Addis Ababa University
School of Graduate Studies
Faculty of Business and Economics
Department of Regional and Local Development Studies

MAJOR CHALLENGES TO THE NATIONAL EXTENSION INTERVENTION PROGRAM (NEIP) IN ADDRESSING THE FOOD SECURITY PROBLEM IN THE SNNPRS

Prepared by: ABERA ABIYO

May 2001
Addis Ababa

MAJOR CHALLENGES TO THE NATIONAL EXTENSION INTERVENTION PROGRAM (NEIP) IN ADDRESSING THE FOOD SECURITY PROBLEM IN THE SNNPRS

A Thesis Presented to the School of Graduate Studies, Addis Ababa University
in Partial Fulfillment for the Master of Arts Degree in
Regional and Local Development Studies

Prepared by: **ABERA ABIYO**

Approved by the Board of Examiners

Name	Signature
ZEWDIE CHIBSE (Chairman, Graduate Committee)	
Beyene Doilicho (Ph.D.) (Academic Advisor)	
Workneh Nigatu (Ph. D.) (Internal Examiner)	
Beyene Haile (Ato) (External Examiner)	

ACKNOWLEDGEMENT

First and foremost, my praise be to the almighty God for helping me to start and finish my study at the university.

Second, I would like to thank my dearest wife, W/o Hirut Teshager who encouraged and supported me to continue my Graduate study.

I would like to express my gratitude to my academic advisor Dr. Beyene Doilicho for his assistance in providing me valuable comments on the essence and contents of this paper.

I would also like to express my heart-felt gratitude to Dr. Meheret Ayenew, Project Coordinator, RLDS, for his wholehearted cooperation in informal and official maters during my study.

I would like to thank all my instructors in the RLDS for their part in providing me with theoretical inputs that helped me to prepare this paper.

I would like to express my gratitude to SG 2000 and SGS for their financial support to this study.

I would also like to thank different Bureaus, institutions and their staff in the Southern Nations Nationalities and Peoples' Regional State (SNNPRS) for their cooperation in providing me with essential information and materials needed for the preparation of this Thesis.

Abbreviations

AAU	Addis Ababa University
ADDP	Ada District Development Project
ADLI	Agricultural Development Led Industrialization
AEZs	Agro Ecological Zones
AMC	Agricultural Marketing Corporation
AUA	Alemaya University of Agriculture
BoA	Bureau of Agriculture
BoPED	Bureau of Planning and Economic Development
CADU	Chilalo Agricultural Development Unit
DAs	Development Agents
DPPO	Disaster Prevention and Preparedness Office
EC-LFSU	European Commission-Local Food Security Unit
EGS	Employment Generation Scheme
EMTP	Extension Management and Training Plot
EPID	Extension and Project Implementation Department
EPRDF	Ethiopian Peoples Revolutionary Front
FDRE	Federal Democratic Republic of Ethiopia
FS	Food Security
FSP	Food Security Program
FSS	Food Security Strategy
FSU	Food Security Unit
HHs	Households
IAR	Institute of Agricultural Research
IECAMA	Imperial Ethiopian College of Agriculture and Mechanical Arts
KAs	Kebele Administration
KAT	Kembata-Alaba-Tembaro
MEDaC	Ministry of Economic Development and Cooperation
MoA	Ministry of Agriculture

MPP	Minimum Package Program
NEIP	Natural Extension Intervention Program
NFPA	National Forest Protection Areas
PADEP	Peasant Agricultural Development Extension Program
PADETES	Participatory Demonstration and Training Extension System
RELC	Research and Extension LIaison
SMSs	Subject Matter Specialists
SNNPRS	Southern Nations, Nationalities, and Peoples Regional State
T&V	Training and Visit
TLU	Total Livestock Unit
WADU	Wolamo Agricultural Development Unit

ABSTRACT

This study reviews the implementation process of National Extension Intervention Program (NEIP) in the South Nations Nationalities and Peoples' Regional State (SNNPRS). It attempts to identify and examine the major constraints to the program in addressing the problem of food security. Although it was proved that the yield per hectare and per capita food production has been increased on the plots of the participants, this study both at the Regional level and from the perspective of the local community indicates that the implementation is encountered with various challenges. While the increased food productivity greatly contributes to the improvement in food security, the various implementation constraints aggravate the problem of food insecurity.

Due to adverse effects of the constraints, food production of the country fell behind the demand since three decades ago. Different package programs were adopted in the past to increase the real income of the small farmers, to alleviate the income disparities within the rural population and create additional employment opportunities. How ever, the living standards of the rural population could not be changed and poor farmers could not benefit from the approaches of the past package programs. The package programs under the Imperial Government of Ethiopia had favored only rich farmers and the package programs under the Dergue had favored Producers' Cooperatives.

Drawing lessons from the past experience, the current Government designed and implementing new extension program employing the strategy which is termed as Participatory Demonstration and Training Extension System (PADETES). This system of extension is aimed at increasing farm productivity of smal-holders through widespread application of improved technology and farmers' participation. Implementation reports obtained from the Regional Bureau of Agriculture proved that crop yield was doubled in most of the cases. The study from the community perspective also revealed that it was possible to

increase the yield per capita as well as food security situation of the households who participate in the PADETES.

Major problems of the NEIP found by this study include natural hazards (drought, erratic nature of rainfall, and various forms of land degradation), limited availability of technology packages in type and quantity, constraints related to input supply and credit, high cosst of inputs and low prices for agricultural products, poor linkage between research, extension and farmers, and insufficient technology disseminating and communication capacity of the development agents (DAs).

On the other hand, the highest increase in crop productivity, creating awareness among farmers about the use of improved inputs, initiating of improved seed productions by farmers in some woredas, increasing interests of farmers from time to time to adopt new technologies are considered to be the encouraging factors of the program in the Region.

In order to achieve the food self-sufficiency objective of the program and enhance food security, the major implementation problems should be overcome and the encouraging factors must be strengthened in the process of implementation.

Table of Contents

Annexes:

List of Tables

List of Maps

Chapter One: **INTRODUCTION**

1.1 Background

1.1.1 Food Security in Ethiopia

The gap between domestic food production and food demand in Ethiopia has increasingly widened since early 1960s. The conditions of food insecurity have been the worst during the years of varying magnitude of droughts. According to Sisay Assefa(1995), in Ethiopia, during 1980s, per capita food production fell by over 2 percent per year. Even after the record harvest of 7.3 million Mt. in 1990, the country faced a shortage of 985,000 Mt. By 1992, the food deficit rose to 1.03 million tones, resulting in an average domestic availability of only1500 to 1600 calories(Sisay, 1995) against the recommended daily requirement of 2300 calories by World Health Organization(WHO) (World Development Report 3, 1992). Low level of agricultural productivity and insufficient food supply mean also low food security status.

Alemayehu (1988) pointed out that, Ethiopia has been self-sufficient in staple food and was classified as a net exporter of food grains till 1950s. Since 1960s, domestic production of food failed to meet the food need of the steadily increasing population. A sharp decline in food production was in 1984's famine year (Alemayehu, 1988). The situation of food insecurity at present has reached a very critical level. Tesfaye Zegeye and Debebe Habtawold (1995) have

listed out some estimation of the dimensions of food insecurity as follows:

> The study of Anderson in 1989 revealed, over 40 percent of the food insecure people in Sub-Saharan Africa are found in Ethiopia, Nigeria and Zaire. IGADD in 1992 asserted that Ethiopia has the highest number of food insecure. IFAD found that nearly 19 million people in Ethiopia were below the poverty line in 1989. Maxwell (1991) estimated the food insecure people in Ethiopia to be 38 million. Whereas the estimations of World Bank and Ministry of Planning and Economic Development in 1992 was 22-27 million, the existing estimations indicate that more than half of the urban population could be vulnerable to food insecurity (Tesfaye and Debebe, 1995: 56)

The impact of the situation on the political instability within the last three decades is quite obvious. To achieve social and political stability, among others, the government has to be able to create and maintain food security by issuing and implementing an appropriate agricultural policy.

The cause for the severity of food shortage could be high population growth rate which is unaccompanied by increasing land productivity and development of other resources of the country. The situation is greatly aggravated by the low level application of essential technology packages in the agricultural sector. Therefore, the problem of such a nature calls for an intervention, which is designed in a way that can bring about faster growth of agricultural productivity, which at the same time helps to conserve the natural resource base.

1.1.2 Extension Package Programs in Ethiopia

The past Extension approaches

Attentive approaches to rural development were experimented over the period 1967-1975. The approaches ranged from intensive package programs in limited geographic areas to minimum package programs serving farmers located along major highways throughout the country (Tesfai, 1975; Belay, 1999). The package approach is defined as concentrating the relevant elements of development within a clearly defined geographical area in a coordinated manner (Imperial Ethiopian Government, Planning Commission Office, 1967).

The first three integrated package projects that were initiated in accordance with the Third Five year plan are the Chilalo Agricultural Development Unit (CADU) in 1967, the Wolamo Agricultural Development Unit (WADU) in 1970, and the Ada District Development Project (ADDP), in 1972 (Tesfai, 1975).

The major components of CADU, WADU and ADDP include development of an improved technological package, dissemination of new practices, staff training, farm credit, output marketing, rural water supply, rural health, rural road, and soil conservation.

The aims of the first three intensive packages or integrated rural development projects were to:

1. Raise the real incomes of small farm households, mainly with holdings of 20 hectares and less, in their respective areas,
2. Elicit participation of small farmers and local government authority in their development efforts,

3. Control adverse employment effects and, whenever possible, generate new additional employment opportunities,
4. Narrow prevailing income disparities by directing efforts mainly towards farmers in the lower income brackets,
5. Continuously search for suitable methods for furthering rural development nationwide, and
6. Provide data for formulating better projects in the future (CADU, 1969; WADU, 1973; ADDP, 1974)

By 1970 it was concluded from the experience of CADU and WADU that the intensive package program was too costly, in terms of both financial and trained man power, for expansion on a large scale to meet the national objective of reaching about 90 percent of the farming population in the next fifteen to twenty years (Tesfai, 1975). Therefore, the Minimum Package Project (MPP) was launched in 1971.

The MPP-I, which was based on the concept of concentrating efforts on few proven innovations, was designed to reach a large number of farmers throughout the nation by employing technique developed and/or tested by the intensive package projects which were to be retained primarily as testing ground for new innovations (Tesfai, 1975). The department known as Extension and Project Implementing Department (EPID) had an exclusive responsibility for the planning and implementation of the MPP. The approach of MPP-I was designed to be less costly per farmer served than CADU, WADU and ADDP and assumed to be capable of serving a large percentage of the of farming areas in Ethiopia in the next fifteen to twenty years (EPID, 1971). The major components of MPP-I include dissemination of new practices, farm credit and home economics training. The major means of dissemination were the trial fields, which were operated by the extension agents and the model farmers. Trial fields

compare the traditional farming systems with a system of using fertilizers, insecticides, improved varieties, implements and agricultural practices. Model farmers were selected by the extension agents and were expected to lead in the adoption of new innovations and eventually convince at least about 75 percent of the farmers in their area to participate in EPID's extension program (Tesfai, 1975).

Though EPID was able to provide agricultural services in 280 of the 580 districts and some improvements were made in terms of adoption of improved inputs, MPP-I failed to have significant impact on the agricultural sector because the government was reluctant to put in place the necessary reform measures in the areas of land tenure, tenant-landlord relationships as well as organizational and Administrative systems of the different institutions entrusted with agricultural development of the country (Belay, 1999).

Following the 1974 revolution, the new military regime in power enforced a land reform on March 4, 1975. The land reform banned private ownership of rural lands and established Peasant Associations as the basic instrument for implementing the land reform. The average Peasant Association membership was 250-270 families (households) and it encompassed 800 hectares or more.

At the end of the MPP-I period, there was a plan to undertake MPP-II over the 1975/76-1979/80 period. However, because of the political instability and major structural changes in the rural areas including the formation of peasant association and producers' cooperatives as well as the implementation of the land reform, it was not possible to carry out this plan.

Therefore, until the beginning of the 1980s there was not well organized and coordinated extension work in the country. It was only in 1981 that MPP-II was started. MPP-II had the same objectives as MPP-I. However, under MPP-II it was envisaged to cover 440 of the total 580 districts and reach as many farmers as possible. One major difference between the two was the channel they employed in the transfer of technology. Under MPP-II, peasant associations and cooperatives were used as the focal points through which improved inputs, techniques of production and advice were channeled to the member farmers.

During its implementation (1981-1985), the MPP-II did not attain its stated objectives because the very few extension agents available in the country were made to cover as wide area as possible without adequate facilities and logistical support. The same agents were overloaded with different assignments, such as collecting taxes, promoting producers' cooperatives, collecting loan repayments, mobilizing labor and resources on the part of public authorities, which were, at times, not in their domain of responsibility. Poor research-extension linkage was also the other factor responsible for the mediocre performance of the extension service of MPP-II. Most importantly, the country had no capacity and resources to develop innovations suitable to its socially and ecologically varied regions. Moreover, as compared to the MPP-I, in the course of implementing MPP-II, the Ministry was compelled to work under a very limited budget (Belay, 1999).

The Peasant Agricultural Development Extension Program (PADEP) was a strategy prepared to supersede MPP-II beginning 1985. The program was designed to bring perceptible changes in

peasant agriculture through concerted and coordinated efforts in the areas of agricultural research and extension (Belay, 1999).

The program had different objectives for the different agricultural development zones. It was initially planned to concentrate on high potential areas so as to raise their production and productivity by channeling the limited resources and extension services. To this effect, 148 surplus producing districts were selected out of a total of 580.

PADEP employed a modified Training and Visits (T & V) extension system. In the selected district an extension agent was assigned to serve 1300 peasant households through contact farmers organized into groups (the conventional T &V system recommends one extension agent for 800 farmers) and 2500 farmers in all other areas (non surplus producing areas).

The rural and agricultural sector is viewed as a focal point of development in EPRDF's Five Years Development Program (1995/96-1999/00) for several reasons. Since 85 percent of the country's population is living in rural areas engaged in agriculture, mobilizing the country's resource for the purpose of development requires working with the rural population. Focusing on rural development and increasing agricultural productivity is the key to find a lasting solution to Ethiopia's chronic food security problem.

Thus, the Government of Ethiopia launched a National Extension Intervention Program (NEIP) in 1994/95 in order to address the issue of food security more efficaciously. The program is mainly geared towards assisting small-scale farmers to improve their productivity through

disseminating research-generated information and technologies on major food crops including teff, maize, wheat, sorghum, barley as well as potato and forage crops such as cow peas and vetch.

Current Extension Program and its Strategy

Drawing lessons from past experience, the Federal Democratic Republic of Ethiopia (FDRE) has formulated an "Agricultural Development–Led Industrialization (ADLI)" strategy, taking agriculture as the development base and, within this framework, focusing on raising the productivity of the small scale farmers who are the key actors and partners at the grassroots level. Formulated within ADLI is the new system of agricultural extension, termed as "Participatory Demonstration and Training Extension System (PADETES)"(Ministry of Agriculture, 1999). As the name implies, the system is based on demonstrating to and training of farmers in proven technologies in a participatory manner. The system which has been developed after a critical evaluation of past extension practices has also given enough room to accommodate present changes in extension philosophy, i.e., involving the utilizer sub-system (Ministry of Agriculture, 1999).

As shown in the *Table 1* below, the outcome of 1994/95 has demonstrated the existence of effective technology packages that could relieve the country from its chronic food shortage, provided policymakers, researchers, extension agents and farmers work hand in hand.

Table 1: **Yield achievement by farmers, 1994/95(Evaluation report of 1994/95 NEIP)**

REGION	Traditional Average Qtl/ Ha				EMTP Average Qtl/ Ha			
	Maize	Wheat	Teff	Sorghum	Maize	Wheat	Teff	Sorghum
Tigrai	10	7	4	9	30	20	10	25
Amhara	15	7	6	14	50	35	15	30
Oromyia	16	11	6	11	45	34	13.5	31
SNNPRS	16	12	6	-	41	27	13	-
Harari	12	-	-	8.5	25	-	-	20

Source: Ministry of Agriculture (1994/95)

One of the Regional States in which the NEIP is being implemented is the Southern Nations, Nationalities and People's Regional State (SNNPRS). There is reasonable increase in agricultural production and productivity due to implementation of the NEIP since 1995/96 in the SNNPRS. However, The program is constrained by a number of problems like most of the endeavors to improve agricultural productivity, which are the immediate solutions of food insecurity.

Major challenges to the implementation of NEIP in the SNNPRS include environmental variability (erratic nature of rainfall, recurrent drought, flood, etc.), shortage of farmland, insufficient package approach for diverse agro-ecological zones, inadequate supply of agricultural inputs, inefficient system and inadequate availability of input credit, poor performances of agricultural inputs and output market, lack of sufficient capacity of the

implementing agents, inadequate services provided by extension agents, and poor linkage between research, extension and farmers.

The purpose of this study is to look into the implementation process of the NEIP and assess major challenges of the program that aggravate the problem of food insecurity in SNNPRS.

1.2 Problem Statement

Development programs of many governments are very attractive when planned on papers. A number of challenges emerge during implementation as a result of some unpredicted variables and lack of accommodation capacity for risks of failure.

The Ethiopian government has launched a National Extension Intervention Program (NEIP) since 1994/95. The ultimate goal of the program is national food self-sufficiency and hence achieving food security. It was announced through the media and government annual reports that the program had been successful in achieving its objective during the early years of implementation. Success of NEIP could improve the availability of food at national and local level. Food insecurity could be aggravated by the failure of national endeavors that include NEIP. Improvement in food availability, which is one of the three dimensions of food security, namely, food availability, access, and stability in turn could enhances the conditions of food security. Like the agricultural development programs of most underdeveloped countries, the implementation of NEIP is faced with various constraints. Thus, a number of environmental,

social, economic, technical and institutional factors are believed to have constrained the achievements of NEIP.

In order to address the food insecurity problem in a country like Ethiopia with multitudes of development problems, among other things, the aforementioned constraints should be taken into account when agricultural extension program is planned. Hence, it should be designed in such a way that most critical factors are taken into account.

1.3 Research Questions

1. What were the Regional Plans and achievements of the NEIP?
2. *Are improved agricultural technologies available for the various agro-ecological zones in the Region?*
3. *At what proportion of the Region has the NEIP been implemented?*
4. To what extent have the food security problems been addressed through the implementation of the NEIP in the Region?
5. What were the major constraints to NEIP in addressing the problems of food security in the SNNPRS?
6. *What are the prospects to the adoption of the NEIP in the Region?*
7. What measures are required for the success of NEIP in the Region?

1.4 Objectives

1.4.1 General Objective

The general objective of this study is to review the implementation process of NEIP and thereby identify and examine the major constraints, which exacerbate the situation of food insecurity in the SNNPRS. Thus, recommendations that could be useful for program design, policymaking and implementation will be forwarded.

1.4.2 Specific Objectives

The specific objectives of the study are to:

1. Present an overview of major issues associated with food insecurity in the SNNPRS,
2. Review the plan and implementation of the NEIP in the SNNPRS within the period of EPRDF's Five Year (1995/1996- 1999/00) Development Program,
3. Identify the major constraints to the Regional NEIP, and
4. Propose corrective measures based on the research results.

1.5 Significance of the Study

A number of studies have been conducted on the problem of food security and reports are available on the evaluation of extension programs undertaken in Ethiopia since 1960s. Different studies have found that the majority of Ethiopian population in almost all regions of the country

are severely affected by chronic and transitory food insecurity. It is essential that the studies should focus on the effects of the extension programs in improving food insecurity. Consideration of major implementation problems is also useful to manage and minimize risks of failure in the planning and implementation of any development program in the future.

This study will assess the major constraints to the implementation of the NEIP by linking it to the issues of food security. Its significance is that it attempts to provide some realistic information for the national and regional planners and policy makers concerned with extension and food security programs in Ethiopian.

1.6 Limitations

Factors that affect the subject of food security are many. Agricultural productivity is one of the factors that indeed has immense contributions to the prevalence of food security. The central theme of this study is the achievement and constraints of the NEIP in SNNPRS. The study involves limited number of packages and areas since it is based only on performance of three major crops (wheat, maize and Teff) packages in the survey area.

1.7 Sources of Data and Methodology

1.7.1 Sources of Data

Most of the data required for this study are obtained from secondary sources. Information related to planning and implementation of the NEIP from the libraries and documentation centers of the Federal Ministry of Agriculture (MoA) and the SNNPRS-Bureau of Agriculture (BoA) and Bureau of Planning and Economic Development (BoPED) and Regional Food Security Unit (RFSU) are used. Literature related to agricultural extension and food security from the libraries of Addis Ababa University and other institutes are also reviewed. In addition, to fill the gap of information obtained from the available documents and records, primary data are collected through quantitative and qualitative techniques.

Qualitative data for primary research are collected through the interviews and discussions conducted with officials and experts of the Badawacho Woreda Office of Agriculture, SNNPRS - FSU and BoA. Sources of quantitative data are the sample HHs of the survey woreda whereas the sources of primary qualitative data are various group discussions, interviews with DAs and key informants held at the survey area.

1.7.2 Methodology

1.7.2.1 Methods of data collection

A) Qualitative data collection

In order to study the perception of farmers about the new agricultural extension and its effect on the food security situation at HH level, information is gathered through:

- Extensive group discussions;
- Semi structured interview with Key informants, DAs, experts and officials; and
- Direct observations.

This method enable to assess the extent of changes brought about by the program in improving the food habit and living standard of the community in the study area.

B) Quantitative data collection

Quantitative data are collected through survey method. Structured questionnaire is administered to collect data related to input supply, credit facility, technology packages utilization, agricultural productivity, marketing of agricultural products, extension services rendered by the DAs, major constraints to the NEIP and availability of food grains at household level.

i) ***Sampling design :*** The sample is taken from Badawacho woreda, which is one of the 72 woredas and 5 Special Woredas of the region. A woreda is consisting of KAs with slightly varying environmental conditions. Among 46 KAs of the woreda 27 are classified into wet 'Woinnadega' and 19 are classified into dry 'Woinadega' AEZs.

The wereda is more relevant in the region to this study since it is one of the woredas where extension package is implemented since 1996 according to the information obtained from the Regional BoA and it is also one of the most seriously affected twenty woredas of the region by food shortage in 2000 according to the report obtained from the Regional DPPO.

Experts of regional BoA also suggested the advantage of sampling from a single locality with varying AEZs. This helped to save the time and travelling cost of the field work.

ii) ***Sample size:*** The sample is consisting of 80 HHs. Two KAs were randomly selected from the two different AEZs (one from each) and 40 HHs were randomly selected from each of the sample KAs. Out of 80 HHs, 40 are from Jarso-Onjojo, which belongs to wet 'Woinadaga', and 40 are from Kerenso I, which belongs to dry 'Woinadega' AEZ. The sample HHs were taken from the continuous participants of NEIP from 1996 – 2000 and represent the participating HHs. *Table 2* shows the selected KAs and HHs for the survey.

Table 2: **Sample HHs selected for the survey**

Name of the KA	**AEZ**	**Number of HHs**		**Sample Size**	**Sampling Weight**
		Total	**Participants**		
Jarso-Onjojo	Wet 'Woinadega'	722	265	40	15%
Kerenso I	Dry 'Woinadega'	623	267	40	14.9%

1.7.2.2 Methods of data analysis

- Qualitative data are analyzed by systematically organizing the information and giving attention to the opinions, ideas, perceptions and preferences of the grassroots beneficiaries of the program.

- Quantitative analysis is carried out using simple and relevant statistical methods such as mean, range, percentages, and proportions.

1.8 Organization of the Paper

The paper is organized into seven Chapters. Chapter one is introduction. Literature review is presented in the chapter two. Chapter three describes the study Region. Food security situation of the SNNPRS is described in fourth chapter. Chapter five describes NEIP in the SNNPRS. Chapter six discusses the issues of food security and NEIP in the SNNPRS from the perspective of the farmers taking the case of Jarso-Onjojo and Kerenso I KAs in Badawacho Woreda. The final chapter presents the summary and conclusions.

