ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE UNDERLYING CAUSES OF HOUSEHOLD FOOD INSECURITY AND COPING STRATEGIES:
THE CASE OF *LEGAMBO WEREDA*, SOUTH *WOLLO* ZONE, *AMHARA* REGION, NORTH EASTERN ETHIOPIA

BY

ESHETU BEKELE YIMENU

Settlement and housing pattern in *Legambo Wereda* (*Segnogebeya* area).

May, 2000
Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE UNDERLYING CAUSES OF HOUSEHOLD FOOD INSECURITY AND COPING STRATEGIES:

The Case of *Legambo Wereda,* South *Wollo* Zone, *Amhara* Region, North Eastern Ethiopia

A Thesis presented to the School of Graduate Studies,
Addis Ababa University

In Partial Fulfillment for the Degree of Master of Arts (M.A. Degree) in Regional and Local Development Studies (RLDS)

By
ESHETU BEKELE YIMENU

June 2000
Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE UNDERLYING CAUSES OF HOUSEHOLD FOOD INSECURITY AND COPING STRATEGIES: THE CASE OF *LEGAMBO WEREDA*, SOUTH *WOLLO* ZONE, *AMHARA* REGION

By

Eshetu Bekele Yimenu

Regional And Local Development Studies

(RLDS)

Approved by Board of Examiners:

1.	Chairman, Graduate Committee	Signature
2.	Mulat Demeke (Ph.D.) Advisor	Signature
3.	Yared Amare (Ph.D.) Internal Examiner	Signature
4.	Debebe Habtewold (Ato) External Examiner	Signature

Acknowledgements

First and for most I acknowledge, with many thanks, Dr. Mulat Demeke my academic advisor, for his encouragement to get me writing on such a vast, complex and tiresome, but very interesting, relevant and burning issue, for his tireless, constructive and valuable suggestions in correcting and advising my works from draft proposal up until the end of the thesis work.

The following agencies also deserve gratitude in providing me generous assistance in gaining access to secondary data: CSA (both at the head quarter and *Dessie*), DPPC offices (at Bahir Dar and Dessie), Regional Integrated Food Security coordination office, South *Wollo* Department of Agriculture, Planning and Economic Development Department, SCF-UK in *Dessie,* EECMY in *Dessie* and *Washera,* South Wollo Zonal Administration office and *Legambo Wereda* council, office of Agriculture, office of finance. In general, I am grateful to the Regional, Zonal and *Wereda* level government offices and officials for their understanding and cooperation during the fieldwork.

I am particularly grateful to my parents who persistently owed me advice and assistance in almost every respect during the course of this study and my stay at the University.

My gratitude and thanks also go to different personalities and colleagues (especially, *Ato Debebe H/Wold, Ato Getachew Adem, Ato Tibebu Adgoayechew, Ato Dilnesaw Asserat, Ato Haylie Mekonen, Ato Gugssa Yimer* and many others for their constant encouragement and friendly assistance). I am also indebted to my friends in the MEDaC, Federal DPPC office, SERA project, MoA and those in *Bahir Dar*, *Dessie* and *Kombolcha*. My thanks particularly goes to *Ato Demeke Deboch* who helped me in entering the data into the computer. *Ato Meles G/Tsadik, Ato Gebeyhu Goshu and Ato Aklilu Dufera* deserves my gratitude in providing me some of the photos taken from *Legambo* during the 1998/99 drought.

I am also very grateful to the Department of RLDS and its entire staff for all kinds of facilitation in the process of carrying out this research and my stay in the department for the past two years.

Finally, this research was largely made possible by a financial assistance from Sida through the facilitation of the Bureau of Planning and Economic Development of the *Amhara* Region and they deserve my thanks. A huge vote of thanks also goes to the enumerators: Afework Gizaw, Menlik Hailu, Matyas Hailu, Teklehaymanot G/Tsadik, Teshale Tekola, and Wondwosen Abate (all of whom are working in south *Wollo)*. Furthermore, thanks also goes to the heads of households, key informants and all those involved in the group interviews and discussions.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS AND FIGURES

ABBREVIATIONS

AADU	Ada Agricultural Development Unit
AAU	Addis Ababa University
ADLI	Agricultural Development Led Industrialization
ANRS	Amhara National Regional State
CADU	Chilalo Agricultural Development Unit
CIDA	Canadian International Development Agency
CPE's	Centrally Planned Economies
CRDA	Christian Relief and Development Agency
CSA	Central Statistical Authority
DA's	Development Agents
DPPC	Disaster Prevention and Preparedness Commission
EECMY	Ethiopian Evangelical Church Mekane-Yesus
EEA	Ethiopian Economic Association
EGS	Employment Generation Scheme
ETB	Ethiopian Birr
FAO	Food and Agriculture Organization (of the UN)
FDRE	Federal Democratic Republic of Ethiopia
GDP	Gross Domestic Production
GNP	Gross National Product
HHH	Household Head
HADU	Humera Agricultural Development Unit
IDR	Institute of Development Research
IEC	Information, Education and Communication
IFPRI	International Food Policy Research Institute
IFAD	International Fund for Agricultural Development
IFSP	Integrated Food Security Programme
IGADD	Inter-Governmental Authority For Drought and Development
ILRI	International Livestock Research Institute
IMF	International Monetary Fund
IRD	Integrated Rural Development
Kcal	Kilocalorie

LDCs	Less Developed Countries
masl	meters above sea level
MEDaC	Ministry of Economic Development and Cooperation
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoH	Ministry of Health
MoPED	Ministry of Planning and Economic Development
MT	Metric Tone
NDPM	National Disaster Prevention and Management
NGO's	Non-Governmental Organizations
NSP	Nutrition Surveillance Programme
OAU	Organization for African Unity
OPEC	Oil Producing and Exporting Countries
PADEP	Peasant Agricultural Development and Extension Pprogramme
RLDS	Regional and Local Development Studies
SAP	Structural Adjustment Programme
SERA	Strengthening Emergency Response Ability
SCF-UK	Save the Children Fund (United Kingdom)
Sida	Swedish International Development Agency
UN	United Nations
UNDP	United Nations Development Programme
USD	United State Dollar
USAID	United States Agency for International Development
USSR	United Soviet Socialist Republic
WADU	Wolyita Agricultural Development Unit
WFP	World Food Programme
WHO	World Health Organization

Abstract

This study reports both theoretical and empirical findings on the underlying causes of food insecurity and households coping strategies in Legambo Wereda, South Wollo, one of the chronically food insecure weredas of the Amhara region. Although the causes and coping strategies of households were not studied before, the study wereda has been and is being repeatedly affected by drought-induced food insecurity and the majority of the households were and are exposed to migration and death and the remaining ones are dependent on food aid. Thus, the objective of this research was to identify and analyze the major causes of food insecurity and coping strategies of households during food crisis in the wereda. The analysis was made using the household data collected from three kebeles (Segnogebeya, Ermeti, and Tach Akesta), that are representing different agro-ecological and production zones of the wereda for the year 1998/99.

Descriptive statistics on major household characteristics (such as: size and age-sex distribution, dependency ratio, fertility and mortality, migration, ethnicity and language, religious composition, marital and literacy status) of the households were discussed. Moreover, the major activities of the households and major farm characteristics and access to productive assets (such as: farm land, crop production, farm inputs and extension, draft animals and farm tools and livestock production), and other variables (such as: non-farm opportunities, food aid, and coping strategies) were analyzed based on primary and some secondary data collected from Federal, Regional and local level offices and information obtained from group discussions and key informants. In addition to food availability calculations used to measure the level of household's food security status, linear regression analysis was carried out.

The study result has shown that, inter alia, households with relatively better access to resources, non-farm income, urban center and better coping mechanisms were proved to have relatively better food security status than others. In the study wereda, relatively better off households were observed in woinadega agro-ecology than those in dega areas.

As revealed by the study results, more than 64 percent of the population in the wereda was found to be below the food poverty line. Overall, the study population fulfills only 87 percent (1553 Kcal/person/day) of their per capita caloric requirements from all available sources (including food aid) at the lowest level of survival consumption rate (which is 1785 Kcal/person/day). Food poverty, as found out from the study results is highly correlated with agro-ecology, non-farm access, possession of cultivable land and other productive assets such as oxen, family size and nearness to urban centers. The OLS regression results, also revealed that among other variables, agro-ecology, non-farm income, cultivated land and proximity to the wereda center were found out to have positive coefficients and highly significant (all significant at 99 percent confidence level) in determining household's food security status. Hence, the underlying causes for household food insecurity are found to be highly related with resource access, location, and non-farm opportunities.

It is, therefore, suggested that among other things, focus on family planning, diversifying the rural economy (particularly, by giving more emphasis to livestock and agro-forestry development), creating off-farm employment opportunities and backing up some of the traditionally known coping mechanisms must receive policy attention to reduce household food insecurity. Policy instruments, such as skill training and credit particularly paying more emphasis to the dega areas could help develop non-farm income for food insecure households. Moreover a well designed and planned resettlement programmes should be seen as an instrument for ensuring sustainable livelihood and food security of the most vulnerable households in Legambo.

CHAPTER I

I. INTRODUCTION

Food, among others, is the basic necessity of life and access to it is also a basic human right. As argued by Hopkins, "Food security is a fundamental need, basic to all human needs and the organization of social life. Access to necessary nutrients is fundamental, not only to life per se, but also to stable and enduring social order" (in Maxwell and Frankenberger, 1992:28).

However, a very large number of people all over the world are suffering from hunger and malnutrition. The magnitude of the problem is more intense in the developing parts of the world. Currently more than 800 million of the people living in the developing countries do not have enough food to meet their nutritional requirements. Worse yet, the number of such people is expected to grow at an alarming rate-unabated and un-backed by an equal growth in food production.

Africa has more countries with food security problems than any other region. According to the World Bank's estimate, Africa alone will have a shortage of 250 million tons of food by the year 2020. FAO also estimates as two-thirds of all countries suffering food insecurity are in Africa, where of the 44 countries with critical food security, 30 are in Africa. "Present trends would mean that the number of chronically undernourished in Sub-Saharan Africa would rise from 180 to 300 million by the year 2010" (FAO, 1999). In Ethiopia in particular, food insecurity has been and is a serious problem affecting a large majority of the country's poor especially at rural areas.

Charles Wood, who has attempted to compile famine data covering several centuries of Ethiopian history, indicated that eight serious famines have taken place in the period between 1890 and 1975 (cited in Dessalegn 1988). Furthermore, as Dessalegn himself tried to estimate, five 'killer' famines and serious food shortages occurred between 1950 and 1985. Mesfin has also argued as 25 million people have been affected by famine during the periods between 1958 to 1977. In general, the available literature on the Ethiopian food situation suggests that famine and chronic food insecurity were quite common in the country's long history.

With 64 percent of the population living under the poverty line, there is low calorie supply as percent of requirement and high food import dependency ratio in Ethiopia even when compared to LDCs in Africa. The food availability ratio indicates that the country covers (including food import) only 73 percent of the minimum requirement (which is estimated at 1770 Kcal). Moreover, 52 percent of Ethiopian population is suffering from high magnitude of food insecurity (FDRE, 1996).

Within Ethiopia, food insecurity is more severe in the *Amhara* region, especially in places like South *Wollo*. Many parts of South *Wollo* have often been affected by chronic food insecurity. Households and individuals in this Zone have been and are largely dependent on food aid.

