20 members of action group.

The formation of group issues/problems discussed, and the training provided would depend on the need of the community. Some of specialized training provided was basically on agriculture, home science, hygiene, forestry, soil and water conservation, rural water supply vegetable and poultry raising programs. In Bale Zone, Agri-Service Ethiopia started in 1987 through action oriented training program. (ASE, 2000).

Agri-service Ethiopia (ASE) "has been engaged in rural development for the last 30 years (since 1969). During this time, it has grown in program content, operational areas, and changes in its organizational development". The mission of ASE " is to work with the poor communities in rural Ethiopia towards attaining food security, protecting and rehabilitating of the environment and provision of adequate social services. Enhancing the capacity of the communities through training is a cross-cutting function of ASE." (ASE, strategic plan 2000-2005, Jan-2000). Currently, ASE has four main regional project offices, two in Amhara regional states-in Eastern Gojjam and North Shoa (recently started), the second in Bale zone- Oromia regional state, and Omo zone- in SNNP regional state. Its main development program is integrated rural development in general, but its main focus is on community training and supporting basic social services for rural poor community (table 3.2).

Table 3.2: Operational areas of ASE

Location			No of PAs	No.of Households heads		
Region	Zone	Woreda		Male	Female	Total
SNNP	<i>Semen omo</i>	<i>Boreda-Abaya</i>	7	5435	262	5697
		<i>Kutchu</i>	4	5533	61	5594
		<i>Chencha</i>	3	1885	293	2178
Sub total		3	14	12853	616	13469
Oromia	Bale	<i>Gollocha-</i>				
		Gassera	10	5069	207	5276
		Ginir	6	2424	174	2598
		Goro	4	883	20	903
Subtotal		3	20	8376	401	8777
Amhara	<i>Misrak</i>	<i>Debay Tilat Gin</i>	9	8974	1145	10119
	<i>Gojam</i>	<i>Lalomama</i>	10	7461	2246	9707
	2	2	19	16435	3391	19826
Total	4	8	53	37664	4408	42072

Source: ASE, 2000, P: 25

ASE was operational in 20 peasant associations or 32 villages in *Gollocha-Gasera*, *Ginir* and *Goro woredas*, serving a total number of 8777 heads of farmers households (4.6% female headed). These *woredas* have vast plain of depleted pasture for livestock relatively sparsely populated than other parts of the country. The rural community depends on mixed farming, which plays a significant role in attaining the household food system based on two seasons of rainfall. Since 1997, the ASE started new phase with some modifications in its intervention. The modification includes dividing the training program into two.

1. General Awareness Raising Training (GART)
2. Skill Promotion Training (SPT)

ASE has transferred its service from non-formal education to an Action Oriented Training Program (AOTP) and finally to an integrated rural development program for the purpose of developing human resources at rural grass roots level. Selected community members who were selected to be included in training were provided training on health, environment general agriculture etc through general awareness raising training program. And, then, some of them would get transferred to skill promotion training program. This latter program focuses on income generating type of training that provides skills toward developing the level of productivity.

The mission and vision were designed to attain objectives like promoting modern farming methods among the rural society. The objective includes strengthening women's role in socio-economic condition through GART and SPT, improving the productivity level of households, initiating rural society to enable producing working tools and implements, awareness raising about environmental conservation of soil, water, forest and mobilizing communities to develop basic services like water, health and education.

Farmers were made to identify, plan, implement, monitor and evaluate activities so that they may be able to solve their problems. The training and extension activities that are under crop and livestock production have components like training, local level seed (crop) production, vegetable production, and promotion of organic farming, forage development, improved bee-keeping, poultry production, animal production and veterinary services, environmental sanitation and protection, family planning, personal hygiene and community health and literacy.

Bale is characterized by bimodal type of rainfall in two seasons, Belg and Meher. The Belg season starts in March and extends to early July while the Meher season extends from August to November. There is some instability in patterns of rainfall in terms of duration and areas. Irregularity and inadequacy of rainfall is a common occurrence. And sometimes, there would be unexpected (unusual) rainfall, which would interrupt the harvesting of Meher crops. For instance, as a result of such unusual rainfall the yields of cereals and oil seeds have been reduced by 30% and 35%, respectively, in 1998. At another time of the same year rainfall scarcity during Belg season of 1998, resulted in wilting and even some crop failures. The reduction in crop yields has also occurred as a result of infestation of worms and stripe rust, consequently about 50 percent of faba bean, field pea, linseeds yields has been reduced.

The livestock condition in the selected *woredas* of Bale has been in good condition because of erratic rainfall condition. The rainfall condition helped for better germination of grazing plants. But diseases like Anthrax, Black leg, lambskin disease and others frequently infect most livestock of the areas. Concerning the crop production, the most frequently occurring crop incidence that reduce yields of these areas are Wag, African Boll Worms- (*Heliothis Armigera*), frost occurrence, stripe and stem, rust infestation, and water logging.

ASE uses training as a main means and strategy to attain the specified objectives. Awareness raising training is conducted to new project areas to create behavioral change of the local people. While skill promotion training is provided for selected groups of individuals on specific type of activity that enables them to generate income and increase production.

The ASE principle of training is based on assumption that it should be properly designed, and targeted that targeted training can bring about motivation and participation of the rural community through their internal need and effort. The training itself has the following guiding principles. They are:

1. There should be learner center.
2. The training should focus on problem solving.
3. It should focus on life improving.
4. It should rely on need, and be experience based.
5. The training should be flexible and actual situation based.
6. The training should be participatory to involve the disadvantaged communities.
7. It should be action based that can easily be realized.

The community training is actually provided by DA (Development Agent) at selected development centers, villages or peasant association sites. The curriculum is also developed at development center level by focusing on needs of the community participant. The training was provided using teaching material aids, like posters, leaflets, booklets, and officers, readable printing materials are also distributed. Other training mechanisms include home and farm visits, demonstration and farmers field days. Home and farm visits are intended to help initiate participant farmer to convert in to practices then motivate his/her neighbors and those who follow. Training provided for the rural farmers started with action oriented approach and then integrated rural development, which includes general awareness and skill promotion training. These performances are indicated in tables 3.3, 3.4, 3.5, 3.6 below. The table shows the trend of participants in training since the beginning of operation of ASE in Bale Zone in 1987.

Table 3.3: Participant of different training in different phases

Year	Participants in Action Oriented /Integrated Rural Development-IRDP		
	Male	Female	Total
1987	20	15	35
1988	97	76	173
1989	216	172	338
1990	340	267	607
1997	717	460	1177
1998	439	398	837
1999	424	320	744
2000	274	156	430

Source: Bale RPO, 2000.

The performance and/or achievement is evaluated in terms of registered farmers and those who graduated or completed the training courses; the total performance of training program was 60% from 1987 - 2000. The detail is shown in table3.4.

Table 3.4: The overall trainees participation during 3 phases.

Phases	Participants						
	Registered			Graduated			% of Graduate
	Male	Female	Total	Male	Female	Total	
1987 - 1992	673	530	1203	673	530	1203	100
1993 - 1996	2838	2546	5384	1134	956	2090	39
1997 - 2000	2402	1735	4137	1854	1334	3188	77
Total	5913	4811	10724	3661	2820	6481	60

Source: ASE, Bale Regional Program Office, 2000

ASE has been conducting General Awareness Raising Training (GART) for the past working years. But the trend of attendance by poor-rural community is becoming critical. The attendance and interest of community has been declining. The ASE should focus on immediate interest of the community by changing topics and becoming flexible. The training sessions have been modified since 1987. Initially the training was provided for six months duration, two sessions per week during the first and second phases. In the third phase, this program has been adjusted because of the two farming seasons of local areas, which made farmers too busy and would force them to drop out of the training. This can be noticed by comparing the percentage of trained farmers with the number of those registered for training, which means the total achievement is only sixty percent. In the latter training phase, besides its modification in terms of session and length of duration, the topic of training has also been modified and made to focus on including the immediate needs of the trainees. Some of newly included topics were social development, geographical concepts, gender, civic and human rights, family planning, nutrition, harmful practices, and concepts about sexually transmitted diseases. General agricultural education comprised improved crops, livestock production, vegetable production, and bookkeeping and diseases and pest-controlling mechanisms. Environmental and natural resource conservation include soil, water and plant protection and seedling methodologies. In the income generating skill training, the issue of credit and saving training was also given. The extension activities of ASE for the areas specified were undertaken by DA (Development Agents) and VLDP. The average ratio of DA to farmers served is 627, which ranges between 599-903 households. The average number of VLDP is 273 that range between 226 to 325 households.

Table 3.5: Some components of Agri- Service Ethiopia in Bale program

Amount in number	SUPERVISION AREA			TOTAL
	Gassera	Delo- sebro	Goro	
1. Develop. Center	4	5	1	10
2. No of PAs	7	9	4	20
3. No of Villages	13	15	4	32
4. No of House holds	2997	4877	903	8777
5. No of Supervisors	1	1	-	2
6. No of DAs	5	8	1	14
7. No of VLDP	13	15	4	32
8. Community Agents	4	5	1	10

Source: ASE, 1999, P: 5

Skill development training (skill promotion training) focuses on income generating activities like vegetable production, organic farming, poultry production, forage development and beekeeping were given in separate programs since 1997 for 1556 participants. Demonstration type of training was provided to help or support skill development training on development agent compounds and selected farm plots in form of participatory on specialized activities. Some demonstration activities undertaken between 1997-2000 are shown in table 3.6.

Table 3.6: Demonstration conducted between 1997-2000

	Components	1997	1998	1999	2000
1	Local Level seed	22	34	50	-
2	Promotion of organic farming	64	11	42	3
3	Forage Development	-	19	44	2

Source: Bale ASE regional program office, 2000

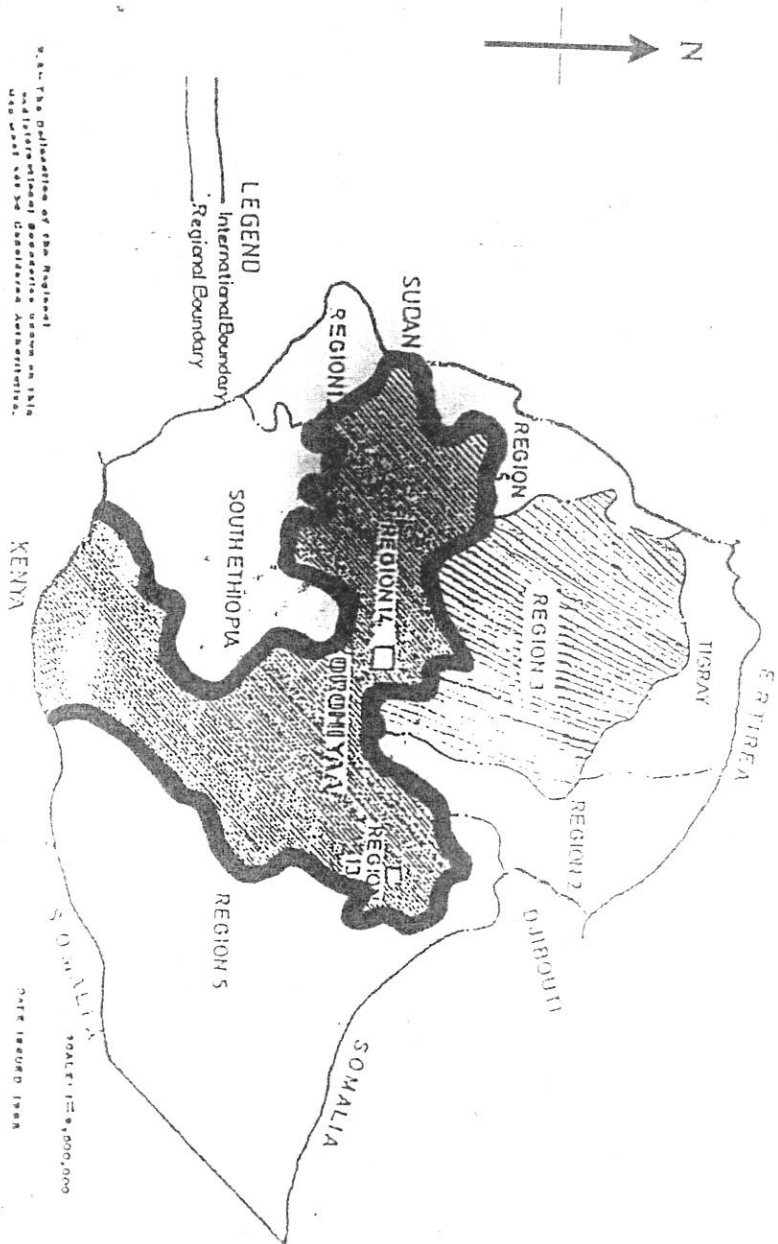
As the table shows, the activity of demonstration provided was not of sustained nature. Similarly, farmers' field days were conducted next to training completion. With a view to help participants' gain knowledge through experience sharing and to enable them to evaluate the performances and to suggest their opinion for future improvement.