Chapter Two: LITERATURE REVIEW

2.1 Food Security/Insecurity

World Bank (1992) defines food security as "access by all people at all times to enough food for an active and healthy life". Sufficiency and access determine the food security situation of a country or a household. Success in production and distribution plays an important role in influencing the food security status of an individual or a society at large. On the other hand, food insecurity is defined as "a situation in which the individuals of a society have neither the physical nor the economic access to the nourishment they need" (FAO, 1981 in SNNPNS-FSU, 2001)

FAO (1997) described food security at three different levels as follows:

> 1) Food security at national level is described as a satisfactory balance between food demand and food supply at reasonable prices. This is intended to indicate where adequate food is available and where most of the population has access to that food. 2) Households are identified as food secure if their entitlements, or demand for food is greater than their needs, defined as the aggregation of individual requirements. 3) An individual is food secure if his or her consumption is always greater than need, as defined by physiological requirement (FAO, 1997:4-5)

According to the above definitions, food security at one level does not imply food security at another level. A country which is food insecure will certainly contain groups of population which are food secure, and many countries which are food secure at national level contain groups of population who are food insecure. Food security at the household level does not imply that all members of the household are food secure. A food insecure household may also contain food secure members.

Food security according to FAO (1997) has three dimensions: availability, access, and stability. Food availability is determined by the level of food supplies, composed of subsistence production and market supplies stemming form domestic production, food stocks and food imports. Access to food is the result of the ability to expressed food needs (beyond subsistence production) as effective demand. Stability refers to variations and the risk of shortfalls in food production, supplies and/or demand over time. The three dimensions of food security clearly imply food security at individual level. However, the definition of food security at national/regional and household level is useful when national economic policies are discussed.

Furthermore, it is important to raise the subject of food self-sufficiency in relation to the food security as a national issue. The concept of food self-sufficiency is generally taken to mean the extent to which a country can satisfy its food needs from its own domestic production. It is sometimes thought that the best way to increase a country's food security level is to increase its level of self-sufficiency and this idea has a certain intuitive appeal. It may seem that a country has more control over its food supply if it is not dependent on international markets, where food imports may come from countries which could be politically hostile. Also, there is apperception that developing countries may be exploited on international markets (FAO, 1997).

Self-sufficiency in food as development objective constitutes one of the main points of the strategy adopted by the African countries in the Lagos Plan of Action in 1980, though this has never been fully implanted. A number of African countries have, however, declared food self-sufficiency as a priority objective in their national plans (FAO, 1997).

According to Valdes and Konandreas (1981), food insecurity is caused by two major reasons: shortfalls in domestic production and sudden fluctuations in the prices of food imports and national food or non-food exports. Tapsoba (1990) also identified inappropriate policies and neglect of the agricultural sector, lack of technological change, and institutional weakness and lack of basic infrastructures as the major causes of food insecurity in Africa.

The common causes of food insecurity suggested by Young (1992) are: reduction of people's food entitlements due to poor harvest, reduction in food availability, increased market prices, loss of livestock and other resources, and loss of waged labor or other sources of income.

The underlying cause of housed food insecurity according to Quinn V., and et al (1990) are small landholdings, low soil fertility, low-income levels and limited employment, and labor constraints in agricultural production. These authors further suggested that addressing these problems require more policy options that could increase food security. Policy interventions that are thought to affect food security at household level include access to land, support crop research in high value and yield variety crops, non-farm opportunities, extending access to credit and inputs , labor-saving devices with particular focus on women.

The study of Getachew (1995) found out that farming systems (agro-ecology), land size, farm output, livestock, household size, and fertilizer use are all determinants of household food security/insecurity. This study revealed that households who have established access to larger land size are better off than those with less land size are, hence food insecurity is more severe among those households with little landholding. Increased farm output is also tested as reducing risks of household food insecurity. During non-drought year the application of fertilizer on the household farms decreases a likelihood of household food insecurity.

Drought as noted by Dagnew (1997) has also been considered as the immediate major cause of food insecurity in many parts of Ethiopia.

Markos (1997) pointed out that land resources and means of farming, crop and livestock production, non-farm income, expenditure and household assets are said to be the determining factors of household food security or insecurity.

Regarding means of farming which includes oxen holding, farming system, and labor; as the results show that households with no ox, practicing traditional farming practice, and many

family size are food insecure and vice versa. Moreover households with relatively better production and livestock holding are proved to be food secure than otherwise.

The results of regression analysis by Tegene, Mulat and Roth (1999) suggests as expected the increase n land holding oxen holding, fertilizer and seed application showed significant increase in food availability.

According to Beyene (2000) adoption of improved technologies is required to improve food security and quality of life of households. The result of his research suggests that educational level of the household head, size of land, number of oxen owned by the household, proximity to the main road, and availability of the technological package and credit facility are the factors that affect farmers' adoption decision and household food security.

One of the concepts related to household food security is coping strategy. 'Coping strategy' could be defined as " a mechanism by which households or community members meet their relief and recovery needs, and adjust to future disaster-related risks by themselves-without outside support" (Dagnew 1993, in CRDA 1997). As Davies (1993) pointed out, "coping strategies are the bundle of poor people's responses to declining availability and entitlement in abnormal seasons of years".

According to Getachew (1995), CRDA (1997), and Yared (1999), coping strategies include changes in cropping and planting practices, reducing food consumption, sale of livestock, collecting and eating wild foods, migration to urban areas in search of employment, use if inter-household transfers and loans, sale of possessions (e.g. jewelry), sale of fire wood and charcoal, food aid conception, sale of productive assets, break-up of households, and distress migration. Furthermore, households who have diversified (off-farm) sources of income are often able to cope with crisis than others (Yared 1999).

2.2 Extension System

2.2.1 The concept of agricultural extension

The definition of extension by Van den Ban and Hawkins (1998) involves the conscious use of communication to help people form sound opinion and make good decisions. According to Ray G.L.(1996), Extension may be defined as the science of making people innovative for improvement in their quality of life (Ray G.L., 1996:5).

According to Farquhar (1962):

> Agricultural extension is a service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural people (Farquhar, 1962 in Williams 1968:8).

They provide farmers with technical advice as a guide to improved farming methods and, less frequently, with economic information about their production and management problems to assist them in analyzing the alternatives available and making decisions about farm operations.

Common elements in the definition of extension are highlighted by Roling (1998) quoting Zuurbier's work (1984):

> Extension is an intervention, extension uses communication as its instrument to induce change, extension can be effective only through voluntary change, extension focuses on a number of different target processes and outcomes which distinguish it from other

communication interventions, and extension is deployed by an institution (Roling, 1998: 13, 167).

A definition of extension, which encompasses the various common elements would be: Extension is a professional communication intervention deployed by an institution to induce change in voluntary behavior with a presumed public or collective utility (Roling, 1998: 49) Although its definition is controversial in different countries, many writers emphasize that extension is a systematically designed and planned activity.

Extension approaches vary in their objectives. Objectives of some extension systems are to fulfill the local needs while others try to satisfy the national needs. There are also other extension systems, which attempt to carry out both national and local objectives. Some focus on qualitative objectives (empowering of the society through organization) rather than quantitative objectives (achieving higher per capita income or gross domestic product).

The importance of national food self sufficiency rather than equity is emphasized in some of the extension approaches. In Ethiopia, for example, in the present agricultural extension system, the government treats "PADETES" as a part of the national economic strategy, "ADLI" and its ultimate and short-term goal is to achieve the national food self-sufficiency.

2.2.2 Technological Changes in Agriculture

Development strategies of the 1950s and early 1960s gave priority to promote the industrial sector by neglecting agriculture. The rapid population growth, on the one hand and the widening gap between the demand for the supply of food, on the other hand, has brought an impetus for agriculture to receive increased attention in the late 1960s.

One of the basic factors in the transformation of agriculture is 'technological change. Seclar (1993; cited in Dejene, 1995) described that adoption of new technologies, on a regular basis among others, induce a dynamic growth process that enable the agricultural sector to produce food cheaply, and innovations for new ideas methods, practices or techniques of production that provide the means of achieving sustained increase in farm productivity (Abate, 1989:19). Adnderson (no date: 30) pointed out that adoption of a new technology not previously used in the production process implies technological change, adoption being defined as the act of incorporating something into production process. It is important to note that the generation of new technology is not suffice by itself but the degree of its diffusion does so. In this regard, Anderson (31) stated that the adoption of technology must be preceded by technology diffusion where the latter term implies the act of making technology available to potential adopters and is that a link between R&D and adoption. Mosher (1966) emphasized that new technology adoption and diffusion alone is not enough to get agricultural moving and thus changes in the institutional, infrastructure, and cultural factors must occur in the process of transformation.

2.2.3 Technology, Research and Extension: The relationship and their role in agricultural productivity

Agricultural research, as defined by Habtemariam (1996:165), is a purposeful, controlled, often formal, systematic, critical and intensive activity whose prime objective is to generate or adapt technically and financially feasible, economically viable and socio-culturally acceptable technologies to promote or transform traditional agriculture. Therefore, research is the basis for the generation and adoption of technologies, and in which these technologies can be diffused through extension messages. In recent development approaches, environmental issues have come on the front line and the term 'environmentally sound' technologies is incorporated in to research's definition.

Agricultural research is aimed at solving definite problems in the process of agricultural production. In order to effectively solve agricultural problems, research activities have to be undertaken in a continuous manner. Anderson (no date) stated that effective agricultural research should be based on the objective of solving a defined problems or agricultural problem orientations that require a research program of a cumulative nature, i.e, new research must be based on the outcome of the previous research. This would eventually lead to better results and provides the basis for new technology to be generated. The development of new technology could lead to further enhance the research in light of developing better technologies. It is here that the link between agricultural technology and research offer an understanding of their interrelationships.

The reasons for limited contributions to economic growth by agricultural technology and research, among others, are lack of financial and skilled human resources, poor priority given to these activities, and institutional problems (Anderson, no date; Mellor, 1976; Habtemariam, 1996). Agricultural technology, as Anderson claimed, may reduce or increase production risks.

Agricultural technology developed by the research centers could be communicated through the extension system. Extension system in this case can be defined as a process through which new ideas, techniques or materials are communicated or introduced in a number of ways to the agricultural community (Habtemariam, 1996:168). The shortcomings, experiences and requirements of extension system that are acquired through the adoption of the new technologies are also communicated back to the concerned research institutions. It can be argued that agricultural technology, research and extension are mutually interrelated and the weakness in one could be reflected in others. Therefore, development policies opted for promoting agricultural technology, research and extension with the aim of accelerating agricultural growth should give attention to the intrinsic interrelationships.

2.2.4 Agricultural Research and Extension in Ethiopia

The evolution of agricultural research and extension in Ethiopia dated back in the 1950's and 1960's, respectively. Research activities were undertaken by different institutions although Institute of Agricultural Research (IAR) was the main responsible one. It was establishes in 1966 and it tried to generate improved technologies that are mainly adaptable to specific agro-ecological conditions. High-yielding varieties were experimented on IAR's research outreach

stations that were eventually demonstrated to farmers by the Extension Department of the MoA (Goshu, 1995; Habtemariam, 1996). Moreover, research and extension activities fell under different institutions that seriously lacked coordination. Habtemariam (1996) stated that IAR and MoA formed National and Zonal Research and Extension Liaison Committee (RELC) in 1986 with the aim of coordinating and devising research priorities, make periodical review of research- extension mechanisms, etc. Nonetheless, RELC could not bring substantial improvements in the coordination of research and extensions as its activity was left to different institutions (MoA, 1989).

Extension service was introduced in the country along with the introduction of the comprehensive package projects and the beginning of modern farms (Dejene, 1996; Habtemariam, 1996; Beyene, 2000). It has been further enhanced in the successive package programs such as the minimum package programs (MPPs) and the peasant agricultural development program (PADEP). The implementation of these programs and the impacts they brought on agricultural productivity and on the income of rural farm households are briefly discusses below.

The CADU, WADU, and ADDP were some of the comprehensive package approaches that were enforced in the late 1960s and early 1970s. These comprehensive package programs were funded by SIDA, the world Bank, and USAID with the aim of bringing about "economic and social development, to give the population increased awareness of and responsibility to the development process, and to verify methods of agricultural development " (Cohen, no date: 6).

The comprehensive approach was replaced by minimum package projects (MPPs) and initiated in the early 1970s in high potential areas. Both the comprehensive and MPPs were facilitated in high potential areas on the premises that concentrating resources on most promising regions yield better results than spreading them thinly over broader areas (Cohen, 1986; Dejene, 1996; Befekadu and Berhanu, N. 1999/2000).

Although package projects that consisted of improved seeds, fertilizers and chemicals and infrastructure development together with dissemination of extension messages (Tesfai, 1975; Habtemariam, 1996; Dejene, 1996) failed to meet the objective of accelerating rural development at large and food self sufficiency in particular. Tesfai (1975) and Dejene (1996) noted out that these largely 'aid-financed' projects whose primary objectives were to increase the real income of the small holders, to enhance their participation in rural development, to generate additional employment opportunities and narrow the prevailing income gap of farm households benefited the land lords than the poor. Furthermore, Shenin described the resultant effects of such covert policies of most developing countries as:

> ... policies aimed primarily at accelerating economic growth, in most developing countries, have benefited the upper 40 percent of he population and allocation of services and investment funds has tended to strengthen rather than to offset the trend (Shenin, 1988:425).

The major factors pervading the achievement of the packages' objectives among others, are area-focused nature of the program, lack of access to resources by the poor, tenure insecurity, weak collaboration betweeb Research and institutions, and lack of functional and purposeful linkages between technology generation and adoption (Desselegn, 1984; Bruine, 1990;

Befekadue and Berhanu, N. 1999/2000). Lack of access to resources (mainly credits, oxen and implements) and the tenure system limit the application of modern technologies and investment in land improvements on a sustainable basis.

Agricultural development of the post -1974 has been characterized by land nationalization, the establishment of peasant associations and producers' cooperatives, villagization, resettlement program, etc., intended mainly to transform the peasants agriculture (Dessalegne, 1984; Hansson, 1995; Dejene, 1996) or simply "to get agriculture moving" (Mosher, 1966). The 1975 land reform of the country was considered by many to bring about marked change in the development of the peasant agriculture through generating sufficient food for he population and surplus for the growth of the sector itself and other sectors of the economy. However, it could bring neither equity nor growth.

In the beginning of the 1980s, the second minimum package program (MPP II) was enforced thinly spread over a broader area and remained unfruitful. Further, the PADEP approach to extension services was enforced in grain surplus producing 'Awrajas' in the 1980s that was funded by the World Bank. The PADEP was mainly gave prior attention to the producers' cooperatives that accounted for 2 percent of the total cultivated land while neglecting the peasant sector that accounted for 94 percent of the cultivated land (Brune, 1990; Mesfin, M., 1994 Hansson, 1995). Hence, the 1980s agricultural extension system shifted form the model farmer approach to the producers' cooperative approach (Habtemarima, 1996) implying that the bulk of the public agricultural expenditure was channeled to the producers' cooperatives as well as the state farms. Producers' cooperatives and state farms received better agricultural

technologies and farm implements, access to credits, extension services, and better quality lands (Mesfin, M., 1994; Hansson, 1995).

The PADEP extension approach, as its predecessors, heavily relied on improved technologies developed by researchers to be applied in grain surplus producing 'Awragjas' involve a class and spatial bias (Dejene, 1996; Habtemariam, 1996). The approach was basically to increase the agricultural productivity through introducing new crop varieties, widespread application of inorganic fertilizers and T & V extension system to be communicated through the SMSs by developing the "ideal" production practices so as to maximize yield (Low, 1984; Woodhouse, 1994; Goshu, 1995).

The peasant agricultural sector was also suffering from the marketing and distribution of outputs and inputs during the 1980s. Marketing of agricultural output was monopolized by the state owned intuition-the Agricultural Marketing Corporation (AMC). AMC purchased agricultural products at fixed prices through compulsory quota deliveries. Hansson (1995:31) stated that state farms and producers' cooperatives received higher prices of 10-20 percent than the private peasants on grain sold to AMC. This statement apparently indicates that the peasant sector suffered not only from the bias in agricultural technology access but also from the price differentials.

The current strategy in Ethiopia gives emphasis to increase agricultural production with the major objective of making the country self–sufficient in food production (MoPED, 1993) through effecting the new extension program, PADETES, among others. The new extension

program, as the case may be in the past, focuses on the widespread application of improved seeds, fertilizer, pesticides and other chemicals, and improving agronomic practices, etc. to enhance the productivity of major cereal crops (Habtemariam, 1996; Takele, 1996). In its early period of implement, the NEIP gave priority to potential areas and latter its coverage was expanded to moisture –stress environments (SNNPRS-BoA, 2000).

Although there was no much evidence on yield levels from the moisture-stress areas, crop productivity on 'farmers-managed demonstration plots' in the potential areas has shown considerable rise over the traditional practices (Takele, 1996). He further argued that the application of the available technologies could produce better results if they are applied on most favorable environments and managed properly. Hence, conducive environment is essential for improved technologies to give desirable response for the rise in productivity. Such environment, among others, includes suitable farmland, adequate moisture, and proper application of the inputs, good farm management, and adequate extension messages. However, the present practice of broadening the extension coverage has become quite demanding on the existing inadequate farm resources that makes the success of increasing productivity to be questioned (Howard et al, 1999). Furthermore, the past as well as the present extension practice in Ethiopia signifies 'blanket recommendations' in the application of available technologies with out considering the great diversity of agro- ecologies and nutrient requirements of crops (Habtmarim, 1996; Mulat, 1996). It was observed that demonstration plots became less productive due to the above reason in some areas, particularly in mid-lowlands where land is relatively suitable for crops. In addition, both research and extension hardly gave emphasis to farmers' knowledge and that in turn resulted in the gap between technology generation,

dissemination, and adoption. This situation has been described as 'such gaps will persist as far as farmers and their centuries aged indigenous knowledge about their physical and biological environments are taken into account by the existing agricultural research-extension institutions' (Amare, 1977; Seleshi, 1980; Langlais et al, 1984 as cited in Habtemariam, 1996). Howard et al described the following on the rapid expansion of extension plots:

> ... expansion implies not only a challenges for the extension agents who will progressively encounter farmers with less capacity to adopt the technologies but also researchers who must work to [generate] and adapt improved varieties and other technologies to more difficult production environments (Howard et al, 1999: 53)

From the above statement, it is obvious that technology adoption on demonstration plots at a broader scale, which is unable to realize the resources at hand, may produce unsatisfactory results. It seemed that extension has moved ahead of research activities in the country without reinforcing each other. Hence, it can intuitively be concluded that the contribution of research and extension to agricultural development, in general, and to raise productivity, in particular, may not be attainable as envisaged by the present extension practice.

The major challenges to agricultural productivity in Ethiopia include declining farm size, weather changes, tenure insecurity, soil degradation, poor (often not well developed) link between research and extension systems, lack of credits, imperfect agricultural market, and poor infrastructure (Habtemariam, 1996; Mulat, 1996; Befekadu and Berhanu, N., 1999/2000). In order to find lasting solution for the problems of the sector each of the above constraints should be considered while policymaking, program designing and implementation.

Chapter Three: DESCRIPTION OF THE STUDY REGION

3.1 Physical Conditions

3.1.1 Location, Land Area and Topography

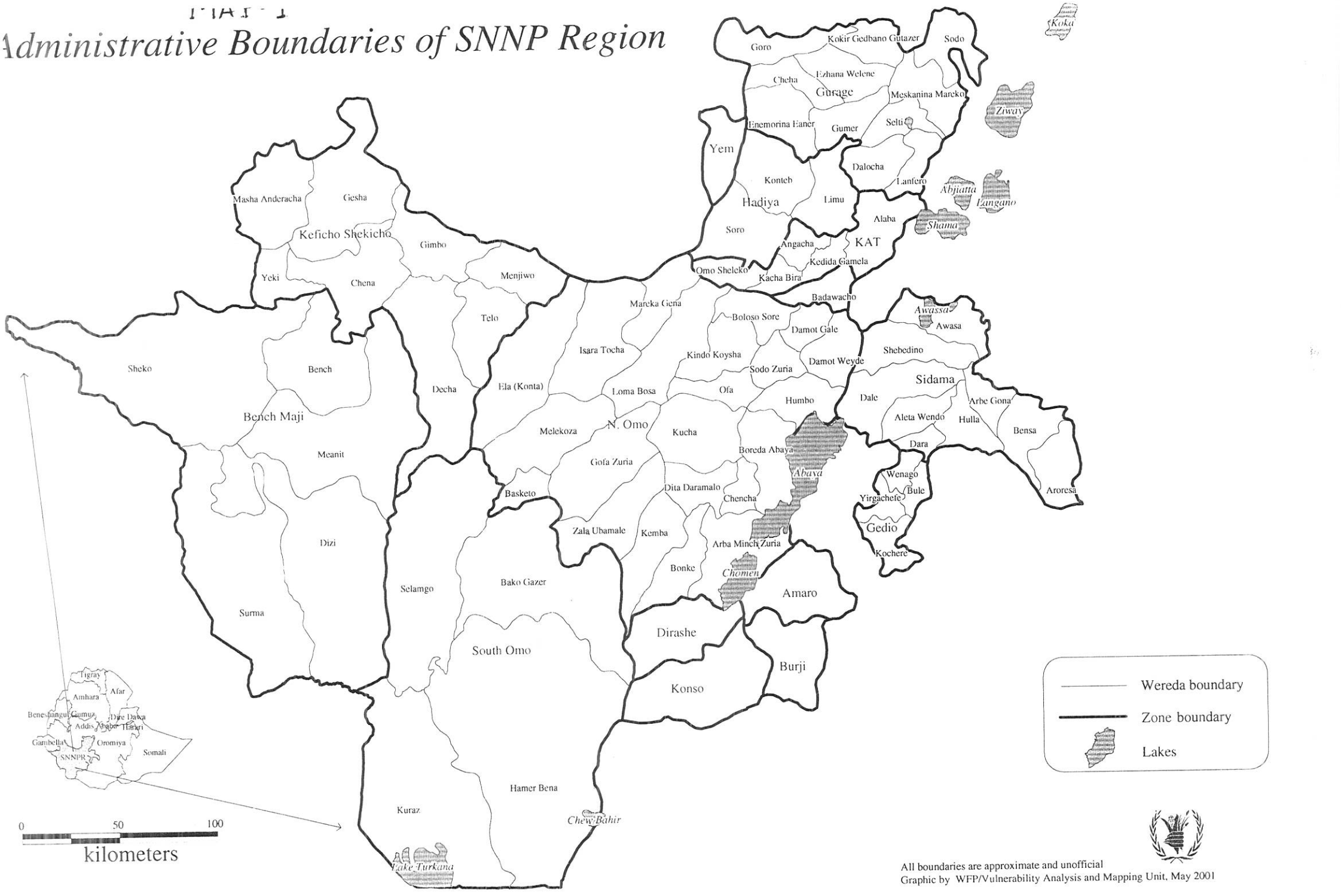
Location and Land area

The Southern Nations, Nationalities and People's Regional State (SNNPRS) is located in the Southwestern part of Ethiopia bordering with Kenya in the South, the Sudan Republic in the Southwest, Gambella Regional State in the Northwest and Oromiya Regional State in the North and East. The region lies roughly between $4^0$27' and $8^0$30' latitude North and $34^0$21'and $39^0$11' longitude East. The SNNPRS has an area of about 113,539 Km^2 and accounts for ten percent of the total area of the country (Woody Biomass Integrated Strategic Planning Project-WBISPP, 1997). The average population density of the region is 97.5 persons/Km^2 in 1997.

Topography

Much of the region is characterized by undulating topography with part Omo- Ghibe basin and part of the Rift Valley Lake basin forming part of it in the West and East, respectively. There are a number of chains of mountains associated with plateaus such as the Guraghe highlands in Guraghe Zone, the Sidama highlands in eastern parts of Sidama Zone and the Amaro and Burji highlands in Amaro and Burji Special Woredas.