Food insecurity, in South *Wollo* in general and *Legambo Wereda* in particular, is a serious and continuous problem. The *wereda* has been and is being hit by repeated drought (even in relatively good harvest years) resulting in massive death and out-migration. Thus, the great majorities of the households in the *wereda* have been and still are dependent on food aid. The

major causes of the problem are varied, complex, and interrelated at the very lower levels. Developing sound policies and effective implementation modalities to attack this problem requires specific knowledge and understanding of the food security situation, causal factors and coping mechanisms at the household levels.

The purpose of this research is therefore, to identify and examine these varied and complex factors, that are responsible for food insecurity at the household level and household's coping mechanisms during food crisis in the *wereda*. Furthermore, based on the findings and conclusions, policy recommendations that are sought to be instrumental for sustained food security at micro-level would be suggested.

1.1 Background

1.1.1 Global Situation

As the recent trends in the world food economy indicates, in the mid-1970s, the world was perceived to be in the midst of a severe food crisis. Adverse weather in South Asia, Europe, North America and the former USSR highly affected the global cereal supplies. The OPEC oil price rise in 1973 also increased the price of energy and other agricultural inputs (such as: fertilizer) which further aggravated the situation (FAO, 1997).

Towards the end of 1974, the peak of the grain price crisis had already passed. Global cereal stocks almost doubled between the mid-1970s and mid-1980s. The overall cereal production has continued to grow over the past 25 years, with growth in wheat (3.8%), rice (3.0%), and maize (2.7%) easily outstripping population growth (ibid.: 13). Thus, overall per capita world food supply has continued to grow on the average over the last 30 years (see Table 1.1).

Table 1.1: Per caput Food Supplies for Direct Human Consumption, Historical and Projected

(Calories/day)

	1961-63	1969-71	1979-81	1990-92	2010
Developing countries	1960	2130	2320	2520	2730
Africa, Sub-Sahara	2100	2140	2080	2040	2170
N.East /N.Africa	2200	2380	2840	2960	3120
East Asia	1750	2050	2360	2670	3040
South Asia	2030	2060	2080	2300	2450
Latin America/Caribbean	2360	2510	2270	2740	2950
Developed Countries	3020	3180	3270	3330	3470
Former CPE's	3130	3290	3350	3160	3380
Others	2980	3130	3230	3410	3510
World	**2300**	**2440**	**2580**	**2710**	**2860**

Source: FAO, 1997.

As Table 1.1 shows that figures for broad country groupings show considerable variations in both level and trend. Among other developing countries, figures for sub-Saharan Africa clearly indicate that food supplies have worsened since the early 1970s. Other developing countries, especially East Asia and the Near East and North Africa registered significant growth.

Therefore, although there has been an increasing food grain production in the world to meet the food requirements, the great majority of population in the developing parts of the world has no adequate and reliable access to food. This failure in access to food, though varies from country to country and region to region, is mainly due to low level of economic development and social, cultural and political reasons in these developing countries.

In reality, however, there is no world food problem, but there is a problem of hunger in the world. As it is stated in the World Food Summit, food supplies have increased substantially, but constraints on access to food and continuing inadequacy of household and national income to purchase food, instability of supply, and demand as well as natural and man made disasters, prevent basic food needs from being fulfilled (1996:1). Moreover, it is true that an increase in food output will lead to a reduction in hunger and malnutrition. But, studies revealed as hunger and malnutrition has increased despite a rise in global food supplies. Because, the availability of food at global level doesn't guarantee food acquisition at national or household levels uniformly throughout nations. As Griffin pointed out,

> There is no evidence that food is becoming increasingly scarce in the world. On the contrary, the data indicate that for the world as a whole the amount of food produced continues to rise, and it is safe to assume that never in history has the physical supply of food per capita been greater than in the last ten or twenty years. If humanity continues to suffer from hunger-and we are now witnessing the worst famines in forty years-the explanation can not be in terms of a global inadequacy of food" (1987:18).

1.1.2 The African Food Security Crisis

Most of the human sufferings that are arising from food insecurity are in the developing countries, especially in Africa and more specifically in Sub-Saharan Africa. The most intractable food insecurity facing the world in the 1980s and 1990s is the food and hunger crisis in sub-Saharan Africa-the poorest part of the world. According to the World Bank (1995a), out of the 39 poorest countries in the world, 24 are in Africa and the UNDP (1996) also indicated as the region is sheltering 32 of the world's 48 least developed countries (Tekolla, 1997). Again the world bank's 1992 report shows that sub-Saharan Africa alone had a poverty stricken population of 216 million and according to the same source, it was estimated as the figure will go up to 304 million by the year 2000.

Until about 1962, Africa had been a net food exporter. Since then, Africa has increasingly become a net food importer (Tapsoba, 1988). This inadequacy of domestic food production has seriously weakened Africa's capacity for coping with both short-term food emergencies and the longer-term and sustained food needs of its population. Per capita food production has declined steadily in most countries since 1970s and it was very much below what it was in the 1960s and prior to that. As domestic food production failed to keep pace with population growth and required amount of demand, the gap had to be filled by food imports.

Food imports, as a percentage of agricultural imports were about 80% and 83%, on average during the periods between 1975-85 and 1981-1985 respectively (Tapsoba 1988). In general, as indicated in a number of studies and reports, since 1980, the food and agricultural sector

has been and is being a net foreign exchange user and has significantly contributed to Africa's balance of payment deficit. 'Grain imports by the Sub-Saharan African countries has increased at an annual average rate of 14% from 1966 to 1984, and a significant portion of this has accounted for food aid, increasing from about 100,000 tons in 1966 to 4 million tons in 1984' (Christensen, 1987:68).

Lofchie (in Hollist and Tullis) explained as the crisis was and is even more severe in some parts of the region in the following words:

> The continent is increasingly unable to feed its people. Domestic food production in many countries is now woefully inadequate. The gap between production levels and national needs through the continent has greatly increased, requiring massive grain imports. And in certain of the most seriously affected countries, such as, Ethiopia, the Sudan, Mozambique, and Chad, even extraordinary efforts to provide food assistance has not prevented starvation (1987:98).

According to the FAO (1993), currently, the number of hungry and malnourished people in Africa is believed to be between 175 and 200 million. Despite the continued food imports and international aid, daily caloric intake in Africa remained almost stagnant at 2100 calories per caput on average. These current levels, are much less than the standard for an adequate diet of 2400 calories for active and healthy life and are even below those attained in the 1960s (which was 2140 Kcal).

The problem, as different studies suggest, will continue in the year 2000. Projections to the year 2000 for Sub- Saharan countries, for instance put production at 110 million tones of basic food staples and demand at about 160 million tones, which shows a serious and widening food gap, with West Africa, Central and Eastern Africa, and Southern Africa accounting 67%, 22.6% and 10.4% respectively (see Table 1.2 below).

Table 1.2: Average Annual Consumption and Production of Basic Food Staples in Sub-Saharan Africa

(Million metric tons)

	CONSUMPTION		PRODUCTION		DEFICIT	
	1979-83	**2000**	**1979-83**	**2000**	**1979-83**	**2000**
Sub-Saharan Africa	83.5	161.3	75.9	110.4	-7.6	-50.9
West Africa	37.1	76.1	33.4	42.0	-3.6	-34.1
Central Africa	13.4	24.4	12.7	19.2	-0.8	-5.3
Eastern & Southern Africa	33.1	60.8	29.8	49.2	-3.2	-11.5

Source: L.Pauline, 1986 (in FAO 1996:195).

Despite all these, many writers argue as Africa has a huge agricultural resource potential. Then, **the question is how this resource-rich continent has now become one of the poorest and why is it not able to tap these resources and feed its people?** The problem, according to many scholars, is due to many and interwoven internal and external factors (Eicher 1985, Lofchie 1987, Demery and Aaddison 1987, Tapsoba 1988, and Geier 1995). In any case, any attempt to solve the problem of food insecurity should identify and analyze the underlying causes of the problem.

However, although there are varied views and analysis of the causes of the African food problem, the following three factors seem to be the root causes of the continent's agricultural crisis and food insecurity.

a) Inappropriate policies pursued by the African countries with a bias and neglect against the food and agricultural sector;

b) Lack of technological change; and

c) Institutional weaknesses and lack of basic infrastructure (Hoisington and Bunyasi 1985, and Tapsoba 1988).

Although in many African countries, agriculture is a major sector that accounts for more than 50% of the GDP, employment generation, foreign exchange earning, and raw material supply for the industrial sector, many countries in the continent devote only an insignificant national

budget. For instance, as mentioned by Tapsoba (1988), many of the region's countries allocate only less than 10% of their national budget to the sector.

Most of the African nations, since independence, have favored industrial and urban development at the expense of agricultural and rural development. Within the food and agricultural sector, indigenous policies have largely devoted the best lands and agricultural investment to commercial plantations for export crops and have neglected the food sub-sector. This neglect has resulted in, shortage of domestic production, reduced farmer income and incentive, heavy taxation on export crops, increased and subsidized food imports and aid, and worsening balance of payment (Hoisington and Bunyasi 1985, and Tapsoba 1988).

The neglect of the agricultural sector, in general and the food sub-sector, in particular, is also illustrated by lower official producer prices fixed by the governments and consequently, farmers have not been encouraged to produce beyond their household consumption requirements. Moreover, lack of credit to make long-term investment and to acquire agricultural inputs (such as: fertilizer improved seeds, pesticides, etc.) have highly affected productivity.

Many African governments have also been practicing policies that are aimed at favoring the urban areas in providing cheap food and raw materials to the urban consumers and industries, which aggravated the rural-urban migration. This has also drained the active labor force from the agriculture sector leaving negative impacts on the development of the sector and ultimately aggravating the food crisis.

With regard to the technological weaknesses, the production and productivity in Africa is heavily constrained by the rudimentary nature of technology usage. In Africa, there has been not a significant technological change since the 1960s except the expansion of area under

cultivation (Tapsoba 1988). Particularly, the inadequate use of improved farming tools, agro-chemicals, improved seeds and poor livestock husbandry practices have affected the subsistence (smallholder) sector. Furthermore, the very limited agricultural research has often been confined to the research centers rather than reaching the complex farming system at the grassroots level.

In Africa, institutional weaknesses in areas like research and extension, manpower development, local institutions and basic rural infrastructures had seriously affected the food and agricultural production in general.

> Investment in basic institutions to develop human resources, to research and disseminate new and appropriate technologies for agriculture, and to strengthen internal market linkages have been highly inadequate. At the same time while traditional forms of security against food emergencies such as the communal ownership of food reserves and the means of production especially land and water have been weakened by rural-urban migration and other social factors, modern systems have not been set up to replace them (Hoisington and Bunyasi 1985 :80)

Lack of skilled manpower in general and in the agricultural sector in particular, had a considerable impact on the development of Africa's agriculture. Agricultural research has not been successful in the food crop sub-sector, and the traditional production technologies were not able to provide increased output necessary to keep pace with a rapidly increasing population of the region. Also agricultural extension which is a basic link between the research results and the farmer was very weak in the whole agricultural system.

Inadequate and fragile physical infrastructure, such as, all-weather and feeder roads and weak transport systems contributed to high distribution costs and irregular input deliveries. And this had impaired the transporting of food surpluses out of producing areas into food deficit areas and urban markets. This in turn constrained agricultural development and food security of different countries in the region.

One can then safely argue that as all these factors are highly interrelated and above all as the policy environment can affect other factors. If technologies, research and improved management (including human resource development) are known to increase crop production and productivity, and efficient marketing, distribution and transportation networks result in easy access to improved agricultural inputs and food availability, there must be a sound policy environment. Without a sound and stable policy environment obviously there will not be a significant change on food production and food security of a given country.