The phase between 1997-1999 and 2000 was called integrated rural development program (IRDP) because it included training on organic farming, saving and credit, community health, basic education, veterinary services, and the like. The training and awareness raising activities were undertaken in the form of demonstration, pluralistic form of participation of farmers. The spheres in which training and demonstration undertaken are crop and livestock production, local level seed production, vegetable production, organic farming system, forage production and development, poultry production, beekeeping, veterinary services, forestry, soil and water conservation, seedling production, rural water supply etc. Generally the approach of ASE is need-based integrated rural development with appropriate and flexible strategies on adult training, extension, community organizations and use of indigenous resources

The programs were guided by operational guidelines and systems that enable effective management of human, financial and material resources. Despite this guideline, some common problems (constraints) on the part of ASE are encountered among which are shortage of skilled manpower, especially DAs, logistic mainly transport constraints and some limitations (weak sides) of the NGO. Some of these limitations are

- a) Concentration of power and duties in the head office, larger number (over staffing) of man power in head office.
- b. High overhead cost due to superfluous human power in the head offices, distant location of regional project offices, which raise transport and other running cost.
- c. Problems related to monitoring and evaluation because of inadequate base line data and documentation.
- d. The gradual decline of farmers program participation in general awareness raising training (GART) because of:
 1. Some aspects of training program like the length of training duration for 6 (six) months.
 2. Frequent session of training every week.
 3. The larger member of participants in one group.
 4. Expectation of participants in training program to get material inputs.
 5. Other socio-economic problems of participant house holds.
 6. Lack of need assessment to provide training and weak preparation and curriculum of teaching.

Fig. 1 Location of ANRS and ONRS in Ethiopia



Source: Oromiya Planning and Economic Development Bureau

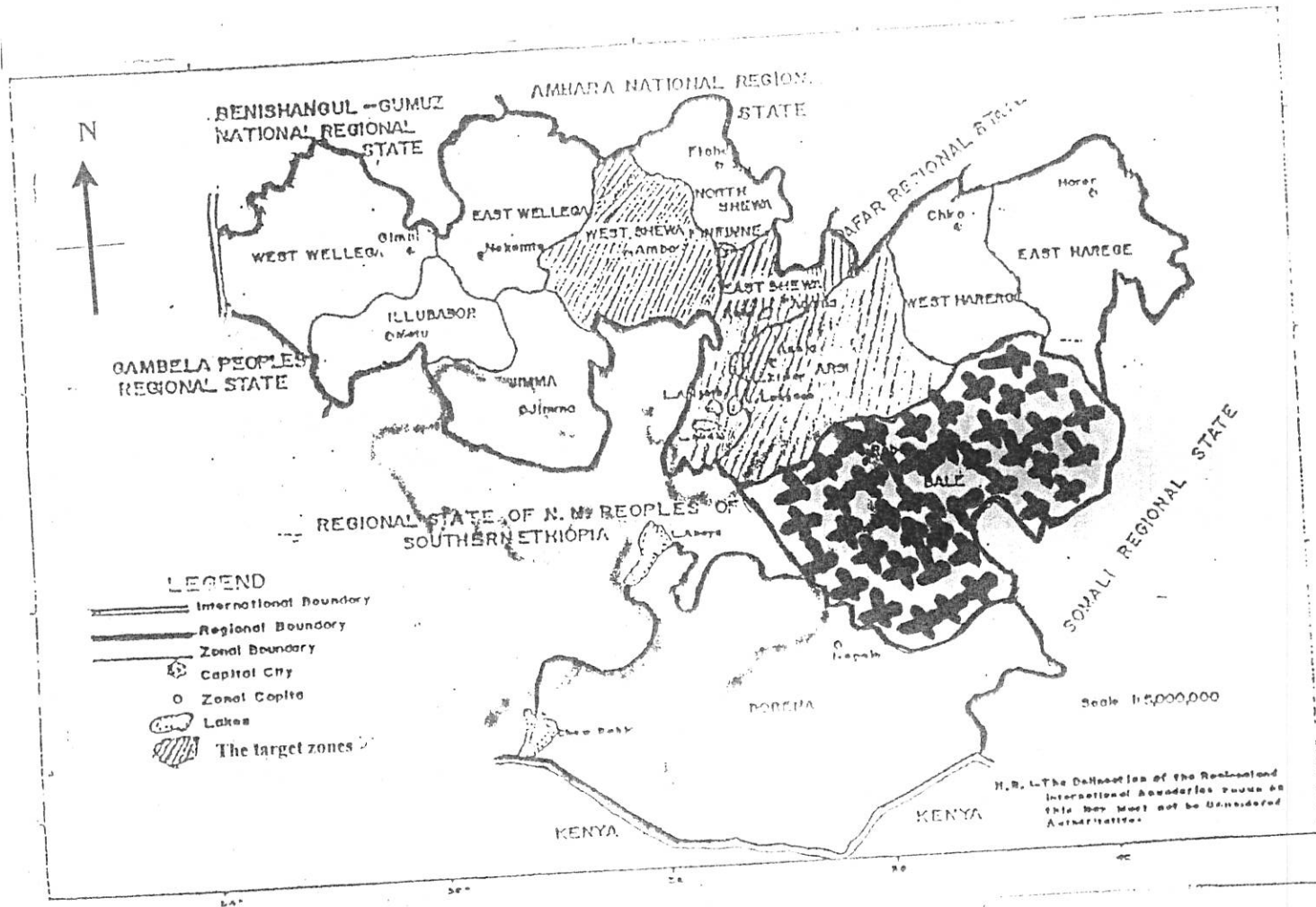
CHAPTER FOUR

THE STUDY AREA

4.1. General Characteristics of Bale Zone

Bale Zone is one of the 12 Zones of Oromia regional state with an area of 67,329.59km.² The zone is located between the range of 400 and 4377 meter above sea level. Administratively, the zone consists of 17 *woredas*. The size of these *woredas* varies according to the climatic condition. Those at the highland areas are relatively small but more populous. Whereas, those lowlands are larger in size and less populated. *Woredas* like *Sinana-Dinsho, Goba, Adaba, Agarfa, Dodola and Gasera-Golocha* and the like are some of the *woredas* located in the high land areas. The others like some parts of *Ginir, Goro, Madda-Walabu, Berbere* and the others are mainly low land and less populated. According to Zonal Planning and Economic Development Department, the total population of the Bale Zone in year 2000 was 166,730 urban and 1,243,138 rural that is a total population of 1,409,868. Classification according to sex indicates that male totals 618,354 and female equals 624,884. About 94.69 percent of Bale Zone population is agrarian. The rest, 2.88 percent of the zone, relies on trade and the other 2.43 percent of the locality is employed in different institutions and organizations. Climatically, Bale Zone is classified into *Wurch* (1.6%), *Dega* (13.33%), *Weyina Dega* (21.6%), *Kolla* (60.63%) and the rest is arid zone (2.9%). The zone is characterized by two rainy seasons, namely Meher and Belg. Meher rainy season constitutes about 60 percent of the agricultural output and the rest of 40 percent is produced during Belg.

Fig. 2 Zones of ONRS in which the Study Sites are Located



Source: Oromiya Planning and Economic Development Bureau

The soil character of Bale zone varies according to the topography and climatic situation. Majority of the high land is used for agriculture having different texture, chemical composition and color. In some areas, there is severe soil degradation because of erosion, over-cultivation and over-grazing. But most lowlands are under-utilized and vegetation covered. In the highland areas like Dodola, Adaba, Gassera-Gololcha, parts of Ginir and Goro, there is extensive deforestation because of population expansion, new settlement for farmland, and currently introduction of commercial farming by investors (commercial agro-investors) to produce wheat.

In terms of ethnicity about 80 percent of the population, is Oromo and the rest are Amhara, Somali, and others. More than 85 % percent of the population is Muslim and the others are mainly Orthodox Christians. In settlement pattern the highest proportion is located in rural but in highland (*Dega, and Weyina Dega,*) areas. Almost all of them are producers of cereals, mainly wheat, barley, oats, teff and maize. According to Planning and Economic Development Department of the zone, agricultural crops' output in the year 1988 *E.C.* has reached 3.5 million quintal. Out of this, more than half is the production of wheat and barley. The estimated area of land under cultivation was 323,650 hectare. Next to barley, wheat is produced for consumption. During a good harvest year, farmers produce and share fifty percent of their product for consumption. The proportion of the percentage of cereals used for consumption increases during a period of unreliable harvest. Out of 17 *woredas* in Bale, 10 of them are drought prone areas. About 10 percent of the zone's population is food aid dependent, because these areas are located in low land, dry and hot (*Kolla*) parts of the zone. According to the statistical report of the planning department, 35 metric tones food aid on the average is distributed for needy-people yearly. Estimated number of rural households in 1997 was 237,290. Average family size is about 5 persons per household.

And according to the calculation of the department, GDP per capita income of the population of the zone was Birr 877.86. Crop and livestock productivity is very low because of poor husbandry practices and productivity. In highlands fetching firewood and water is the main burden of the community because of the serious scarcity of firewood and water. The local area community is deficient in terms of basic social services like basic education, health, clean water and the like. According to National statistical report, primary school enrolment is about 11%, and the illiteracy rate is 73%. Infant and child mortality is about 120 and 176 per 1000 live birth, respectively (ASE, Jan.2000, and pp: 22,23).

The extension activity in the zone is found to be low. In this zone there are about 168 development centers, 116240 participant farmers in package programs in year 2000. The average annual distribution of fertilizer ranges from 50,000 to 60,000 quintals. In the zone, there are some common problems and constraints, which hinder or negatively affect the productivity of agricultural activities. These problems are:

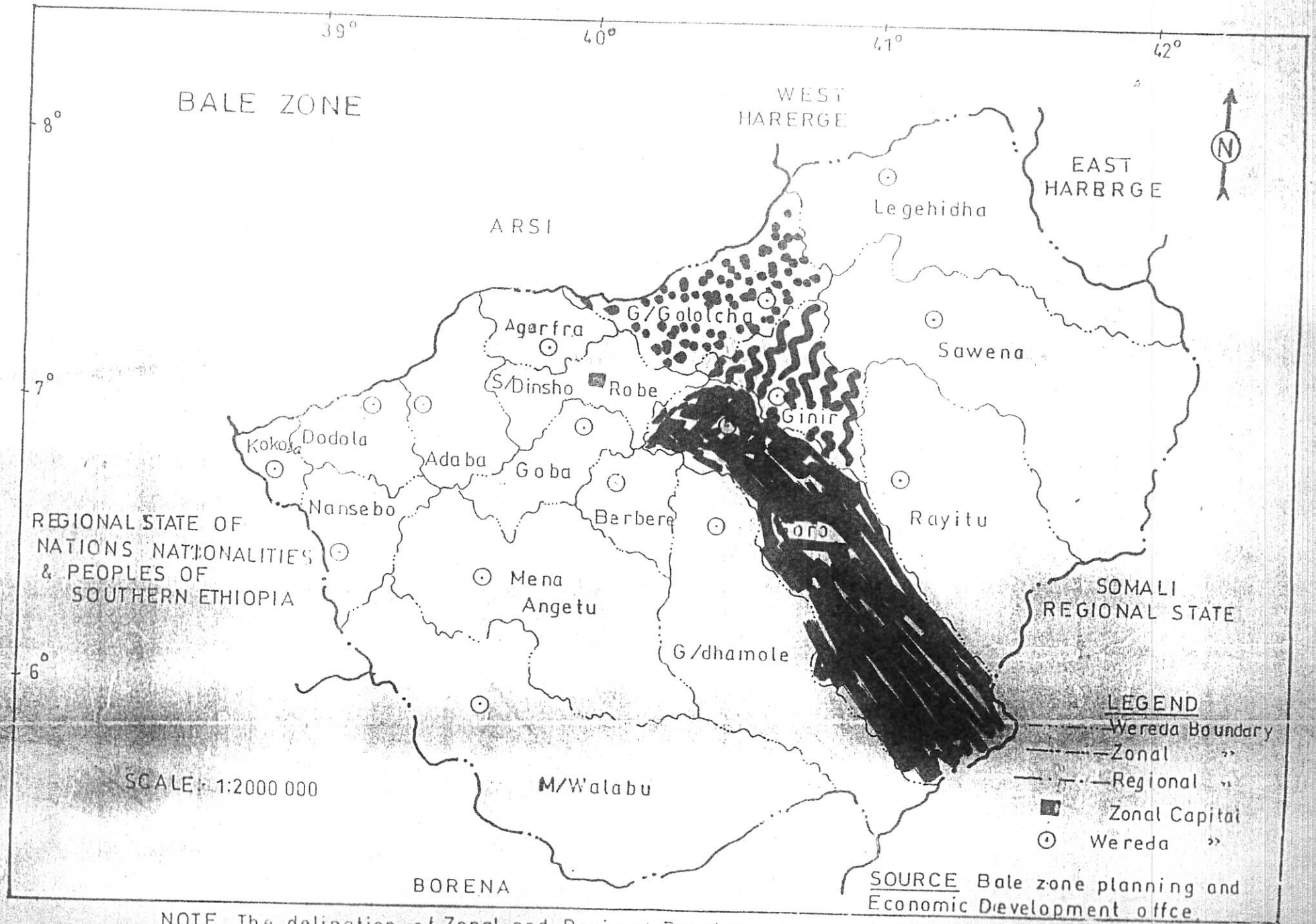
1. Erratic rain fall pattern.
2. Poor infrastructures.
3. Absence of land use policy
4. Poor natural resources conservation.
5. Poor cooperative atmosphere among farmers to overcome their local problems (socio-economic).