Administrative Boundaries of SNNP Region



All boundaries are approximate and unofficial
Graphic by WFP/Vulnerability Analysis and Mapping Unit, May 2001

The altitude variation of the region ranges from 376 meters above sea level at Lake Rudolf (lowest area in the region) to 4,207 meters above sea level at mount Guge (highest peak) in Debub Omo (SNNPRS-BoPED, 1998).

3.1.2 Climate, Vegetation and Agro ecology

Climate

The amount and distribution of rainfall varies from place to place within the region. Its intensity, duration and amount increase from South to Northeast and Northwest. The mean annual rainfall for the region ranges from 400 to 2,200mm.

Temperature which is one of the element of climate is usually inversely related to altitude as a result of this, it decreases from South to Northeast. Thus the mean annual temperature of the region in general ranges from 15^0c to30^0c.

Vegetation

SNNPR has a relatively wide area of forest-covered land found in western parts of the region. The vegetation covers that are associated with high forest areas (woodland, bush land, shrub land and grass land) constitute 53.8 percent of the total surface area of the region. According to Woody Biomass Strategy Planning Project Study, about 11 percent of the total area of the region is covered by forest. These patches of forest include broad leaf forest, mixed forest, Riverine forest and plantation forests in different parts of the region mainly in Bench-Maji, Kaffa-Shaka, North Omo, Sidama, and parts of South Omo Zone, and Yem and Amaro Special

Woredas. The 14 National Forest Protection Areas (NFPA) are also identified in the above-indicated Zones, which will be strengthened in the future for efficient management and utilization of forest resources (SNNPR-BoPED, 1999:22). Out of above-mentioned five Zones, the highest coverage of forestland is found in Kaffa-Shaka, 46.1 percent and in North Omo, 15.6 percent of the total forested land surface in the region.

Agro-ecology

The type of agro-climatic Zones, the altitudinal range, the percentage and climatic condition for the region are indicated in the *Table 3* as follows.

Table 3: **Percentage distribution of Agro-ecological Zones**

Agro-Ecological Zone	Altitude in meters	Area Covered in percent	Climatic Condition
Haroor	Below 500	8.6	Hottest
Kolla	500-1,500	48.9	Hot
Woina Dega	1,500-2,500	33.9	Warm
Dega	2,500-3,500	8.4	Cool
Wurch	Above 3,500	0.2	Coldest
Total		100	-

Source: WBISPP (April 1997)

3.1.3 Land Use and Land Cover

Land use and land cover are often used interchangeably. According to Regional BoA, the land use/cover types of the regions are given in *Table 4* below.

Table 4: **Types of land use/cover in the SNNPRS**

Land use/ cover type	Area	
	Hectare	Percent
Cultivated land	2,737,210	23.3
Grazing land	2,357,480	20.1
Forest, bush & shrub	2,112,280	18.1
Cultivable	1,565,490	13.3
Others	2,978,180	25.2
Total	11,750,640	100

Source: SNNPRS-BoA (1999)

SNNPR-BoA identified four regional conventional land use systems, namely cereal system, Enset-root system, shifting cultivation system and Agro-pastoral and pastoral system.

1) The cereal system encompasses two subsystems or areas, the central rift valley and southern rift valley. In central rift valley the principal cereal is maize with Teff, whereas in southern rift valley the cereal system is based on sorghum with some maize.

2) In Enset-root system: two sub-systems have been identified, the first is Enset as main staple food and the second is Enset as co-staple with cereals and tubers. Enset is the main staple food in the Guraghe, Hadiya, Kembata and Sidama areas. In the Guraghe area Enset is dominant almost to the total exclusion of other crops. Enset as a co staple crop with cereals and tubers is found in Wolaita, the Amaro mountain, Semen Omo high lands and through out the Keffa highlands.

3) The shifting cultivation system is practiced in the river valleys of Gibe and Gojeb Rivers, in low lands of Semen and Debub Omo.

4) Agro-pastoral and pastoral system, encompasses most parts of Hamer Bena, Kuraz, Selamago, Surma Dizi and Menit areas in Debub Omo and Bench Maji Administrative Zones of SNNPRS.

On the other hand, according to the SNNPRS-BoPED (1997), out of the 113,539 Km^2 total area of the SNNPR; 26,585.2 Km^2 or 23.4 percent is cultivated, 15,621.0 Km^2 or 13.8 percent is cultivable, 23,130.2 Km^2 or 20.4 percent is grazing land, and 19,721.5 Km^2 or 17.4 percent is covered by shrub, bush and forest and 28,754.3 Km^2 or 25.3 percent is other.

3.1.4 Major Natural Resources of the Region

Major natural resources of the region are forests, wildlife, soil, water, energy and minerals. According to the study of WBISPP, 11 percent of the total area of the region is covered by the

patches of forests which include broad leaf, mixed and plantation forests (WBISPP, 1997). Regarding water resources, many perennial and seasonal rivers are found in the region. River Omo, among others, is ranked first by volume and length in the region. Its catchment area is estimated to be about 78,000 km^2. The catchments of all the rivers in the region are fertile and the rivers have high potential for irrigation

3.1.5 Natural Resource Degradations

In the SNNPR degradation of the natural resource base (the soil, water and forest) has reached a level where sustainable agriculture to day is at risk. A program document prepared by the SNNPRS-FSU in collaboration with European Commission Local Food Security Unit (2000) has outlined some indicators of the Region's resource degradations as follows:

- Around 200 million tons of soils are lost from the high lands of the region every year, some 912,000 hectares of lands experienced soil loss rate of 51-100 tons/hectare/years.
- Forest cover from 40% once in the past dropped down to around 10% and is still going worse.
- The amount of rainfall is dropping from year to year.
- Irrigation structures and lakes of Abaya and Awassa are getting filled up with sediment.
- I n 12 woredas of the region has population support capacity already been exceeded.

- 792,000 hectares of land in the region has already experienced soil loss of more than 100 tons /hectare/year (SNNPRS-FSU, 2000)

High population pressure, over grazing, deforestation, absence of fallowing, up and down cultivation, removal of all crop residues from fields, use of dung for fuel, delayed planting of certain crops after the onset of rain, together with natural phenomena like topography, erosivity and erodibility are the major causes of land degradation in the region (SNNPRS-FSU, 2000).

3.2 Socioeconomic Situations

3.2.1 Population, Ethnicity, Settlements and Administration

Population

According to the projection by the SNNPRS-BoPED, population the SNNPRS in 1998 was estimated to be 11.3 million. The sex composition of the population revealed that about 5.6 million are male while 5.7 million are female .the sex ratio is 99:100. The distribution of the population by residential places shows that 7.2 percent of the people live in urban setting while 92.8 percent of them resided in rural areas (SNNPRS-BoPED, 1998).

The age distribution data depicted that children (0 to 14 years) and youth (15 to 24 years) together account for over 65.0 percent of the total population of the region. Age structure indicates that the population of the region is considerably young and dominated by young age

dependents (0-14) which account 46.7 percent of the total population. The age structure of the population is depicted in the form of pyramid. The age pyramid shows a wide-base population age structure, that is, an age structure with a very large proportion of children and a very small proportion of elderly persons. This is typical age structure characterized by high fertility and mortality.

Among the nine administrative zones and five special woredas of the region, the highest sizes is recorded in North Omo, Sidama and Guraghe have 25.1 percent, 19.7 percent and 15.0 percent of the total population of the region respectively. The most densely populated zones in the region are Gedeo, Sidama and KAT with densities of 457.5, 325.5 and 314.7 persons/Km^2 respectively (SNNPRS-BoPED, 1999).

The projections for the years 1995-2000 reveals continuous increase in the size of the region's population. By the year 2000, the region's total population would increase by 14.5 percent in comparison with its size at the census base year, 1994 (SNNPRS-BoPED, 1999).

Ethnicity

More than 45 indigenous ethnic groups with their distinct languages and cultures inhabit the SNNPR. The different languages these ethnic groups speak belong to the broad language families, i.e. Omotic, Cushitic, Semetic and Nilotic (SNNPRS-BoPED, 1998).

In terms of their population size, sidama, Wolaita, Hadiya, Silte, Sebat bet guraghe, Gamo, Keffa, Gedeo, Kembata, Kullo, Amhara and Goffa may be considered as the twelve major ethnic groups in the region.

Settlements

Some 80 percent of the population live in highland areas (which cover 40 percent of the total area of the region) while the remaining 20 percent of the population live in the semi-arid and arid southern lowlands below 1,500 meters (which cover 60 percent of the total area of the region).

In the SNNPR agriculture is the backbone of the economy accounting for more than 90 percent of the total employment. It is, therefore, worth considering that agricultural density in the region to be described. In the SNNPR out of nine zones and five special woredas Gedeo, Sidama, KAT, Hadiya, Guraghe, Semen Omo zones and Yem special woreda are the ones with high agricultural density having 394, 295, 285, 258, 197, 108, and 94 persons per Km^2 respectively. On the contrary Debub Omo and Bench-Maji zones are the ones with low agricultural density having 14 and 14 persons per Km^2 respectively (SNNPRS-BoPED, 1998).

Administrative division

For administrative purpose, the region is divided into 9 Zones (with 72 woredas) and 5 Special Woredas based on ethnicity and language identities.

3.2.2 Land Tenure and Agriculture

Land Tenure

Land was fragmented due to the redistribution policy of the Derg regime. Although, no measures related to land tenure are taken at current in the region, there is potential risk of land

redistribution. According to the Constitution of Federal Democratic Republic of Ethiopia, land is owned by the state and farmers are entitled only with the right to use it. Moreover, the Regional Government is accorded with the power of issuing laws on land redistribution by the provisions of the Constitution. Like the conditions in the rest parts of the country, the existing land tenure in the is not conducive for most of the private small and large-scale cultivators who can play a great role in the development of agricultural sector.

Situation of food production

The regional food production for the year 1996 was 23.9 million quintals of different items, which equals to 17.0 million quintals of wheat equivalent, while the requirement were 24.9 million quintals of wheat equivalent. The gap, which is 7.8 million qt of wheat equivalent, was to be filled by purchasing from outside the region or by food aid (SNNPRS-BoPED, 1998).

Landholding and oxen

Concerning the landholding, about 72.7 percent of the household heads do have farmland less than or equal to 2 ha. In the agricultural production the availability of a draught animal is crucial. In light of this 43.4 percent of the rural household heads do not have oxen and 26.7 percent have only one ox per family. Due to this and other related problems, agricultural production in the region is not sufficient to feed the population.

Crop production

a) Staple crops: The major food crops produced in the region include Enset, Maize, root crops, Wheat, and Teff. The share of the crops in 1997 constitutes 27.0 percent, 24.6 percent, 17.0

percent, 7.9 percent and 6.4 percent respectively. In promoting crop production and agricultural productivity, utilization of agricultural inputs such as fertilizer, improved seeds and pesticides are of great importance. In 1996 400,100 quintals of fertilizer and 8,900 quintals of improved seeds were distributed. The amount of pesticide distributed was 11,375 Liter (liquid) and 8,652 kg (powder).

b) Cash crops: Beside production of food crops, the Region is known for its production of export commodities, such as coffee, hides and skin. In the production years 1994/95; 1995/96 and 1996/97 total supply of coffee to the central market was 37,455; 66,912 and 60,911 tones respectively. Total pulping and hulling stations in the year 1997/98 are 170 and 98 respectively.

Livestock Production

On the other hand, though the contribution of livestock toward agricultural production and hence food security is significant, the attention paid to this sub-sector was very low. The regional total livestock potential is 8.1 million total livestock units (TLUs). But the vet personnel available were about 209 making the ration 1:38. That is less than one fourth of the expected achievement at the end of the Five-Year Development Program.

Regarding the supply of skin and hides, the number of hides supplied to the central market in the years 1995, 1996 and 1997 was 288,232, 234,220 and 208,246 respectively. In the same years sheepskin supply to the central market was 1.30, 1.32 and 1.42 million while goatskin supply to the central market was 0.57, 0.60 and 0.80 million respectively (SNNPRS-BoPED, 1998).

Agricultural Extension Program

To avert the food shortage in the region by intensifying the extension service, the new extension package program has been started. From the inception of this program, numbers of farmers in different woredas have been covered. The number of farmers covered by this program is continuously increasing from year to year. In the year 1996, 45,044 farmers were embraced, 22,523 hectares of land have been cultivated and 794,740 quintals of agricultural products have been produced. During the same year 43,039 quintals of fertilizer and 8,691.50 quintals of improved seeds have been used. In the year 1998, 640,593 farmers were embraced, 229,706 hectares of land have been cultivated and 5,594,974 quintals of agricultural products have been produced. During this year 412,381 quintals of fertilizer and 49,751.07 quintals of improved seeds have been used (SNNPRS-BoPED, 1998).

To facilitate this, DAs have been assigned in the rural areas. According to the data obtained from the Regional BoA, in the year 1998, there were about 3,989 DAs in the region. The estimated number of total rural households in that specific year was 2,304,959 and based on these data the ratio of DAs to the rural households was 1:578, which indicates that, quite little is left to achieve the targets of five-year Development Plan.

Irrigation

Irrigated agriculture is the best means to minimize the effect of moisture stress due to drought situation and hence the development of small-scale irrigation schemes is being undertaken in the region.

SNNPR is best endowed with big rivers, lakes, springs & subsurface water potential to bring about 648,000 hectares of land under irrigation. However, out of the regions total irrigation potential only, about 2.77 percent has been developed under irrigation by traditional, private and government farms (SNNPRS-FSU, 2000). To exploit the potential efficiently and thereby to contribute to food security greatly, the regional government has set a priority focus for irrigation development in the region.

The recurrent drought situation in the region has called for attention to plan and implement irrigation schemes. Currently, the Regional Government has established a Commission for Sustainable Agriculture & Environmental Rehabilitation of the region to intensively undertake small-scale irrigation schemes implementation. The commission is responsible for study and implementation of irrigation projects.

3.2.3 Institutions, Services and Infrastructure

Education

The SNNPR is one of the regions in the country where both formal and non-formal education do not reach the majority of the population. The schools in the region are unevenly distributed and most of them are physically deteriorating and do not have the necessary facilities. Due to cultural and other constraints there is a high dropout rate at the lower level, which mostly affects participation of girls and creates educational wastage. In 1995/96 academic year, at the primary level, the rate of participation of girls was 29.6 percent.

With due emphasis given to extend education to all segments of the society by the regional government, primary school enrollment has increased sharply over the past three years reaching 43 percent in 1996/97. However, a lot remains to be done to reach the majority of the population, which at present do not have access to education.

Health

Most part of the region is found at a lower altitude with considerably warm temperature, which optimizes the reproduction of disease causing organisms. People living in areas below 2,000 masl are highly prone to malarial infections. Most of the diseases occurring in the region are water born parasitic, which are related to socio-economic problems associated with the rural poverty. Dense settlement of population in some of the rural areas, the physical nature of the area, the low level of awareness of the society towards personal hygiene and environmental sanitation, scarcity of safe and potable water and the poor economical life of the society are the contributing factors to the problem.

In the region there are 11 hospitals, 7 district and 4 zonal. Nine of the hospitals are governmental and two of them are non governmental. There are also 83 health centers (80 governmental and 3 non governmental), 366 health stations (310 governmental and 56 non governmental) 407 health posts, 23 pharmacies (5 non governmental and 18 private), 28 drug shops (2 non governmental and 18 private) and 413 rural drug venders. There are also 80 private clinics (SNNPRS-BoPED, 1999).

According to the Ethiopian new health policy standard, one district hospital is for 250 thousand people, one zonal hospital for 1 million people and one health center for 25 thousand people. However, in the region 1 district hospital serves 1.6 million people, one Zonal hospital serves 2.8 million people and one health center serves about 136 thousand people. The population having access to primary health care facilities is estimated to be about 40 percent, which is very low as compared to the national average (46 percent). The rural population having access to safe water and the sanitation coverage are lower than 18.2 and 7.9 percent, respectively.

Potable water has an intimate relationship with the welfare of mankind. The status of water supply and sanitation sector in the region is extremely poor. Most of the people do not have access to adequate quantity of safe drinking water. Adequate water supply for rural communities in Ethiopia is defined as 20 liters/capita/day available within a range of 0.5-1 km from a dwelling.

The level of health/hygiene education and the general awareness of the population concerning potable water and safe environmental sanitation are extremely low. Existing data suggest that, in Ethiopia 27 percent of the population have access to safe water, as compared to 48 percent in Sub-Sahara African countries.

In the SNNPRS, despite the considerable advances of recent years, the coverage of safe drinking water is still remains low in rural areas. Only 20 percent of the rural population has access to safe drinking water (SNNPRSS-BoPED, 1999). The problem is much serious in

drought prone areas due to shortage of rainfall, which leads to the drying of surface flow and the general decline in yields of the springs and ground water level.

Transport

Economic growth in general and rural development in particular mainly depends on the presence of good and reliable transportation and communication system. In SNNPR, the most important and widely used means of transport is road transport. In 1986 E.C the total length of all weather road was 2910 km. This figure has increased to 4015.9 km. in 1990 E.C. of which 473 km is asphalt and the remaining considerable length is mainly gravel and rural roads. At present, all weather road density of the region is 35.4 km/1000 km^2.

Chapter Four: AN OVERVIEW OF FOOD SECURITY IN THE SNNPRS

This chapter discusses the overall food insecurity situation of the region, indigenous coping mechanisms and Regional Government's Food Security Program (RFSP).

4.1 The Most Severely Food Insecure Areas of the Region

The recent phenomenon of the region provides an evident that a good majority of the population in almost all areas of the region is affected by the shortage of food and becoming dependent on relief food aid. Region particular information on the dimensions of food insecurity is not available because studies undertaken on the issues of food security in general are so limited. How ever, this study used information related to relief assistance carried out by the Disaster Prevention and Preparedness Commission (DPPC). According to the Early Warning System Reports (EWSR) of the DPPC, the number of population needing relief assistance in different woredas of the region for the years 1996 to 2000 is indicated in *Table 5* below.

Table 5: **Relief Assistance Requirement in the SNNPRS From 1996 to 1999**

S. N.	Zones	Woredas	Affected Population				
			1996	1997	1998	1999	2000
1	Hadiya	Limu	-	20,000	56,239	56,239	44,500
2		Badawacho	25,000	2,300	10,800	20,800	27,100
3		Soro	-	20,000	3,231	3,231	16,800
4		Misha	-	-	3,340	3,340	10,400
5	KAT	Omo Sheleko	20,000	4,000	34,985	34,985	28,900
6		Kachabira	-	5,000	17,613	17,613	22,100
7		Kedida-Gamla	-	5,000	9,970	9,970	10,200
8		Alaba	-	-	5,000	50,000	23,300
9		Angacha		-	6,322	6,322	10,700
10	North Omo	Gofa	10,000	-	16,000	55,246	52,06
11		Zala Ubamale	5,000	8,000	16,093	21,237	50,000
11		Humbo	10,000	-	32,000	24,486	68,000
11		Damot Woide	15,000	15,000	25,000	17,682	57,000
14		Kemba	5,000	4,700	15,000	14,560	30,000
15		Boreda	-	10,000	15,000	16,080	41,241
16		Kucha	6,000	12,000	20,000	13,640	31,125
17		Kindo Koisha	20,000	19,000	38,121	39,200	57,000
18		Damot Gale	15,000	19,000	35,400	21,983	68,255
19		Boloso Sore	40,000	26,000	40,000	69,995	90,000
20		Dita Daramalo	-	-	12,000	17,206	20,273
21		Ofa	30,000	12,000	6,000	3000	30,000
22		Soddo Zuria	-	15,000	6,000	3,500	55,515
23		Chencha	-	-	3,045	1,800	15,097
24		Bonke	-	-	-	9,550	22,000
25		Mirab Abaya	8,000	-	-	-	-
26		Arbaminch Zuria	-	2,700	-	16,000	16,142
27		Lome Bossa	-	-	-	-	14,800
28	South Omo	Selamago	-	-	-	-	8,400
29		Bako Gazer	-	-	-	-	31,200
30		Hamer Benna	-	-	-	-	48,000
31		Kuraz	-	-	-	-	39,400
32	Guraghe	Lamforo	8,600	6.500	-	-	3,100
33		Silti	-	5,000	-	-	3,000
34		Dalocha	6,600	3,500	-	-	3,800
35		Meskan	-	8,000	-	-	9,100
36		Goro	6,500	-	-	-	6,000
37	Sidama	Awassa	-	3,500	-	-	14,000
38		Shebedino	-	500	-	-	22,000
39		Dale	-	2,500	-	-	21,000
40		Aleta Wondo	-	-	-	-	12,000
41		Bensa	-	-	-	-	16,200
42	Gedeo	Yirgacheffe	19,600	4,000	-	-	-
43	Bench Maji	Sheko	-	6,800	-	-	-
45	Special Woreda	Konso	94,100	-	57,352	70,297	167,000
46	//	Derashe	-	28,400	17,152	24,000	42,000
47	//	Burji	8,000	-	6,304	32,607	28,500

Source: Adapted from EWSR for the Years Indicated above (DPPC)

The Regional Disaster Prevention and Preparedness Office (DPPO) further assessed the woredas which are recurrently affected by drought and food shortage and identified them for particular attention in the year 2000. According to the SNNPR-DPPO (2000) descriptions, the Region suffers from both chronic and transitory food insecurity in 46 drought prone woredas and it is unlikely that food security problems will be solved in some of the region's woredas in the near future. Areas currently identified as drought prone are listed in *Table 6* below.

Table 6: **Drought prone woredas, population affected and relief distribution in SNNPRS during 2000**

Zone/Special woreda	Number of drought prone woredas	Population affected	Relief distribution(qt)
Sidamo	7	103,205	12,901
Gedeo	0	0	0
Burji	1	28,457	3,998
Amaro	1	10,000	1,250
Keffa Sheka	0	0	0
Bench Maji	0	0	0
Yem	0	0	0
Hadiya	4	98,764	16,160
KAT	5	95,222	13,298
Gurage	5	43,297	4,962
North Omo	17	718,508	48,373
South Omo	4	124,740	16,626
Derashie	1	42,200	4,750
Konso	1	167,310	19,616
Total	46	1,431,703	141,934

Source: SNNPRS-DPPO (June 2000)

Among the above 46 woredas, which experienced recurrent food shortage, the first 20 woredas that are most seriously affected by the problem have been identified by the Regional DPPO.

These woredas are Humbo, Kindo-Koisha, Damot-Woide, Boloso-Sore, Damot-Gale, Kucha, Zalaubamale, Boreda-Abaya, Ofa, and Kemba Woredas in North Omo Zone, Omo-Sheleko and Kachabira Woredas in KAT Zone; Kuraz Woreda in Souh-Omo Zone, Badawacho and Lemo Woredas in Hadiya Zone; Dalocha and Meskan-na-Mareko in Guraghe Zone, and Konso, Burji, and Derashe Special Woredas (SNNPRS-DPPO, 2000).

The peasants and pastoralists in the respective above-mentioned woredas depend on rain for crop production, pasture and water availability. The recurrent drought, variability in seasons distribution, fluctuating frequency and intensity of the rainfall result in crop failure and water and pasture shortage, which force the population of the woredas to rely on relief food.

4.2 Major Causes of Food Insecurity in the Region

The predominant use of backward agricultural techniques and inadequate extension services remain great obstacles to attain desirable levels of food production. Increasing magnitude of drought for extended periods over wider areas of the region is depleting the resources of the population at risk and is badly affecting the coping capacity.