Among other factors that are areas of considerable debate in the literature, the most widely mentioned ones which are said to be aggravating the food security problem include: drought; high population growth rate; environmental degradation; political instability and wars; and unfavorable international economic environment and heavy debt burden.

Furthermore, currently poverty as a major cause of food insecurity is widely perceived by almost all the researchers and the academicians. "Food Insecurity is almost inevitably a result of poverty" (FAO, 1997:17). Thus, poverty eradication through economic growth is believed to be an instrument to improve access to food and ultimately guarantee food security.

Finally, it is appropriate to ask **what efforts have been done to curb this alarming trend of food security crisis?** In most of the Sub-Saharan African countries there was a general recognition that the situation that had prevailed in agriculture since the 1970s and characterized the overall economic environment for the early 1980s not only is sustainable but also must be changed. As indicated by Christensen (in Hollist and Tullis, 1987), the Economic Commission for Africa's joint Economic Report on Africa (1985) stressed the role of mistaken policies in decreasing agricultural output, fostering inefficient parastatal

structures, and eroding incentives for private entreprnurship. The OAU's July 1985 summit meeting had similarly gave due emphasis about the importance of agriculture and the need for policy changes to spur increases in economic growth. The World Bank and the USAID's analysis of African agriculture have also consistently indicated the need for policy reforms.

Although there was a growing debate and consensus on that change must be made, there remain disputes about what form should these changes take. The range of policy reforms being discussed includes: **changes in food and agricultural policies; changes in macroeconomic policies; and changes in institutions and infrastructures** (Christensen in Hollist and Tullis 1987, Tapsoba 1988, Hoisington and Bunyasi 1984, Maxwell 1992).

The main measures and policies utilized by many African countries to affect food and agricultural output were in various price policies, including producer price support and input subsidies. "The initial phases of the policy reform concentrated heavily on changes in agricultural price policy, because the pervasive practice of holding down prices for officially marketed foodstuffs and key export crops was a major disincentive to increase production (Christensen, in Hollist and Tullis 1987:76). Other policies include trade policies, food aid, credit, etc.

The second policy reform, the macroeconomic policy agenda, is not only meant for its impact on agriculture, but for its wider economic impact. These policy prescriptions mainly emphasized the need for changes in the exchange rate, generally to end the overvaluation of African currencies.

The third, the institutional reform agenda has mainly focused on the state's role in the economy in general as well as the inefficiency and cost of the institutions created to support this role (parastatals). Thus, in many of the African countries, reducing government employment, and eliminating or reforming inefficient parastatals, is becoming a pragmatic requirement, especially in countries facing severe, sustained, economic hardships (Ibid.: 82).

But, have these policy changes led to increased output for agriculture as a whole, and increased food output in particular? No, the IMF and World Bank's conditionality, which has tended to increase agricultural productivity through agricultural incentives and the Structural Adjustment Policies (SAP) was a significant deterioration in overall economic performance throughout most of the continent. Thus, the key for the problem rather seems to be other factors, which can profoundly affect food production and/or output. These factors, as well stressed in the 1996s World Food Summit, are those of household food security, poverty, and sustainability and environment. Particularly, creating an enabling political, social, and economic environment designed to ensure best conditions for poverty eradication.

1.1.3 Food Security Situation in Ethiopia

A clear understanding of the level and potential situation of a country at large and the region, and local administrative areas that are pertinent to this study in particular, can obviously lead us for a profound analysis of food security/Insecurity situation at all levels. Therefore, this part of the paper after briefly highlighting the overall socio-economic condition of the country, tries to discuss the agriculture sector performance, food production and requirements of the country, policies and strategies that are pursued by the governments of Ethiopia in different times to enhance the food crisis, challenges behind the food crisis, and finally looks into the situation and magnitude of food insecurity at the local levels (in the *Amhara* Region, South *Wollo Zone* and *Legambo Wereda)* and introduces the study *wereda.*

a) General Socio-Economic conditions

Ethiopia, by any standard is leveled as one of the poorest countries in the world. Its economic status is incompatible with the ever-increasing number of population. The current total population size of Ethiopia is estimated 63 (of which 85% is rural population) million with an average growth rate of 3.2% per annum (CSA). If we consider some of the statistical facts that reveals the miserable situation of the country, infant and child mortality is 116 and 171 per 1000 live births respectively. Life expectancy is only 51 years. The overall health service coverage is only 51%, which means only 51 persons out of every one hundred persons have a potential access to basic health services. Dependency ratio, which is defined as a quotient between the sum of the population aged 0 to 14 and 65 years and above (population assumed to be economically not active) to the population of working age group, 15 to 64 years (economically productive population) is 95. Which means, every 100 persons in the economically productive age take care of themselves and additional 95 persons for their livelihood (CSA 1999; MoH 1999).

The current enrollment rate of primary and secondary schools education is only 37.4 percent and 13.0 percent respectively. In other words, only less than a third of the primary school age children (between the age of 7 and 12), attend their schooling. Out of this number only 19 percent and 9 percent of the appropriate age groups advance to the junior and secondary level education respectively. Interesting enough only one- percent advance to the tertiary level of education. Moreover, only 12 percent of the rural population and 80 percent of the urban population have access to safe drinking water (CSA 1999, Befekadu and Brehanu, (eds.) 2000). Infrastructure networks like road is very poorly developed i.e., 15.2 km per 1000 square km and has been severely damaged by the civil war (Ethiopian Road Authority 1997).

Regarding access to basic facilities/services the situation is equally alarming. As far as food market is concerned 78.3 percent of households in Ethiopia are 9 km away from this basic facility. Almost half (47.3 percent) of the total households in this country have to travel half a day to reach a postal service. Transportation service is hardly available for about a quarter (24.4 percent) of the households as they are situated at a distance of 20 km from the places where the service is available. Furthermore, about 37.1 percent of the total households are living at least 20 km away from the telephone station and more than 89 percent of the households travel about 4 km to the drinking water points. In the rural areas almost 95 percent of the households use traditional fuel (firewood, leaves/dung cakes) for cooking and 84.4 percent of the households have no toilet facilities at all (CSA 1999).

In Ethiopia, around 87 percent of the households are spending between 2,000 and 12,599 Birr per annum, of which the bulk of the population (about 63%) of the households, spent less than 5,400 Birr per year. As regard to income, more than 78 percent of the total households in the country are earning between 2,000 and 12,599 Birr per annum. Almost 34 percent of the total households are directly spending what they earned. As cited in the Befekadu and Brehanu (2000), the country's real per capita GNP for the year 1998 was 100 USD. The average figure for low-income countries for the same year was $520 while the average for Sub-Saharan Africa was $480.

The overall calorie intake per person per day at the national level is only 1770. This figure is much lower than the minimum calorie level, i.e., 2100 kcal recommended for the country. In general, these all statistical figures reviewed above indicate that the country is the poorest of all the poor countries in the world.

b) The Performance of the Agriculture Sector

Agriculture is the bedrock of the Ethiopian national economy. It is the mainstay in realizing the food security in the country. It is the source of livelihood especially for the rural people who constitute for more than 85 percent of the total population of the country. It accounts for 50 percent of the Gross Domestic Product (GDP), generates about 90 percent of the export earnings and supplies 70 percent of the country's raw material requirement for large and medium sized industries that are agro-based (MEDaC 1999). Above all the sector provides employment for the large and rapidly growing rural population. Therefore, since the economic, socio-cultural and political life of the country depends on the development of agriculture, the transformation of this sector is of paramount significance for the country as a whole. Yet, poor management, lack of improved technologies, inappropriate policies, etc. kept the sector's performance at low level of productivity.

The country's annual agricultural production declined from 2.1 percent between 1965 and 1973 to 0.6 percent between 1973 and 1980 to minus 2.1 percent between 1980 and 1987 (Taddesse Berisso 1998, in Tegegne, et al (IDR) 1998). The performance of the agricultural sector through out the 1980's was very low with cereal production increasing at a rate of 1.7 percent per annum compared to the population growth of 2.9 percent annually. Per capita agricultural production declined by 2.7 percent, while crop productivity has remained low at an average per hectare yields of 1.2, 0.6, and 0.5 tons for food grains, pulses, and oil seeds respectively (MEDaC 1997). Thus, in spite of the huge potential for the development of the agricultural sector, the country has been and is being facing with serious food supply shortage.

Historically, Ethiopia was considered to be the potential breadbasket of the Middle East. Even in the 1960's, the country was hoped to be one of the success stories in its agriculture in Africa (Markos, 1997). Ethiopia has a total land area of about 113,000,000 hectares. Though there is no comprehensive survey on the land use pattern of the country 12.6 million hectares (10.3%) of the total area is intensively cultivated, and a further 15.3 million hectares (12.5%) is moderately cultivated. High forest and wood land areas account for 6.9 percent, while grassland for 30.5 percent and the remaining 39.8 percent goes to for shrub land, bush land, vegetation cover and water bodies (Befekadu and Brehanu, (eds.) 2000).

The main agricultural activity of the country is concentrated in the highland areas where the huge proportion of the country's population (more than 80%) is settled. Out of the total 111.7 million hectares[1], about 45 percent lie above 1500 meters which contain over 95 percent of the regularly cropped areas and around two-thirds of the country's livestock (high land reclamation studies, cited in Debebe 1999). Of which some 46 percent of the total lands (including 13% marginal areas that could be brought for cultivation), are estimated to be available for cultivation (Ibid.). Regarding the irrigation potential of the country, it is estimated that about 3.5 million hectares of the lands can be irrigated using the major river basins. But, currently only an insignificant proportion of this land, about 161, 010 hectares (4.6%) is put into use (Befekadu and Brehanu, (eds.) 2000).

The country also has quite a substantial potential of livestock resources in the continent. According to the estimates of CSA, Ethiopia has: 35.6 million heads of cattle, 13.4 million sheep, 10.5 million goats, 0.5 million equines, and 33.0 million poultry (1998).

[1] Adjusted for Eritrea

The country's crop development sub-sector is dominated by small-scale farmers following traditional, low input and output, rain fed and mixed farming, and backward agricultural technologies. Small-scale farms account for 95 percent of the total area under the crop production 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 these farmers while the remaining 6 percent of the food crops and 2 percent of the coffee production goes to the modernized farms (MEDaC 1997, Debebe 1999).

In Ethiopia, agricultural production is characterized by the severe fluctuations of rains. As can be seen from Table 1.3 below, there is a wide fluctuation of production during the periods between 1980 and 1996. During this period, on the average, to harvest 12.2 quintals of cereals 5.4 million hectare of land was cultivated or 12 quintals per hectare was produced. In 1995 and 1996, due to the conducive weather, agricultural area expansion, and the use of improved inputs there was a good production yields.

Moreover, during 1982, there was a good yield per hectare for almost all kinds of crops (cereals, pulses and oil seeds). Particularly, as it is revealed in the table, pulses and oil seeds productivity was relatively favorable in the years 1983 and prior to that. However, since 1984, though there seems an increasing trend in area cultivated, production and productivity trends registered relatively declining and fluctuating trends.

Livestock is a major contributor in the country's agricultural production system. Though it varies from region to region, livestock have diverse functions. According to ILRI (1995), livestock sub-sector functions can be classified in several ways: output produced-food (i.e., meat, milk, eggs); input to cropping (i.e., manure and draft power); raw materials (e.g., wool

and skin, etc.); cash income through sales of live animals or their output; savings investment through increasing the size and quality of the herd; social functions (such as: paying bride wealth, helping destitute families and providing animals for feasts or ritual ceremonies).