4.2. Some Characteristics of Sample Woredas.

Out of the existing 17 woredas of Bale Zone, Agri-Service Ethiopia has been involved in three of them. They are Gassera-Gololcha, Goro and Ginir (Gindhir). These woredas are among the ones with a reliable potential for agricultural outputs (crops and live stock) and they have all kinds of climatic condition (*Dega, woyina dega and Kolla*).

These three woredas have a total population of 347381 (current estimation) with 90-peasant associations. In 1992/93 E.C agricultural season, a total of 84736 hectare of land was under cultivation. Output obtained was estimated to be 475191 quintal in Gassera Gololcha woreda and 157228 quintal (Meher season only) in Goro woreda. According to documents and interviews obtained from the woredas' office of agricultural development, the main crops produced in these woredas are prioritized (ranked) and accordingly, wheat is the first one, teff is the second (except in Ginir (4th)) and barley is the third one. Through extension packages, the level of productivity of these outputs is 25-50 quintal for wheat per hectare. Barley ranges 18-35, and maize 18-40 quintal per hectare (Woredas' office of Agricultural Development). These three woredas are located in the middle part of Bale and highland and semi highland part of the zone. Lege-hidha, Sawena and Rayitu woredas in East and Somali regional state in South Eastern part are bound the woredas. Woredas like Agarfa, Robe, Berbere, and G/dhamole are also neighboring woredas of the three woredas.

Most surveyed areas of the woredas have *Dega and Weyna Dega* climatic zone and about 75 percent of the area have highland topography and larger plain of land (for instance Ginir has 4.3% mountain, 63.02% plain land and 32.8% gorge and slope (valley)).



NOTE The delineation of Zonal and Regional Boundaries shown on this Map must not be considered Authoritative

The land areas are completely deforested and with no vegetation left at all, except some acacia bush on hills and valleys. The soil fertility is cultivable but with decreasing fertility because the fallow land is decreasing. The same land is cultivated during *Meher* and *Belg*. The land does not give reasonable output unless artificial fertilizer is used.

The Bale zone is one of less densely populated areas. Relatively speaking, the highland areas of the three woredas are more densely populated than others. More than 95 percent of the woredas' population is located in rural areas. According to an interview with woredas' office of agriculture, about 95 percent of the population of Goro woreda is Muslim. In Ginir 70 percent are Muslim, and 30 percent are Christians. Similarly in Gassera Gololcha the majority resident population is Muslim. Concerning distribution on ethnic basis, the majority of the woredas' residents are Oromo. For instance, 89 percent (Oromo), 8% (Amhara), 1% (Somali) and 2% (others) are in Ginir woreda

Table 4.1 - Some basic characteristics of the sample woredas, 2000

	Area of woreda (ha)	Population Number			Rural Household		No Of PA	Climate (%)			Cultivated Land 1992/93 (Ha)	Agri.- Output (Qt)	No of DAs
		Rural	Urban	Total	Male	Female		Dega	W.Dega	Kolla			
Gololcha- Gassera	-	138080	7032	145112	19364	1369	39	4.2	48.4	47.4	29458	475191	39
Ginir	201056	-	-	111335	15513	1129	24	0.9	72.7	26.4	31347	-	37
Goro	451009	84459	6475	90934	-	-	37	1.5	30	50-60	23931	157228	-

Source: Field survey and interview of respective woredas' Agricultural Development Office, 2001

4.2.1. Gassera-Gololcha woreda: According to the survey, the three *woredas* have their own specific characters. For instance, most population of *Gassera Gololcha* woreda is living in *woyina dega* climatic zone. According to the previous survey of agricultural crops of this woreda, the main cereals produced were prioritized (ranked) to be wheat, teff and maize. But according to the woreda office of agricultural development, the main crops produced in the woreda are ranked thus; wheat, barley, teff, and maize, respectively. In this woreda, the number of peasants participated in extension package has increased from 210 in 1987/88 E.C. to 13,000 in 1992/93. Because of this participation and personal motivation, the output obtained from the woreda during the last three years has increased. Accordingly, total crops output obtained in 1990/91 E.C. was 200,832.3Qt. The output in 1991/92 increased to 491,390.75Qt and that of 1992/93 was 475,191 quintals. For the increase of such output, commercial agriculture investors have made some contributions. Farmers imitate methods of cultivating, using fertilizer, seedling, weeding, harvesting and others from the commercial agriculture investors.

In this woreda, the tendency of farmers to use fertilizer is decreasing because; the farmers couldn't pay back the debt since they would buy fertilizers on credit. Moreover, in some areas, the plots of farmers germinated strange (new) weeds. Another reason, the farmers fear to take credit is of unreliable (erratic) rain season.

The consumption behavior of farmers shows a slight change. They are constrained by cultural, and religious attitude. In addition to this, because of limited economic capacity, they consume a limited crop type. Mostly they produce teff for market. To minimize the risk of limited cash on hand, there are some introductions of diversification of activities, like production of vegetables, fruits, poultry, and rarely modern beekeeping.

A limited demonstration and training is underway on how to use products of animals (livestock) including chicken. To change their consumption behavior and diversification of farmers' households, other credit facilities for women have also been started by other NGOs like OSHO (Oromo Self Help Organization) and PEACE credit providing and training NGOs.

Conservation activities in the woreda are very minimal. The bare land was with dense forest 20 years ago. But now, because of population expansion, and farmland, some households started to plant Eucalyptus trees and 'Tid' around their compound. According to Woreda the Agricultural Office, in the woreda, since 1991 E.C., there has not been significant and official land distribution, which means, the land that belongs to one household varies from half hectare up to 3 or more hectare. The average land holding of a household is 2.3 hectare.

4.2.2. Ginir woreda: The second sample woreda is Ginir, which covers areas of 201,056 hectare. The cultivated land in 1992/93 E.C. was 31,347 hectare that was divided into 30402 for annual crops and 944.8ha., for perennial crops. Forestland in the woreda is estimated to be 68508 ha. The settlement in the woreda is on 3229 hectare.

The occupation of the woreda resident (population) is classified as 90 percent consisting agricultural farming, 0.58 percent trade, 8% trade and farming, and the rest pastoral. This woreda has 16642 rural households. Out of this 1129 are female headed. Ginir woreda is different from other woredas by its better practicing a small-scale irrigation vegetable and fruit. The family households diversify their income by selling fruits, vegetables and livestock. The average land holding per household in the woreda is 2ha, with the minimum of 1.5 and maximum of 2.4 hectare.

As a result of introduction of other farming practices like vegetables and fruits, some (limited) areas of the woredas rural household consumption habit is changing. Some of the common fruits and tree crops produced are banana, papaya, "chat", coffee, mango etc. Irrigation is practiced only in this woreda. This is because of the climatic change in low land areas of the woreda. The farmers were forced to find other alternative of water resource by diverting river and drilling water wells.

As is common in other woredas, newly introduced seeds of crops are becoming less productive, because the crop types do not resist pests and diseases. Wheat type '604' and teff types (cross-37 and DZ 358,354) are the only most successful types of seeds. Once the rain fluctuates, pests and diseases (mainly Wag) easily attack crops. This phenomenon discouraged farmers from being more productive and buying inputs on credit basis. The main problem of the woreda related to agricultural practice is environmental change, namely, shortage of rainfall.

4.2.3.Goro woreda: Goro woreda has an altitude ranging 1400-2300 meter above sea level (asl) with settlement areas of 9400 hectares of land. Goro woreda is specialized in producing spices like fenugreek (Abish), cowpeas (Ater), beans (Boloke), lentils (Misir), linseed (Telba), 'Nueg', Dinbilal; horse beams, "Tikur Azmud" and the like.

This woreda with some similarity to that of the Ginir woreda has the problem of climatic change, and also spread of pests and diseases (wag, rust locust, cricket, army worm, 'Filka' (soil born disease) is widely common. This phenomenon frustrated farmers from taking credit of inputs. The credit activity in the woreda is minimal because of the perception of credit as a gamble, which is taken as a sin.

There is no introduction of other types of agricultural practices like vegetable and fruits. Extension activity in the woreda is very minimal because of lack of trained manpower. The highland population of the woreda is better in terms of food self-sufficiency compared to the low land. According to the *Woreda's* agricultural office, the productivity level of crops in this woreda in modern and traditional practices has been compared in the table 4.2.

Table 4.2: Comparison of traditional and modern agricultural practices in terms of productivity in the woreda.

Type of crops	Productivity level of crops per hectare	
	Traditional	Modern (extension)
Wheat	14 Qt	30 Qt
Barley	18 Qt	30-35 Qt
Teff	6 Qt	16 Qt
Maize	20 Qt	35 Qt.

Source: Woreda 'Goro' office of Agriculture, (Interview and document), 2001.

4.3. Some common problems and constraints of the woredas

As a whole, the three woredas have some common problems and constraints that threaten their agricultural productivity. Some of these are:

- a) The rate of utilization of Urea fertilizer among farmers has been decreasing because of poor quality and mis-utilization of it.
- b) The selected seed types once distributed for farmers cannot be used again because of non-resistance of these types to infestation of pests and diseases.
- c) There is a shortage of supply of improved seeds.

- d) As a result of unreliable and erratic trend of rainfall pattern, the interest of farmers to use fertilizer on credit basis has decreased.
- e) Kolla areas (low land) are more food insecure.
- f) Income level of farmers is affected negatively by selling their cereals during harvesting period, when the price of crops is very cheap.
- g) Health problem-specially in low land areas.
- h) Shortage of water especially in low land areas.
- i) Desertification is expanding because of deforestation, which is as a result of population expansion and farming land.
- j) Low participation (enrollment) rate of children because of impact of backward culture and religion
- k) The land distribution is not proportional.

CHAPTER FIVE

MAJOR FINDING AND DISCUSSION.

5.1: Descriptive Analysis

5.1.1: Characteristics of the sample households-size, age, sex, ethnicity, language, religion, educational status.

As described in the objective of the study, it is of interest and important to measure the impact of the rural community training provided by Agri-Service Ethiopia on the status of food security of rural households. To attain this measurement a comparative approach was taken with other rural surveyed households, which are non-beneficiaries. Accordingly, the sample distribution for three woredas was made corresponding to the magnitude of involvement of integrated rural development program of ASE, which mainly included community training program.

The total sample size for three woreda is 200. This amount is distributed according to the number of participant farmers of the woredas. The sample size of beneficiaries and non-beneficiaries is proportionally distributed. The total number of beneficiary (participants of Agri Service Ethiopia) sample is 98 and that of non-beneficiary is 102 (table 5.1).

Table 5.1: Distribution of the participants of ASE and non-participants and corresponding sample size

Name of woreda	Involvement of Agri-service Ethiopia in Kebeles and Household		Corresponding sample size of village and households included			
	Number of villages included	Total Number of household included	Number of Villages	Number of households		
				Total	Beneficiary	Non-beneficiar
1.Gassera-Gololcha	18	5276	9	132	65	67
2. Ginir	7	2598	2	50	25	25
3. Goro	4	903	1	18	8	10
Total	29	8777	12	200	98	102
Percentage			41.38%		1.11%	

Source: ASE,2001 and sample data

Age, Religion, Ethnic group, Educational status and Head situation of the sample household

In terms of religion, the surveyed households are fifty percent Orthodox Christians and 50 percent Muslims. When it comes to ethnic distribution, 162 or 81 percent are *Oromo*, 36(18%) are Amhara, and the rest 2 are *Tigre* and *Gurage*. In terms of their educational status, illiterate head of households (29), adult education (77), elementary school is about 39, and junior and high school accounts 55 in number. According to head of the household situation, 174 sample households are male-headed, and the rest 26 are female headed. Their age distribution is with an average of 43 years old, with a minimum age of 20 and maximum age of 86 years old (see detail annex 1,table 1). 38 percent of the sample household heads have attended adult education and the rest 94 (or 47 percent) of the total household heads have attained educational status of elementary and above. According to the analysis the sample size in terms of beneficiary and non-beneficiary of Agri-Service Ethiopia is indicated in the following table5.2.