Several causes can be enumerated under the problem of food security in the Region. The Regional FSU identified some of them and listed as follows:

> These are: shortage of farmland, population pressure, recurrent droughts, malaria epidemic out breaks in low land areas, back-ward agricultural practices, variability of onset and cessation seasons of the rains, shortage of irrigation schemes, poor methods of

storing production, unstable market conditions, stress of high debt burden cycle upon farmers (from year to year), prevalence of diseases affecting livestock (poor veterinary-service), shortage of pasture and water (due to droughts and land size), decrease in total field coverage of Enset plant (staple food of the population), unemployment, deforestation and land degradation, inadequate micro credit service, shortage and untimely procurement of agricultural inputs; lack of technical education (for high school completes), disruption of adult education, harmful traditional practices (extravagant feasts), existence of deep-rooted poverty, and low intervention to support the population (especially farmers) to overcome poverty and mitigate drought impacts (SNNPRS-FSU, 2000: 22)

From the above information it is clear that alleviation of food insecurity requires several interventions, which are beyond the available resources and technical capacities of the region. In order to direct its limited resource, Government should take wiser selection of feasible and viable actions.

4.3 Regional Coping Strategies of Food Insecurity

Most of the coping strategies practiced in the Region are not that much different from the popular ones in all the Regions of the country. Some of them may be peculiar to the Region and even more peculiar to some localities in the Region depending upon the difference in the availability of resource types, capacities and cultural practices. This section presents the existing coping strategies by looking from two different perspectives. There are indigenous responses by the affected population termed as traditional coping mechanisms and Government response in terms of relief food aid distribution

4.3.1 Traditional Coping Mechanisms

In response to food insecurity, vulnerable people will engage in complex series of coping activities related to production, assets holdings, income and consumption to cope with the situation.

Vulnerable households adapt various coping mechanisms to overcome food shortages. They may use one or a combination of such coping mechanisms, which imply changes in food and cultural habits. It is clear that such coping mechanisms are always strong related to the available natural resources and have severe impact on environment and proper management of natural resource. Accelerating of deforestation and losses of soil and water will result from the traditional coping strategies.

The Program Document prepared by the SNNPRS-FSU (2000) identified three types of traditional mechanisms, namely, risk minimizing, income stabilization, and consumption management mechanisms, which are practiced by the affected population (SNNPRS-FSU, 2000:22).

The 'risk minimizing' mechanisms are attempts of the affected households to adapt alternative means of managing the available resources with risks aversion and searching every possibility to get food. The Regional FSU has identified several risk-minimizing mechanisms which include inter cropping, sowing at earlier times, selecting late grown crops, moving with their

livestock to where feed is available, de-stocking the livestock to reduce losses in death, approaching relatives who are well off to ask for food or money, contracting out of farmlands to those who are better, selling bigger animals like bulls, cows, horses or mules to buy grain and small animals like sheep, goats or heifers etc. with the remaining parts.

The second type of traditional coping strategy, which is termed as 'income stabilization' mechanism, has various practices within it. Under these mechanisms, various actions of the affected households are stated. Some of them include:

- search for loan,
- selling of permanent assets (such as trees, orchard plants),
- selling of their household utensils, farm tools and other properties,
- selling of livestock products which they need like milk cheese, butter milk and eggs,
- selling of firewood which accelerates deforestation,
- selling of grass, charcoal and wood,
- selling of some of their animals (goats, sheep, cows which do not produce calves, oxen, heifers and others). Unless they lack alternative means they do not sell milking cows and heifers. Instead of selling heifers they sometimes exchange heifers for bulls with their relatives, and then they sell the bulls they get,
- migrating to places where they expect jobs or food leaving their families at their residing localities or sometimes (some of them) taking their family members along with them,
- partial selling of wood from which their house is built of and after that make smaller cottage for their families to stay in,

- selling part of their nightwear (Shema or Buluko) and sometimes the whole wear.
- migrating of women to towns to service in private homes and bars, and
- practicing of women and girls of petty trade (brewing Araki, local beer).

The third type of traditional coping strategy is termed as 'consumption minimizing'. This includes different practices of the affected households to reduce the amount of household consumption due to the lack of capacity to cover. The Regional FSU also identifies these practices as follows:

- minimizing of the quality, quantity and frequency of their daily diet,
- eating of cottonseeds, fine brands of some crops especially that of sorghum,
- shifting to low quality and low price food and inedible plants,
- sending of some of their family members to stay with relatives,
- quitting of children's school (drop out),
- sometimes wives with some young children will leave their husbands alone and go to their parents or relatives, and
- abandon their residential place and move with the family members to the wife's/husband's relatives for the bad days to pass.

4.3.2 Relief Aid Distribution

In the face of recurring drought and famine and ever-increasing number of food insecure population of the region, distribution of food aid is becoming a regular duty of the Government

since few years ago. Relief aid distribution is the Government intervention with active participation of international donors and NGOs against transitory food insecurity. It is the second perspective of the regional coping strategies with food insecurity.

Regarding its implementation, there is an institutionalized channel of relief aid distribution. When a locality becomes prone especially to drought caused disaster such as crops failure famine, water and pasture shortage, the KA leaders report the situation to the woreda council and ask for relief aid. Most of the time Early Warning Committee of the woreda undertakes assessment in the affected areas. Then the report of Early Warning Committee about the disaster that is to occur will be submitted to the woreda council. The woreda council having application from the KA, and the assessment report from the Early Warning Committee, pays a visit to the areas with relevant department heads to learn about the severity of the disaster. After having sufficient information, the woreda council tells the KA leaders to select the most affected people, and then the officials carry on the work of targeting the households. After receiving the report, woreda council sends the statistics of affected population to the zonal Disaster Prevention and Preparedness Committee with information of beneficiaries, duration of relief and amount of food aid needed for relief aid to be dispatched either through EGS or gratuitous relief, and sometimes both.

In the case of relief resource scarcity, local authorities, rather than undertaking retargeting, prefer to maintain initial beneficiaries, while reducing the ration rates according to available relief food.

When relief aid is made available to the woreda, the woreda Disaster prevention and Preparedness Committee allocates the relief food to the kebeles according to the number of beneficiaries they have.

4.4 Components of Food Security Strategy of the Regional Government

The Regional Food Security Unit (SNNPR-FSU) in collaboration with European Commission Local Food Security Unit (LFSU) has prepared a Program Document for the project which is intended to be implemented from January 2001-December 2002. According to this document, in the years to come, the SNNPR region will focus on both high and low potential areas as well as the pastoral and agro-pastoral areas with the introduction of the food security strategy, strengthening Extension Packages and various other interventions in an attempt to sustain food security.

The regional food security strategy and program incorporates the three major components of the national strategy. These are:

- Economic growth and employment generation;
- Additional Entitlement/Access and Targeted Programs; and
- Emergency capabilities.

As per the information obtained from the Regional FSU, the main components of the Regional Food Security Program (RFSP) are integrated agricultural development (crop production, livestock, marketing and rural credit), watershed development, small-scale irrigation, water

supply schemes, micro enterprise development, rural roads, and rural credit (SNNPR-FSU, 2000).

Despite attempting to describe the overall situation of the food security in the Region, the major theme of this study is to identify the implementation problems of NEIP. The following chapter will deal with implementation process, the role of NEIP in food security, and the problems and prospects of the program.

Chapter Five: **NEIP IN THE SNNPRS**

Although food security is a function of integrated programs, undertaking of the Extension program in the region is taken as a key Government intervention in response to the food insecurity. This chapter identifies the major implementation challenges and states the role that NEIP/PADETES could play on the food security of the region.

5.1 Objectives of the Regional NEIP

The Regional NEIP has a coherent objective with the National Program, which is part of the ADLI Strategy. A document prepared by the SNNPRS-BoA entitled "Status of Agricultural Extension Program in SNNPRS-An Overview of Major Achievements and Constraints" outlined them as follows:

- Attainment of food self-sufficiency through increased agricultural production, both in terms of quantity and quality;
- Improvement in the quality of life of rural population through employment creation, poverty reduction and improved nutrition; and
- Reversing the rapidly expanding ecological degradation (SNNPRS-BoA, 2001: 3)

In line with the National Program, the food self-sufficiency is the major objective of the Regional Program. The agricultural extension system in current use is known as the "Participatory Demonstration and Training Extension System" "(PADETES)". It has adopted practical ideas that are found to be beneficial for small-scale farmers both from modified T & V

extension system and SG-2000 approach. The concept of PADETES is explained in the document prepared by the SNNPRS-BoA as follows:

> Participatory agricultural extension consists of a basket of approaches to extension that involve "outsider" facilitators working closely with local communities. The participatory extension is best used with smallholder farming communities. The farmers take more active, participatory role than in conventional extension. The farmers are encouraged to identify agricultural problems, prioritize them and seek solutions (SNNPRS-BoA, 2001: 4)

Participatory extension aims at strengthening the community's ability to carry out the above activities with limited assistance from outsiders.

Using PADETES, in aiming to achieve the food self-sufficiency, SNNPRS has undertaken practical activities in planning and implementation of NEIP during the past EPRDF's Five Years (1995/96-1999/00) Development Program. The following sub-sections will present some of these activities.

5.2 Regional Planning and Achievements of the NEIP

During the years 1995/96-1999/00, planning targets of NEIP in the Region were increasing year to year being encouraged by the good results obtained in the crop extension packages of the earlier implementation years. According to the information obtained from the SNNPRS-BoA, the package was planned in different terms. Some of them are presented below.

5.2.1 Area Coverage

This section describes the planning and achievements of crop extension package in terms of number of Extension Management and Training Plots (EMTPs) as well as zonal and woreda coverage. According to the PADETES standard, EMTPs are half hectares farmers managed demonstration plots. In the year 1995, 4,200 plots were planned and 3,901 were achieved. In the year 1996, 37,032 plots were planned and 45,045 were achieved. In the year 1997, 101,698 plots were planned and 105,630 were achieved. In the year 1998, 656,000 plots were planned and 544,572 were achieved. In the year 1999, 970,294 plots were planned and 627,207 were achieved. Achievements during the second and third yeas surpassed the planning. The proportion of area under extension from the total area cultivated in the year 1999 is 17 percent. *Annex 1* provides spatial distribution of the planned and achieved areas in terms of EMTPs.

Regarding the planning of the program with respect to the zonal and woreda coverage, it was rapidly extended to cover almost all the region within not more than two to three year's period. Areas with high potential for cereal production had been covered by the ongoing extension in the first year program. In the second implementation year, the scope of the program was increasingly extended to cover more than 50 percent of the region. Presently, the program is implemented in all woredas of the region except the postural areas in about five woredas (Salamago, Kuraz and Surama in South Omo Zone and Menit and Dizi in Bench Maji Zone).

The planning targets of the fourth and fifth year were extremely high, may be either misled by the impressive results of previous years or accompanied with the increasing implementing

capacities in terms of man power, finance and other requirements. However, progressive results could not be obtained during these years due to various limitations and constraints associated with agricultural activities in developing Regions like SNNPRS (See *Annex 1*).

5.2.2 Farmers Participation

According to the information obtained from the SNNPRS-BoA (2000), during the years, the number of participating farmers increased from 3, 901 in 1995 to 685,160 in 2000 (which accounts for 30 percent of the total farm households in the region). The report also indicates that the participation of resource poor farmers, women farmers and copy farmers is increasing (SNNPRS-BoA, 2000:7). However, the farmers participation at present is becoming constrained by several financial and technical problems.

5.2.3 Inputs Supply and Utilization

The existing practice of the region indicates that input supply is mainly dependent on the availability of imported inputs, domestic research generated inputs and the farmers' capacity to purchase them. Major inputs distributed to the farmers during the program years are chemical fertilizers and improved verities of crops (mainly maize, Teff, wheat, sorghum, and barley). The information obtained from the SNNPRS-BoA (2000) explains that the use of agricultural inputs increased from 200,009 quintals in 1995 to 415,000 quintals of fertilizer in 2000 and from 1,368 quintals in 1995 to 48,000 quintals of improved seed in 2000. According to SNNPRS-BoA (2000), farmer managed demonstration approaches increased the farmers' confidence on

the technology adaptation/use. On the other hand, limited availability of inputs and monopolistic nature of regional input supply system hinders the optimum utilization of inputs by the farmers.

5.2.4 Rate of Technology Packages Adoption

A number of technology packages have been introduced since 1995/96. The firs one to be introduced was crop production package which include cereals (maize, wheat, Teff, barely, sorghum); pulses (bean, pea, haricot bean, groundnuts, etc...); vegetables, root crops, and spices in 1995/1996; and coffee; and Enset extension in 1997/98. Livestock package (poultry, fattening and vet service, diary and forage and bee keeping) was introduced in 1996/97. Soil and water conservation, agro-forestry, rural technology and post harvest technology packages were introduced in 1997/98. Home science extension package was introduced in 1999 in the SNNPRS.

Adoption rate for each package is different for different reasons in most cases determined by the availability and affordability. For example, adoption rate for crop production, especially maize and wheat is very high due to availability of improved seeds. A livestock package is highly accepted but it is not readily available. Similarly, adoption for high value crops is also very good but its supply is very limited.

On the other hand, some technologies, which can't fit the interest of the farmers, have lower acceptance rate among the farmers (for example, soil and water conservation packages and agro-forestry package due to their lack of immediate effect and short-term economic return).

5.2.5 Extension Personnel

According to the information obtained from the SNNPRS-BoA (2000), the number of Development Agents (DAs) increased from 950 in 1995 to 4, 023 in 2000 in the region. Training for the DAs is given at diploma and certificate level. A series of short-term training of Subject Matter Specialists (SMSs) and DAs are a major part of capacity building in extension program. Through agreements made with different Agricultural Colleges, a lot of DAs and SMSs have already graduated. Short-term training and field days are often organized to develop the experiences of extension personnel (SNNPRS-BoA, 2000).

5.2.6 Volume of Production

The production records obtained from the SNNPRS-BoA (2000) indicate that the total annual grain production of the region increased from 13.31 million quintals in 1995 to 16.08 million quintals in 1999. The details of production records for major crops in the region from 1995 to 1999 are indicated in *Annex 4*. The contribution of extension package to the increase in the production volume is very significant since production per hectare on the extension plots is double or more than double in most cases as compared to the conventional farms *(Annex 3)*.

5.3 The Role of NEIP on the Regional Food Security

NEIP is a nationwide program undertaken by the concerted effort of the central and regional governments within the framework of the EPDF's Five years development program (1995/96-1999/00). The principal aim of the regional NEIP is attaining of food self sufficiency by raising the productivity of small-holder farmers through the use of improved technological packages. Measuring the improvement in the food security situation of the region due to the implementation of NEIP is not easy. However, it is possible to measure the food production at the regional level during a certain period of time. Increasing domestic food production is a fundamental means of increasing food availability, which is one of the crucial elements of food security. Therefore, effective implementation of the program could doubtlessly change the food security situation of the region in particular and the country in general.

The effect of the program on the food security could be explained comparing the data related to food production with and without the use of extension. This situation at the region could be analyzed using the data obtained from the SNNPRS-BOA (2000). According to the data, area coverage of cereals extension package during the first year of the program (1995) was 1,950 hectares which is only 0.13 percent of the total area of 1,462,981 hectares under cereals. The yield obtained through extension at the same year was 48,750 quintals which is 0.36 percent of the 13,311,769 quintals total regional cereals production of the year *(Annex 2)*. The average per hectare production during 1995 through extension was equal to 25 quintals whereas it was only 9 quintals per hectare through conventional farming (computed from *Annex 2*).

Areas covered by extension continuously increased from year to year within the period of the program. Accordingly area covered by extension in the year 1999 was 259,897 hectares, which is 17 percent of the total area of 1,534,942 hectares total area under cereals. The yield obtained through extension package was equal to 6,067,216 quintals, which is 38 percent of the 16,066,221 quintals total regional cereal production of the year. The average per hectare production through extension was equal to 23.3 quintals whereas the average per hectare production through conventional farming was only 7.8 quintals. *Annex 2* provides the details of cultivated areas and yield obtained through extension and conventional farming during 1995-1999.

The above evidences make clear that the increase in the share of extension from the total cultivated area is accompanied with increasing yields. There will be corresponding increase in the estimation of the total production if the share of extension becomes greater and greater.

Although it is to early to expect major changes within its five or six years of implementation, the existing data indicate some improvements. Regional NEIP could have remarkable impact on the regional food security if its implementation considers various constraints and challenges associated with extension program.

5.4 Major Challenges to the Regional NEIP

Discussions conducted with the senior staff of SNNPRS-BoA revealed that the challenges to the NEIP are tremendous. The major ones are associated with the issues of environmental

variability, shortage of farmlands, inadequate technological packages, limited supply of inputs, inadequate credit facilities, inadequate services of extension agents, poor market performance and poor research-extension-farmers linkage. Each of these constraints will be dealt with in short in the following subsections.

5.4.1 Environmental Variability

Agriculture in the region in general is rain dependent as it is indicated in section 3.2.2 that only 2.77 percent of the total irrigable area have been brought under irrigation schemes during 1998. While most of the NEIP packages are designed for areas with adequate rainfall, the discussions with the staff of SNNPRS-BoA revealed that drought and natural disasters have been the major obstacles to the success of the program in the region. This will be clear when we compare the achievements of NEIP during the years 1996 and 1997, which were characterized by relatively adequate and seasonally stable rainfall with the achievements of the years 1998 and 1999, which were characterized by shortage and seasonal fluctuation of rainfall. According to the discussion with the staff of the SNNPRS-BoA, the short-term destructiveness of environmental variability has been resulted in crop failure and much of agricultural land has remained uncultivated during 1998 and 1999.

5.4.2 Farmland Shortage

Shortage of farmland is one of the major constraints of NEIP in the Region. Such Zones as Gedeo, Sidama, KAT (Kambata-Alaba-Tambaro), Guraghe and Semen Omo and Yem Special Woreda with high potential of crop production are characterized by higher agricultural density as indicated in section 3.2.1. A good majority of farm households in these areas do not have even a land size equivalent to the EMTPs (half-hectare). Shortage of farmland is caused by continuous land redistribution between and within the farm households and land fragmentation as a result of high population growth rate. Farmers who participated with less than the required plot size could gain no economic benefit rather than technical knowledge from the program.

5.4.3 Inadequate Technology Packages

According to the explanations by the staff of SNNPRS-BoA, major problems related to technology package applications include seeds shortage in quantity and type, changing characteristics of hybrid maize varieties (eg BH 660, BH/40), no localized fertilizer application rate (blanket recommendations), shortage of improved livestock breeds, poor linkage between research, extension work and farmers, and shortage of livestock feed. In general, research generated technology inputs are inadequate to cover the needs of diverse AEZs in the region as well as to meet farmers preferences. Lema Mitiku (2000) pointed out that:

> Technical packages supposed to increase agricultural productivity and production have not materialized in some parts of the SNNPRS during some seasons of a year or sometimes the whole year. Repeatedly, farmers have found themselves unable to repay their loan obligations.

> This could happen either due to the high risk and seasonal nature of production that may result in entire crop loss or the failure in the performance of technical packages. The failure of germination of hybrid maize varieties and intolerance of diseases by some wheat verities in Sidama, Hadiya, and North Omo Zones can be cited as potential examples (Lema Mitiku, 2000: 54)

Failure of performance of technology packages represents a challenge to the entire system of PADETES, by aggravating farmers' indebtedness and forcing them to sell their plough oxen and other resource for loan repayment.

Technology transfer in the region is also constrained by backwardness of infrastructure limited availability of technology generated inputs, low financial and institutional capacities, less motivated and incompetent DAs. Regardless of financial problems of resource poor majorities, most of the farmers in the SNNPRS have exhaustively used the already available technologies.

5.4.4 Limited Supply of Inputs

Problems associated with input supply in the region emanate from two different angles. One is from the shortage of input suppliers (imported fertilizers are delivered only by Wondo Trading Pvt. Ltd. Co., Government supported enterprise, and improved varieties are also distributed only through Regional BoA) and other is from the shortage of improved inputs. Since retail trades in the input supply system are not promoted, choices are not available for the farmers. Therefore, farmers are forced to procure inputs only from these monopolistic suppliers whose bureaucracy costs them unnecessarily.

5.4.5 Inadequate Credit Facility

According to the staff of SNNPRS-BoA, while majorities of the farmers (more than 80 percent) in the Region procure inputs on credit, a number of constraints have been associated with it. One of the major constraints is the absence of rural credit institutions, which could be more accessible for farmers. The Regional Government makes a credit agreement with Commercial Bank by the collateral of the regional annual budget. In this case, there is only a single source of loan (Commercial Bank) and the enforcement measures of repayment are very harsh.

Due to lack flexibility in the schedule of repayment, the marketing of agricultural products is worsened. Mulat (1999) stated this as follows:

> Administrative measures used to enforce repayment can also be harsh and inconsiderate of farmers' circumstances. For instance, farmers are forced to pay their fertilizer loans immediately after harvest. Loans are thus paid from sales of grain at very low prices, since the grain market is congested by oversupply immediately after harvest. The interest of farmers who are willing to incur additional costs by delaying crop sales cannot be accommodated under the existing arrangements (Mulat Demeke, 1999: 8).

Although there is no effective mechanism to enforce repayment, one commonly applied measure to enforce repayment is to require all members of a service cooperative or Kebele Administrations to repay all previous loan for the current to be approved. Input delivery may be suspended even when the number of defaulters is small and when the reasons for default are legitimate (e.g. crop failure). Delays in input delivery often result in delays of cropping time, which leads to crop failure.

5.4.6 Inadequate Services of Extension Agents

Some of the problems associated with extension services of DAs were raised during the discussion with the staff of SNNPRS-BoA. Training of DAs lacks knowledge in socio-cultural aspects of the communities, as it is more focused on technical aspects. The training that had been conducted for less than one year is very short and cannot equip DAs with adequate capacity. Due to non-extension assignments like tax and credit collection, extension workers could not meet their proffesional obligations. Therefore, most of the DAs lack reliability and capacity to adequately communicate the extension messages.

5.4.7 Poor Market Performance

According to the discussion with the staff of SNNPRS-BoA, during the years of good harvest, prices for most of the food grains fall below half and one third of the normally experienced. This problem is associated with underdevelopment of general trade in the region. There is also backwardness in the roads transport facilities and communication infrastructure. Problem of market for agricultural products discouraged the farmers to participate in the program.

5.4.8 Poor Research, Extension and Farmers Linkage

Although there are attempts to overcome the shortcomings in the input sector by introducing some FBSPM programs, the farmers in the region are still far from participating in the process of technology generation. Even the extension system is not linked to the research system. This

is not only the regional problem, it is part of the conditions prevailing acros the nation. The activities of institutions involved in agricultural research in Ethiopia such as Institute of Agricultural Research (IAR), Ministry of Agriculture (MoA), Alemaya University of Agriculture (AUA), and other colleges are not coordinated

Research activities by their very nature require high investment and long period to generate improved technologies as well as trained and experienced personnel and adequate logistical support (Anderson, no date; Griffin, 1973). Without fulfilling these basic conditions, innovation of economically viable and socially feasible new technologies at a regular basis and transferring them to the utilizers in a sufficient amount is unthinkable within the present extension situation of the region.

Habtemariam (1996) noted that the new agricultural technologies generated by the research institutions were not often based on the real problems of farmers and were featured by pieces of individual experiments. The extension agents that are often small in number, and also lack appropriate training to communicate these technologies to farmers. Currently available technologies are so limited and they are decided at national level to be transferred to the users. This implies the existence of top-down approach in the national extension system. Since all regions contain various localities with diverse socio-economic and agro-ecological backgrounds, the system could not promote effective extension works at the regional levels. In order to attain a good result in technical fitness, economic viability and social fitness of a technical package, farmers participation and their recommendation in research process is

essential. Furthermore, research activities should be reorganized to accommodate the local situations for an effective technology transfer system.

5.5 Prospects to the NEIP

The major problems and achievements of the program are briefly discussed above. In the due course of implementation, it is obvious that some achievements have been found to be encouraging while there are a number of constraints have been found to be discouraging.

Encouraging factors include the highest increase in crop productivity, creating awareness among farmers about the use of improved inputs, initiating of improved seed productions by farmers in some woredas, and increasing interests of farmers to adopt new technologies.