However, among other things, the livestock sub-sector is constrained by overgrazing, animal diseases, and poor management. Except their number, livestock in Ethiopia, both in terms of growth and quality has not been satisfactory even compared to the sub-Saharan African countries and countries in eastern Africa (such as, Kenya). Mortality rates have remained high at average rates of 8-10% for cattle, 14-16% for sheep and 11-13% for goats. These rates are much higher for the younger animals in each species. Young cattle mortality can go up to 13% for one-year old calves; mortality rates for one-year-old sheep and goats can range from 15-18% (Mulat 1999, Befekadu and Brehanu, (eds.) 2000:175). For this and other reasons such as, problems associated with feed, low genetic quality, drought, and lack of sufficient veterinary services the sub-sector is constrained to perform the above functions.

c) Food Production and Requirement Trends

Ethiopia has been self-sufficient in staple food and was classified as a net exporter of food grains till the late 1950s. It was documented that the annual export of grain to the world market raised to the extent of 150,000 tons in 1947/48 (Alemayehu 1988, as cited in Debebe 1999). However, starting the early 1960s, the country's domestic food supply situation has been declining and failed to meet the food requirements of the people.

In the process of production and requirement of food, though the experience of food deficit and famine varied across the country, the underlying conditions were often the same as research findings on the country's agricultural production reveals. These include, fluctuation of production (due to shortage of rainfalls and drought), lack of employment opportunities,

limited household assets, isolations from major markets, low level of farm technology, constraints to improvements in human capital, and poor health and sanitation environments. Food insecurity symptoms are therefore, the outcome of an interaction between natural, policy failure, socio-economic and environmental factors.

Food availability in Ethiopia is to a large extent determined by the country's domestic production of cereals. Ethiopia's diverse ecology and climate provide for a complex set of agro-ecological environments. This in turn has led to the relative importance of cereals and root crops by production regions. Shewa, Gojjam and Arsi together are often responsible for the bulk of cereal production of the country. And Gamo Gofa, Bale and Illubabor are producing least amount of grain and are more producing root and cash crops (mainly coffee, which is the country's major export crop).

Though the high potential areas are responsible for the production of cereals, both national level cereal production and resultant food availability have followed declining trends since the 1960's. Per capita cereal production has been declining by 4 kg per year on the average. The downward trend has not been also smooth and uninterrupted throughout the years. In some years such as, 1975, 1979, 1996 saw large increases in cereal production which may be partly associated with good rains and policy changes (IFPRI 1995, MoA 1998, Kifle Lemma 1999).

There is also variation within the country in terms of food production, due to variations mainly in rainfall and drought. Nevertheless, the overall production trend has been markedly negative. Except in 1996, Ethiopia has long been a food-deficit country. Even under normal climatic conditions, the country experiences a shortfall in food production to the tune of 25

percent of what the country's people actually need (MoA, 1998).

The trend lines for per capita cereal availability and food availability shows the same picture. According to IFPRI (1995), cereal availability per capita has been declining at an average of 5.3 kg per annum and per capita availability of all foods (cereals, pulses and roots) has been declining by 2.7 kilograms per year, while the population grows at higher rates. For the last couple of decades, since the beginning of 1980s, the total production of the country has increased only by 1.6 percent and growth in population was rated between 2.8 and 2.9 percents per annum. Per capita production, as a result of high population growth on one hand and a slow food production rate on the other, dropped by 0.7 percent. Generally, it is declined by nearly 15 percent; from 176 kg in early 1980s to less than 148 kg in the late 1990s (Debebe, 1999).

As can be seen from table 1.3 below, domestic food production showed a downward trend since 1982 up to 1994, and it has displayed improvements in the mid and late 1990s. The per capita level of food production also decreased from 176 kg in the early 1980s to 133 kg in early 1990's; which indicates a decline by nearly 25 percent (see Table 1.3).

Table 1. 3: Food production and Availability in Ethiopia ('000 MT)

Detail	1980-82	1983-85	1986-88	1989-91	1992-94	1995-99
Domestic Production	6597.8	6168.3	6022.5	6484.8	5885.4	8586.3
Import	558.1	923.4	1453.1	1533.1	1388.6	705.1
Export	54.1	45.4	33.2	25.1	18.3	41.0
Food Availability	7101.8	7046.3	7443.1	8192.9	7255.7	9410.0
Per Capita Production(kg)	176.0	149.5	130.5	132.2	114.2	147.5
Per Capita Food Availability (kg)	189.3	170.9	162.3	163.1	140.8	161.5
Surplus/ (Deficit)	(1358.2)	(2283.7)	(2846.9)	(3094.6)	(4347.0)	(3698.3)

Source: Debebe (1999).

This inter annual fluctuation on the food availability has been balanced both by commercial and food aid. As noted in Debebe (1999), commercial imports have increased from 0.5 million tons to a level of 1.5 million tons, which has shown a 300% increment. Between the

period of 1980 and 1999, the proportion of import volume to domestic production has ranged between 6% and 24%. That is per capita food import raised from 10 kg in relatively good years to a level of 30 kg in bad years.

d) Major Challenges of Food Security in Ethiopia

As discussed above, the Ethiopian agriculture has registered poor production records for the past three decades and the production was not compatible with required amount of consumption. This poor performance of the sector has resulted in widespread food insecurity in the country. Currently, it become quite common to hear estimates that almost more than half of the Ethiopian population is food insecure. The reasons, the number, and the magnitude vary from place to place within the country. Food insecurity, as mentioned elsewhere in this study, has different degrees (could be chronic or transitory) depending on the access to food by the households.

Though the causes of food insecurity are many and interrelated in Ethiopia, the major cause is drought and resource degradation, the latter is the result of policy failures. Recurrent droughts were documented since the ninth century, which were accompanied by famine and epidemics. But the degree and geographical coverage of the problem was much more limited at that time (Pankhurst, 1985). Ethiopia has been suffering from both chronic and transitory food insecurity, induced by drought. Within the past two decades, three major famines have occurred in the country (in 1974, 1984/85, and 1994) claiming the lives of many Ethiopians. The number of drought affected population in the country between the years of 1981 and 1995 ranged from a minimum of 2.53 million in 1987 to 7.85 million in 1992 (Befekadu and Brehanu, (eds.) 2000). In Ethiopia, according to the IGAD, 1990 study, nearly 71 percent (38 million) rural population were food insecure (cited in the Ethiopian Herald, Feb. 1998). World Bank's (1992) estimates also put the number of chronically and seasonally food insecure people at 21 million (40%) and MoPED also estimates some 27 million (50%) of the total population of Ethiopia in 1992 (see Appendix III for details).

Current situation is also frustrating. The reduction in production mainly as a result of poor *Belg* rains followed by late, low and erratic *Meher* rains in the past couple of years have meant that the country is once again faced with severe food crisis. Recently released FAO/WFP crop and food supply report-January 2000 (cited in Masefield 2000), revealed that estimates of food production, needy people, and food aid for the years 1995 up to 2000 are substantial (see table 3). As Masefield quoted from the FAO/WFP's report, the present food aid levels have been exacerbated by the significant depletion of livelihood assets in recent years as a result of multiple shocks, together with the erosion of traditional coping mechanisms and opportunities for income diversification for many rural households.

Table 1.4: Approximate crop production, Food aid Requirements, and Needy Population: Ethiopia, 1995 - 2000

Year	Estimated crop production (Million MT)	Revised Estimate of Food Aid requirement (MT)	Revised Estimate of Needy Population
1995	___	492,000	4 million
1996	11.8	262,000	2.7 million
1997	8.8	329,000	3.4 million
1998	11.3	602,000	5.3 million
1999	10.7	460,000	6.6 million
2000		898,936[2]	7.7 million

Source: Masfield Abi, based on FAO/WFP Report 2000, on crop & food supply assessment.

IFAD (1989), based on some selected socio-economic indicators[3], identified some five old demarcated provinces as highly deprived: Wollo, Gamo Gofa, Illubabor, Harrarghe and Sidamo. Shoa, Arsi, Gojam, and Wollega were classified as less deprived areas with reasonable access to resources, goods and social services (Tesfaye and Debebe, 1995).

The deprived regions, which are said to be structurally food deficit areas of the country experience food insecurity even during good harvest seasons. For instance, in the 1996 production year, due to several factors there was good agricultural production performance at an aggregate level. At the national level it was reported that the country produced surplus food and has attained self-sufficiency in food. However, this surplus production performance

[2] It is expected that estimated food aid requirements will ultimately exceed 1 million MT by the end of the year

was not evenly distributed throughout the country, places those are often called vulnerable, especially in the North Eastern highlands remained in need of substantial food assistance. Over the course of 1997 DPPC appealed for more than 400,000 MT of food to assist 3.4 million food insecure people (Kifle Lemma 1999).

But, what are the major causes of food insecurity/agricultural crisis that recurrently affect this much number of populations in Ethiopia? There are multidimensional factors that contribute to the challenge of food insecurity in Ethiopia. Among the major factors that are responsible for the country's food insecurity or poor performance of the agricultural sector are: population pressure, inadequate and/or diminishing farm size and land degradation; inadequate and variable rainfall; land tenure insecurity; lack of credit and inputs; backward farming practices and lack of adequate extension; poor infrastructure (road and marketing); and others (like crop pests and diseases (both livestock and crop), war, etc.

Population is one of the crucial factors in determining the development of agriculture and ensuring food security. The current size of population and its anticipated fast growth are the main factors determining future food consumption requirements. But, currently compared to the daily calorie intake of 2,100 Kcal recommended level, the estimated per capita calorie intake for Ethiopia, which is 1,770 Kcal per person per day (16% below the minimum level accepted by the government) on the average is far below the nourishment and adequacy level. Thus, the Ethiopian agriculture, which is based on subsistence farming and low in production and productivity can not feed the high population growth that is, almost 3 percent per annum.

[3] level of input and credit uses; oxen availability ; infant mortality rate; state of nutrition; etc.

The declining farm size which currently averages 1 hectare and even below that in some parts of the country is due to the high population pressure, and some studies warn as there is no further possibility to expand the farm lands and carry the pressure in many regions. As indicated in the annual report of EEA, 62 percent of the households in Ethiopia cultivate less than 1 hectare and over one-third (36%) of the holdings are less than 0.5 hectare. These households are often not able to produce enough grain to meet their family's consumption requirements.

The main cause of environmental degradation and depletion of agricultural resources is associated with the population pressure and the level of technology developed in farming. The level of degradation and soil infertility is very serious in some parts of the country, especially, in northern highlands, mainly due to population pressure and cultivating marginal lands. The amount of soil lost is estimated at 2 billion tons per annum as revealed in many studies. Thus, the problem of environmental degradation, if continued un-checked will obviously aggravate the problem of rainfall which frequently results in crop failures in north eastern Ethiopia, especially in places like South *Wollo*, North *Wollo* and *Waghimra.*

Lack of adequate and timely rainfall is one of the serious problems that cause food insecurity in Ethiopia. In Ethiopia, where irrigation practice, as mentioned earlier is very poor, high rainfall variation in intensity and time has been and is definitely affecting the food crop-producing households in particular and the agricultural communities as a whole in Ethiopia.