Table 5.2: Basic Data distribution of head of household with respect to beneficiary and non-beneficiary

	Beneficiary	Non-Beneficiary	Total
Religion			
-Muslim	53	46	99
-Orthodox Christian.	44	56	100
Ethnic group			
- Oromo	80	82	162
- Amhara	16	20	36
- Others	2	-	2
Educational status			
- Illiterates	7	22	29
-Adult Education	32	45	77
-Grade	22	17	39
- Junior and high school	37	18	55
Head situation			
- male headed	86	88	174
- Female headed	12	14	26
Age of head of household (mean)	39.41	46.42	
Family size (mean)	6.89	6.42	

Source: Survey data calculated, 2001

The basic data indicators i.e. educational status, religion, ethnic group, family head situation, average age of head of household and family size (mean) of the total sample size are found to be proportional between beneficiary and non-beneficiary. The training program provided to the households by Agri-Service Ethiopia is inclined to educated households and younger family heads. This could be a result of favourable capacity understanding of the younger educated heads of families. From 98 beneficiary sample family heads, 91 were acquainted with learning and teaching approaches. The other feature of the sample size of household heads has 6-7 family members. The major activities of rural household under the survey and similar local areas involve agricultural activities, mainly crop production and livestock production.

5.1.2. Performance of agricultural production

Land is one of the basic resources that determine the life of farmers. Accordingly, Bale zone can be considered as area where rural farmers have better (larger) area of land. The cultivable land area per family (household) ranges from minimum of 0.5 hectare to maximum 12.5 hectare with an average of 3.21 hectare. This indicates that there is no proportional land distribution among the farmers. The larger number of farmers' cultivable land is concentrated around 2.5 and 3.5 hectare per household. Out of this magnitude of cultivable land per household, the land cultivated in the last farming season of 1992 was an average of 3.21 hectare, having the range of 0.5 hectare (minimum) and maximum of 7.75 hectare of land. When we classify the land usage into beneficiary and non-beneficiary farmers, there is no significant difference on their capacity to utilize it. The average land usage (cultivated) for the beneficiary household is 3.24 hectare but that of non-beneficiary is 3.18 hectare.

Table 5.3 indicates that there is no significant difference between the farmers included under the program of Agri-Service Ethiopia and non-participants. There is a slight indication of the impact of training on actual cultivated land, rented-in-land, share- cropped-in-land and others.

Table 5.3: Land utilization features of sample farmers

	Land Utilization of Farmers	Total Number Of farmers Responded	Classification of Farmers			
			Participant of ASE		Non-beneficiary Farmers	
			N ^o of farmer	Average land (ha)	N ^o of farmer	Average land (ha)
1	Own Cultivable land	200	91	3.27	101	3.16
2	Own land left fallow	112	64	1.09	48	0.82
3	Cultivated land in 1992 E.C. farming season	200	98	3.24	102	3.18
4	Total rented-in land cultivated	20	9	1.0	12	0.88
5	Total share-cropped-in land cultivated	44	22	1.57	22	1.25
6	Gift in land cultivated	10	5	0.33	5	0.83
7	Rented out land	6	2	0.56	4	0.61
8	Share cropped out land	22	12	1.02	10	0.80
9	Gift or lent out land	22	10	0.73	12	0.98
10	Own grazing land	135	69	1.06	66	0.85
11	Rented in Grazing land	7	1	0.5	6	0.92
12	Own garden land	186	93	0.42	93	0.40

source: Survey data, January,2001

One analyzing the changes that take place in the lands under cultivation in the past, one notices that the general situation does not have significant difference. The farmers were asked if they have cultivated the same size of land in the past. Out of 200 sample households 118 (59%) out of which (54 are beneficiary) and (64 are non-beneficiary households) have responded that they have cultivated the same plots of land. 42 (21%) of the household said that they cultivated larger plot of land. The rest 40 (20%) have said that the size of land they cultivated decreased in size in the last two years. The impact of this fluctuation of cultivated land influences their attitude negatively or positively on their trend to be more productive. (Table 5.4)

Table 5.4: Change of Land size cultivated during the last 2 and 5 years in %

	Total	Beneficiary (%)	Non- Beneficiary (%)
Land size cultivated during the last two years			
- The same size	118	55	62.75
- Larger size	42	25.5	16.67
- Smaller size	40	19.5	20.58
Land size cultivated during the last five years			
*The same size	99	43.3	55.88
*Larger size	43	22.68	20.59
*Smaller size	57	34.02	23.53

Source: Survey computation

The numbers of respondents who faced land size decrease in the last five years constitutes 29 percent of the total. Out of these, 33 of the respondents (or 16.5 percent) were those trained under Agri-Service Ethiopia.

The main reasons for smaller size of land under cultivation of the families responded are: a) land redistribution among the family members (54% or 31) respondents. b) Land redistribution by *Kebele*, 11 respondent 20 percent. On the other hand, the main reasons for the larger size of land cultivated during the last two years are: a) land re-distribution by kebeles - 19 respondents or 43 %. b) Share-cropped-in and land inheritance 17 respondents or 39 percent.

It will be indicative if land cultivated for one of the main crops of the Woredas is shown here. Accordingly, wheat is cultivated on average of 1.34 ha, a minimum land area of 0.25 hectare and maximum of 4 hectares. If we classify this cultivated land into participants and non-participants, the average land cultivated for wheat under participant farmers was 1.43 hectare and that of non-participants was 1.25 hectares. This difference of cultivated land between beneficiaries and non-beneficiaries is statistically significant at 10 percent level.

5.1.2.1. Crop Production: It is obvious that generally Bale Zone or its highlands are known for cereal production mainly wheat, barley, oats, maize, teff. According to our sample size, a survey (questionnaire) made for two hundred households, indicated that the rural households have produced at least 20 types of crops and vegetables. Out of 200 households interviewed, 196 have responded that they cultivate wheat. Next to wheat, 187 households produce barley. The third one is reported to be maize by 140 households. The others 4th, 5th, 6th, 7th are oats (aja)(89), teff (88), linseed (44) and horse beans (43). So, from the response of the households, we can understand, the first main crops produced in Bale or three woredas are *wheat, barley, maize and oats and teff*. These crops constitute 80 percent of crop production according to the report made by household.

According to the field survey undertaken, crop yields obtained per crops and correspondingly in terms of beneficiary (participants) and non-beneficiaries indicates that the difference is found to be insignificant. The following table 5.5 indicates these features in comparative approach.

Table 5.5: Average Crop Yields According to Participants and Non-Participant of ASE

Crop Type	Number of Respondents		Average Yield (Qt/ha)		Total Yield Average Qt/ha
	Beneficiary	Non-Beneficiary	Beneficiary	Non-Beneficiary	
Teff	44	44	6.47	6.41	6.44
Barley	89	98	12.17	10.98	11.55
Wheat	98	98	12.71	12.81	12.76
Maize	70	69	14.46	15.42	14.94
Oats (Aja)	44	45	9.25	11.32	10.39
Horse bean	17	26	12.10	14.68	13.78
Cow peas	21	17	8.82	8.06	8.46

Source: survey data

The number of respondent households of the participants and non-participants of ASE concerning the production of crop items mentioned above are nearly equal when one analyzes their average yield in terms of participants and non-participants of ASE. There is no statistically significant difference between the two groups. But from crude figures of the crop type, we can understand that the level of wheat yield (main crop of the zone) is found to be lower in terms of the participants of Agri-Service Ethiopia than non-participants. The main reason is found to be crop loss (damage) that occurred. Similarly, the participants have relatively lower productivity or yield in maize, oat and horse beans. Other reasons can be less impact of GART training in short run, which is not more specific kind of training. For other crops like barley, teff and cowpeas the participants have greater outputs (nearly 1 Qt/ha) than non-participants. But still the differences between them are not statistically significant.

5.1.2.2. Estimated Value of crops (cereals, pulses, oil crops) Produced: The sample woredas in specifically, and Bale Zone in general, are known for some of the major crops. These include wheat, barley, maize, teff, oats (Aja), horse beans, cowpeas, linseeds and lentils. The sample households were asked whether they produced crops, what types of crops, what quantity of each crops, and the estimated value of each crops for the last 1992 agricultural year.

According to the question the quantity produced has been mentioned above. Here we will look at the estimated average value of each crop per household (Annex 1 table 2). The most frequently produced crops are wheat barley and maize. And the larger value of output is obtained from wheat. Presently, farmers consider wheat as commercial crop, which means they produce it for generating income (cash).

This also indicates that the extension and innovation activities program on wheat by governments and NGOs are expanding. But as described in crop loss section, wheat production has been facing serious crop damage because of pests and diseases, mainly, wag and others.

When we look at estimated value of the crop output produced in 1992, in terms of participants of Agri-Service Ethiopia and non-participants. table 5.6 shows that though standard deviation of non-participants is greater than that of beneficiaries the non-participant farmers are generating higher output value. The main reasons can be the crop loss that the beneficiaries have faced in the year and the types of crops that they are producing.

Table 5.6:- Estimated Value of Crops Output Produced in 1992 E.C.

	No of Respondent Household	Estimated Value of Out put	
		Mean	Standard Deviation
Beneficiary	98	4353.04	3086.69
Non-Beneficiary	101	4454.67	3236.19

Source: Survey data computed, January 2001

The maximum crop types that one household produced is 9 types, and the minimum is 1. The average crop types a household produced is found to be 4.39. In terms of beneficiary and non-beneficiary, average crop diversification of beneficiary household is 4.41 and that of non-beneficiary is 4.36. From these numbers we can understand that the two groups are not significantly different.

Analysis is also made in terms of the users of improved seeds according to crops. The total number of households responded that they used improved seeds for all six types of crops constitute 15%.

We can understand that the level of average yield for teff, barley, wheat and cow peas crop types is found to be relatively higher for those used improved seeds, even though there is no statistical significance and the number of respondents is smaller. When we see in terms of the participants of ASE, the situation looks like similar, though the number of farmers used improved seeds is higher in participants of ASE. The improved seed user farmers for wheat production were 59 out of 98 total participant farmers, which constitute 60.2 percent. But of non-beneficiaries, were only 18 out of 102 are non- participants. This indicates that the surveyed households, which used improved seeds, faced crop loss higher than non-users of improved seeds.

Those who used improved seeds of wheat faced 8 quintal/hectare losses because of various reasons related to environment diseases, pests, and crop seed varieties. While others, non-users of improved seeds, faced only about 4.2 quintal/hectare wheat crop losses. That explains why the wheat yield of participant farmers is lower than that of non-participants (table5.7).

Table 5.7. The yield obtained in terms of crop types as a result of improved seeds used

Crop Type	Beneficiary vs. Non-Beneficiary		
	Total Number	Users of Improved Seeds	
		(Yes)	No
Teff	Beneficiary = 44	4	40
	Non-Beneficiary 44	2	42
	Total	6	82
	Mean Yield	12.22	8.94
Barley	Beneficiary= 89	10	79
	Non-Beneficiary =98	6	92
	Total	16	171
	Mean yield	13.88	12.49
Wheat	Beneficiary = 98	59	39
	Non-Beneficiary = 98	18	80
	Total	77	119
	Mean yield	13.22	12.45

Source: Survey data computed, January, 2001

The research concerning fertilizer used has also been made. Based on the questionnaire made for participants and non-participants, significant responses were obtained on only five types of crops mainly on wheat, barley, teff, oats and maize in descending order. Except horse beans, the yield obtained in quintal of the participants of Agri-Service Ethiopia has outperformed the non-participants. In addition to this, the number of participants who used fertilizer for specified crops are 192, whereas those non-participants who used fertilizer (Urea and DAP) are only 165.