On the other hand, the discouraging factors are natural hazards (drought, erratic nature of rainfall, and various forms of land degradation), limited availability of technology packages in types and quantities, constraints related to input supply and credit, declining interest of farmers to participate in the package program due to high cost of input and low price of agricultural products, poor linkage between research, extension and farmers, and insufficient technology dissemination capacity of DAs.

Encouraged by the achievements and in responding to the challenges, the regional government has initiated some endeavors to strengthen its capacity in some areas of activities to bring about effectiveness in the future implementation of the program.

Farmers Based Seeds Production Management (FBSPM) which is already initiated in some areas is one of the most prominent measures of the regional government to strengthen the program. FBSPM Programs are undertaken by the participation of capable farmers who can extend a minimum of half hectare of land for the seed production, fulfill the down payment and whose capacity is proven by DAs to repay the credit on the scheduled period. Seeds are supplied for the farmers from the research centers and those selected farmers undertake the production under close supervision of DAs. After the careful harvest and storage, the production will be sold and distributed to the farmers who participate in the package. FBSPM programs are more accessible by farmers.

The advantages of the FBSPM programs as elaborated by the experts of the Regional BoA include low procurement cost, short time to deliver, involve no bureaucratic processes, low transportation cost, resisting disease, weeds, pests and insects, and better productivity.

According to the information from the Regional BoA, the total estimated seed production of three major crops (maize, wheat and Teff) in selected 53 woredas of Hadiya, Sidama, Kefa-shekka, North Omo, KAT, Gurage and Bench Maji in the year 2000/01 is 400, 110,405 and 21,424 quintals, respectively.

On the other hand, information obtained from the BoA about the seed distribution for the participant farmers of extension package in the whole region during 1999/00 indicate that a

total of 23,774.75 quintals of maize, 58,477.325 quintals of wheat and 11,939 quintals of Teff were distributed.

The contribution of FBSPM is very significant in the Regional input supply system when the amount of seed distribution for the participants of extension package in 1999/00 compare with the estimated seed production by the FBSPM in 2000/01. We can take the example of wheat distribution of 1999/00 and estimated wheat production by the FBSPM in 2000/01 in three zones of the region. The estimated wheat production of 26,4000 quintals in Hadiya, 28,330 quintals in KAT and 37,175 quintals in Gurage Zone by the FBSPM in the year 2000/01 is by far greater than wheat distribution of 1,870 quintals in Hadiya, 225.05 quintals in KAT and 5,002.78 quintals in Gurage during 1999/00 *(Annex 6).* This information leads to the conclusion that the above three zones can fulfill the need of improved wheat varieties and even can export significant surplus seeds to their neighboring zones if the actual production is comparable with the estimated one.

The rapid increase in the number of DAs and the current ratio of 1DA to 572 HHs (or a total of 4,023 DAs to 2.3 million farm HHs) in the region, according to SNNPRS-BoA (2000), is a good progress to attain a ratio of 1DA to 500 HHs as indicated in the regional short term planning. The planned ratio is already attained in some zones of the region even at present time since the assignment of DAs is unevenly distributed. However, the problem is that most of the DAs, with respect to their skill and knowledge, could not fulfill the need for the rapid development in extension package.

During the discussion with SMSs and officials in the Extension Department of the Regional BoA, it was revealed that more than 50 percent of the current DAs lack basic capacity to render extension services. The experts revealed that most of the graduate farmers are found to be even better than some of the DAs in the process of technology dissemination. They said that the other important measure to improve the future implementation of the program is recruiting, re-assigning and retraining of the DAs and this will be the immediate task to be accomplished by the Regional Government.

Moreover, field days and farmers days are the most effective strategies of technology dissemination which are widely practiced in the region. The DAs and Agricultural Offices at woreda and zonal level arrange them. The adopter farmers themselves demonstrate the technologies through field and farmers days to their colleagues and other respected guests representing different organizations and localities. Agricultural Offices representing the Extension Organization are only facilitating the process but the major roles are played by the farmers themselves. The existing gaps due to the weak extension activities of DAs are attempted to be filled by the farmers themselves since they teach one another through officially arranged occasions as well as regular social interactions at the community level.

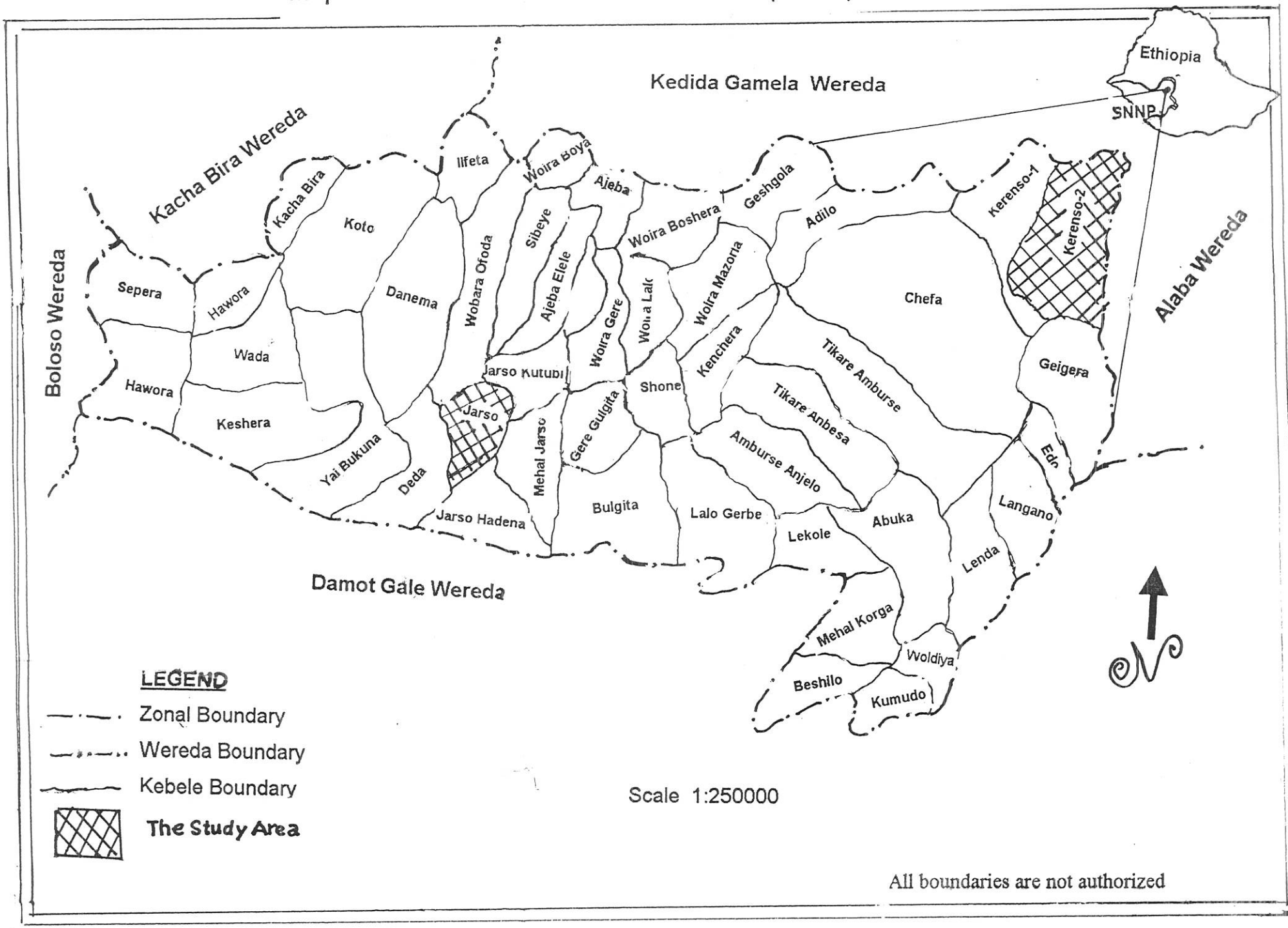
Chapter Six: FOOD SECURITY AND NEIP FROM THE PERSPECTIVE OF FARMERS: The Case of two Kebele Administrations in Badawacho Woreda

6.1 The Woreda

6.1.1 Physical Features

Location, Land Area, Land Use/Cover and Climate: The two KAs selected for the study are located in Badewacho woreda, one of the four woredas of Hadiya Zone and found 345 Kms in the Southwest away from Addis Ababa and 110 Kms away from Awassa (the Capital City of SNNPRS). Hadiya Zone is one of the nine Zones of the SNNPRS. Regarding the neighbors of the woreda, Alaba Woreda in KAT(Kambata-Alaba-Tembaro) Zone is bordering in the East, Damot Woide Woreda in North Omo Zone is bordering in the Southeast, Bolosso Woreda in North Omo Zone and Ajje Woreda in the East Shoa Zone of the Oromia Region are bordering in the West, Damot Galle Woreda in the North Omo Zone is bordering in the South, Kacha-Beara Woreda in KAT(Kambata-Alaba-Tembaro) Zone is bordering in the Northwest, and Kedida Gamela Woreda in KAT Zone is bordering in the North. The woreda is detached from the other three woredas of Hadiya zone and located in about 80 Kms distance from the zonal center being surrounded by woredas which which are not belonging to Hadiya Zone. The total area of the Woreda is 56,675 km^2 and divided into 46 KAs.

Map-2 Kebeles of Badawacho Wereda (SNNP)



Land cultivated for coffee accounts for 5.8 percent and land covered by both natural and man made forests accounts for 9 percent. The majority of the land, about 78 percent are allocated for cereal and non-cereal crops.

The Woreda is divided into two AEZs, namely wet "woinadega" and dry "woinadega". Half of the KAs belong to wet and half of them belong to "woinadega".

6.1.2 Socioeconomic Conditions

Population: The total number of population in the Woreda, by the year 2000, was 251,791, out of which 123.401 were male and 128,390 were female. Currently, there are 46 KAs in the Woreda with a total of 42,413 registered heads of households.

Agriculture and Land holding: Mixed farming, crop and animal husbandry are practiced. Enset and root crops are the predominant crop widely grown. Agroforestry has been the traditional farming system where maize, Teff, wheat, and barely are grown side by side as staple food and cash crops. The use of improved agricultural inputs in the woreda is so limited. Only 15,403 quintals of chemical fertilizers which is 0.363 quintals per HH were distributed to farmers by the year 1999. Only 67.5 quintals of improved wheat, which is 0.002 quintals per HH, 161 quintals of Teff, which is 0.004 quintals per HH, and 1,672 quintals of maize seeds which is 0.039 quintals per HH were supplied to farmers through the extension package by the same year *(Annex 9)*. The number of trained development agents was raised from 23 in 1996 to 63 in 1999, and the number of farmers targeted by the extension package has increased from

798 in 1996 to 12,619 in 1999. A significant part of the agricultural produce is lost due to infestation and post-harvest storage and mishandling.

Regarding land holding, the majority of the HHs, i.e. 37.2 percent own 0.5-1 hectare. HHs who own less than 0.5 hectares account for 30 percent. Around 16 percent of the households in the woreda own land between 1 and 2 hectares, 4.5 percent own land greater than 2 hectares. Whereas the rest, i.e. 12 percent own no land in the woreda.

With respect to the livestock Raising, there are 136,821 cattle, 220 horses, 88 mules, and 6,250 donkeys in the Woreda according to the information obtained from the Woreda Office of Agriculture. However, there is only 1 veterinary clinic in the center of the Woreda, Shone town, providing vet services to the large livestock population in the area. There is only 1 vet doctor, 1 assistant vet physician, and 5 assistant vet technicians.

Health and Education: The ten top diseases in the Woreda between 1998 and 1999 were malaria, intestinal parasites, diarrhea, lower respiratory tract infection (LRTI), gastritis, malnutrition, joint problems, skin infection, eye diseases, and sexually transmitted diseases (STDs). Regarding the availability of health service, it is only one health center in the capital of the woreda. The number of trained health personnel is lower than the need. There are only 2 medical doctors, 6 senior and junior nurses, 9 health assistants, 4 primary health workers, 1 laboratory technician, and 1 sanitarian. In the rural areas, 29,800 people have access to potable water supply, while in the woreda town 9,300 people get clean potable water. Health coverage is by far inadequate compared with the population.

Access to primary education particularly (1-4 grades) and enrollment rate is insignificant and, mostly, the enrollment of girls as compared to boys is very low.

6.2 Main Findings of the Research

6.2.1 Household Characteristics

All heads of the sample HHs were male and the mean age of HHs from wet 'Woinadega' is 38 and mean age of HHs from dry 'Woinadega' is 40.

Relatively large family size is common among the HHs of dry 'Woinadega' than wet 'Woinadega' since polygamy is more experienced by the people of dry 'Woinadega'. The survey result indicates that 27.5 percent of the HHs in dry 'Woinadega' had a HH size of greater than 10 while no HHs in wet 'Woinadega' had the same size. The HH size of 22.5 percent of the sample HHs in dry and 30 percent of the sample HHs in wet 'Woinadega' is 8-10. A family size of 5-7 is experienced by 45 percent of the HHs in dry and 65 percent of the HHs in wet 'Woinadega'. A family size of less than 5 is experienced by only 5 percent of the HHs both in dry and wet 'Woinadega'.

There are great disparities in size of land holding between dry and wet 'Woinagega'. Regarding the holding of HHs from dry 'Woinadega,' 32.5 percent hold greater than 2 hectares, 32.5 percent hold between 1.5 and 2 hectares, 15 percent hold between 1 and 1.5 hectares, and 20 percent hold half to one hectare. From wet 'Woinadega,' non of the HHs have a holding of

greater than 2 hectares, only 5 percent hold between 1.5 and 2 hectares, 17.5 percent hold between 1 and 1.5 hectares, 67.5 percent hold between 0.5 and 1 hectare, and 10 percent hold less than half hectare.

According to the local standards of wealth ranking, from the total farm HHs of the Woreda, 80 percent in dry and 85 percent in wet 'Wionadega' are poor and very poor. However, their share in the participation of the package program is very small, ie., only 12.5 percent in dry and 20 percent in wet 'Woinadega' from the poor farm HHs could participate in the program. Most of the participants are medium and rich while non of the very poor farmers could participate in the program. From the sample HHs in dry 'Woinadega', 30 percent are rich and 57.5 percent are medium. From the sample HHs in wet 'Woinadega', 20 percent are rich and 60 percent are medium. Indicators of wealth ranking in dry 'Woinadega' are size of landholding, amount of food grains produced and reserved annually, number of livestock (especially cows and oxen), types of materials from which the houses they live in is constructed (grass-hatched or corrugated iron sheets). Indicators in wet 'Woinadega' include all the above and possession of perennial crops like Enset and coffee as well as possession of HH assets.

6.2.2 Adoption of Crop Types

Regarding the adoption of crop types, maize, Teff and wheat are adopted by 22.5 percent, maize and wheat are adopted by 65 percent and only Maize is adopted by 12.5 percent of the HHs in the wet 'Woinadega'. In dry 'Woinadega', maize and Teff are adopted by 70 percent of the HHs, only maize is adopted by 30 percent of the HHs and wheat is totally not adopted. Informal

study indicates that no packages have been significantly adopted in the area other than maize, wheat and Teff.

6.2.3 The Role of Extension Package in Improving Food Production

Different levels of average increase in the yield of three major crops (maize, Teff and wheat) during 1996-2000 is reported by the HHs from the two AEZs. In dry 'Woinadega', over 60 percent of the HHs reported that the average increase is 1 and half times greater, some 17.5 percent of the HHs reported that the average increase is double, and the remaining 22.5 percent of the HHs reported that the average increase is triple when compared to the traditional way of farming. On the other hand, in wet 'Woinadega', Only 5 percent of the HHs reported that there is no difference in the yield, over 80 percent of the HHs reported that the average increase is 1 and half times grater, 15 percent of them reported that the average increase is double when compared to the production through traditional farming. During the various group discussions at survey woreda, it was revealed that, the use of improved package on a big size of land holding results in high return than small size of land holdings.

As regard to the average increase in per capita production of all the tree crops together during the years 1996-2000, respondents in the two AEZs had reported differently. In dry 'Woinadega', 42.5 percent of the HHs reported that the average increase in the per capita production is double whereas 50 percent of them reported that it is one and half times greater. On the other hand, 35 percent of the HHs in wet 'Woinadega' reported that the average increase in the per capita production is double whereas 60 percent of them reported that it is one and half

times greater. *Table 7* below shows the percentage distribution of HHs with respect to the reported average increase in yield.

Table 7: **Percentage Distribution of HHs According to the Reported Average Increase in Yield of the Three Crops (maize, Teff and wheat) Under the Extension Package from 1996 to 2000**

AEZ	Proportion of HHs Reported							
	Triple		Double		1.5 times greater		No difference	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dry 'Woinadega'	9	22.5	24	60	7	17.5	-	-
Wet 'Woinadega'	-	-	6	15	32	80	2	5

Source: Survey Data

6.2.4 Food Security in Pre- and Post-Extension Period

Most of the respondents have indicated that the HH food security situation has improved with respect to the availability of food at household level in post extension than in pre extension period.

All the respondents have reported that the average per capita food grain production at HH level was lower in the pre extension than the average per capita food grains production at HH level in the post extension. *Table 8* below shows the percentage distribution of HHs with respect to the reported average increase in per capita food production.

Table 8: **Percentage Distribution of HHs According to the Reported Average Increase in Per Capita Food Production in Post-extension Period (from 1996 to 2000)**

AEZ	HHs Reported							
	Triple		Double		1.5 times greater		No difference	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dry 'W/dega'	-	-	17	42.5	20	50	3	7.5
Wet 'W/dega'	-	-	14	35	24	60	2	5

Source: **Survey Data**

According to the responses of all sample HHs to the question about the number of daily meals, it is generally increasing in post-extension period.

Only 20 percent of the HHs in dry and 17.5 percent of the HHs in wet 'Woinadega' were getting 3 meals per day in the pre-extension. This proportion increased in the post-extension and reached 100 percent in dry and 60 percent in wet 'Woinadega' in the post-extension. Moreover, in wet 'Woinadega', 25 percent of the sample HHs could get 2 meals per day while the rest 15 percent could get only one meal per day in the post extension. On the other hand, 15 percent of the HHs in wet 'Woinadega' could not get even one meal per day in the pre-extension period. *Table 9* below shows the percentage distribution of HHs according to the reported HH dietary experiences.

Table 9: **Percentage Distribution of HHs According to the Reported HH Dietary Experiences as Indicated by the Number of Meals Per Day in Pre- and Post-Extension Period**

AEZ	Proportion of HHs Reported							
	Three meals		Two meals		One meal		Less than one meal	
	Pre-ext.	Post-ext.	Pre-ext.	Post-ext.	Pre-ext.	Post-ext.	Pre-ext.	Post-ext.
Dry 'W/dega'	20	100	55.5	-	27.5	-	-	-
Wet 'W/dega'	17.5	60	50	25	17.5	15	15	-

Source: **Survey Data**

The percentage of food consumed in the HHs covered by own production has shown a sharp increase after the implementation of extension package by the HHs of all the respondents. In dry 'Woinadega', the proportion of HHs that could cover all HH food consumption by own production increased from 40 percent in the pre-extension to 60 percent in the post extension. The rest 40 percent of the HHs can also cover more than half of the HH food consumption by own production in the post extension. The highest rate of coverage of HH food consumption by own production in dry 'Woinadega' is greatly attributed to the availability of relatively large size of land holding.

Although there is an increase in production, the proportion of full coverage of HH food consumption by own production in the wet 'Woinadega' is not as high as that of dry 'Woinadega'. In wet 'Woinadega', 22.5 percent of the respondents who could cover all HH food consumption by own production in the pre-extension period are still maintained in the post-extension period.

In wet 'Woinadega', the proportion of HHs that could cover more than half of the HH food consumption by own production increased from 22.5 percent in the pre-extension to 50 percent in the post-extension. More over, in the post extension, 17.5 percent of the HHs could cover a quarter to half while the rest 10 percent could cover a quarter of the HH food consumption by own production in the wet 'Woinadega'. *Table 10* below presents the percentage distribution of HHs according to their capacity to cover the HH food consumption by own production in pre- and post-extension

Table 10: **Percentage Distribution of HHs according to their Capacity to Cover the HH Food Consumption by Own Production in Pre- and Post-extension**

AEZ	Proportion of HHs that could Cover the HH Food consumption by their own production							
	Full		More than Half		Quarter to Half		Less than quarter	
	Pre-Ext.	Post-Ext.	Pre-Ext.	Post-Ext.	Pre-Ext.	Post-Ext.	Pre-Ext.	Post-Ext.
Dry 'W/dega'	40	60	60	40	-	-	-	-
Wet 'W/dega'	22.5	22.5	22.5	50	22.5	17.5	10	-

Source: **Survey Data**

Information obtained from various group discussions and interview held with key informants and DAs at the survey woreda revealed more about the improvement in the food security situation of HHs who are participating in the extension program.

According to the information obtained from DAs, excess production over the HH consumption had been obtained during some years with good weather conditions. This enables to feed the ever-increasing number of families on small size of farmland. The package incorporates high yielding and some drought and disease-resisting varieties, which are helpful to maintain the food security even in the years of drought.

Key informants explain the role of extension in the household food security by saying that it has been a source of income and means of buying and rearing livestock, which in turn enhance the household food security status.

Various group discussions have emphasized the role of extension package in food security in terms of increasing food availability at household level. Food reserve, which could be available only from September to February every year in the pre-extension period, it is becoming available

up to April and May every year in the post-extension period.

6.2.5 Problems in Applying the Extension Package Program

Problems Associated with Input Supply:

Regarding the problems associated with input supply, majority of the respondents reported multiple problems while few respondents reported fewer problems or single problem. About 67.5 percent of the HHs in dry 'Woinadega' and 92.5 percent of the HHs in wet 'Woinadega' similarly reported that the problems are lack of competitive suppliers, insufficient varieties to meet the range of farmers preferences, lower quality of seeds, reduced quantity of seeds and fertilizers from the amount indicated on sacks, and delaying of input supply from the appropriate cropping seasons. Small proportion of the respondents, i.e., 12.5 percent of HHs in dry 'Woinadega' and 7.5 percent of the HHs in wet 'Woinadega' reported that lack of competitive suppliers and insufficient variety of seeds are the main problems. On the other hand, in dry 'Woinadega', 15 percent of the HHs reported that delaying of input supply from the appropriate cropping seasons is the main problem while 5 percent of the HHs reported that lack of competitive suppliers is the main problem. *Table 11* shows the percentage distribution of HHs according to the reported problems associated with input supply.

Table 11: Percentage Distribution of HHs According to the Reported Problems Associated with Input Supply

AEZ	Proportion of HHs Reported									
	Lack of competitive suppliers, insufficient varieties to meet the range of farmers preferences, lower quality of seeds and non-localized use of fertilizers, reduced quantity of seeds and fertilizers from the amount indicated on sacks, and delaying of input supply from the appropriate cropping seasons.		Lack of competitive suppliers and insufficient variety of seeds		Delaying of input supply from the appropriate cropping seasons		Lack of competitive suppliers		Total	
	#	%	#	%	#	%	#	%	#	%
Dry 'Woinadega'	27	67.5	5	12.5	6	15	2	5	40	100
Wet 'Woinadega'	37	92.5	3	7.5	-	-	-	-	40	100

Source: **Survey Data**

Farmers participated in various group discussions indicated more problems associated with input supply. Shortage of transportation from the input distribution centers to the farmers village, inefficient bureaucratic process and underdeveloped office capacities cause unnecessary loss of farmers working days during the distribution period. Most of the DAs discriminate farmers based on friendship and political views. They consider farmers as supporters and non-supporters of the leading party and give priority to get enough quantity and adequate quality of inputs to supporter and member farmers. Other problems closely related to the input supply they indicated are the ever-increasing prices of inputs beyond the financial capacity of the majority of farmers and requiring the farmers to repay all the previous credit for the eligibility to receive the credit of current season.