Land tenure security is believed to have a significant impact on the growth agricultural production, sustained land management and environmental protection and rehabilitation. In Ethiopia, the land tenure policy had been the major problem to make these impacts real. As kifle pointed out, '*private investment in agriculture was discouraged as land was put under government control. Land insecurity, coupled with the fear that the land will be distributed*

or taken by the government any time had stifled possible diversification attempts and investment in agriculture' (1999:12). This has an effect not only on the agricultural production, but also on the concerns in protecting the environment.

Lack and access to rural credit has also had negative impacts on the development of the food security situation of the rural poor. Though the farmers more or less are agitated to use improved technologies, inadequate availability of the technologies coupled with the farmers' capacity to acquire them kept the adoption rate very low. "In the Ethiopian agriculture, there is virtually nothing to speak of modern inputs such as fertilizers, improved seeds, pesticides, improved tools equipment machinery" (MEDaC 1997). The rate of fertilizer consumption, for example, is only 10.8 kg of nutrient per hectare of arable land compared to 48 kg in Kenya and 60 kg in Zimbabwe (World Bank 1995, cited in Mulat et al 1997, as quoted in Debebe 1999).

An estimated 75% of farmers are more than a half-day walk from all weather road. The average road density is estimated to be 21 square kilometer of land or 0.43 km per one thousand populations (FDRE 1996). This inaccessibility has made the supply of agricultural inputs, delivery of food aid, marketing agricultural outputs, and health and other service provisions difficult for the rural households.

Pest attacks and disease outbreaks (both on crops and livestock) have also worsened the lives of smallholder farmers and affected the agricultural production and productivity.

Who are the food insecure groups in Ethiopia? As cited in Dagnew Eshete 1997 (in CRDA 1997), Maxwell (1992) has categorized the food insecure group in Africa (including

Ethiopia) into the following five groups:

a) families that are poor in the ownership of productive and non- productive assets, but live in surplus agricultural areas;

b) the resource-poor living in disaster-prone and other marginal areas;

c) poor pastoralists mainly in low land areas;

d) the urban poor; and

e) refugees, displaced persons and others affected by war/civil conflicts.

In general, the rural landless people, female-headed households, the urban poor and, in some areas the elderly and the handicapped feature with increasing prominence among the food insecure group.

Thus, it can be deduced from the foregoing presentation that, the Ethiopian agriculture is in a serious crisis resulting in severe food insecurity severely affecting the vulnerable households. To eliminate the root causes of this problem, thus, it requires launching well-designed and integrated development policies in general and agricultural development in particular.

e) Policies and Strategic Efforts towards Enhancing Food Security

To narrow down the problem of food insecurity, different policy measures were taken by the Ethiopian governments during different historical periods. During the Imperial time, the package Programme approach was adopted in the 1960s. The programmes were mainly focused on Integrated Rural Development (IRD) to be implemented in a regional framework basis. CADU (Chilalo Agricultural Development Unit) was initiated in the former Arsi administrative region by Sida's financial and technical assistance. The overall objective of CADU was provision of development inputs (such as, fertilizer and improved seeds), targeting on the peasants. And the effect was expected to have a spiral effect latter on

affecting other areas. However, due to CADU's high operational costs involved, the Programme did not take the expected effects.

Latter on the experience of CADU was replicated in Wolayta Agricultural Development Unit (WADU), the Ada Agricultural Development Unit (AADU), and latter Humera Agricultural Development Unit (HADU). Of course, these programmes were not successful either.

During the 1980s, the Dergue's major policy intervention on the food and agriculture issue was mainly to increase productivity of small holding peasant agriculture through PADEP (Peasant Agriculture Development Extension Programme). PADEP was exercised in many parts of the country and financed by multilateral institutions (like the World Bank etc.) and governments (such as, Italy).

The policy and strategic framework particularly for food security in Ethiopia, however has been predicated on:

a) the National Food Security Strategy of 1996;

b) the Agricultural Development Led Industrialization (ADLI) strategy; and

c) the National policy on Disaster Prevention and Management. These contain important food security and agricultural development statements.

The Food Security Strategy addresses both the supply and the demand sides of the food equation, which means it addresses both the availability and entitlement respectively. It gives due attention on three major areas: increasing food and agricultural production; improving food entitlement; and strengthening capability to manage food crisis.

The food production component focuses on the availability and distribution of improved technologies in areas of reliable rains. And expansion of irrigation schemes in rainfall short areas. In the second, food entitlement, the strategy aims at reducing food insecurity through introducing alternative poverty reducing development schemes. The emergency capability involves maintaining food security reserves for emergency interventions.

The overall development strategy of the country, ADLI, places heavy emphasis on agriculture as the engine of growth. In the strategy agricultural development, particularly the development of smallholder agriculture is given a high priority. These efforts to raise the productivity of small-holder agriculture is envisaged to proceed in two ways: by using the technical know-how through extension and using improved and more appropriate technologies/inputs to ultimately increase productivity.

National policy on Disaster Prevention and Management aims to link relief with development. Through the community participation in local level development programmes and plans, especially in the most vulnerable areas, NDPM helps the needy to benefit from Employment Generation Schemes (EGS) in the form of food/cash. Thus, it is a strategy to create an Employment Generation scheme in order to alleviate the risk of seasonal food insecurity on the one hand and that of dependency syndrome (which is often created by free food handouts) on the other.

In general, Ethiopia has had a food security policy as such only since the formulation of the national food strategy in 1996. However, although the efforts did not bring the desired level of domestic supply to ensure food security, a number of measures were taken and policies has been pursued since the 1960s.

f) The Regional Dimension of Food Insecurity within Ethiopia

Since the country as a whole is diverse in the agricultural production potential and resource endowment, there is a wide range of variation in area cultivated, total food produced, population distribution, and consumption requirements among the regions. For instance, among different administrative regions the highest potential is found in Keffa, Iillubabor, Sidamo, Wellega, parts of Gojam and parts of Shewa while a low potential of arable land is found in many parts of Hararghe, Wollo, and Tigray (former administrative classifications). This could be attributed to the early settlement and high population density in the north and the farming systems of the south and south Western regions which are dominated by perennial crops while northern and central highlands are regions of annual crops which require greater land area to support people (Tegegn 1995, cited in Dejene et al, 1995, as cited in Reta 1998).

As a result of these difference in potential between the regions, the number of food insecure people are also varying considerably. According to Debebe and Tesfaye (1995), food insecure in Ethiopia are largely resource poor households and are found in almost every region except in some surplus producing pockets of Gojam, Arsi, Shewa and perhaps Wellega.

g) The *Amhara* National Regional State (ANRS) in Perspective

The Amhara National Regional state (ANRS), has a total area which is estimated to be 170.15 thousand square kilometers with an estimated total population of 15,879,236 of which 89.92% and 10.08% live in rural and urban areas respectively. Administratively, the region is divided into 11 Zones (including *Bahir Dar* special administrative zone), 105 *Weredas*, and 3051 *Kebele* administrations.

Topographically, the region can be divided into two main parts, the low land (below 1500 m.a.s.l) and the high land (above 1500 masl). The high land comprises the northern and eastern parts of the region, while the low land is mainly located in the northwestern part of the region. This dichotomy can further be classified on the basis of altitude variations: *Kolla* (31%), *Dega* (25%) and *Woinadega* (44%) agro-climatic zones.

As indicated in the region's IFSP, out of the total areas of the region about 27.3 percent is under cultivation, 39 percent left for grazing and browsing, 2.1 percent and 12.6 percent covered by forest, bush and shrubs respectively, and 18.9 percent is not currently put into productive use. The remaining 9.1 percent represent settlement sites, swampy areas, lakes, and the like.

Many rivers in the region have high irrigation and electric power generation potential. Abay (Blue Nile), Tekeze, Awash, Mille, Belese river basins drain the region. The annual average discharge rate of these river basins is estimated at 35 billion cubic meters. However, the current consumption rate does not exceed 1 percent and the irrigation potential of the water sources is estimated at 450 thousand hectares of land (ANRS, IFSP 1997).

Most parts of the region are topographically rugged. Though study results warn that farming on lands above 5% of slope endangering heavy soil loss, most of these rugged hills and mountains have been intensively cultivated for a longer period of time. Consequently, the land is heavily degraded in many parts of the region, and this resulted in 1 to 2 percent reductions in agricultural yields due to soil erosion. Deforestation is also another problem area of the region; supply of forest products has fallen by 32 percent (IFSP, 1999).

The region's population depends on crop and livestock husbandry for living. Crop production is predominantly rain-fed and farming is based on very backward and inefficient cultivation method. This resulted in very low yield productivity.

As part of mixed farming, the region possesses 8.94 million cattle, 3.7 million goats, 3.83 million sheep, 1.4 million equine and 9.07 million poultry. These figures, as pointed in the IFSP's report, accounts 33.29 percent of the country's total livestock resource. However, shortage of feed and diseases are the major threats of the livestock husbandry. Though not tapped, there is also an estimated 16 to 20 thousand tons of annual fish catch potential from the lakes (IFSP, 1999).

The region is endowed with 4.7 million hectares of cultivable land and the major source food is cereal production. Cereals accounted, on the average, for 80 percent of the regions cultivated land and 85 percent of crop production. The annual regional agricultural production is estimated at 109-kg per capita and industrial production at approximately ETB 17 per capita (IFSP, 1997:3 and 1999:5).

Shortage of land holding is another critical problem in the region. Although there are areas where farm households holding goes below 0.5 ha, according to the region's IFSP, average land holding is 1.7 ha and on the basis of per capita land requirement 94.4% of the households have insufficient land. The problem is more serious in drought prone and highland areas. Moreover, draught power being the major productive asset for the region's farmers, 19.9% of the region's farmers do not own an ox, 29.2% own an ox and 10% have a pair of oxen and the remaining are reported as having more than two oxen.

quintals on the average at the same period of time.

Overall, though the region is one of the surplus crop producing areas of the country, several parts of the region are repeatedly affected by food insecurity. In recent years the probability of drought occurrence is as high as three out of ten years and it has now become an inevitable event since some four decades ago, especially in the eastern parts. "There was no any single year since 1950, where there was no drought in the eastern part of the region" (ANRS, IFSP 1997). Though the causes of food insecurity that are listed and discussed above are also shared by the region, the following major points are identified by the region's Food Security Programme as major constraints for food security in the region:

- technological backwardness in agricultural practices and recurrent drought;
- inability to use water resource for agricultural purpose;
- natural resource degradation;
- pest attack;
- absence of non-farm income opportunities;
- problems related with the livestock economy;
- population pressure and access to social services; and
- rural marketing and credit problems.

Thus, cognizant of this serious and continuous food problem, which threatens the lives of the majority in the region, the ANRS has designed on the Integrated Food Security Programme (IFSP) for five years (since 1997). The IFSP, through a method of participating all stakeholders in the region's development, has identified, the resource poor farmers and vulnerable households; rural households in the areas of both acute food and water shortage; and returnees from the past resettlement and the landless as direct beneficiaries of the

The region is also very weak in terms of infrastructure and services. Only 22 percent of the total population has access to all weather roads. The density of all weather roads is 10.7 km per thousand square km, which is far below the national average. Low potential health service coverage, which is only 37.3% coupled with malaria and other disease outbreaks, has severely affected the region's productive labour force. In the region, infant mortality and under five mortality rate is 116 and 170 respectively. Gross enrolment ratio in primary (grade 1-8) and secondary (9-12) schools is 40.4 and 7.4, which signifies as the region is below the national coverage and only ahead of two peripheral regions (Afar and Somali), and only 18 percent of the region's rural households have access to potable water supply (CSA 1998; MoH 1999; MoE 1999; and ANRS-IFSP 1999).