Therefore, the ratio of participants to non- participants is 1.16: 1. Even though the level of statistical difference of significance does not exist, (except maize) between the two groups of farmers, the participants used to use fertilizer. (See table 5.8)

Table 5.8: The Rate of fertilizer used per crop cultivated in hectare

	Crop Type	Beneficiary Vs Non-beneficiary		Number users of fertilizer (both)	Average rate of fertilizer used KG/ha)	Statistical level of significance
		Number of Respondent				
1.	Teff	Beneficiary	44	16	79.43	
		Non-Beneficiary	44	16	75.25	
2.	Barley	Beneficiary	89	49	70.48	
		Non-Beneficiary	98	32	54.03	
3.	Wheat	Beneficiary	98	66	78.56	
		Non-Beneficiary	98	59	61.54	
4.	Maize	Beneficiary	70	6	68.33	at 5%
		Non-Beneficiary	69	7	40.10	
5.	Oats	Beneficiary	44	14	94.76	
		Non-Beneficiary	45	8	64.03	

Source: Survey data computed, Jan. 2001

The rate of the utilization of improved seeds between beneficiary of ASE and non-beneficiary indicates that 60.2percent (or 59) of the beneficiary and 18.4% of non-beneficiary households have responded that they used improved seeds. According to the feedback from the questionnaire, only a total of 77 households out of 196 respondents said that they used improved seeds. The rest 119 households did not use improved seeds. When we look to the level of wheat yield as a result of improved seeds between the participant and non-participant, yield (Qt/ha) for participant is 13.22 and 12.45 for non-participants.

In the analysis of crop-yield mentioned before, attempt was made to indicate that the yield of wheat (Qt/ha) of participants is found to be better than that of non-participants. This result is obtained despite the fact that wheat production of participants of ASE has faced crop damage or loss. The level of loss of participants' visa-a-vise non-participants is found to be 1.90: 1(8: 4.2 yields), which means when one qt of wheat of non-participants is damaged, the crop (wheat) loss of participants is 1.9 quintal per hectare. The reasons could be the nature of improved seed used, which is mainly exotic or non-tolerant to the climatic changes and diseases.

Except wheat, the crop losses in others are found to be similar and not significantly different. In terms of fertilizer usage, participant farmers used or applied larger rate of fertilizer (KG) per hectare than non-participant farmers. Accordingly 37.1% of participants of Agri-Service Ethiopia used fertilizer whereas only 28.4% of the non-participants used fertilizer. This is statistically significant at 1% level. The majority of fertilizer used was for the main crops commonly produced. Wheat takes the first place, then barley, teff, and oat respectively.

The quality of land cultivated is one of the factors that determine the productivity of crops. To analyze our sample data in terms of this quality, we classified the land into *lem* (fertile), *Lem teuf* (middle) and *teuf* land (less fertile). Based on this classification, questions were prepared for households under sample survey that generated 193 respondents. The number of households who said that their land is *lem* accounts 44%, those who said that their land is *lem teuf* (middle fertile) share 48 percent and those households, who have *teuf* land, share 8 percent, of the total. According to this land classification, the yield obtained from *lem* land quality is found to be 13.08 qt/ha, that of *lem teuf* is 12.85 qt/ha and yield obtained from *teuf* land is 8.7 qt/ha.

Next to the quality of lands, from cultivation up to post harvesting activities and situations, the yield obtained for two groups of households has been analyzed. Accordingly, almost 100% of the respondents use animals as a means of land preparation. Both groups of households use broadcasting for fertilizer application and planting method. Human power is the main method used in weeding, harvesting, and transporting from threshing site. The main threshing instruments are animals. In most cases, the timing for all types of farming activities described in the table is undertaken at normal time. Analysis has also been made on some of the specific types of crops about the land preparation and other consecutive works. Wheat is selected here, focusing on the major crop in Bale. For land preparation, 90% of the beneficiary and 100% of respondents of the non-participants use animal power. Only 3% of participants responded that they use machinery.

Figure 3: Farmers and DA group discussion and training



Photo: Courtesy of ASE

As is the case for the whole types of crops cultivated, land preparation is at normal time for 69% of participants and 77% of non-participants who responded (table 5.9).

Table 5.9: Methods and Timing situations of the households' activity from land preparation to threshing.

	Agricultural activities	Percentage and Number of the Respondent	
		Participant	Non-participant
1	Main method of land preparation -Animals	100%(46)*	98%(45)*
2	Timing of land preparation At Normal Time	87.5%(42)	78.3%(36)
3	Planting situation Broadcasting	100%(43)	100%(45)
4	Timing situation of planting Normal	85.1%(40)	74% (34)
5	Weeding situation		
	Human	85.4% (35)	90%(36)
	Machine	7.3% (3)	2.5(1)
6	Fertilizer application		
	Broad casting	97.1%(33)	90%(18)
7	Timing of fertilizer application		
	Normal	94.3%(33)	94.7%(18)
8	Harvesting method:		
	Normal	94% (43)	98%(43)
	Machine	4.3%(2)	2.3%(1)
9	Harvesting time:		
	Normal	87%(40)	78% (35)
	Too Early	6.5% (3)	22%(10)
10	Method of transporting from threshing site		
	Human	23% (11)	24% (11)
	Animal	71%(34)	74% (34)
11	Main method of threshing		
	- Animal	88%(42)	85%(39)
12	Timing of threshing		
	- Normal	87%(39)	86%(38)

Note *the figure in parenthesis indicate the magnitude of respondent in number.

Source: Survey data computed.

From the table one can observe that there are some indications of slight improvements in being conscious on the part of participants in terms of using machinery. Additionally, in terms of being at normal time to perform the required activity, the participants of ASE dominate the share compared to non-participants.

5.1.3.Natural resource (Soil) Conservation Practice: Soil fertility is one of other factors that determine the productivity level of the agricultural crops. To analyze this situation, questions have been put for both groups of households. The question focuses on whether the trend of fertility of their farmland is decreasing. Accordingly, 74% (20) of the participants and 76% of non- participants have responded that the fertility of their soil is decreasing. Those, who could maintain the fertility of the soil shares 19% of participant farmers and 10% of non- participant farmers. So to reduce the decrease in fertility of soil, soil conservation practice is one of the factors. A question has been put for both groups of households if they undertake conservation practices. The response of participant farmers who practices soil conservation share only 35% and that of non-participants are 19%. From this response, we notice that 65% and 81% from the two groups (respectively) do not practice soil conservation. Therefore, this situation aggravates the situation of fertility decline of their farmland in the future.

Questions were also raised whether they take initiatives them selves or other external bodies initiated them to practice soil conservation. The participant farmers received initiatives 50% from extension agents and the rest were self- initiated plus by their neighbors. Whereas, non-participants personally took initiatives took undertake soil conservation. The main soil conservation measures that participant farmers are undertaking are contour-ploughing.

Figure 4: Degraded land because of deforestation



Photo: Courtesy of ASE

The main reason for not under taking soil conservation practices have been found to be (94% of participants) and (77% of non-participants) that there is no erosion problem. The farmers were also asked if they took any training on soil conservation. Accordingly 93% of the participant farmers have responded that they took training whereas that of non-participant farmers who didn't get any training related to soil conservation are 86%. This indicates that participants have more access to training. In relation to this, we have tried to identify who provided the training for farmers. According to the response, 54% and 43% of participant farmers get training from Agri-Service Ethiopia and new extension service by government respectively; the non-participants get training from extension program of Derg and the present government extension program.

5.1.4. Tree Crops: The other crops, next to cereals, pulses and oil crops that the rural farmers produce are tree and garden crops. On questions regarding tree crops, the interviewed households have responded that about 30 types of crops have grown in the woredas.

Some of these main tree crops grown by respondent households are: eucalyptus, *tid* (both local and imported), *Girar*, *Gesho*, *Wanza*, *Chat*, *Grawa*, *Kunde Berbere*. According to this list, the most frequently reported tree crops are eucalyptus and 'tid' trees. One hundred thirty seven (137) households report eucalyptus tree, and 58 households report Tid. The others are Girar by 26, Gesho by 17, Wanza by 16, Chat by 12 households. The first six types of tree crops constitute 78% of total respondents. The average tree crops that a farm has are shown in (Annex 1 table 3)

Out of the total reported 30 types of tree crops, trees in full production have been distinguished. The main tree crops that reached at full production include Eucalyptus, Tid, Girar, Wanza, Gesho, and Grawa. Those tree crops that reached full production level have been estimated in value terms. The estimated average value of tree crops is found to be Birr 514, with minimum of Birr 15 and maximum of Birr 3000 per household. Out of the main tree crops mentioned above the (highest) average value is obtained from eucalyptus, which is Birr 489. Only 73 households reported value estimation of tree crops.

When we look from participants' and non-beneficiaries' point of view; households (participants) who have tree crops are 66 in number, and non-beneficiaries, are 59. The average value of tree crops in a farm is found to be 389 trees for beneficiaries of Agri-Service Ethiopia, and 302 trees in non-beneficiaries farm (table 5.10).

Table 5.10: Estimated value of tree crops with respect to participants

	Beneficiary	Non-Beneficiary
Estimated Value (in Birr)	389	302
No of household responded	28	27

Source: Survey data

The sample households were also asked if they grow tree crops in 1992 E.C. Out of 200 sample household 146 or (73%) of them have responded in the affirmative that they grow tree crops. Based on their response, the households have mentioned the reasons why they grow tree crops. The first purpose they grow tree crops for firewood, and generating income and the second purpose is for construction materials, for firewood and for fence in descending order (see Annex 1,table 4) The other question, in relation to tree crops, that the households were asked was about source of seedling. Accordingly, a total of 323 responses were obtained. Out of the responses, the sources of seedling by NGO accounts 147 for respondents, which constitutes 46% of the seedling report. The second source is community-nursery, and their own nursery. The main NGO that has been playing a role in seedling distribution was ASE.

Figure 5: Nursery and seedling activity

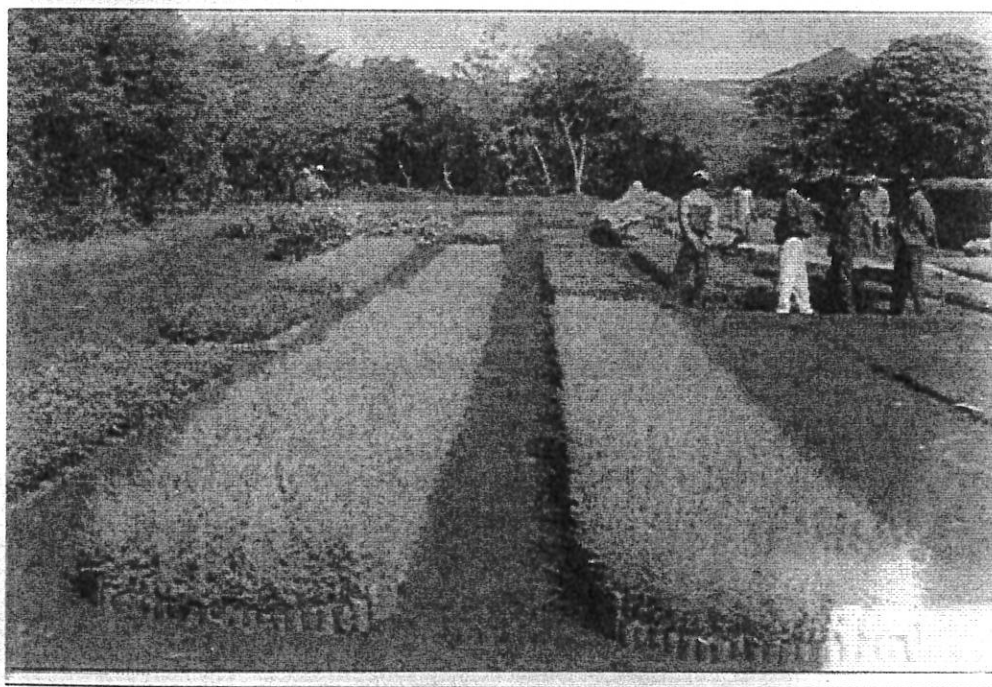


Photo: Courtesy of ASE

In terms of beneficiary and non-beneficiary, 83% of beneficiary households and 66% of non-beneficiary households grow tree crops. In addition, 56% of participant farmers and 33% of non-participant farmers get seedling from ASE (or other NGOs). The next sources of seedling are community-nursery, and their own nursery. Here, 18% and 11% of beneficiary households get seedling from **community nursery** and **own nursery** respectively. And 16% and 17% of non-beneficiaries get seedling from community nursery and own nursery. Here we can easily understand that the role of Agri Service Ethiopia in tree crop production and seedling program is very significant, because, at least, the respondent households have awareness about importance of tree crops and diversification of their income and crops. The reason why both groups of the households do not grow tree crops is shortage of land. Here 73.3% of beneficiary and 44% of non-beneficiary households reported have shortage of land. The other reasons are shortage of money, risk of land tenure, and shortage of labour.