Problems Associated with Credit Repayment:

During the survey, it was found that 95 percent of the HHs in dry and 92.5 percent of the HHs

in wet 'Woinadega' procure inputs on credit whereas 5 percent of the HHs in dry and 92.5 percent of the HHs in wet 'Woinadega' procure inputs on cash. Among the sample HHs, 70 percent in dry and 80 percent in wet 'Woinadega' said the price of input is extremely high while only 30 percent in dry and 20 percent in wet 'Woinadega' said the price is not easily affordable.

All the respondents receiving the input on credit reported that the interest rate is steadily increasing from 1995/96 to date and the current 10% interest rate is unaffordable.

All the respondents using credit with slight variation based on AEZs reported multiple problems associated with the credit repayment. Crop failure, unaffordabiltiy, low prices for agricultural products, and non-flexible schedules of repayment at leaner seasons were reported as major problems by 28.9 percent of the respondents from dry and 37.8 percent of the respondent from wet 'Woinadega'. Crop failure, unaffordability, and low prices for agricultural products were reported as major problems by 34.2 percent of the respondents from dry and 24.3 percent of the respondents from wet 'Woinadega'. Unaffordability and low prices for agricultural products were reported to be the major problems by 15.8 percent of the respondents from dry and 16.2 percent of the respondents from wet 'Woinadega'. Crop failure and low prices for agricultural products were reported to be the major problems by 15.8 percent of the respondents from dry Woinadega'. The rest 5.3 percent of the respondents from dry 'Woinadega' reported that crop failure and non-flexible schedules of repayment were the major problems. Unaffordability, low prices for agricultural products, and non-flexible schedules of repayment were reported to be the major problems associated with credit repayment by 21.6

percent of the respondents from wet 'Woinadega'. *Table 12* below shows the percentage distribution of HHs according to the reported problems associated with credit repayment reported.

Table 12: **Percentage Distribution of HHs According to the Reported Problems Associated with Credit Repayment**

AEZ	Proportion of HHs Reported											
	Crop failure, unaffordabiltiy, low prices for agricultural products, and non-flexible schedule of credit repayment		Crop failure, unaffordabi lityand low prices for agricultural products		Unaffordability and low prices for agricultural products		Crop failure and low prices for agricultural products		Unaffordability, low prices for agricultural products, and non-flexible schedules of repayment		Crop failure and non-flexible schedule of credit repayment	
	#	%	#	%	#	%	#	%	#	%	#	%
Dry 'Woinadega'	11	28.9	13	34.2	6	15.8	6	15.8	-	-	2	5.3
Wet 'Woinadega'	14	37.8	9	24.3	6	16.2	-	-	8	21.6	-	-

Source: **Survey Data**

Information gathered through group discussions and key informants' interview also indicates more problems related to the credit system. The availability of credit couldn't meet the demand. Farmers are not certain to get the credit on time since DAs lack reliability when they recommend the farmers who should get credit. Other problems include government's being of a single creditor and restrictions in the provision of input loan, i.e., input credit is given only in kind but never in cash and it is also restricted only to crop production. Discriminatory and harsh treatments by officials involved in credit administration and the DAs are also other problems associated with credit system.

Causes of Crop Failure

All respondents reported that they faced either partial or total loss of production due to crop failure in some of the seasons during 1995/96 – 1999/00. All the respondents with some variations related to the difference in the AEZs reported multiple causes for the crop failure. Accordingly, 25 percent of the sample HHs from dry and 32.5 percent from wet 'Woinadega' reported drought, erratic nature of rainfall, crop disease, use of non-qualified seeds and fertilizers, and pre-and post harvest infestations as major causes while 37.5 percent of the HHs from dry and 15 percent of the HHs from wet 'Woinadega' reported the same causes except pre-and post harvest infestations. The other 17.5 percent of the HHs from dry and 30 percent of the HHs from wet 'Woinadega' reported drought, erratic nature of rainfall and crop diseases while 20 percent of the HHs from dry and 22.5 percent of the HHs from wet 'Woinadega' reported drought, erratic nature of rainfall and use of non qualified seeds and fertilizers as major causes of crop failure. *Table13* below shows the percentage distribution of HHs according to the reported causes of crop failure.

Table13: **Percentage Distribution of HHs According to the Reported Causes of Crop Failure**

AEZ	Proportion of HHs Reported							
	Drought, erratic nature of rainfall, crop disease, use of non-qualified seeds and fertilizers, and pre-and post harvest infestations		Drought, erratic nature of rainfall, crop disease, and use of non-qualified seeds and fertilizers		Drought, erratic nature of rainfall, and crop disease		Drought, erratic nature of rainfall, and use of non-qualified seeds and fertilizers	
	#	%	#	%	#	%	#	%
Dry 'Woinadega'		25		37.5		17.5		20
Wet 'Woinadega'		32.5		15		30		22.5

Source: **Survey Data**

As to the number of times the HHs faced a total loss of the harvest from 1995/96 to 1999/00, the majority faced 1 to 2 times total loss. Thus, 47.5 percent of the HHs from dry and 65

percent of the HHs from wet 'Woinadega' reported 1 time total loss while 47.5 percent of the HHs from dry and 35 percent from wet 'Woinadega' reported 2 times total loss. Moreover, 5 percent of the respondents from dry 'Woinadega' reported 3 times total loss of harvest. *Table14* below shows the percentage distribution of HHs according to the reported number of times the HHs faced a total loss of the harvest from 1995/96 to 1999/00.

Table 14: **Percentage Distribution of HHs According to the Reported Number of Times the HHs Faced a Total Loss of the Harvest from 1995/96 to 1999/00**

AEZ	Proportion of HHs Reported					
	1 time total loss		2 times total loss		3 times total loss	
	#	%	#	%	#	%
Dry 'Woinadega'						
Wet 'Woinadega'						

Source: Survey Data

In addition, the various group discussions and the interview with key informants during the fieldwork revealed the failure of some varieties at germinating stage due to non-qualification of seeds and crop diseases like smut, pests and insect attacks as a major causes of crop failure.

The sample HHs also responded to questions related to the condition of price of agricultural products at local markets during harvest seasons and during the rest of the seasons. With regard to the question about the prices of agricultural products during the harvest seasons, 100 percent of the HHs from dry and 55 percent of the HHs from wet 'Woinadega' reported that the prices are very cheap whereas 45 percent of the HHs from wet 'Woinadega' reported that prices are cheap at harvest seasons. More over, 55 percent of the HHs from dry and 27.5 percent of the HHs from wet 'Woinadega' reported that the prices are cheap during the rest of the seasons. The other 32.5 percent of the HHs from dry and 45 percent from wet 'Woinadega' reported that

the prices are competitive, and the rest 12.5 percent of the HHs from dry and 27.5 percent form wet 'Woinadega' reported that prices are expensive during the rest of the seasons.

As to the question about administrative measures taken on the delaying of credit repayment due to crop failure and/or lower market prices for agricultural products, respondents had only two answers. Thus, 65 percent of the HHs from dry and 62.5 percent of the HHs from wet 'Woinadega' reported that government denies the provision of the current input credit while 35 percent of the HHs from dry and 37.5 percent of the HHs from wet 'Woinadega' reported that harsh administrative measures including jailing are exercised.

As to the HH means of credit repayment in case of crop failure and/or low prices for agricultural products, most of the HHs in dry 'Woinadega' reported selling of livestock while respondents from the wet 'Woinadega' reported various means in combination. In dry 'Woinadega', 84 percent of the HHs reported selling of livestock which is the major source of personal wealth in the area, 8 percent reported selling of livestock in combination with borrowing from friends and relatives and renting out of farmland, and 8 percent reported selling of livestock in combination with borrowing from friends and relatives as a means of credit repayment. In wet 'Woinadega', 30 percent of the HHs reported selling of livestock, 22.5 percent reported borrowing from friends and relatives in combination with selling of household assets and livestock, 17.5 percent reported borrowing from friends in combination with selling of livestock, 12.5 percent reported renting out of farmland in combination with selling of household assets and livestock, and the rest 17.5 percent reported all the above means in combination. Since HHs do not have other means, they are forced to use the means indicated

above, despite these means lead them to abject poverty situation and serious food insecurity. *Table15* below shows the percentage distribution of HHs according to the reported means of credit repayment in case of crop failure and/or low price for agricultural product.

Table 15: **Percentage Distribution of HHs According to the Reported Means of Credit Repayment in Case of Crop Failure and/or Low Price for Agricultural Product.**

AEZ	Proportion of HHs Reported											
	Selling of livestock in combination with borrowing from friends and relatives		Selling of livestock in combination with borrowing from friends and relatives, and renting out of farmland		Selling of livestock		Borrowing from friends and relatives in combination with selling of household assets and livestock		Renting out of farm land in combination with selling of household assets and livestock		All the above means in combination	
	#	%	#	%	#	%	#	%	#	%	#	%
Dry 'Woinadega'	3	8	3	8	34	84	-	-	-	-	-	-
Wet 'Woinadega'	7	17.5	-	12		30	9	22.5	5	12.5	7	17.5

Source: **Survey Data**

In addition, in various group discussions, it is indicated that farmers are often exposed to the exploitation of local usurers who borrow money with interest rates of 50 to 100 percent when they are excluded from input credit due to their inability to repay the previous credit.

Chapter Seven: SUMMARY AND CONCLUSIONS

7.1 Summary

The agricultural sector plays a dominant role in the Ethiopian Economy. It accounts for about 50 percent of the gross domestic product (GDP), provides employment for 85 percent of the population, generates about 90 percent of the export earnings, and supplies about 70 percent of the country's raw material requirement for large and medium size industries that are agro-based (MEDaC, 1999). Estimations by the National Accounts indicate that, crop production accounts for about 60 percent, livestock accounts for about 27 percent and forestry and other sub-sectors account for about 13 percent of the total agricultural value added.

The foundation of the country's food production is agriculture and its contribution to the food security is enormous. However, the sector is entangled with natural and policy driven problems. The natural problems include rainfall variability, recurrent drought, land degradations, etc whereas policy environments are characterized by wrongly induced agricultural policies. As a consequence of all these factors, crop production deteriorated and agricultural production severely declined, and hence, the sector has failed for over three decades now, to feed the country's population. Low productivity of agriculture thus has forced the country to depend largely on imported food and international food aid.

Small-holder farmers who have been practicing low input and low output rain-fed mixed

farming with traditional technologies dominate the sector. Small-scale farmers on the average account for 95 percent of the total area under crop and for more than 90 percent of the total agricultural output. Moreover, 94 percent of food crops and 98 percent of coffee is produced by small-scale farmers (MEDaC, 1999).

Different extension approaches were implemented in Ethiopia to increase the agricultural productivity. The application of imported fertilizers and improved seed varieties has been introduced since 1960s at different scale of adoption. The late 1960s and the early 1970s extension approaches were area focused, and they largely benefited the land owning class or the rich farmers and the package program of the Dergue period gave priority to state farms and producer's cooperatives that accounted for about 6 percents of the sector's production (Brune, 1990; Hansson, 1995). The aim of these extension approaches was to increase the productivity of small-holders. However, due to the lack of access to basic means of production (the land and financial resources) by the poor, all package programs failed to meet the objectives of increasing productivity of small-holders.

The small-holder farmers are the major producers of food crops for domestic consumption. The report of MEDaC (1999) pointed out that food security could only be achieved through promoting small-holder development in a sustainable manner. Thus priority is given by the PADETES to encourage small-holder farmers to raise their productivity through designing of incentive packages such as access to fertile land, credit and tax incentives, improving budgetary allocation for agricultural sector, provision of inputs, building of infrastructure, etc.

Agricultural extension is the basis for raising the productivity of the small holder farmers, the main actors and participants at the grass root level. Thus, a new system of agricultural extension, Known as PADETES is formulated. The system is based on demonstration and training of farmers on proven technologies in line with the philosophy of bottom-up development approach. The strategy gives special emphasis to human resource development (organization, mobilization and empowerment) along with its efforts in transferring appropriate technology. As to the implementation of the strategy, it involves a package approach geared towards three different agro-ecological zones namely, reliable moisture, moisture stress and nomadic pastoral areas. According to rapid appraisal made in the reliable moisture areas, the results achieved in 1994/95 and 1995/96 have demonstrated high output and yield that concretize the effectiveness of the strategy and justify that it is possible to overcome chronic food shortages in a short period of time if the strategy is implemented at a wider scope (MEDaC, 1999:148).

This study has reviewed the implementation of the NEIP/PADETES in the SNNPRS and thereby identified the major implementation problems. The study has also attempted to discuss the role of PADETES in addressing the issue of food insecurity. Although the study is based mainly on the documents and discussions with experts and officials of the Regional Bureaus, a field study involving 80 HHs in Badawacho Woreda of Hdiya Zone was undertaken to see the situation at the grass roots.

The studies at regional level as well as the study from the perspective of the community similarly indicate that, despite the immense role of PADETES in addressing the problem of

food insecurity, the program is entangled with a number of hindrances. The most prominent problems are natural hazards (drought, erratic nature of rainfall, and various forms of land degradation), limited availability of technology packages in type and quantity, constraints related to input supply and credit, declining interest of farmers to participate in the package program due to high cost of input and low price of agricultural products, poor linkage between research, extension and farmers, and insufficient technology dissemination capacity of DAs.

7.2 Conclusion

Major constraints leading to food insecurity in the SNNPRS have been discussed in the earlier chapters. The most important one to remind is the low level of agricultural productivity due to low level of applications of improved farming techniques, continuous fragmentation of land resulting from high population pressure and rainfall variability. Recurrent drought that affects the majority of the population in the region is also the other most important cause for severity of the food insecurity.

Variables that affect the food security status of a people are numerous. Conditions that lead to the improvement in food security include sustainable increase in food production and supply to alleviate food shortage, improved household incomes, improved markets and transport infrastructure, improvement in the conditions of education, health and sanitation. One of the meaningful actions by the Government in the SNNPRS in response to the problem of food insecurity is the implementation of NEIP, which is part of the new national development strategy.

Although it is not easy to specify the exact portion contributed by the agricultural extension to the improvement of food security situation at the household or local level, the increase in per hectare and per capita food production as well as the availability of food in the households who participate in the program could explain a conspicuous role of NEIP on food security.

In conclusion, in order to overcome the major implementation problems, attain the food self-sufficiency objective of NEIP, and hence, to improve food scrutiny, measures should be taken in the following matters:

i) ***Inputs supply:*** Predominant inputs distributed on credit under the PADETES in the region are chemical fertilizers and improved seed varieties of major cereal crops. In order to encourage farmers' participation and raise crop productivity, policy makers and implementing agents have to take the following into account.

   1) Fertilizer marketing should be open for different wholesalers. The regional government should invite different importers and distributors of fertilizers instead of giving a monopoly to Wondo Trading Pvt. Ltd. Co.

   2) To improve the distribution systems small local traders should be given access to credit and should be involved in the retailing of fertilizers.

   3) Since a good majority of the farmers under the condition of low price of agricultural products couldn't afford the current prices of fertilizers which are

made to be compatible to the market prices, government should provide subsidies in order to encourage farmers participation in the PADETES.

4) Shortage of seeds should be alleviated by encouraging private producers and distributors instead of the current dependence of the region on Ethiopian Seed Enterprise and Pioneer Seed Company as the only sources of seed supply. The already initiated FBSPMS should be strengthened and expanded since it facilitates farmers access to the seeds.

ii) *Input* ***credit:*** The issues related to credit include directing of credit in favour of single supplying agent in the region, high interest rate, limited availability of credit to be extended to farmers, tight repayment schedules and non-conducive administrative enforcements. Improvements that need to be made on these issues are:

1) Fertilizer credit sales should be available for a number of agents who can supply with possible least price.

2) The present 10 percent interest rate is not easily affordable by majority of the farmers. Thus, conducive loaning system should be developed and institutions like Rural Banks and Service Cooperatives that are already initiated in the region should be restructured, strengthened and expanded with objective of involving in the provision of input loans with reasonable interest rate for the poor majority of farmers.

3) Repayment schedules should be relaxed to allow farmers to sell their products at relatively better prices to be able to repay the credit and remain with some benefits driven form the PADETES.

4) Suspending of the input credit for the current crop season, which is widely used in the region as an administrative enforcement against delaying repayments, has greatly affected the participation of farmers in the PADETES. In order to encourage farmers' participation and attain sustainable increase in production, it is advisable that input credit should be allowed based on the willingness of farmers to incur additional interest without requiring repayment of all the previous credit.

iii) ***Marketing of agricultural products:*** The problem is mainly related to the backwardness of infrastructure, specially the rural roads in the region. Most of remotest areas in the region have experienced prices of cereal crops that are not greater than half of the prices paid in some areas of the region with relatively developed market centers. Thus improvement in the roads and transport system could enhance the agricultural marketing. In addition, it has been observed that farmers are in great need of agents who can stabilize the markets of their products. Such organizations as service cooperatives are useful in the real context of Ethiopian economy in which strong and competitive private sector is not developed.

iv) ***Technology package adoption***: Although there is a considerable increase in food crop productivity on the plots of the adopters of the package, the number of farmers participating in the NEIP/PADETES and the area cultivated under the program in the

region is still too low to bring about a conspicuous effect on food production and self sufficiency. Problems associated with lower rate of technology adoption are lack of finance, availability of only limited types of crop extension packages, inappropriateness of seed varieties which often result in crop failure at germination stages, non localized use of fertilizers, and inadequate communication of extension messages. In order to overcome these problems, the following measures should be taken:

1) Despite financial constraints that hinder sustainability, farmers in the region have exhaustively applied the available technical packages. Farmers need more adaptable technologies to the local conditions to be generated and distributed.

2) Alternative seed varieties should be made available to the framers to choose so as to avoid seeds, which do not fit their specific agro-climatic and soil situation. The application of fertilizers should also be localized in order to safeguard farmers from the danger of crop failure resulting from blanket recommendations.

3) A good communication environment and transparency should be promoted in order to attain high level of technology adoption. In principle, PADETES requires conducive bottom- up relations. However, most of the actions are induced and as a result there is no reciprocity among farmers and DAs. Therefore, to avoid this organizational problem, the immediate responsible office for the extension program should take necessary measures.

region is still too low to bring about a conspicuous effect on food production and self sufficiency. Problems associated with lower rate of technology adoption are lack of finance, availability of only limited types of crop extension packages, inappropriateness of seed varieties which often result in crop failure at germination stages, non localized use of fertilizers, and inadequate communication of extension messages. In order to overcome these problems, the following measures should be taken:

1) Despite financial constraints that hinder sustainability, farmers in the region have exhaustively applied the available technical packages. Farmers need more adaptable technologies to the local conditions to be generated and distributed.

2) Alternative seed varieties should be made available to the framers to choose so as to avoid seeds, which do not fit their specific agro-climatic and soil situation. The application of fertilizers should also be localized in order to safeguard farmers from the danger of crop failure resulting from blanket recommendations.

3) A good communication environment and transparency should be promoted in order to attain high level of technology adoption. In principle, PADETES requires conducive bottom- up relations. However, most of the actions are induced and as a result there is no reciprocity among farmers and DAs. Therefore, to avoid this organizational problem, the immediate responsible office for the extension program should take necessary measures.

v) ***Extension personnel:*** The most popular extension personnel in the face-to-face communication with farmers are DAs. The problems associated with the extension services of DAs emanate form the lack of interest and motivation on one hand and lack of competence on the other. To improve the overall services of extension personnel, the following considerations should be take in to account:

1) The initial recruitment of DAs should be based on academic criteria and merit system, not on ideological and political orientations.
2) Educational level of the current DAs should be upgraded through short term training and the present skill of other staff should be upgraded through a number of refreshment courses and short term training.
3) DAs should be provided with incentives such as housing facilities and other allowances.
4) The extension organization in general should be staffed with qualified and sufficient manpower.
5) The institutional capacity of the implementing body should be enhanced to accomplish all the above tasks.

vi) ***Linkage between research, extension and farmers:*** Currently available technologies are selected at national level to be transferred to the users. These practices had promoted the top-down approach in the national extension system, which opposes the basic principle of PADETES. For the effective technology dissemination process, the real environment of farmers should be considered. Farmer's participation and

recommendation should be taken into account in research and extension. Extension work should be supported by research and should accommodate farmers' preferences

The implementation process of NEIP in the region could be enhanced if the recommended measures are taken into account. The success of NEIP in turn will increase food productivity leading to food security.

References

Abate Bekele (1989). *Income Potential Assessment of the Improved Wheat Varieties at Farm Levels.* Proceedings of the Workshop on problems and Prospects of Rural Development in Ethiopia, IDR, AAU, Addis Ababa.

ADDP (1974). *Retrospect and Prospect.* June 1994, Debre Zeit, Ethiopia.

Alemayehu Lirenso (1988). *Food Aid and Agricultural Production in Ethiopia.* Ethiopian Journal of Development Research, Vol. 10, No. 1, Addis Ababa.

Amare, Getahun (1997). *Raising the Productivity of Peasant Farmers in Ethiopia.* Association for the Advancement of Agricultural Science, in African Journal, 4(1).

Anderson (No date). *Agricultural Research and Technology in Economic Development.* Longman Pvt. Ltd., UK: 30-31

Anne, Thomson and Manfred, Metz (1997). *Implications of Economic Policy for Food Security: A training Manual.* FAO, Rome.

Ban, Van den and Hawkins (1998) *Agricultural Extension,* Second Edition, Blackwell Science.

Befekadu, Degefa and Berhanu, Nega (2000). *Annual Report on Ethiopian Economy.* Vol. I, The Ethiopian Economic Association, Addis Ababa.

Belay Kassa (1999) *Constraints to Effective Extension Work in Ethiopia: The Insider's View:* A Paper Prepared for the Ninth Annual Conference on Ethiopian Economy, October 08-09 1999, Addis Ababa.

Beyene, Taddesse (2000). *Differential Adoption of Agricultural Technologies: Implications for the Choice between Equity and Growth.* A Paper Presented on Monthly Seminar Series, RLDS, Addis Ababa University.

Brune, S. (1990). The Agricultural Sector: Structure, Performance and Issues, 1974-1988: In Eshetu Chole et al 9eds.), *Ethiopia: Rural Development Options.* Zed Books Ltd., London and USA.

Burkey, S. (1993). *People First: A Guide to Self-reliance, Participatory Rural Development.* Zed Books Ltd., London and USA.

CADU (1969). *Tentative CADU Program for 1970/75.* March 1973, Addis Ababa, Ethiopia.

Chambers, R. (1983). *Rural Development: Putting the Last First.* John Wiley and Sons Inc., New York.

Conway, G. and Barbier, E.B. (1990). *After the Green Revolution: Sustainable Agriculture for Development.* Earthscan Publishing Ltd., London.

Cohen, J. M. (1987). *Integrated Rural Development: The Ethiopian Experience, The Debate.* Upsala The Scandinavian Instuitute of African Study.

---------- (No date). *Effects of the Green Revolution Strategies on tenants and Small Scale Land Owners in Chilalo Regions of Ethiopia.*

CRDA (1997). *Training Program of on Food Security and Vulnerability.* Presented and Conducted by International Development Consulting Firm, Dessie, Ethiopia.

Dagnew, Eshete (1997). *Training Program of on Food Security and Vulnerability.* Presented and Conducted by International Development Consulting Firm, Dessie, Ethiopia.

Dejene, Aredo (1995). Transforming Agriculture: A Conceptual Framework: In Dejene Aredo and Mulat Demeke (eds.), *Ethiopian Agriculture: Problems of Transformation.* Proceedings of the Fourth Annual Conference on the Ethiopian Economy, Addis Ababa.

---------- (1996). *The Regional Dimension of Agricultural Planning and Policies in Ethiopia, 1960-1991: A Review and Implications for Today.* Ethiopian Journal of Development Research, Vol. 18, No. 2, IDR, Addis Ababa.

Dessalegn, Rahamato (1984). *Agrarian Reform in Ethiopia.* Institute of African Studies, Motala Grafiska AB, Motala, Sweden.

EPID (1971). *Plan of Operation for EPID (1971/72-1974/75).* July 1971, Addis Ababa.