When we see the food security situation of the region, ANRS suffers from both chronic and transitory food security problems in 49 declared drought prone and food insecure *weredas*. Most food insecure *weredas* are in North and South *Wollo*, North *Gondar* and *Waghemra* zones, where the annual rainfall can be as low as 500 mm. According to IFSP's report, assuming the 2100 Kcal, analysis of the past three years data shows that the food insecure *Weredas* of the region on the average meet 62 percent of their food requirements through domestic production. The number of population, which is chronically affected by food insecurity, is estimated about 2,466,742. This accounts for about 17% of the total population of the region and 36% of the food insecure *Weredas* population.

The total supply of food from local production, food aid, and other food sources in cereal equivalent for the past five years (1992/93 - 1996/97) on the average was 27,720,565 quintals. The demand during the same period at 2.25 quintal per caput was 31,688,107 quintals and the food availability ratio was 87.2%. This has showed a net deficit of 3,967,542

program in those food insecure *Weredas.*

The problem of food security as repeatedly mentioned in this study is very serious in eastern part of the region, more specifically in places like south *Wollo.* In south *Wollo* all of the *weredas* are categorized as food insecure by the region. *Wollo* as a whole, almost always has been mentioned when the issue of drought and famine is raised. Its history is punctuated by famine. As indicated in Webb and Von Braun (1994), in Ethiopian famine and food shortage chronology, *Wollo* is considered since 1953 as has been experiencing sever droughts and famines that have resulted in widespread human and livestock deaths.

South *wollo* zone, which has a total area of 1,773,681.25 ha and 2.4 million (of which 89.43% is rural) population is situated in the Eastern high land plateaus of the Amhara region. South Wollo has a great geographical diversity and rugged topography, which contains, mountains, hills, plateaus, gorge and valleys. The topographic features represent diversified elevations, which ranges from 1000m.a.s.l. (*Chiframeda*) to 4247 m.a.s.l. (*Amba Ferit*). This wide range of elevation enabled the zone to have four agro-ecological zones: *Wurch, Dega, Woinadega,* and *Kolla.* The zone on the eastern part is clearly defined by the steep edges of a mountain wall, which is the Western edge of the great African Rift Valley, having an average altitude of 2624 m.a.s.l. This act as a vast retaining wall which drops abruptly into the low, arid and hot Afar depression.

The dry seasons of the zone include the time between October through May, and the wet season runs from June to September (*meher)* and a short rainy season (*belg*) occurs during February to April. The average annual rainfall and temperature is assumed to be 1055 mm and 18.9^{0} c respectively. The zone is drained by two major basins, *Abay* and *Awash*. The

major permanent rivers in the Abay basin are *Weleka, Derame and Beshilo*. Rivers like *Borkena,* Upper *Mille* and *Cheleka* are the main tributaries of the Awash basin.

Though agriculture started very early in the area, still more than 89% of the population earn their livelihood directly from agriculture, basically subsistence farming. This long stay in traditional agriculture coupled with population pressure has resulted in destruction and ecological disturbances. Steep mountains, sloppy areas and grazing lands are converted into farming lands in many parts of South Wollo, especially, western parts of south Wollo. This in turn has led to substantial erosion hazards, diminishing soil fertility, disruption of the hydrological cycle, land sliding catastrophe, desertification, erratic behavior of rainfall, and a further reduction in the ability to produce food and other biological resources required by the increasing human and livestock population.

The zone has witnessed at least three (1973/74; 1984/85; and 1999) disastrous famines in the last three decades in which hundreds of thousands succumbed to a tragically slow and painful death (Meles and Gebeyehu 1999). According to different sources, all of these were due to rainfall failures. The 1973/4 famine was precipitated by the widespread failure in mid-1972 of the main rains (kremt), exacerbated by the total failure of the Belg rains of 1973. In 1973, however, as argued by Sen (1981), while there was no food decline for Ethiopia as a whole in the famine year, there was clearly a shortage of food in the province of *Wollo.* Thus, the shortage could be explained in terms of two different ways. One is the fall in food output in *Wollo*-a *direct entitlement failure* for the farmers and the other one is a *trade entitlement failure* for other classes of the society in the province. In general, the people in *Wollo* had not only faced a decline in food production, but also a collapse of income and purchasing power during 1973.

Similarly, the immediate cause of the 1984/85 famine was the failure of the *Belg* rains of 1984, following a poor harvest in the previous year. The 1999 drought was also the consequence of Belg rains failure too which was aggravated by the inadequate main season rains. Since the western part of the zone (places like *Legambo*) are mainly *belg* dependent, it was almost a complete crop loss due to severe shortage of moisture. According to the local Office of Agriculture and DPPC, the whole western part of south *Wollo*, was exceptionally affected. Reports from the zonal office of DPPC reveals, as 876,466 people have been affected and receiving food aid amounting more than 109,350 quintals between the months of June and August in 1998/99. According to SCF-UK's Nutritional Surveillance Program (NSP) 1999 report, even out of those households who have relatively received rains only 40% managed to plant, and of this number 60% have reported complete failure of area planted.

In south Wollo in Belg growing Weredas, the belg rains have once again failed. Severe livelihood indicators are now evident. Cereal prices started rising, livestock conditions are poor, and terms of trade have started declining. According to the zonal DPPC's 2000 assessment, over 929 thousand people require emergency food assistance during this year 2000).

1.2 The Study Area

1.2.1 Location and Size

Legambo is one of the 15 rural *Weredas* of south *Wollo* Zone, within the *Amhara* National Regional State. It is approximately located between 39^0 20'east latitude and 11^0 20'north longitude. The *Wereda* is bordered by *Dessie Zuria* in the East, *Jama* and *Wereillu* in the South, *Debresina* and *Kellela* in the West and *Tenta* Wereda in the North (see figure 1a and 1b). It has an estimated total area of about 107,687.5 hectares, of which as available data

indicate 41,501 hectare is cultivable land and all of it (41,501ha) is currently cultivated (see Table 1.5 for detailed land use of the Wereda).

Table 1. 5: Current land use/Land cover pattern of the *Wereda*

In hectares

	Total area	Farm land	Natural Vegetation						plantation	Waste Land	Water body	Developed area
			Forest Land	wooded shrub land	wooded grass land	shrub or bush land	Riverian forest	Grazing land				
Legambo	107687.5	41501	657	22928	-	22929	-	7872	1378	1666	351	8403
South Wollo	1773681.25	626349	15650	84141	53345	399345	4121	162203	40858	268488	8093	111088.25

Source: Compiled from South Wollo Department of Agriculture (1998) land use document.

The *wereda* comprises of 30 rural and 1 urban *Kebeles.* The *Wereda* town *Akesta* is located on top of a hill (3130 masl), connected by a wide area of hills and valleys is about 500 Km North of Addis Ababa, 100 Km from *Dessie*- the zonal center, and 580 Km away from *Bahir Dar*- the regional capital. Currently a projected total population of *Akesta* town is 3340 (of which 51.35 percent comprises female population). In terms of services and facilities, the town has a rural hospital and a junior secondary school. *Akesta* is connected with the zonal capital (*Dessie)* and other surrounding western *Weredas* (such as: *Kellela, Wegedi, Debresina, Sayint, Tenta, Meqdela, Wereillu,* and *Jama)* by an all weather road. But, other parts of the *Wereda,* except some 15 *kebeles* that are only accessible during dry season, are not connected with the *Wereda* center. *Akesta* also has a postal and telephone services, but the town lacks other basic facilities like, electricity and taped potable water.

1.2.2 Topography and Climate

Topographically the *Wereda* is dominated by the highlands, which varies from gently undulating slopes to hilly terrain and its altitude ranges between 1500-3915 meters above sea level (m.a.s.l). These areas are characterized by chains of mountains and plateaux. The agro-climatic zones of the *Wereda* include, *Woina dega* (areas between 1500 and 2300 masl), *Dega* (areas between 2300 and 3200 masl), and *Wurch* (includes areas above 3200 masl). The *Woina Dega, Dega* and *Wurch* parts of the *Wereda* constitute 58.73 percent, 39.13 percent, and 2.14 percent of the total area of the *Wereda* respectively.

The annual mean temperature in these areas of the *Wereda* is 15°c. The Wereda has a bimodal rainfall system, i.e., the main (*kiremt* or *meher*) and short (*belg)* rainy seasons. The *kiremt* or *meher* rainy season includes the period between June and September and the *belg* season include the period from December to April, and this short (*belg)* rain is often irregular and unreliable. The average annual precipitation in the Wereda is 1160 mm. As the *Wereda* agriculturists reports there is not sufficient precipitation in the *belg* season, and even in the main farming season the moisture is very low for agricultural production. The *wereda*, as the existing information shows, produces 90% and 10% of its *meher* cereals in *woinadega* and *dega* agro-climatic areas. In the belg season also, of the total production 85% and 15% of the cereals are produced in *dega* and *woinadega* areas (South *Wollo* Department of Agriculture 1998, Region 3 DPPC 1998 field data).

With regard to the economy of the *Wereda*, subsistence and traditional agriculture, both crop and livestock production, is the most important means of livelihood for the population in *Legambo.* About 98 percent and 2 percent of the population earn their livelihood directly from smallholder mixed farming (agro-pastoralism) and trade respectively. The Wereda as a

whole is drought prone and food deficit. There were continuous and serious droughts and crop failures in different historical periods affecting the lives of the residents. Due to the unfavorable climatic conditions, even most recently the failure of the *belg* rains, have seriously affected household food security in the *Wereda.* Hence, vulnerable households were and are forced to migration and fully relay on food aid.

In the *Wereda,* as the food balance table prepared by the regional IFSP indicates that, crop production is often far below the consumption requirements of the population. For example, the *wereda* has been receiving food aid amounting 16174, 8004 and 7670 quintals in 1994/95, 1995/96 and 1996/97 respectively. Interesting enough, even after channeling these amounts of food aid, the overall deficit during the mentioned years was: -228314, -226000, and -132850 quintals of grains respectively. Therefore, there is a widespread and continuous food deficit and insecurity in the *wereda.*

As can be seen from Table 1.6 below, the rainfall trend during the past six years generally was irregular and insufficient. For instance, the average rainfall in 1999 was only 4 mm and there was very little rains in months of January, March and June. This fluctuation and decline in rainfall usually results in drought in the *Wereda.* Especially the year 1999 was characterized as a poor year both for rainfall and agricultural production.

Table 1.6: Total monthly & average annual rainfall of the *wereda* from 1994-1999 (in mm)

year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Avg
1994	0	25.1	207.2	51.3	3.8	17.2	343.5	232.3	83.8	5.1	5.2	7	81.8
1995	0	17.5	55.8	106.2	63.5	17.8	190	150.3	28.9	0.1	0.8	43.5	56.2
1996	126.5	12.7	115	79.3	130.8	52.8	179.1	238.3	17.5	0	40.7	60.9	87.8
1997	50.8	0	73.3	69.7	5	89.1	231.3	237.5	5.6	36.4	52.2	7.1	71.5
1998	32.7	65.9	133	48.6	100	24.1	456.7	238.1	48.4	41	0	0	99.1
1999	25.1	0	4.1	0	0	18.7	0	0	0	0	0	0	4.0

Source: *kombolcha* meteorology station 1999.