5.1.5. Garden Crops: Garden crop production is one of the crops that are less expanded in Bale zone and the corresponding three woredas. According to the questionnaire, the household responded that from beneficiary and non-beneficiary some produce garden crops during raining seasons. This implies that irrigation activity is less practiced. 77.4 percent of beneficiary respondents and 58.4% of non-beneficiary respondents grow garden crops. The rest do not grow garden crops. The main reason for not growing garden crops is shortage of land. Accordingly, 55.6% from the beneficiary and 39.6% of non-beneficiary do not produce garden crops because of shortage of land. The next reasons for both groups of households are shortage of labour and shortage of money to buy seedling.

The skill promotion training of garden by ASE is more directed to women (gender sensitive). This indicate that of the respondent of participants, female headed or any member of the household has started to benefit from the training

Figure 6: Training of gardening

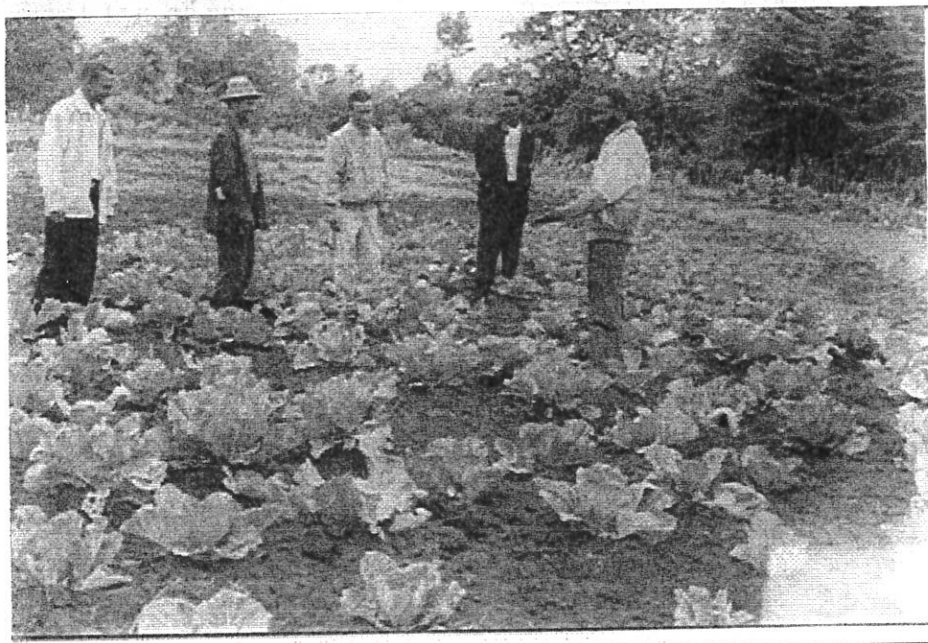


Photo: courtesy of ASE

Those producing garden crops are producing in their own compound according to 90% of responses. Some of the main garden crops that the households grow are onion, cabbage, potatoes pepper and garlic in order. (See Annex 1, Table 5).

The average cash earning from sales of these garden crops for 130 respondent households is found to be Birr 85.87. But, generally, the estimated value from output produced is Birr 113.28. Garden produce in the sample woredas' households indicate that estimated value of these crop output produced by participants of ASE have higher value of out put estimated compared to non-participants

5.1.6. Crop Marketing (Sales): Farmers are also selling some of their output produced in a year for the various purposes. According to the present survey 341 responses have been reported. Average income from sales for the total crops is found to be Birr 572.31(see Annex 1, table 5). With respect to selling crops 168 households out of total 200 sample households, have responded. Out of 168, only 109 of them have sold at least one of the crops (cereals, pulses, oil crops, tree crops and garden crops). Concerning quantity of crops sold, the average kilogram sold is 1230, with minimum value of 7kg and maximum of 6800kg. On the other hand, average revenue from selling crops is found to be 1514 Birr.

In terms of beneficiary and non-beneficiary, average income of beneficiaries from sale of crops is Birr 1473 while that of non-participants is Birr 1555.50. According to this figure, non-participants are getting higher income than participants. The number (percentage) of households who sold their crops is 64% from beneficiaries and 65% from non-beneficiaries.

5.1.7.Livestock production: Next to crop production, livestock production is expanding in Bale Zone. Out of 200 households interviewed, 197 responded about their activities of livestock production. Before indicating the level of production of livestock, the head of households were asked if they received any training related to livestock.

According to this, out of 200 households 100 of them have received training in one of the stakeholders in the country. Seventy-five of 100 trained farmers were trained by Agri Service Ethiopia, which is 75% of the total. The rest 25 or 25 percent of trained farmers were trained during Derg extension program, new extension program and by SG/2000.

In terms of participant farmers and non-participants, the ratio or percentage of trained farmers from participants of Agri- Service Ethiopia is found to be 90.8%, and that of non-participant farmers is only 10.8%. This implies that participant farmers of ASE are more acquainted with modern ways of livestock production than non-participants. Statistically, their difference is significant at 1%. The training and related program of Agri-Service Ethiopia in relation to livestock includes

- a) general Awareness Raising Training (GART) which includes general agriculture of improved livestock production methods
- b) Forage development and production
- c) Improved bee keeping
- d) Poultry production
- e) Veterinary services
- f) Rural water supply.

Before measuring the impact of these types of activities undertaken by Agri-Service Ethiopia and comparing them with non-participants farmers, let us see the livestock population reported by sample households interviewed. Here livestock is categorized into 5 parts, which includes:

- a) Cattle
- b) Small ruminants (sheep and goats)
- c) Pack animals (equines)
- d) Poultry
- e) Beekeeping

From the table we understand that, except poultry production, the participants of Agri-Service Ethiopia have lower livestock number compared to non-participants. But in terms of estimated value, participant farmers have **livestock, which have higher value** (except pack animals). This indicates that the participant farmers have **better knowledge of livestock management and handling than non-participants**. Quite naturally; the quality of their livestock is better than that of non-participants.

Table5.12: Average number and estimated value of livestock type in terms of beneficiary and non-beneficiary

Livestock type	Beneficiary		Non-Beneficiary	
	Average Number	Estimated Value	Average Number	Estimated Value
Cattle	9.28	1521.83	11.0	1328.63
Small Ruminant	4.08	111.78	4.43	80.31
Pack animals	1.99	487.39	2.16	570.68
Poultry	6.90	9.49	6.80	8.29

Source: Survey data computed

5.1.8.Poultry and Bee keeping production: It has been indicated in previous sections that Agri-Service Ethiopia has given skill promotion training on poultry and beekeeping production for selected farmers, mainly women, who took General Awareness Raising Training (GART). The purpose of the training was to diversify the income, production and consumption of the household, especially targeting women. Accordingly, attempt has been made to show in the survey undertaken whether the households, which have started producing poultry and beekeeping (beehives) are greater from the beneficiary farmers of ASE than non-beneficiary.

The poultry production of participant farmers of ASE is statistically better at 5% level of significance, whereas, bee keeping is totally produced by participants of ASE in our sample survey.

Figure 7: Modern beekeeping training



Photo: Courtesy of ASE

From table 5.13, we can see differences between beneficiary and non- beneficiary, in both poultry and beekeeping (beehives) the greater share is from the beneficiary farmers of ASE than non-beneficiary

Table 5.13: Poultry and Beekeeping production in terms of beneficiary and non- beneficiary

Production type	Beneficiary (percentage and number)	Non-beneficiary (Percentage and number)
Poultry owned	12.5%(40)	6.8%(22)
Bee keeping (Beehives)	2.2%(7)	-

Source: survey computed data

5.1.9. Problems and constraints related to cattle production: It is clear that cattle production holds larger proportion in livestock husbandry. Accordingly, a survey has been made on sample households if they have some constraints to expand the cattle production. Accordingly: shortage of drinking water, 'Gendi' disease expansion, lack of feedings, and other animal diseases are the most frequent constraints that limit their output.

Attempt has been made to indicate the problem in terms of participants and non-participant farmers. The total numbers of respondents in this respect is 197 households (table 5.14). The table indicates that both groups of the farmers are victim of all problems mentioned. There is no significant difference in terms of the problem they face.

Table 5.14: - Problems related to cattle production

Problem Type	Beneficiary Response		Non-Beneficiary Response	
	%	No	%	No
1. Lack of drinking water	92.7	89	95	96
2. Gendi Disease	87.5	84	82.2	83
3. Lack of feeds	86.5	83	91.1	92
4. Other diseases	80.2	77	78.2	79

Source: Survey data computed

5.1.10. Forage production: This production activity is another sphere in which Agri- Service Ethiopia has been providing training. It is aimed to help the livestock production to be sustainable. The shortage of livestock feeds is indicated in the above table. The households were asked if they produce forage for their livestock. Out of 192 responded households, only 59 of them have answered 'yes'.

Out of these 53 households 33 (62.3%) produce forage at their backyard. The remaining produces under-sowing, over-sowing and other methods. The number of beneficiary from these 59 respondents is 51 (or 86.4%) the rest are non-participants. In terms of methods of production there is no difference between participants and non-participants i.e. majority of both groups produce at back yard.

5.1.11.Income from livestock products Analysis has been done whether the sampled households have generated income from livestock products. The types of products included are: hide/skin, butter, dung cake, chicken, eggs, meat and honey. According to these products mentioned, 224 responses were found from the households. The responses found with respect to these products that the households sold at least one of these products and generated additional income in the last 12 months. Most of the livestock products sold are hide and skin, butter, milk and egg (see Annex1, table 9). The revenue generated from these products varies according to their type. The number of households that sell these products and generate income was 117. The mean revenue generated in a year was Birr 200.57, with a standard deviation of Birr 309.18.

Concerning fattening of oxen, out of 200 households interviewed only 20 of them have reported. According to this report, the average profit in a year was Birr 115.70. Majority of the reporters (75 percent of them) were getting Birr less than or equal to 500.

Table 5.15: Income generated from sale of livestock products

Livestock product type	Income (Birr)			Number of participants and average income (Birr)			
	Average	Minimum	Maximum	Participants		Non-participants	
				Number	Average income	Number	Average income
Hides/ skins	5	1.20	25.88	11	27.91	5.	21.4
Butter/cheese*	17.5	26.00	189.26	38	126.8	28	274.04*
Milk/cream	8	3.00	101.1	6	105.00	4	95.25
Dung cake	125	4.00	262.5	2	fully participated	-	-
Chicken	5	3.00	58.74	34	58.88	14	58.39
Egg*	4	2.00	43.17	46	48.83	24	32.33*
Meat	54	6.30	236.17	4	183.25	--	342
Honey	75	6.00	252.14	7	252.14	-	-

Source: Survey data computed

*-Statistically significantly different at 10%.

As the table indicates, the participants of ASE are greatly involved in producing livestock products and this group is generating larger income (revenue) than non-participants.

5.1.12. Non-Farm Activity: The other form of agricultural activity in the rural part of the country is non-farm activity, which is additional source of income for the farmer. A question was put for sample households from both groups (participants and non-participants of ASE). But only few responded. And the activity mentioned was not basically significant.

But generally, in addition to their farming, occasionally some form of trading among head of households have been reported but trading is not their major works. This absence of non-farm activity indicates

1. Agri-Service Ethiopia did not give training of farmers on this sector.
2. The farmers consider non-farm activity as inferior
3. Non-farm activity is taken as the work of the poor farmer and the inferior.

In the sampling technique simple random sampling has been used, which does not classify the household according to their income. Therefore the insignificant numbers of non- farm activities performed in the Woredas were randomly excluded.

5.1.13. Household Consumption Pattern: We tried to see the agricultural production (crops and livestock), marketing (sale) and finally non-farm activities. But the sustainability of a household also depends on the consumption pattern of its family. Consumption pattern is determined by various factors like family size, culture, religion, educational status, climatic and environmental situation and distribution and availability of foods, and also the level and diversification conditions of production. Consumption status in a family also varies according to age, sex and position of members of households. In the present case, it is indicated that the pattern of consumption situation of households surveyed in terms of their report on what types of crops they consumed in the last 12 months without getting into the detail of distribution, level and condition of consumption of family members. Accordingly, the main crops that the households reported to be consumed are teff, barley, wheat, maize, horse beans, and cowpeas.

Table 5.16 indicates the number of households reported that they consumed in the last 12 months, according to the beneficiary and non-beneficiary. The sample households consume mainly wheat, barley, maize and teff. From animals products, butter/cheese are consumed at higher level next to cowpeas and horse bean, because they can easily produce at home.

In terms of beneficiary and non-beneficiary, there is a slight difference on consumption of eggs and beef, in which the participants of Agri-Services Ethiopia consume the higher rate. This shows that, the training on the livestock production has brought a positive impact on consumption patterns

Table 5.16: Consumption Patterns of Households.