FAO (1997). *Implications of Economic Policy for Food Security.* Prepared for the Agricultural Policy Support Service, Pilicy Support Division FAO and GTZ, Rome, Italy.

Getachew, Diriba (1995). *Economy at the Crossroads: Famine and Food Security in the Rural Ethiopia.* CARE International in Ethiopia.

Goshu, Mekonen (1995). Agricultural Research and Extension in Ethiopia: An Overview: In Dejene Aredo and Mulat Demeke (eds.), *Ethiopian Agriculture: Problems of Transformation.* Proceedings of the Fourth Annual Conference on the Ethiopian Economy, Addis Ababa.

Gsanger, Hans (1994). *The Future of Rural Development: Between the Adjustment of the Project Program and the Sectoral Program Design.* Frans Cass and Co. Ltd., England.

Habtemariam, Kassa (1996). Agricultural Education, Research and Extension in Ethiopia: Problems and Linkages: In Mulat et al (eds.), *Sustainable Intensification of Agriculture*

in Ethiopia, Proceedings of the Second Conference of the Agricultural Economic Society of Ethiopia, 3-4 October 1996, Addis Ababa

Habtemariam, Abate (1997). *Targeting Extension Service and the Extension Approach in Ethiopia.*

Hansson, G. (1995). *The Ethiopian economy, 19774-1994: Ethiopia Tikdem and After.* Routledge, New York.

Lema Mitiku (2000). *Reorientation of an Extension Service for Sustainable Agriculture with Reference to the Southern Nations, Nationalities and Peoples' Regional State of Ethiopia.* Dissertation Prepared for the M.Sc. degree in Agricultural Extension Systems and Management, The Univerity of Reading, England.

Low, Alan (1984). Placing Improved Agricultural Technology in the Hands of Resource Poor Farmers: In Maddok, N. and Wilson, F. (eds.), *Project Designed for Agricultural Development.* Ashgate Publishing Ltd., USA.

Markos, Ezra (1997). *Demographic Responses to Ecological Degradation and Food Insecurity: Drought Prone Areas in Ethiopia.* PDOD Publication Series (doctoral Dessertation), Thesis Publishers, Prinseneiland, Amsterdam, The Netherlands.

MEDaC (1999). *Survey of the Ethiopian Economy:Review of Post Reform Developments (1992/93-1997/98).* Final Report, Addis Ababa.

..... (1998). *Federal Democratic Republic of Ethiopia: Food Security Program (1998-2002).* Food Security Unit, Draft Report, Addis Ababa.

Mellor, J. (1976). *The New Economic Growth: A Strategy for India and Developing World.* Cornell University Press, and Ithaca.

MoA (1989). *A Brief Review of Agricultural Extension in Ethiopia.* Department of Agricultural Extension, MoA, Addis Ababa.

------- (1998). *Combating Food Insecurity.* A Special Issue Prepared on the FAO Regional Conference for Africa, February 16-20, 1998, Addis Ababa

Mosher, A, T. (1966). *Getting Agriculture Moving: Essentials for Development and Modernization.* Praeger, New York.

Mulat, Demeke (1996). Constraint to Efficient and Sustainable Use of Fertilizers in Ethiopia, in Mulat et al (eds.), *Sustainable Intensification of Agriculture in Ethiopia.* Proceedings of the Second Conference of the Agricultural Economic Society of Ethiopia, 3-4 October 1996, Addis Ababa

Mulat, DemeKe and Techane, Adugna (1999). *Institutional Constraints in Input Marketing:*

The Case of Fertilizer. A paper presented on the Ninth Annual Conference on Ethiopian Economy, October 8-9, 1999, Addis Ababa

Pausewang, S. (1990). *"Meret Le Arashu" Land Tenure and Access to Land: A Socio-Historical Overview.* In Eshetu Cholle and et al (eds.) Ethiopia: Rural Development Options, Zed Books Ltd., London.

Ray, G. L. (1996). *Extension Communication and Management.* Calcutta, India.

Rice, Elzabeth et al (1998). *Farmers Use of Improved Seed Selection Practices in Mexican Maize: Evidence from Siera de Santa Marta.* International Journal of the Development Studies.

Roling, Niles (1985). *Extension Science: information Systems in Agricultural Development.* Cambridge University Press.

Samia, Z. and Wubshet, A. (1996). Human Resource and Intensive Agriculture in Ethiopia, in Mulat et al (eds.), *Sustainable Intensification of Agriculture in Ethiopia.* Proceedings of the Second Conference of the Agricultural Economic Society of Ethiopia, 3-4 October 1996, Addis Ababa.

Shenin, T. (1988). *Peasants and Peasants Societies.* New Edition, Penguin Books, England.

Sisay Assefa (1998). *Perspectives on Agricultural Policy. Rural Poverty, and Food Insecurity in Ethiopia.* A Paper Presented on The Inaugural and First Annual Conference of Agricultural Economics Society of Ethiopia, 8-9 June 1995, Addis Ababa.

SNNPRS-BoA (2001). *Status of Agricultural Extension Program In SNNPRS: An Overview of Major Achievements and Constraints.* January 2001, Awassa.

SNNPRS-BoPED (1998). *Socioeconomic Profile of SNNPRS.* Awassa, Ethiopia.

SNNPRS-FSU (2000). *Promotional Employment Generation Scheme: Program Document 1.* SNNPRS-FSU in Collaboration with EC-LFSU, September 2000, Awassa, Ethiopia.

Takele, Gebre (1996). SASAKAWA Global 2000 Project in Sustainable Intensification of Agriculture in Ethiopia: In Mulat et al (eds.), *Sustainable Intensification of Agriculture in Ethiopia.* Proceedings of the Second Conference of the Agricultural Economic Society of Ethiopia, 3-4 October 1996, Addis Ababa

Tegegn, Gebre Egziabher and et al. (eds.) (1999). *Aspects of Development Issues in Ethiopia.* Proceedings of a Workshop on the Twenty Fifth Anniversary of the IDR, Addis Ababa University, Ethiopia.

Tesfai, Tecle (1975). *The Evaluation of Alternative Rural Development Strategies in Ethiopia:*

Implications for Employment and Income Distribution. Michigan State University, African Rural Employment Paper No. 12 1975, East Lansing, Michigan.

Tesfaye, M. Zegeye and Debebe, Habtewold (1995). *Food Security in Ethiopia: A Situation Analysis.* A Paper Presented on the Inaugural and First Annual Conference of Agricultural Economics Society, Series No.2, Central Statistical Office, Addis Ababa.

WADU (1973). *Phase II Project Proposal for WADU.* June 1973, Soddo, Ethiopia.

Williams, B.D. (1968). *Agricultural Extension.* Melbourne University Press Ltd.

Woodhouse, P. (1994). Extension Systems for Agricultural Projects: In Maddok, N. and Wilson, F. (eds.), *Project Designed for Agricultural Development.* Ashgate Publishing Ltd., USA.

Yared, Amare (1999). Household Resources, Strategies and Food Security in Ethiopia. A study of Amhara Households in *Wogda,* Norht Shewa. The Department of Sociology and social Adminstration, Addis Ababa University, Ethiopia.

ANNEXES

Annex 1

Crop Extension Package Achievement in SNNPRS (1995-1999)

No zone/special Woreda	1995		1996		1997		1998		1999	
	Panned in plot	Achieved in plot	Planned in plot	Achieved in plot	Planned in plot	Achieved in plot	Planned in plot	Achieved in plot	Panned in plot	Achieved in plot
1 Sidama	800	827	7,050	8,777	18,498	26,224	100,000	92,858	130,631	76,145
2 Gedio	440	413	1,240	1,680	2,858	1,819	10,000	3,139	12,000	6,153
3 Debub Omo	80	31	411	466	978	360	3,000	1,292	12,000	6,153
4 Semen Omo	942	586	7,956	9,864	20,756	21,343	160,000	1,221,100	279,386	129,619
5 Guraghe	300	385	6,742	8,385	18,105	17,273	120,000	115,124	203,271	135,653
6 Hadiya	210	567	5,120	5,320	15,920	14,162	100,000	116,707	136,873	135,316
7 KAT	630	577	4,471	6,508	13,844	18,179	100,000	85,505	120,000	99,153
8 Kefa-Sheka	388	247	2,410	2,063	5,559	3,256	35,000	15,992	54,280	21,812
9 Bench-Maji	180	43	440	570	1476	950	8,000	3,265	9,711	4,710
10 Amaro	70	54	175	424	810	149	5,000	974	2,406	668
11 Burji	80	66	175	201	676	457	2,000	1,876	3,066	1,853
12 Konso	-	-	75	75	750	974	5,000	1,590	7,750	2,114
13 Yem	80	82	692	637	1274	390	3,000	3,739	5,097	2,029
13 Derash	-	-	75	75	194	99	5000	413	2108	245
Total	**4,200**	**3,901**	**37,032**	**45,045**	**101,698**	**105,630**	**656,000**	**544,572**	**970,294**	**627,207**

Source: SNNPRS-BoA (2000)

Annex 2

Area Cultivated in Hectares and Cereals Production Obtained in Quintals through Conventional and Extension Programs in SNNPRS (1995-1999)

No	Programme	1995		1996		1997		1998		1999	
		Area	Product	Area	Product	Area	Product	Area	Product	Area	Product
1	Extension Package	1,950	48,750	22,523	816,434	48,757	1,269,654	222,033	5,138,031	259,897	6,067,216
2	Conventional	1,461,030	13,263,019	1,398,013	14,019,816	1,451,178	12,814,042	1,309,226	13,503,228	1,275,045	9,999,005
	Total	1,462,981	13,311,769	1,420,536	1,499,935	1,499,935	1,4083,696	1,531,259	18,641,259	1,534,942	16,066,221
3	Share of Extension	0.13%	0.36%	1.60%	5.50%	3.30%	9%	14.50%	14.50%	17%	38%
4	Share of Conventional	99.87%	99.64%	98.40%	94.50%	96.70%	91%	85.50%	85.50%	83%	62%

Source: SNNPRS-BoA (2000)

Annex 3

Major crop productivity (Qt. Per hectare) in SNNPR (1995- 1999)

S.N	Type of Crop	1995		1996		1997		1998		1999	
		Conventional	Extension	Conventional	Extension	Conventional	Extension	Conventional	Extension	Conventional	Extension
1	Maize	12	30	13	53	15	45	14	44	10	36.4
2	Wheat	11	17	12	31	12	22	12	20	13	26.7
3	Teff	5	6	5	12	5	7	5	8	5	9
4	Sorghum	8.5	16	9	17	10	20	10	21	6	16
5	Barley	9	15	9	17	9	17	9.5	15	7	19
6	Irish Potato	68	-	70	-	70	100	72	86	85	89

Source: SNNPRS-BoA (2000)

Annex 4:

Area and Production of Major Crops in SNNPRS (1995-1999)

No	Type of Crops	1995		1996		1997		1998		1999	
		Area in Hectare	Production in Quintal	Area in Hectare	Production in Quintal	Area in Hectare	Production in Quintal	Area in Hectare	Production in Quintal	Area in Hectare	Production in Quintal
1	maize	488,011	5,881,494	452,905	6,643,039	502,803	7,235,084	556,271	9,909,677	529,673	7,565,882
2	Sorghum	153,657	1,306,919	116,068	1,159,225	108,113	901,879	121,868	1,329,812	143,483	894,325
3	Teff	277,321	1,469,858	259,626	1,758,580	253,970	994,140	283,133	1,767,154	281,742	1,648,444
4	Wheat	164,962	1,779,914	165,860	1,991,028	175,420	2,013,952	169,849	2,357,143	184,711	3,048,019
5	Barley	169,818	1,523,681	172,983	1,579,975	188,951	1,653,481	167,485	1,697,669	142,176	1,210,473
6	Millet	9,610	78,152	8,004	75,312	5,347	31,292	8,037	72,798	7,483	37,649
7	Emer wheat	3,540	10,784	1,718	18,273	266	2128	139	1,012	822	6,225
8	Faba-pea	62,947	437,593	71,011	525,366	73,016	439,352	60,346	438,299	67,678	561,934
9	Field bean	58,208	372,281	70,203	408,590	68,917	412,049	60,326	353,101	64,191	422,723
10	Haricot bean	56,982	370,050	85,843	614,355	69,830	361,953	91,057	652,235	95,866	603,718
11	Chick-Pea	6,181	29,980	8,188	33,323	5,641	23,897	5,483	36,981	8,756	37,699
12	Lentil	6,498	28,318	3,429	13,367	2,263	5,147	1,635	5,769	1,531	4,665
13	Oil crops	5,346	22,121	4,316	15,817	2,102	9,342	5,632	19,609	6,590	23,236
	Total	**1,462,981**	**13,311,769**	**1,420,536**	**14,836,250**	**1,456,640**	**14,083,696**	**1,531,260**	**18,641,259**	**1,534,702**	**16,064,992**

Source: SNNPRS-BoA (2000)

Annex 5

Area Covered, Purchased Seeds Used and Amount of Seed Produced by the Farmers Participation in SNNPRS (1998-1999)

Types of Seed	1998			1999			2000
	Area (Hectares)	Purchased Seed (Quintals)	Produced Seed (Quintals)	Area (Hectares)	Purchased Seed (Quintal)	Produced Seed (Quintals)	Target Seed Production (Quintals)
Maize	9	106	295	8.5	100	213	400
Wheat	1,438	10,557	34,113	2961	25,259	75,915	110,405
Teff	1,729.5	3,413	14,063	2,163	5,247	17,724	21,424
Potato	-	-	-	20	-	-	8,030
Field bean	-	-	-	30	155	609	3,320
Barley	-	-	-	-	-	-	2,400
Total	**3,176.5**	**14,076**	**48,471**	**5,182.5**	**30,761**	**94,461**	**145,979**

Source: SNNPRS-BoA (2000)

Annex 6

Estimated production of Zonal and special Woreda Farmer Baed Seeds Production and Management programs (FBSPM) in SNNPRS in 200/01

S. N	Zone/ Special Woreda	Maize			Wheat			Teff		
		Area (ha)	Number of farmers participated	Estimated production (Qtls)	Area (ha)	Number of farmers participated	Estimated production (Qtls)	Area (ha)	Number of farmers participated	Estimated production (Qtls)
1	Hadiya	-	-	-	800	1600	26,400	500	1,000	4,000
2	Sidama	20	40	400	224	448	4,480	372	744	2,604
3	Keffa Sheka	-	-	-	380	760	7,600	40	80	280
4	North Omo	-	-	-	300	600	6,000	500	1,000	3,500
5	KAT	-	-	-	852	1,704	28,330	485	970	5,820
6	Gurage	-	-	-	1,130	2,260	37,175	435	870	5,220
7	Bench Maji	-	-	-	28	47	420	-	-	-
	Total	**20**	**40**	**400**	**3,714**	**7,419**	**110,405**	**2,332**	**4,664**	**21424**

Source: SNNPRS-BoA (2000)

Annex 7

The Planned and implemented seed Distribution through Extension package in the SNNPRS in 1999/00

S.N	Zone/ Special Woreda	Maize		Wheat		Teff		Total	
		Planned	Distributed	Planned	Distributed	Planned	Distributed	Planned	Distributed
1	Sidama	7,562.375	4,179.875	6,824.25	1,905	1,171.35	333.05	15,557.95	6417.95
2	Gedeo	388.875	238	1,318.5	-	220	-	1,927.4	238
3	North Omo	14,181.72	7,684.5	12,988.2	2,126.59	1,989.05	207.725	29,158.97	10,018.815
4	South Omo	342-25	252.75	80	-	-	-	422.25	252.75
5	KAT	3180	2,447.75	2,972.75	325.05	622.95	391.58	6,75.7	3,164.38
6	Hadiya	3,073.7	2,762.25	12,690.75	1,870	2,141.75	1,606.875	17,906.2	6239.125
7	Guraghe	5,395	4,272	18,372	5,002.78	5,182.45	718.07	28,949.45	9,992.85
8	Kefa-Shekka	1,333	1,005.125	2,572	1,415.41	515	43.65	4,420	2,464.185
9	Bench-Maji	871.875	796.5	378.875	200	56.85	-	1,307.6	996.5
10	Yem	88	65	130	130		-	218	195
11	Derashe	10.5	-	-	-	-	-	10.5	-
12	Konso	-	-	-	-	-	-	-	-
13	Burji	8	8	-	-	-	-	8	8
14	Amaro	125	63	100	75	37.5		262.5	138
Total		**36,550.295**	**23,774.75**	**584,427.325**	**13,049.83**	**11,936.9**	**3,300.95**	**106,924,52**	**40,125.53**

Source: SNNPRS-BoA (2000)

Annex 8

Total population, total HHs, number of HHs participated in Extension Package and distribution of DAs and KAs within the AEZs in Badawacho Woreda (2000/01)

S.N	Name the KA	Population			Number of HHs		Number of DAs
		Total	Male	Female	Total	Participated in Extension	
	Dry 'Woinadega'						
1	Ambursie I	4,590	2,250	2,340	720	526	2
2	Amubrsie II	5,890	2,887	3,003	953	806	1
3	Mehal Korga	2,511	1,231	1,280	450	382	2
4	Abuka	4,663	2,285	2,378	653	492	1
5	Beshillo	3,025	1,483	1,542	605	323	3
6	Kummuddo	2,638	1,293	1,345	340	217	1
7	Woldeyya	3,745	1,836	1,909	591	448	1
8	Cheffa	6,880	3,372	3,508	1376	224	2
9	Ge'ge'ra	6,200	3,038	3,162	873	166	2
10	Eddo	4,561	2,235	2,326	650	351	2
11	Langano	5,330	2,612	2,718	675	746	2
12	Lenda	5,474	2,683	2,791	889	432	1
13	Tikkare- Anbessa	8,404	4,118	4,286	959	501	2
14	Kerenso I	5,006	2,453	2,553	623	267	1
15	Kerenso II	5,079	2,489	2,590	751	438	1
16	Kenchera	4,583	2,246	2,337	767	277	1
17	Waira-Lalo	7,480	3,666	3,814	1082	290	2
	Wet 'Woinadega'						
18	Shone 01	21,311	10,443	10,868	3,552	280	1
19	Waira-Mazoria	6,420	3,146	3,274	1070	338	1
20	Adilo	6,305	3,090	3,215	974	42	2
21	Geshgola	5,729	2,808	2,921	901	93	1
22	Waira-Gere	3,836	1,880	1,956	799	240	2
23	Waira-Boshera	7,260	358	3,702	1009	238	1
24	Dannema	7,779	3,812	3,967	1929	120	1
25	Deda	4,693	2,300	2,393	789	154	1

Annex 8
Continued ...

S.N	Name of the KA	Population			Number of HHs		Number of DAs
		Total	Male	Female	Total	Participated in Extension	
26	Ya'aa-Bukuna	6,633	3,251	3,382	524	259	2
27	Wobara-na-Offodda	5,764	2,825	2,939	1036	231	2
28	Elfeta	6,644	3,256	3,388	1097	115	1
29	Ajeba-Elelo	2,679	1,313	1,366	628	139	1
30	Ajeba-Borara	3,766	1,846	1,920	766	141	1
31	Ajeba-Chelfo	7,320	3,587	3,733	672	194	1
32	Waireboyya	4,914	2,408	2,506	718	80	1
33	Sybeyya	4,929	2,416	2,513	736	95	1
34	Wadda	6,149	3,014	3,135	1185	192	1
35	Keshera	5,629	2,759	2,870	1033	213	2
36	Seppera	3,550	1,740	1,810	657	191	1
37	Hawwora	3,943	1,933	2,010	588	195	2
38	Kotto	8,090	3,965	4,125	1139	94	1
39	Kachabeara	4,274	2,095	2,179	711	89	1
40	Mehal Jarso	4,020	1,970	2,050	804	310	1
41	Jarso-Kutube	3,799	1,862	1,937	612	313	1
42	Jarso- Hadena	4,057	1,988	2,069	745	282	1
43	Jarso-Onjojo	3,610	1,769	1,841	722	265	1
44	Bulgita	3,738	1,832	1,906	623	311	1
45	Gere-Bulgita	4,494	2,203	2,291	785	310	1
46	Lalo-Gerbe	4,397	2,155	2,242	702	214	2
Total		**251,791**	**123,401**	**128,390**	**42,413**	**12,619**	**63**

Source: Computed from the Annual Reports of Badawacho Woreda Office of Agriculture

Annex 9

Area of land cultivated, amount of input distributed and production obtained through conventional farming and Extension Package in Badawacho Woreda from 1996 -2000.

			1996	1997	1998	1999	2000
Cultivated land	Conventional	Area in hectare	18,310.5	19453	17,956.25	13,268	15,166
		Percentage	97.8	94	82.2	63.3	68.7
	Extension	Area in hectare	399.5	1,224	3,886.5	8,0253.5	8,364
		Percentage	2.2	6	7.8	37.7	11.3
	Total	Area in hectare	18,710	20,677	21,842	21,292	23,530
		Percentage	100	100	100	100	100
Amount of input supplied in quintals	Fertilizers	DAP	399.5	1224	3886.5	8,023.5	8,364
		Urea	399.5	1,069.25	3,817.5	7,379.5	7,166
		Total	799	2293.25	7704	15,403	15,530
	Elected seeds	Maize	87.5	175.625	937.125	1,672.625	1,448.125
		Teff	14.85	70.875	41.40	161	718.8
		Wheat	-	337.5	978.525	67.5	263.25
		Total	102.35	584	1019.925	1,901.125	2430.175
Amount of production in quintals	Conventional	Maize	88,442	-	-	-	-
		Teff	49,882	-	-	-	-
		Wheat	876	-	-	-	-
		Others	12,110	-	-	-	-
		Total	151,310	128,251	204,477	138,853	112,449
		Percentage	87	72.5	48.7	28	24.4
	Extension	Maize	21,700	-	213,664	-	-
		Teff	990	-	1,518	-	-
		Wheat	-	-	-	-	-
		Others	-	-	-	-	-
		Total	22,690	48,603	215,182	356,998	348,567
		Percentage	3	7.5	51.3	72	75.6
	Total	**Maize**	**110,142**	-	-	-	-
		Teff	**50,872**	-	-	-	-
		Wheat	**876**	-	-	-	-
		Others	**12,110**	-	-	-	-
		Total	**174,000**	**176,854**	**419,659**	**495,851**	**461,016**
		Percentage	**100**	**100**	**100**	**100**	**100**

Source: Computed form the Annual Reports of Badawacho Woreda Office of Agriculture

Annex 10

Food Production Constraints and Policy Measures for their Alleviation

Constraints/Problems Limiting the Volume of Food Production	**Policy Measures to Overcome the Constraints/Problems**
Technological constraints	- Intensification/ streamlining of agricultural research - Promotion of agricultural extension and training - Promotion of agricultural mechanization - Improved input supply - Irrigation - Agricultural credits (to finance investments in technical improvements)
Manpower and management constraints	- Promotion of mechanization - Agricultural research and extension to promote technical change
Land constrains	Measures to improve utilization, e.g by - Irrigation - Mechanization - Research & extension - Land reform - Erosion control/natural resource conservation
Infrastructure and institutional constraints	- Improvement of rural infrastructure (e.g roads road maintenance, water supply) - Improvements of rural institutions (e.g input supply, extension , marketing services cooperatives)
Marketing constraints	Improvement of agriculture, marketing system, e.g by - Investment inn rural infrastructure - Institutional reform - constituent marketing & pricing policies - Special subsidies - Credits for marketing operations (incl, storage)
Insufficient production incentives	Reducing production costs, e.g. by - Input price and supply policies Promoting applied research Promoting technical change Improvement or rural infrastructure Agricultural credits Increasing economic returns, e.g. by - Marketing promotion - Producer price policy

Source: FAO (1997): P188

Annex 11: Different Interviews

Annex 11-A: Interview with the Staff of Regional BoA

1) What are the major objectives of the regional NEIP?

2) What are the strategies for the adoption of the technology packages of the NEIP in the Regional State?