1.2.3 Geology, Soil and Vegetation

The *wereda* in general, is found in the central Ethiopian highlands and bounded by the Abay gorge in the west and slopes and plateaus in the east. It has very dissected plateaus rugged and mountainous land forms, except some plain like tabular mountaintops such as *Gimba* area. Moreover, the *Wereda* is drained by the *Abay* drainage basins.

Hilly and steep slopes dominate largely the cultivated lands of the Wereda. For instance, as indicated in one study conducted by the Zonal Agriculture office (1998), 51.8% of the cultivated lands are categorized as hilly and mountainous slopes, and 19.8% of the crop land is in steep and very steep mountain slope. Thus, the croplands in the *Wereda* are not only intensively cultivated, but also are in a very steepy slope area and vulnerable to soil erosion and land degradation.

In *Legambo Wereda* different types of soils are existing. As identified by a study made by the zonal department of agriculture, the coverage of black, brown, red, and gray soils constitute 31 percent, 29 percent, 10 percent, and 5 percent respectively, and the remaining 25 percent covers non-vertic soil type.

Data from the *Wereda* and Zonal agriculture offices reveals that, out of the total land area of the wereda, only 4.4% and 3.37% is covered by natural forest and artificial forest. The climatic climax vegetation is dominated by scattered juniperus forest (South Wollo, NCS 1993). Wooded shrub, shrub or bush, and grazing land constitutes, 27.25%, 5.74%, and 4.85% of the total land cover respectively (Table 1.5).

As key informants reported over the last years, forest and vegetation cover is mercilessly cleared and lands are converted into cropping areas. As it can be observed now, out in the *Wereda* it is quite common to see bare and degraded hills and mountains and sparse grounds that are not covered with trees and grass. In the *Wereda* the major source of fuel for home consumption now is largely animal dung and shrubs.

Fig. 1a Location of the Study Area

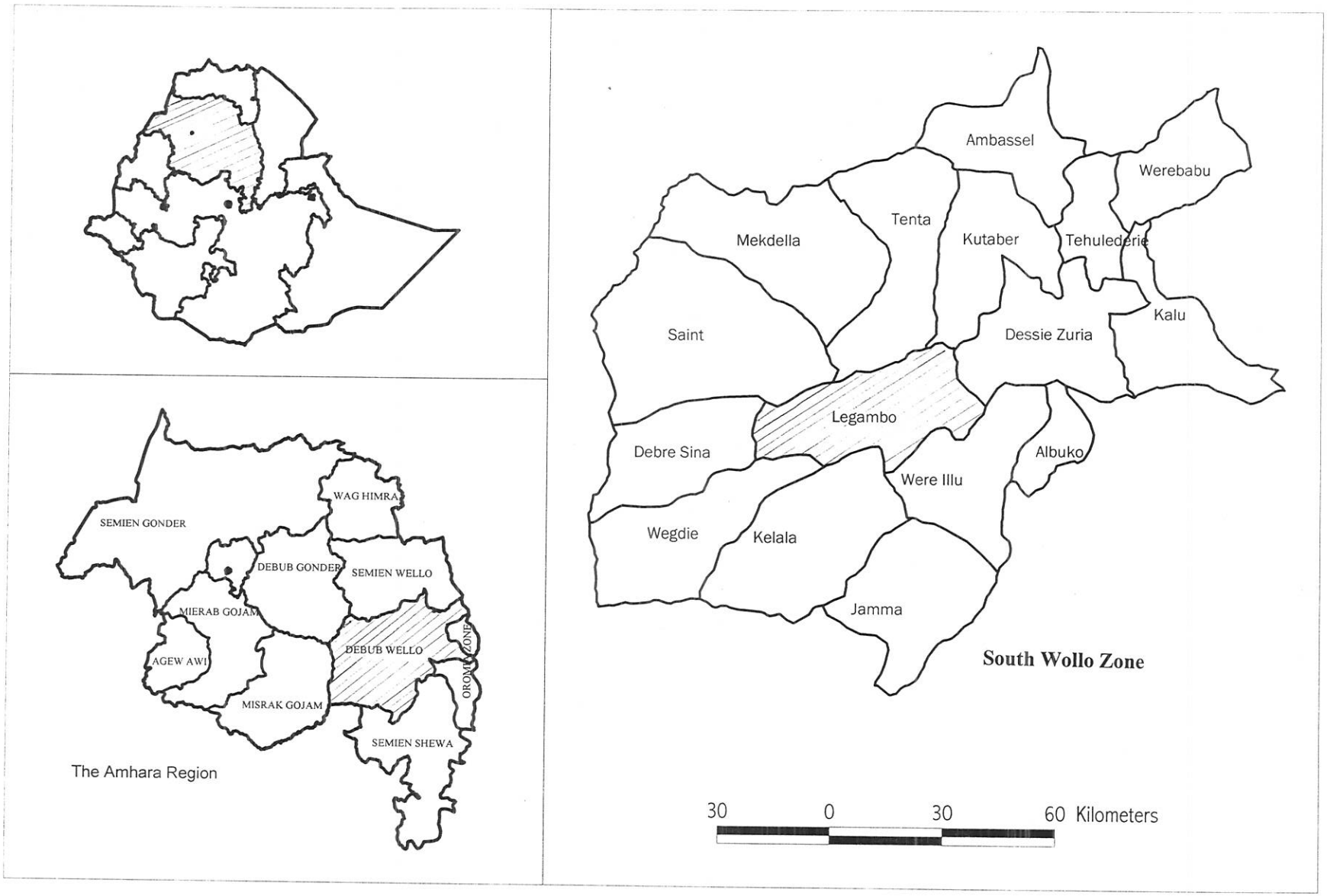
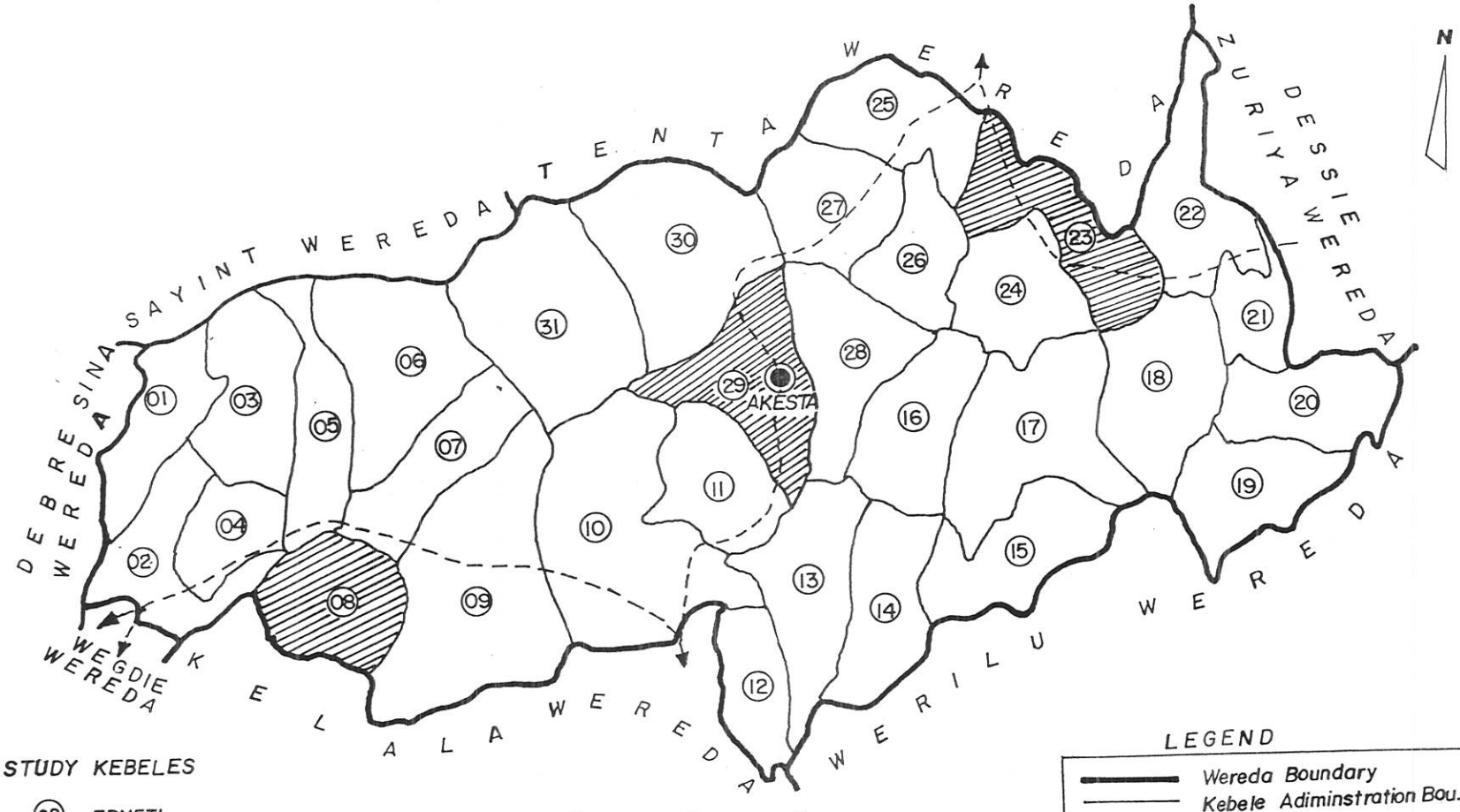


Figure 1b

LOCATION MAP OF LEGAMBO WEREDA (STUDY AREA)



1.2.4 Demographic Characteristics

The population of the *Wereda* is estimated to be 158,785, of which 154,499 (97.3%) is rural and 4,286 (2.7%) is urban. The overall population density for the wereda is 150 persons per square kilometer, which is the highest within South Wollo. The overall sex composition shows 49.2 percent males against 50.8 percent females. The younger generation almost dominates the population age structure and almost 45 percent of the total female population are in their childbearing ages.

As shown in table 4.3 below, the overall sex ratio for the Wereda is 96.8 which indicates a slight excess of females over males. However, the sex ratio both at the young and old dependency ages shows 102.1 males and 130.7 males for 100 females respectively.

The dependency ratio for the young and old age groups is 78.2 percent and 10.3 percent, respectively. The overall dependency ratio in the Wereda reaches 88.5 percent, which means, about 100 persons in the working ages have to support additional 88.5 economically inactive dependents. The economically active persons from the total population accounts 53 percent in the Wereda (see Table 1.7).

Table 1.7 Distribution of population by age, sex, and sex ratio

Age group	Both sexes	%	Male	%	Female	%	Age specific sex ratio
0 - 14	65864	41.5	33278	50.5	32586	49.5	102.1
15 - 49	67888	42.8	31747	46.8	36141	53.2	87.8
50 - 64	16336	10.3	8135	49.8	8201	50.2	99.2
65+	8697	5.5	4927	56.7	3770	43.3	130.7
Total	158785	100	78087	49.2	80698	50.8	96.8
Percentage	100	-	49.2	-	50.8	-	96.8

Source: Computed from CSA population and housing census results for Amhara region 1995.

1.2.5 Ethnicity and Religion

The 1994 Census report indicates that, the major ethnic group (more than 99%) in the *Wereda* is *Amhara,* and a very insignificant proportion constitutes, *Kembata, Oromo,* and *Tigrawi.* With regard to religious composition, 93 percent of the population is Muslim and 6.8 percent and 0.2 percent of the population follows Christianity and catholic beliefs respectively (CSA, 1995).