Type	Total percentage		
	Household Reported	Participants	Non-participants
Teff	62	65.3	58.82
Barley	95.5	93.88	97.06
Wheat	96	95.92	96.08
Maize	78.5	79.59	77.45
Horse bean	53.5	52.04	54.90
Cow peas	67.5	65.31	69.61
Egg	28.5	31.63	25.49
Butter/Cheese	36.5	35.71	37.25
Beef	29	30.61	27.45

Source: Survey data computed

Based on the consumption pattern of the households, measurement has been made at the level of household food security by taking the first 6 (six) types of main crops. But here, attempt has been made to indicate the sphere in which ASE has been involved.

ASE was providing training (skill promotion training) and general awareness raising training on poultry, bee keeping, livestock production and handling. As a result of this influence the farmers are expected to change their pattern of consumption habit correspondingly.

5.1.14. The household food security situation

We have tried to see the production, marketing, and consumption patterns of sample households. The production pattern includes cereals, pulses, oil seeds, tree crops, garden crops, and livestock production. Marketing part of the analysis includes the selling and purchasing of crops and animals (livestock) and livestock products. Finally, it has been tried to indicate the consumption pattern of households. This descriptive analysis is made to indicate the final condition of sample households that is whether they are food secured or not.

Household food security depends on the level of production (availability), consumption pattern, distribution among family members, and the degree of tolerance to drought and famine. This analysis is made according to categorization of the farmer household into participant and non-participants of Agri-Service Ethiopia.

According to different scholars, food production or availability is the main factor in determining status of the household food security. In subsistence economy of less-developing countries, the agricultural sector is mainly dependent on traditional and backward farming method. As a result of this, most rural farmers are living in condition of hand to mouth (i.e. what is produced is consumed). The Ethiopian agricultural sector reflects this characteristic.

In some parts of the country, this subsistence life is more vulnerable to food insecure condition. Based on this reality, we measured the consumption pattern and degree of being food security. The farmers of sample woredas are taken as representative of the tendency to consume what they produced.

As indicated in previous sections, households have responded on their level of crop and livestock production of their households. In addition to their own production, their level of marketing, sale seed reserve are also shown. Therefore, the model for **household food consumption** (AHC)=Actual production (AP) -Sale (S)+Purchase (p)-Seed Reserve (SR)+Food Aid (FA) or Shortly, ($AHC=AP-S+P-SR+FA$) is used because of their subsistence economy. Here, for sample households, we tried to compute the level of food security of the households based on the following assumption

Assumption

1. The household consumption depends on six main crops namely teff, barley, wheat, maize, horse been and cow peas.
2. There is no mal-distribution among family members.
3. The consumption rate throughout the year is the same.

Computation Approach:

1. Based on the assumption, the six main crops were identified, separated in terms of total output produced in the year. Then their quantity (KG) is multiplied by their corresponding actual average prices to get their value in a year (assuming that what is produced is consumed)

2. On the other hand, the national minimum calorie (2100Kcl) is converted to KG and then multiplied by weighted price of the six crops for a KG per capita per day (to change into value). Next step is multiplying the converted value of Kcl per capita by number of household and then change to annual value. Weight price is to say that actual prices of each crop types were identified and weighed according to the level (ratio) of production of six crop types.
3. Finally the computation of the difference of actual consumption value from minimum calorie in terms of value is undertaken and the percentages of sample households, which are food secure and insecure, were indicated.

5.1.15 Measurement of Food Security situation of sample household according to participant and non-participant

According to table 5.17, the percentage and mean values of two groups of households have no significant differences. But still with some percentages the beneficiary households are less secure. The main reasons can be 1) the crop loss that occurred during the production year, which is with greater rate in the case of beneficiary 2) The exclusion of other consumption items from the computation mainly animal products, garden and others in which the beneficiaries have been more accustomed.

d. RELIGN: Refers to religion of head of household. If Muslim RELIGN=1, and 0 if Orthodox Christian. Unlike orthodox Christian farmers Muslim are free to work all weekdays because of some sacred holidays observed by the farmers. Orthodox Christians spend 'tabot' days on social works and minor works instead of working. This situation has negative impact on being food self-sufficient.

e. EDUCDMY: Refers to educational status of head of household. If the education status of the head is Formal education, EDUCAMY=1, and 0 otherwise. Education has a positive impact on productivity. There is a belief that educated head of household is more productive and food secure because he/she can find the means to be more productive and food self-sufficient.

f. CULTLAND: Refers to the size of cultivated land of the main crops of the household. Cultivated land is expected to have a positive effect on households' food security status. Because in agricultural farming land is one of the main inputs that determine the level of productivity. As the land size under cultivation increase, *citrus paribus*, the production yield increase.

g. ASSETD: Indicates whether the household sold any of its assets. The asset that a household sales is expected to help the family to buy the food required for the household. The assets can be livestock or any home produced previously bought (obtained). It implies that at least the household can sell and buy food for consumption. Therefore, it has direct positive impact on being food self-sufficient.

h. OXEN: Refers to number of oxen owned by household. A positive relation between the number of oxen owned and amount of food crops produced is expected. As the household has more oxen, assuming that other factors are constant, agricultural output increases.

i. LNDQLTYD: Indicates land quality cultivated. LNDQLTYD=1 if *Lem* and *Lemteuf*, and 0 otherwise. Land quality (being *lem*- Fertile) has often been perceived as major determinant of productivity.

j. IMPSEEDQ: Depicts quantity of improved seeds used (qt). Using improved seeds is hypothesized to increase the productivity of the household.

k. LOSPRC: Shows rate of crop loss in total production. The higher ratio (rate) of crop loss is believed to reduce the degree of being food self-sufficient.

l. FERTLIZE: Indicates quantity of fertilizer used (kg). Artificial fertilizer is used to increase the productivity of the land under cultivation. It is used as complementary and supplementary to natural fertilizer to increase productivity. The more fertilizer the household uses, the higher the level of productivity and thereby being food secure.

m. AGRISE: If the farmer is participant of Agri-service Ethiopia, AGRISE=1 and 0 otherwise. Participants are expected to be familiar with modern technology. Being participant of ASE is taken to have positive influence on being food self-sufficient.

5.2.2. Results of the econometric model

The model correctly predicts about 84.15% of the observed values, which shows the strength of the model. Moreover the calculated log likelihood ratio-indicating goodness of fitness is also sufficiently large (0.32) or 32%. The chi-square is significant at 1% level indicating that the parameter estimates taken together are different from zero. In what follows the significant explanatory variables are explained. The result is depicted in table 5.20.

Table 5.20: Regression Estimate of the status of household food security factors

Independent variables	Parameter estimates (B) Coefficient	WALD statistics	Odds ratio
1. Constant	3.5330	6.2324	-
2. AGE-1	-0.0217	1.1074	0.9785
3. SEXHH	-0.2249	0.1105	0.7986
4. FSIZE	-0.3584	15.9041*	0.6988
5. RELIGN	0.5158	1.0507	1.6749
6. EDUCDMY	-0.4174	0.6168	0.6588
7. CULTLAND	0.4685	4.3820**	1.5975
8. ASSETD	1.6885	10.2884*	5.4112
9. OXEN	0.0990	0.2288	1.1041
10. LNDQLTYD	0.4435	0.7377	1.5581
11. IMPSEEDQ	-0.3490	4.1099**	0.7054
12. LOSPRO	-5.2726	14.9479*	0.0051
13. FERTLIZE	0.0060	4.0054**	1.0060
14. AGRISE-1	-0.6905	1.7891	0.5013
The likelihood ratio= 0.32			
Dependent variable is The status of household being food secure			

Source: Calculation from observed data.

*: Significant at 1% level

**: Significant at 5% level.

A) *Family size of household*: Consistent with the general argument that larger family size is one of the main factors for food insecurity of household, the result proved that family size has a negative impact on being food self-sufficient. The odds ratio in favour of being self-sufficient in food grain production decreased by a factor of 0.6988 for households, which have larger family size.

B) *Cultivated land:* The result showed that size of cultivated land has a positive impact on food self-sufficiency. Households who have cultivated large area of land are more likely to be self-sufficient in grain crop production

C) *Asset sold by household:* Asset which includes livestock and other equipment (purchase or homemade) are expected to be sold if the family faces food shortage in the household. Accordingly, the measurement indicated that asset sold by the household has positive impact on the status of a household to be food secure. It is found to be significant at 1% level.

D) *Improved seed input used:* The result of the model is found to be opposite to the hypothesis and common sense, i.e. improved seed used input is expected to increase productivity. But here, because of crop damage that the households faced, who used improved seed, the result became contradictory. This is as a result of exotic nature of seeds to local environment. It is found to be statistically significant at 5%.

E) *The rate (percentage) of crop loss occurred with respect to production produced:* The result has confirmed the hypothesis that crop damage has a negative impact on food crop produced. The odds ratio in favour of being self-sufficient in grain production decreased with larger crop loss percentage

F) *Fertilizer input used:* The model measurement confirmed that fertilizer input has a positive impact on household food security. And is found to be significant at 5% level.

Age, sex, educational status, religion of head of households, number of oxen owned, land quality and being participant of ASE training program are found to be statistically insignificant. Some variables like sex and educational status of head of household being participant of ASE do have opposite signs while the other variables are with expected signs

The main focus of this paper is to assess the role of community training provided for rural farmers of sample woredas. The overall aim of ASE training program includes raising awareness of farmers regarding selecting appropriate technologies and options, encouraging farming communities to establish locally sustainable agricultural production system and natural resource conservation that could lead to food security. But as indicated in the descriptive and econometric analysis, the impact of rural community training is not found to be statistically significant. The main reasons can be the crop damage that the participant farmers (who used improved seeds) faced in the production year. In addition, it should be the effect of education (training) on productivity can be stronger in modern, dynamic regions (which is not in case of Bale) than in traditional regions, the degree of sophistication of new technologies, and since agricultural extension is more concerned with the transmission of information than with the formation of competences.

But this information obtained diminishes with time, the value of extension contacts will diminish accordingly (Griffen and Knight, 1989). Consequently the impact of ASE training could not be found to be significant in some main crop production.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1. Conclusion:

The common emphasis of food security is mostly of national level. Concentration on household started to emerge in recent years. Food security can be attained through improved availability of socio-economic infrastructures and services to households. The issue of household food security is becoming more severe in the sub-Saharan African case and in Ethiopia in particular.

Ethiopia has a long history of food deficiency. The causes are enormous. Some of these are traditional ways of farming, high rate of dependency on rainfall, natural resource degradation and increasing number of population compared to the growth of agricultural production. To overcome the problem of food insecurity, the government and other stakeholders are involved in different activities to improve farm productivity. One of these activities is rural community training provided by NGOs as part of integrated rural development program.

Bale zone is one of productive farming areas in Ethiopia where the government and NGOs are trying to change the traditional farming practices and to increase productivity. A highland part of Bale zone is considered as area with high potential of agricultural food production. To utilize and increase the productivity of the area, Agri-Service Ethiopia (ASE) selected three *woredas* with a training program for selected farmer households.

The approach of the training was divided into providing general awareness and skill promotion (specifically targeted). The former kind of training preceded the latter because the latter is more specialized and requires better understanding.

The major objective of this paper was, therefore, to investigate the role of community training on household food security by comparing the productivity level of participant farmers with non-participant farmers. The impact of the training was measured and analyzed quantitatively and qualitatively.

The researcher purposely selected the three woredas in which ASE was involved. Households from both participants and non-participants were randomly selected. Primary data are used to indicate the actual situation. Interviews with farmers and officials of the *woredas* agricultural offices were also conducted and secondary data from offices of Agri-Service Ethiopia and DPPC are also used.

The average family size was 6.89 for participants and 6.42 for non-participants. Male headed accounted for 86% of the participants and 88% of non-participants. Eighty one percent of sample households belong to the Oromo ethnic group.

The sample households mainly involve in producing wheat, barley, teff, oats, horse beans, cowpeas and maize. The average size of cultivated land in 1999/2000 by participants of ASE was 3.24 ha and that of non-participants was 3.18 ha.

The average yield difference between groups is not statistically significant. In case of wheat production, which is the major crop in the area, the yield of participant farmers was lower because of crop damage. Average yield of seven crop types for participant farmers was 10.85 qt/ha and that of non-participants is 11.38 qt/ha.

The average estimated value of output for the participant farmers was Birr 4353.04 and that of non-participants Birr 4454.67 per annum but the difference is not statistically significant.

The level of input utilization, especially improved seeds and fertilizer is higher for participants. The participants also use more of other inputs like machinery for harvesting, though the difference is not significant. The participants are in a better position than non-participants in terms of soil conservation practices, tree and garden production, livestock production and their estimated values. Participants also have better performance in poultry and beekeeping than non-participants.

The consumption pattern of the two groups is almost equivalent. The impact of training in general awareness was not reflected but participant farmers generally consume relatively more of chicken, eggs and honey than non-participants.