3) What is the extension capacity of the Regional State?

4) Considering the annual NEIP plan of the Regional Government from 1995/96 - 1999/00:
   - 4.1) Which areas of the Regional State have been covered by every annual plan of the NEIP?
   - 4.2) What extension packages have been planned during every annual plan of the NEIP?
   - 4.3) What quantity and quality of extension personnel has been considered during every annual plan?
   - 4.4) What is the financial plan for every fiscal year of the regional NEIP?

5) What proportion of the plan of the Regional NEIP has been achieved since 1995/96 in terms of :
   - 5.1) Area coverage?
   - 5.2) Farmers participation?
   - 5.3) Inputs supply?
   - 5.4) Input Credit
   - 5.5) Technology packages adoption?
   - 5.6) Production target?

6) What are the major implementation problems of the NEIP in the Region?
7) What responsive measures have been taken by the Regional Government to overcome the problems?
8) What general lessons had been learnt from the experience to date in implementing the packages of the NEIP in the Region?
9) What are the prospects to the Regional NEIP?

Annex 11-B: Interview with the Staff of the Regional FSU

1) What is the overall food security situation in the SNNPRS?

2) Which areas (Zones and Woredas) in the Regional State are the most food insecure at urrent?

3) What are the major causes of food insecurity in the region?

4) What are the major coping strategies of the food security problems in the Regional State?

5) What are the impacts of the NEIP on the food security situation of the Regional State?

Annex 11-C: Group Interview

1. What improvement has been brought about in the crop production through the implementation of extension program in this area?

2. What are problems associated with adoption of technology package?

3. What are the problems associated with input supply?

4. What are the problems associated with credit facilities?

5. What intervention measures do you recommend to improve the markets cereal products?

6. How do you see the profitability of the extension package?

7. What extension services do the development agents render?

8. What are the problems associated with the services rendered by the development agents?

Annex 11-D: Interview with Key Informants

1. To what extent the farmers in this area are participating in the Extension Program?
2. What improvements have been brought about in the crop production through the implementation of Extension Program in this area?
3. What do you think the perception of farmers about the Extension service?
4. What are the contributions of Extension Program in alleviating the household food insecurity in this area?
5. What are the problems associated with the adoption of technology package?
6. What are the problems associated with input supply?
7. What are the problems associated with credit facilities?
8. What intervention measures do you recommend to stabilize the price of inputs?
9. What are the problems associated with marketing of agricultural products?
10. What intervention measures do you recommend to improve the markets of cereal products?
11. How do you see the overall profitability of the extension package?
12. What extension services do the development agents render?
13. How do you see the relationship of development agents with farmers in this Kebele?
14. What are the problems associated with the services rendered by the development agents?

Annex 11-E: Interview With DAs

1) What problems do you face while undertaking Extension works?

2) Do the local Authorities and officials temporarily or regularly give you any non-extension assignments?

3) From your experience in undertaking the Extension Package what major problems crop up with respect to the following components?

   a. Input supply?

   b. Credit Facilities?

   c. Marketing of agricultural products?

   d. Profitability?

4) What policy measures do you recommend to solve these problems?

5) What do you think the perception of farmers about the Extension service?

6) What are the contributions of Extension Program in alleviating the household food insecurity in this area?

Annex 12

List of Informants

A) From The Regional Level

S.N	Name	Age	Sex	Office	Position
1	Dr. Wolde	40	Male	BoA	SMS and Representing Head, Department of Extension
2	Ato Simayehu Taffesse	46	//	//	SMS, Department of Extension
3	Ato Lema Mitiku	38	//	//	Former Head, Department of Extension
4	Ato Wassie	37	//	FSU	Leader, Regional FSU
5	Ato Alemu Foche	38	//	//	Senior Expert, Regional FSU

B) DAs Working in Badewacho Woreda

S.N	Name	Age	Sex	KA	Level of Education	Years of Service
1	Dawit Sebero	36	Male	Jarso-Onjojo	Certificate of DAs from Agarfa Training Center	6 years
2	Handiso Hadero	35	//	Eddo	//	5 years
3	Tesemma Bellengo	48	//	Mehal Jarso	//	22 years
4	Aynalem Hussien	23	Female	Kerenso I	Diploma from Agricultural College	1 years
5	Bereket Darebo	26	Male	Elfeta	//	1 years
6	Teferi Chufamo	24	//	Lenda	//	1 years

C) Key Informants

S.N.	Name	Age	Sex	Name of KA	Wealth Ranking	Occupation	Socio-political Status in the KA
1	Abebe Mettello	38	Male	Jarso-Onjojo	Rich	Farmer	Executive member
2	Agafari Batiso	47	//	//	Medium	//	Community elder
3	Mirkeno Milkamo	38	//	//	//	//	Executive member
4	Yoel Demamo	40	//	//	//	//	Innovative farmer
5	Jemal Usman	35	//	Kerenso I	Rich	//	//
6	Ossam Yassin	42	//	//	Medium	//	Community elder

Annex 13

Questionnaire to Study The Major Challenges to the NEIP

in Addressing the Problem of Food Security in the SNNPRS

Name of enumerator .....

Date .....

Local Time .....

Id. No. of the Respondent .....

1. General Information

1.1) Zone [1=9, 2=8, 3=7, 4=6, 5=5, 6=4, 7=3, 8=2, 9=1] .... ☐

1.2) Woreda [1=4, 2=3, 3=2, 4=1]..... ..... ☐

1.3) Agro-ecological Zone [1='Dega', 2='Woinadega', 3='Kolla'] ..... ☐

1.4) Kebele Administration [Name of Kebele] .....

2. Questions for the Continuously Participating Farmers in the Extension Package Program from 1995/96-1999/00 with specific reference to the production of three major food grain crops (Wheat, Maize &Teff)

A. Household demographic and socioeconomic characteristics

2.1) Age [Number of years lived since birth] .... ☐☐

2.2) Sex [1=Male, 2=Female[..... ..... ☐

2.3) Household Size [Number of persons living in the house] [1=Less than 5,

2=5-7, 3=8-10, 4=Greater than 10] ....

2.4) Position in the Household [1=Head, 2=Spouse of the head

3=Household member] ....

2.5) Size of landholding in hectare [1=More than 2, 2=1.5-2,

3=1-1.5, 4=0.5-1, 5=Less than 0.5] ....

2.6) Level of Education [1=Illiterate, 2=Read and Write, 3=Elementary

School, 4=Junior Secondary School, 5=High School] .....

2.7) Wealth Ranking according to the local community standards

[1=Rich, 2=Medium, 3=Poor, 4=Very Poor] ....

2.8) Socio-political Status within the Community? [1=Leadership member of the

Kebele Administration, 2=Farmers Cadre, 3=Community elder, 4=Representative

or Leader of Religious Setup, 5=Other(Specify).....

B. <u>The following questions are about the household participation in the Extension Package Program</u>

2.9) For how many crop production seasons have you participated in

Extension Package Program? [1=9-10, 2=7-8, 3=5-6, 4=less than 5] .....

2.10) Which of the following food grain crops have you adopted through the improved

package program? [1= Wheat, Maize &Teff, 2= Wheat & Maize, 3= Wheat &

Teff, 4=Maize &Teff, 5=Only Maize, 6=Only Teff, 7=Only Wheat] .....

2.11) Which of the following inputs have you used through the package program?

[1=Fertilizers, Improved Varieties, Herbicides and Pesticides, Improved Farm

Implements, Post harvest Technologies & Extension services by Development Agents, 2=Fertilizers, Improved Varieties, Herbicides and Pesticides, Improved Farm Implements & Post harvest Technologies, 3=Fertilizers, Improved Varieties, Herbicides and Pesticides, Improved Farm Implements, 4=Fertilizers, Improved Varieties, Herbicides and Pesticides, 5=Only Fertilizers & Improved Varieties] ..... ☐

The following questions are about the household achievements in applying the Extension Package Program

The Table below presents area of land on which the improved package is applied and amount of production obtained during 1995/96-1999/00

Years	Area in Hectare	Production Obtained in Quintals				
		Maize	Teff	Wheat	Total	Average Per Capita
1995/96						
1996/97						
1997/98						
1998/99						
1999/00						
Total						

Instructions for the enumerator:

(1) Fill the figures required in the above Table by asking the respondents,

(2) Compute the required averages,

(3) Based on the information in the Table, complete the answers to the Question # 2.12 – 2.16

2.12) How do you estimate the increase in the yield of Maize through the adoption of improved packages as compared to the harvest through traditional farming?

[1=It is tripled, 2=It is doubled, 3=It is 1 & half times greater, 4=It has no difference] ....

2.13) How do you estimate the increase in the yield of ***Teff*** through the adoption of improved packages as compared to the harvest through traditional farming?

[1=It is tripled, 2=It is doubled, 3=It is 1 & half times greater, 4=It has no difference] ...

2.14) How do you estimate the increase in the yield of ***Wheat*** during the years 1995/96 –1999/00 when compared to the harvest through the traditional farming?

[1=It is tripled, 2=It is doubled, 3=It is 1 & half times greater, 4=It has no difference] ...

2.15) Referring to the above Table, how do you estimate the average total increase in the yield of all the three crops together during the years 1995/96 –1999/00 when compared to the harvest through traditional farming? [1=It is tripled, 2=It is doubled, 3=It is 1 & half times greater, 4=It has no difference] ....

2.16) Referring to the above Table, how do you estimate the average total increase in per capita production of all the three crops together during the years 1995/96 –1999/00 when compared to the harvest through the traditional farming?

[1=It is tripled, 2=It is doubled, 3=It is 1 & half times grater, 4=It has no difference, 5=It is diminishing] ....

The following questions are about the household

problems in applying the Extension Package Program

2.17) Who are the suppliers of improved inputs? [1=The Government, 2=Private Companies, 3=Service Cooperative, 4=Other Community Based Organizations (Specify) .....

2.18) Have you ever faced problems associated with input supply? [1=Yes, 2=No] .....

2.19) If the answer to the above question is Yes, what are the major problems? [1=Lack of competitive suppliers, 2=Availability of varieties does not meet the ranges of farmers preference, 3=Reduced quantity from the amount indicated on the pack, 4=Lower quality, 5=Delaying of delivery from the appropriate cropping period, 6=The problems indicated in all of the above choices, 7=The problems indicated in choice # 1, 2, 3 &4, 8=The problems indicated in choice # 1, 2 & 3, 9=The problems indicated in choice # 1&2, 7=Other administrative Disincentives in the process of supply (Specify)] .....

2.20) What is the current condition of market prices of improved inputs? [1=It is affordable, 2=It is not easily affordable, 3=It is extremely high] .....

2.21) How do you purchase the improved inputs? [1=Buy on cash at subsidized prices, 2=Buy on cash at market prices, 3=Buy on credit at subsidized prices, 4=Buy on credit at market prices] .....

2.22) If you are purchasing improved inputs on credit, where do you get the loan? [1=From the Government, 2=From Private firm, 3=From Local Usurers, 4= Others (Specify) .....

2.23) If you are getting improved input on credit, what is the condition of interest rates during the years 1995/96-1999/00?

[1=Stable, 2=Steadily increasing, 3=Fluctuating and increasing currently, 4=Fluctuating and decreasing currently] ....

2.24) Have you ever faced problems associated with credit repayment? [1=Yes, 2=No] ....

2.25) If the answer to the Question #2.24 is Yes, what are the major problems?

[1=Crop failure, 2=None affordability, 3=Low prices for agricultural products, 4= Non-flexible schedules Repayment, 5=All of the above choices indicate the problem, 6=The problems indicated in choice # 1, 2 & 3, 7=The problems indicated in choice # 2, 3 & 4, 8=The problems indicated in choice # 2 & 3, 8= Other administrative disincentives in credit collection (specify) .....] .....

2.26) Have you faced any problem with crop failure during your participation in the Package Program? [1=Yes, 2=No] ....

2.27) If the answer to the Question #2.26 is Yes, which of the followings are the major causes? [1= Drought, 2=Rainfall fluctuation, 3=Crop diseases, 4=Rduced quality seeds, 5=Pre and Post harvest infestations, 6= All of the above choices indicate the causes, 7=The problems indicated in choice # 1, 2, 3 & 4, 8=The problems indicated in choice # 1, 2 & 3, 9=The problems indicated in choice # 1, 2, & 4, 10=Others(Specify) .....

2.28) If the answer to the Question #2.26 is Yes, how many times have you faced a total loss of the harvest? [1=More than 5 times, 2=5 times, 3=4 times, 4=3 times, 5=2 times, 6=1 time] ....

2.29) Based on the answer for Question #2.26, how many times you faced a partial loss of the harvest? [1=More than 5 times, 2=5 times, 3=4 times, 4=3 times, 5=2 times, 6=1 time] ..... ☐

2.30) What is the condition of prices for agricultural products at local markets during harvest seasons? [1=Very cheap, 2=Cheap, 3=Competitive, 4=Expensive ..... ☐

2.31) What is the condition of prices for agricultural products at local markets during the rest of the seasons? [1=Very cheap, 2=Cheap, 3=Competitive, 4=Expensive ..... ☐

2.32) What options are available to you for the credit repayment in case of crop failure and/or lower market prices for farm products? [1=Extending the time of repayment, 2=Interventions to stabilize the grain markets, 3=Reduction of the interest, 4=Government writes off the credit, 6=Others(Specify) .....] ..... ☐

2.33) What administrative enforcement the loaner (Government) practices against delaying of credit repayments in case of crop failure and/or lower market prices for farm products? [1=Suspending the input credit for the current crop season, 2=Repayment collection by forcing, 3=Taking to courts, 4=Others (Specify) ...] ... ☐

2.34) What means do you have for the credit repayment when there is a danger of crop failure and/or marketing problems? [1=Selling of livestock, 2=Selling of household assets, 3=Renting out of land, 4=Borrowing from friends and relatives, 5=All of the above choices indicate the means, 6=The means indicated in choice # 1, 2 & 3, 7=The means indicated in choice # 1, 2 &4, 8=The means indicated in choice # 1 & 4, 9=The means indicated in choice # 1, 10=Other means(Specify)] .....

C. The Following Questions are About the Household Food Security Conditions with Specific Reference to the Food Availability Since the Implementation of the NEIP

i) Pre-extension conditions:

2.35) How do you estimate the pre-Extension average per capita food grain production of this household by comparing with the condition after the use of improved extension package? [1=It was lower, 2=It was higher, 3=It had no difference] ..... ☐

2.36) If the answer to the above question is 'higher' or 'no difference', which of the followings are the main causes? [1=Natural fertility of land, 2=Bigger land holding size, 3=Smaller family size, 4=No problems associated with recurrent disaster] ..... ☐

2.37) What proportion of the food grains consumed in this household has come from own production? [1=Full, 2=More than half, 3=Quarter to half, 4=Quarter, 5=Less than quarter, 6=No own production] ..... ☐

2.38) Which of the following daily dietary times were experienced in this household? [1=Mor than 3 times, 2=3 times, 3=2 times, 4=1 time, 5=Less than 1 time] ..... ☐

ii) Post-extension conditions:

2.39) How do you estimate the post-Extension average per capita food grain production of this household comparing with the condition before the use of improved extension package? [1=Increasing, 2=Decreasing, 3=No difference] .... ☐

2.40) If the answer to the Question #38 is Decreasing or No change, which of the followings are the main causes? [1=Recurrent drought, 2=Rapid increase in the number of the household members, 3=Diminishing landholding size, 4=No return from the package program] .... ☐

2.41) What proportion of the food grains consumed in this household has come from own production since the application of Extension Package? [1=Full, 2=More than half, 3=Quarter to half, 4=Quarter, 5=Less than quarter, 6=No own production] ..... ☐

2.42) Which of the following daily dietary times were experienced in this household since the application of Extension Package? [1=More than 3 times, 2=3 times, 3=2 times, 4=1 time, 5=Less than 1 time] .... ☐

Signature of the enumerator .....

ANNEX: 14

SOUTHERN NATION NATIONALITIES AND PEOPLES' REGIONAL GOVERNMENT

ADMINISTRATIVE MAP

KEY

- INTERNATIONAL BOUNDARY
- REGIONAL "
- ZONAL "
- SPECIAL WOREDA "
- WOREDA "
- REGIONAL CAPITAL
- ZONAL "
- WOREDA

SCALE 1:2000000

SIDAMA ZONE
1. Awassa Zuria(Awassa)
2. Shebedino(Leku)
3. Dale (Y.Alem)
4. Arbegona (Arbegona)
5. Aleta Wendo(A.Wendo)
6. Hagere Selam(H.Selam)
7. Dara(Teferikela)
8. Bensa (Daye)
9. Aroresa (Kejo)

GEDEO ZONE
1. Wenago (Wenago)
2. Yirgachefe (Y.Chefe)
3. Bule (Bule)
4. Kochore (Chelelektu)

NORTH OMO ZONE
1. Ella/Konta/ (Ameya)
2. Ksara Tocha(Tocha)
3. Mareka Gena(Waka)
4. Loma Bossa (Bale)
5. Boloso Sore (Areka)
6. Damot Gale (Boditi)
7. Damot Woyde(Badesa)
8. Sodo Zuria (Sodo)
9. Kindo Koyisha (Bele)
10. Melekoza (Loha)
11. Gofa Zuria (Sawla)
12. Kucha(Selam Ber)
13. Offa (Gesuba)
14. Humbo Tebela(Tebela)
15. Boreda-Abaya(Berbir)
16. Chencha Zuria(Chencha)
17. Dita Deramalo(Wacha)
18. Zala Ubanale (Beto)
19. Basketo (Laska)
20. Kemba (Kemba)
21. Bonke (Gerese)
22. A/Minch Zuria (A.Minch)

SOUTH OMO ZONE
1. Selamago (Hana)
2. Bakogazer (Jinka)
3. Hamer (Turai)
4. Geleb (Omorate)

HADIYA ZONE
1. Konteb (Korsito)
2. Limu (Bosaina)
3. Soro (Ginbicho)
4. Badewacho(Shone)

K.A.T ZONE
1. Onosholeko(Mudula)
2. Angacha (Angacha)
3. Kachabira (Shinshicho)
4. Kedida Gamela(Durame)
5. Alaba (Kulito)

GURAGHE ZONE
1. K.Gedebano (Guranda)
2. K.Welene (Agena)
3. Goro (Welkite)
4. Cheha (Kadibir)
5. Sodo (Buei)
6. K.T Mareko(Butajira)
7. Gunar (Erekit)
8. Enemorena Ener(Gunchere)
9. Selti(Kibet)
10. Dalocha (Dalocha)
11. Lanfaro (Tota)

KAFFECHO-SHAKECHO
1. Gesha(Daka)
2. Gimbo(Uffa)
3. Kenjewa(Adiakaka)
4. Tello(Telegeselan)
5. Decha(Chiri)
6. Chena(Wacha)
7. Masha (Masha)
8. Teki (Tepi)

BENCH-MAJI ZONE
1. Sheko (Sheko)
2. Bench(Aman)
3. Meinit(Bachuna)
4. Dizi (Tum)
5. Surma(Karder)

SPECIAL WOREDA
1. Yem(Sekoru)
2. Amaro(Kele)
3. Burji(Soyema)
4. Derashe (Gidole)
5. Konso(Karate)

ABREVIATION
A.Minch - Arba Minch
K.Welene - Kebana Welene
H.Selam - Hagere Selam
K.A.T. - Kembata,Alaba,Tembaro
K.Mareko - Meskanena Mareko
Y.Alem - Yirga Alem
Y.Chefe - Yirga Chefe
K.Gedebano-Lokir Gedebano

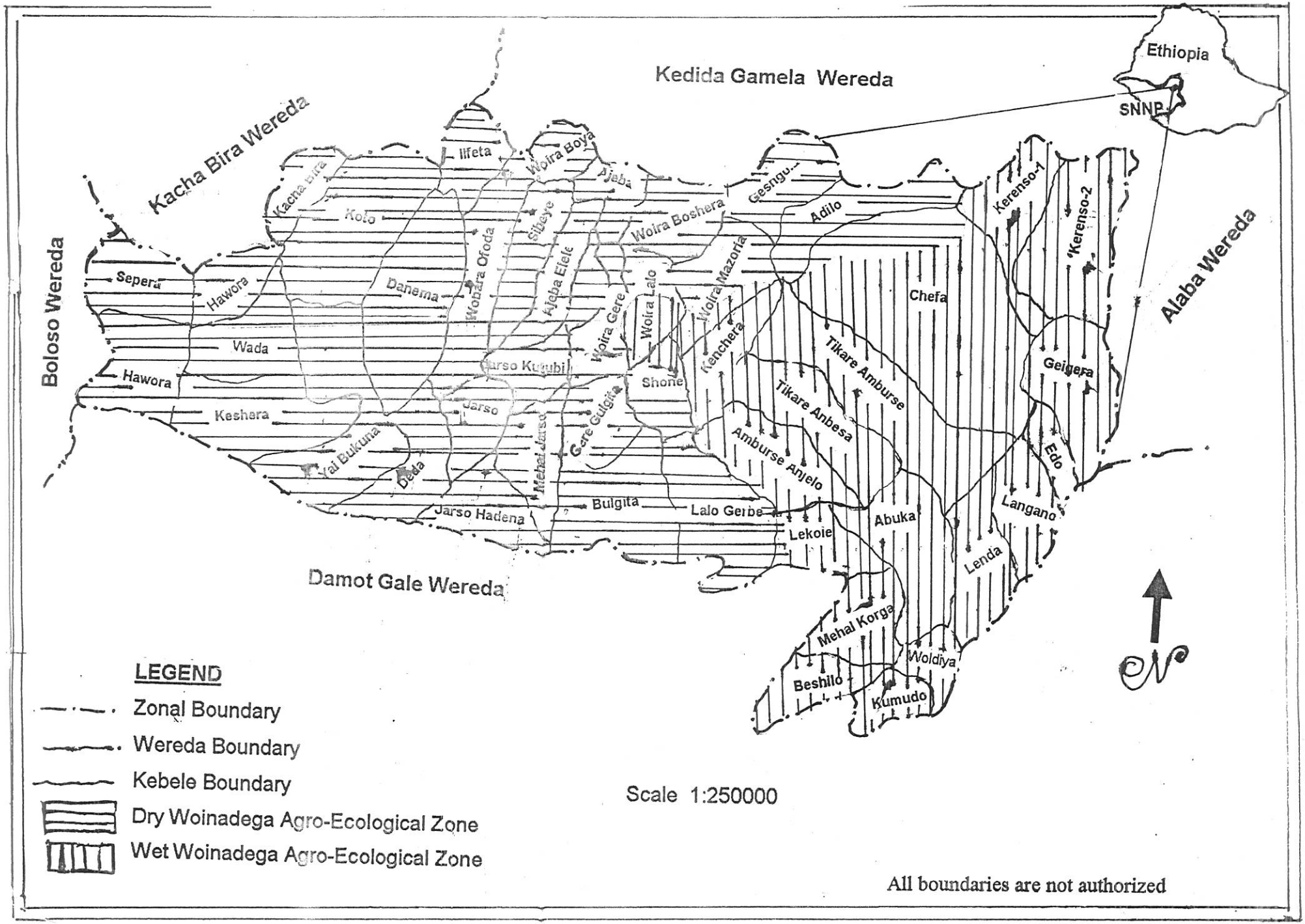
N.B. Woredas and Spe. Woredas Capitals are indicated in brackets

PLANNING AND ECONOMIC DEVELOPMENT BUREAU

CAUTION: The delination of the Regions Zones Special Woredas and Woredas boundaries on this map are not Authoritative

Date Jan. 1996

ANNEX: 15 Agro-ecological Zones of Badawacho Wereda (SNNP)



Declaration

This Thesis is the result of independent work. Where it is indebted to the work of others, acknowledgement has been made.

I declare that it has not been accepted in substance for any other degree, nor it is currently being submitted in candidature for any other degree.

Name	Signature
Abera Abiyo (Candidate)	
Beyene Doilicho (Ph.D.) (Academic Advisor)	