The findings of the study indicate that 32.7 percent of participants and 25.7 percent of non-participant farmers were food insecure, taking 2100 Kcal as minimum kilocalorie requirement.

The econometric analysis showed that, the number of family size, cultivated land, asset-sold, fertilizer, improved seed and crop loss significantly affect food security status of the sample households. The contribution of training program of ASE was found to be insignificant.

In general, some of the main problems identified in the study area are shortage supply of modern inputs, erratic nature of rainfall, high incidence of disease and pests, especially rusts for wheat production, and animal diseases. The farmers are also sparsely settled which hinders the expansion of infrastructure facilities.

6.2. Recommendation: The paper has tried to show multidimensional effects of community training on household food security. In addition to the training provided, we could understand that other factors also determine food self-sufficiency. For instance, the influence of agro commercial investors in surrounding area is positive in introducing new ways of farming, and harvesting mechanism.

The problems and constraints discussed in this paper can be solved through integrated efforts of all sectors and stakeholders. There should be prioritization of these problems to bring changes. Any stakeholder should have mutual relation and communication with each other. Farmers who took training need follow-up and access to necessary inputs; otherwise the farmers are discouraged to apply what they were learned (trained). This has been reflected in the paper that the results are not statistically significant.

Non-formal education of agriculture or training is proved to have an effect on output in favorable environment with information access, modern technology and interaction (according to the theory of Schultz, 1989). But in actual condition, this situation is rare in Bale case.

The supply and utilization of improved seeds should be undertaken with great care because of crop damage (failure) that it brings about. The resistance of the variety to diseases such as rust must be checked before distributing to farmers. The training program should also focus on proper handling of improved seeds. Farmers should have clear understanding of management principle of cultural practices so that the role of ASE can be more productive.

Conditions like supply of necessary inputs should be fulfilled. Attitudinal upgrading concerning credit service, fertilizer application and improved seeds should be undertaken. Governments, NGOs through participation of farmers, should make introduction of small-scale irrigation.

GART should be modified to change the activity and attitude of farmers. Its impact should be seen concretely. The training should be supported with new technology (Fertilizer and others) and methods, which can bring about radical changes in farmers life.

To reduce crop loss, in addition to pre-test of improved seeds, **crops** and **variety** diversification should be practiced by farmers so that the risk of food insecurity and the vulnerable condition of farmers decreases.

The sample households have larger family size, on average six to seven members. This condition is one of the main reasons for being food insecure. Therefore the activity of Agri-service Ethiopia or any other stakeholders should focus on family planning in its (their) integrated rural development programs.

The other suggestion that needs attention is land and related policy. Proper strategies should be designed to diversify non-farm activities and other assets so that rural community can generate and diversify income. GART training program is found to be less impact on the productivity of the farmers. Therefore ASE should change the approaches that training is provided. It should include diversification of activities other than agricultural farming.

On the other hand skill promotion training, which is more gender sensitive, has indicated better results on types of packages that farmers acquired training, like poultry, bee-keeping, garden and tree crop production. Therefore this approach of gender sensitivity should be further improved.

Finally, the impacts of ASE training programs have been observed on some activities like poultry, beekeeping and livestock production (better quality. This strong side of the NGO should be maintained and expanded.

REFERENCES

- Agricultural Economics Society of Ethiopia, 1995, *Food. Security: A brief review of concepts & Indicators*, Addis Ababa, Ethiopia.
- Amemiya, Takeshi, 1981, *Qualitative Response Models*, A survey, Journal of Economic Literature Vol. 19,
- ASE, 1999, *Annual Report*.
- ASE, Feb.2001, *ASE's Development Activities in Bale for the period of 1987 - 2000*
- Ashton David, et al, 1999, *Education and Training Development in East Asia: The political economy of skill formation in East Asian Newly Industrialized economies*, ESRC Pacific Asia Programme, Routledge, Great Britain.
- Bale Zone Agricultural Department, 1990/91, *Annual Report (Oromiffa)*
_____, 1989/90.
- Befekadu, Degefe & Berhanu Nega, 1999/2000, *Annual Report on the Ethiopian Economy*, Addis Ababa, Ethiopia.
- Benor, Daniel and J. Q. Harrison (1977), *Agricultural Extension: The training and Visiting system*, World Bank, USA.
- Chernichovsky, Dov. et al, 1985, *The household economy of rural Botswana: An Africa case*, world Bank working paper 715, Washington DC, USA.
- Clay, Edward and J. Shaw (ed), 1990, *Poverty, Development and food: Essays in honour of H.W. Singer on his 75th Birth day*; Macmillan, Great Britain.
- Coombs, H. Philips and Manzoor Ahmed (1974), *Attacking Rural Poverty: How Non formal education can help*, World Bank Publication, USA.

- Disilva, Emmanuel, (3rd Ed.)(1996), *Poverty alleviation through agricultural projects*, Kay Bysouth, World Bank, Washington DC.
- Dixon, A John et. al (1989), *The Economics of Dry land Management*, London.
- DPPC, 1992, *study of rules & regulations on how to coordinate NGOs in Ethiopia*
- DPPC, July 2000, *The 2000 Belg season crop production performance and July to December, 2000 food supply prospects in Ethiopia, Early warning system*
- Encyclopedia Americana Vol.15.* (1995), Glorier Incorporated, USA.
- Ethiopian Press Agency, April 28, 2000, *Addis Zemen (Amharic)*, Addis Ababa, Ethiopia.
- FAO, 1988, *Training for Agriculture & Rural Development 1985*
- FAO, *Food out look, No 4, 2000* (Bulletin Publication)
- FAO/ECA, *Food and Agriculture in Africa, staff paper No.*, UNECA, Addis Ababa.
- _____, staff paper No 4,
- _____, staff paper No 5.
- Francis, G. David (1994), *Family Agriculture: Tradition and transformation*, Earthscan pub. Ltd., London.
- Gautman, Madhur, 2000, *Agricultural Extension: The Kenyan Experience: An Impact Evaluation*, World Bank.
- Getachew Diriba (1995), *Economy at the crossroads: Famine and Food Security in Rural Ethiopia*, Commercial printing press, Addis Ababa, Ethiopia.
- Getachew Zicke et al(ed) Feb.16.20,1998), *combating food in security; A special issue prepared on the occasion of the 20th FAO Regional conference for Africa*, A.A, Eth
- Gibbs, Christopher et al (1999), *Non Governmental Organizations and the World Bank Supported Projects*, USA.

- Gittenger J. Price et al (ed.) (1987), *Food policy: Integrating supply, distribution, and consumption, EDI series in Economic Development*, World Bank, USA.
- IIZ/DVV, 1998, *Focus on Adult and Non-formal Education in Ethiopia (News letter 4)*, Addis Ababa, Ethiopia.
- Islam, Nurul, (1995), *Population and Food in the early twenty-firsts century: Meeting Future Food Demand of an increasing Population*, IFPRI, Washington DC, USA.
- Jayne, T.S. & Daniel Molla (sept. 1995), *Toward a Research Agenda to promote household access to Food in Ethiopia*, working paper
- Jones, I. William (1995), *The World Bank And Irrigation*, Washington DC.
- Livingstone, I. and H.W. and Ord (1984), *Agricultural Economics For Tropical Africa*, Heinmann Educational Books inc., Great Britain
- Livingstone. I, & H.W.Ord, 1994, *Agricultural Economics for Tropical Africa*, Heinemann Educational Books inc., USA
- Mann, K., Charles and Barbara Huddleston (ed.) (1986) *Food policy frame works for analysis and action*, Indiana University press, USA
- MEDaC Dec., 1994, *National Workshop on Integrating population and Development planning (work shop proceedings), 5-7 may 1994*, Addis Ababa Ethiopia.
- MEDaC (Sept. 1999), *Survey of the Ethiopian Economy: Review of post reform development (1992/93-1997/98)*, Addis Ababa, Ethiopia.
- MOA, 2001, *National Annual Agricultural Extension Report*, Addis Ababa
- Muchow, C. Russell and Jennifer A. Bellamy (ed.) (1991), *Climatic Risk in crop production: Models and Management for the semi-arid tropics, subtropics*, C.A.B. International, United Kingdom.

- Mulat Demeke et al, (1995) *Food security, Nutrition & Poverty Alleviation in Ethiopia, Problems & prospects*, 8.9 June 1995, A.A.Eth.
- New Encyclopedia Britannica* Vol.6 (1993), USA.
- Painuly, J. P. (1995), *Preceding of the national consultation on Environmental issues in agricultural and rural credit*, India.
- Pierce, T. John (1990), *The food resource*, Long man group UK, Hong Kong.
- Poate C.D.and P.F. Daplyn (1993), *Data For Agrarian Development*, Cambridge University Press, Great Britain
- Rietbergen J.R, 1998, *participation & social Assessment Tools and Techniques*, Deepa, Narayana, World Bank.
- RRC, 1985 (Amharic), *Basic Information of NGOs in Ethiopia*.
- Salih, M.A. Mohamed, (1994), *Inducing Food Insecurity: Perspectives on food policies in eastern and Southern Africa*, Nordiska Africa Institute and the Authors, Sweden.
- Sussman, E. Gerald (1982), *The Challenge of Integrated Rural Development in India: A Policy and Management*, Westview press inc., USA.
- Tekolla Y., 1997, *The Puzzling paradox of the African food crisis: Searching for the truth & facing the challenge*, Bradford press, Singapore.
- Tesfaye Tilahun Workineh, (Nov. 1999), *An assesement of the food security situation in Ethiopia*, (Thesis) University of Queens land, Australia.
- Timmer C.peter and etal, 1983, *Food policy analysis*, Johns Hopkins University press, A World Bank Publication, USA
- UN conferences on Trade and Development, 1984, *Food insecurity in developing countries: causes, trends & policy options*.

UNACC/SCN, July 2000, Number 20, *Nutrition and Agriculture (Bulletin of UN system's forum on nutrition)*.

Upton Martin, 1996, *The Economics of Tropical Farming Systems*, Cambridge University press, Great Britain.

USAID, January 31, 2000, FEWS Bulletin: *USAID financed famine early warning system*, USA.

Venkatesan V. & Jacob Kampen, 1998, *Evolution of Agricultural services in sub Saharan Africa: Trends and prospects*, World Bank Publication, USA.

Webb, Patrick and Joachim Von Braun (1994), *Famine and food security in Ethiopia: Lesson for Africa*, J. Wiley and sons, England.

Wellard, Kate and James G. Cope stake (ed.) (1993), *Non Governmental organizations and the state in Africa: Rethinking roles in sustainable agricultural development*, Routledge publisher, Great Britain.

World Bank, (March 2000), *World Development Indicators-2000*, USA.

Yaptenco c.c., Jan. 1993, *Farm servicing Hand Book*, IFDC, Alabama, USA

Yin, k. Robert, 1989, *case study Research: Design and methods*, SAGE Publications inc., USA.

Table 6: The main crops those sold by households.

	Crop Type	Number of Response	Average revenue from sale
1	Wheat	103	1060.96
2	Barley	55	327.74
3	Maize	44	256.89
4	Teff	38	432.18
5	Cow peas	28	222.21
6	Linseed	19	953.42
7	Horse beans	18	252.56
8	Oats	11	219.55
9	Total (Average)	341	572.31

Table 7: Livestock production and value

	Type of Livestock	Number of Respondents	Average of livestock per household	Estimated Value of livestock (Birr)
1	Cattle	196	10.16	1423.74
2	Small Ruminants	60	4.28	93.42
3	Pack animals	144	2.08	529.91
4	Poultry	59	6.86	9.09
5	Beekeeping	7	2.57	12.50
	Total	466	6.37	786.77

Table 8:- Livestock purchased and sold with in the last 12 Months and number of livestock owned one year before

Type of livestock	Average Number of Livestock		Estimated Value of Livestock	
	Sold (No)	Owned one year Before	Purchased	Sold
Cattle	1.87	10.13	769.08	703.04
Small ruminants	0.8	3.98	113.33	97.00
Pack animals	0.9	2.18	412.73	460.84
Poultry	6.4	8.63	16.00	63.93

Table 9: Income from sale of animal products

	Livestock Products Type	Number of Responses		Revenue From Sales (Birr)	
		In number	%	Mean	Standard Deviation
1	Hide/skin	16	7.2	25.88	28.51
2	Butter /cheese	66	29.6	189.26	341.87
3	Milk/cream	10	4.5	101.1	93.40
4	Dung Cake	2	0.9	-	-
5	Chicken	46	20.6	58.74	63.44
6	Meat	7	3.1	236.17	209.19
7	Honey	7	3.1	252.00	177.90
8	Eggs	70	-	43.17	40.46

DECLARATION

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



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JUNE, 2001

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



MULAT DEMEKE (DR)

JUNE 2001