1.2.6 Settlement Pattern

In almost all places in the *Wereda* although the distance between homesteads may not be great, peasants are living in dispersed villages. The houses are often grouped together on the basis of kinship and marital ties. The houses are also located almost always at the feet of high rising hills and mountains. As data from South *Wollo* agriculture department depicts, 88 percent, 10 percent, and 2 percent of the *Wereda's* population is settled in *dega*, in *woinadega*, and *wurch* agro-climatic areas respectively. Furthermore, although some households have houses with corrugated iron roofs, majority of the houses in the Wereda are often built of wood, plastered with mud and their roofs are thatched with grass.

1.3 Statement of the Problem

Although Ethiopia has been trying to address food security and its related elements, today, a significant number of its population is chronically food insecure. Among other things, recurrent drought, faulty development policies, prolonged civil strife, high man land ratio are said to be the major factors that have contributed for the worsening situation, particularly in the northern parts of the country. Especially in the past couple of decades, the over all situation of the country have been worsening and the demand for food has increased ever than before. Consequently, due to the inability to meet the demand, a large number of the country's population remained food insecure.

As indicated by Tesfaye and Debebe (1995), recent evidences show that more than half of the population are food insecure of which the largest group are the rural poor with insufficient land and capital resources to produce enough income or food. Their number, also as confirmed by various studies, ranged between 19 to 38 million and is typically concentrated in structurally food deficit and densely populated areas of the country. Moreover, currently as officially disclosed by the government, more than 8 million people of the country are chronically food insecure. According to IFSP report, more than 2,466,742 households are estimated to be food insecure in the *Amhara* region.

The degree and nature of the problem varies among different regions and localities of the country. Some regions are more prone to drought than others and are often affected by food crisis. For instance, in the recorded history, drought induced famine was and is more serious in *Wollo*, severely affecting household food security. As shown in Mulat, et al (eds. 1995), in the former *Wollo* region alone the total vulnerability and chronic poverty was 85.4 and 52.4 percents respectively. Regarding the extent of deprivation index of access to resources, and goods and social services, *Wollo* is classified as 'highly deprived'. Moreover, according to MEDaC (1999), nearly 53 percent of south *Wollo's* rural households were under the basket of absolute poverty and food insecurity.

The *Amhara* region through its recently established 'Integrated Food Security Program' (IFSP) also categorized 49 out of the 105 *Weredas* of the region as food insecure and (of which 15 are from South *Wollo* Zone) highly susceptible to drought. Thus, the above indicators briefly reveal that there is a high degree of food insecurity when it is viewed at an aggregate level among the *Weredas*. The situation, however, may even be worse than this in *Weredas* like *Legambo* in general and at household levels in particular if closely examined.

Another important point is therefore, although South *Wollo* as a whole is known to be food insecure, the food crisis has been uneven among different *Weredas*, affecting some more seriously than others. This unevenness is often due to variations in climatic conditions, differential resource endowments, geographical locations, vulnerability to drought, soil infertility and low land holding (in general, due to environmental, cultural, socio-economic and political reasons). There are also significant variations among different households in a *Wereda* depending on their strength to survive the crisis (or on their ability to food access).

Although households in *Legambo Wereda* (like any other *Weredas* in the region) derive their livelihood directly from agriculture, they do not produce enough food or income to meet their nutritional needs. As socio-economic studies of south *Wollo* indicates, a large number of *Legambo's* population is chronically food insecure. The major features of food security in *Legambo* are a constant deficit in food supply, a declining trends in food production, and heavy reliance on food aid and *belg* rains. Though the major causes of household food insecurity are varied and complex, drought shocks have been and are still almost a common occurrence in *Legambo Wereda* resulting in death, migration, and severe human sufferings.

Food insecurity now is a mounting problem and virtually became a continuous concern for many rural households in *Legambo wereda.* Farmers belonging to the *wereda* have most difficulties to cope with the food crisis even during normal seasons, and most households are relying on food aid.

While food security has a multiple dimension, which ranges from the global, country, regional, local, household to individual levels; more attention is only given to the country level. Most frequently cited food insecurity reasons (such as: peasant production system, policy problem, economic and political factors) are only generalized and cited from macro

level studies and indicators. Such highly favored macro level view of food production and supply often overlooked the micro level food access, and the results of assessments and measurements at such an aggregate level hides the true pictures at lower levels.

Hence, to arrest food insecurity problems, we must tackle the root causes of it at the very lower levels. Thus, what has often been lacking, is a through understanding of what underlying factors are responsible for food insecurity at different *weredas* and household levels, and what people have done in the periods of food shocks.

Survival strategies have also patterns that differ according to the degree of the problem, season, and by region, community, household, gender, and age. In other words, local people have their own well-established mechanisms for responding to crisis; they are not only dependent on external resources. Type of coping mechanisms adopted, variations in their temporal sequencing, and the variety of mechanisms used at any time changes with severity, duration and prevalence of disruptive factors. Thus, a more complete understanding of local responses to risk in crisis situations is clearly essential if more effective mitigation and proofing strategies are to be designed for proper interventions.

Yet, the varied, complex and interrelated causes of household food insecurity and local responses during crisis situation are not well identified, studied and known, especially at the household level. Thus, identifying, analyzing, and understanding those elements that are responsible for household food insecurity in places like *Legambo wereda* needs urgent research undertakings and the results are believed helps to guide policy decisions, appropriate interventions and integrated efforts to combat food insecurity at the *wereda* and household levels. Hence, this study is proposed on these general grounds.

1.4 Research question

The central question of this micro level research, in general, revolves around major causes that are affecting food security at the household level in the *Wereda*. More specific questions for the investigation include, what are the major factors that determine household food insecurity in *Legambo Wereda*? What kinds of households are vulnerable to food insecurity? How do food insecure households survive? Generally, this study aims to identify and explain the major causes of food insecurity that are constantly threatening the lives of households, and to suggest how can changes be made in the future in *Legambo Wereda.*

1.5 Objective of the Study

As mentioned in the preceding parts, the history of *Legambo Wereda* as a whole is punctuated by recurrent drought and famine crisis. The Wereda as a whole is categorized as food insecure by the region, and food insecurity in this wereda is a chronic and growing problem. This serious problem thus calls for serious attention and appropriate interventions by all development partners, planners, and policy makers. To this effect there is an urgent need for researching the causes of food insecurity and coping mechanisms at the grassroots levels.

Understanding the mechanisms by which households are driven into food insecurity and designing interventions based on effective identification of the food insecure requires a wide range of data and analysis. Hence, this study mainly aims at assessing the overall food security situation of the *wereda,* investigate the major causes of food insecurity and identify coping strategies of the households in the *Wereda.*

The specific objectives of the study includes:

(i) provide a brief and clear picture about the food security situation of the *wereda;*

(ii) identify and examine the major causes of food insecurity among households in the *wereda*

(iii) identify coping strategies of the households during food crisis; and

(iv) finally, recommend some points that are sought as instrumental in changing the current and continuing threats of food security in the *Wereda.*

1.6 Significance of the Study

Household food insecurity has become important concern of government as well as donors and NGOs at different levels in Ethiopia. Currently, the issue is one of the top agendas of the central and regional governments in the country. Moreover, a huge amount of aid and government resource has been devoted both by the government and non-governmental organizations and also donors, particularly to the drought prone areas of the *Amhara* region to address the issue. However, in the absence of such an organized data and a tangible information at the local and household levels, attempts have often been not a success.

Thus, to design strategies for the reduction and ultimately alleviating household food insecurity, its root causes need to be identified and investigated very closely. It is such a background that attracted the researcher to make a study on the underlying causes of food insecurity in the *Wereda* at the household level. In general, against the background of very little attention given to the study of household food security, the seriousness of the problem, and non-existence of any micro-level research on the subject in *Legambo Wereda*, this study will be significant for variety of reasons.

More specifically this study will:

(i) have practical implications, since a clear understanding of the major causes of food insecurity at the micro level will help planners, policy makers, donors, and NGOs working in the area to design appropriate and effective policies, development endeavors, aid and other targeting and interventions;

(ii) help to understand the overall situation and to support the local knowledge and development initiatives;

(iii) the study result could also be further utilized for interventions in other similar *Weredas* and within the entire zone;

(iv) helps in providing reliable information to meet the prevention, preparedness, planning and implementation needs of the *Wereda* and vulnerable households; and

(v) give insight to researchers and students about the problem and stimulates further investigations of the problem.

1.7 Organization of the study

After this introductory and background chapter, chapter 2 explains conceptual framework and measurement issues. Chapter 3 reviews relevant literature to establish a background framework for the study. Chapter 4 outlines the data and methodological background to the study. Chapter 5 presents major findings and discussions from the household survey data. Finally, the last part of the paper summarizes the study and suggests recommendations.

CHAPTER II

CONCEPTUALIZING FOOD SECURITY

2.1 Concepts and Definitions of Food Security

For a broader analysis and understanding it is important to look into the concepts and definitions of food security and the issues embodied in it. Thus, in this section the meanings, interrelationships, different conceptual issues, etc. that have a direct bearings on the food security with major emphasis on the household levels will be dealt.

As the issue has become important from time to time, the concept of food security has similarly become so complex and confusing. 'The main cause of complexity is a shift in the level of analysis: from a primary concern in the 1970s with national and international food security, defined in terms of the level and reliability of aggregate food supplies; to a focus in the 1980s on individual and household food security, with the emphasis on access, vulnerability and entitlement' (Maxwell, 1992).

Equating national food security with food self-sufficiency is such a problem that needs to be clearly understood. In the early-1980s food security strategies focused on achieving food self-sufficiency using policies designed to maximize domestic output of food crops. However, attaining macro-level food self-sufficiency does not assure the achievement of food security at micro-level.

This leads us to a further distinction between macro ('food supply insecurity') and micro ('food consumption insecurity') dimensions of the problem. According to FAO (1986:197), the two terms are summarized as,

> "**food supply insecurity** (sometimes called **National Aggregate Insecurity**) arises when a country is unable to supply its aggregate food requirements either through domestic production, imports, or run-down of stocks and reserves. Food supply security is not the same as national food self-sufficiency. Although supply security can be achieved through a policy of self-sufficiency, it can also be achieved through food imports, or by a combination of imports and domestic production." On the other hand, "**food consumption insecurity** (some times called **Individual Insecurity**) exists when certain individuals or groups cannot gain access to adequate food given their nominal incomes and the price and availability of food. Food consumption insecurity often takes the form of chronic insecurity amongst vulnerable groups. Food supplies may be secure i.e. a country may possess adequate aggregate food supplies to meet needs, yet consumption insecurity may still exist i.e. certain groups lack adequate food."

Sen, for instance, has demonstrated as famines are more often caused by fluctuations in households' entitlements to food than by fluctuations in total food supply at regional or country level. Thus, although national aggregate insecurity always entails individual insecurity, the later (food consumption insecurity) can exist regardless of the status of aggregate national or regional food supply.

Furthermore, the conceptual framework of food security has developed in approaches and points of major emphasis have changed with change in time, and new and relevant aspects have been added for the analysis. As in the literature, the concept of food security attained wider attention in the early 1980s after the debate on 'access' to food and hence, the focus of the unit of analysis shifted from national and global levels to household levels. Theoretical basis for this paradigm shift from macro to micro and from production to access was fundamentally set by Sen's 'entitlement approach'.

Maxwell and Frankenberger (1992) cited nearly 32 definitions and developments in the concept of household food security. However, some are more cited by different writers and researchers than others. For instance, the following are some of the definitions that are most frequently cited:

a) Household 'food security' by the UN (1990, in CRDA 1997:3), is defined as "The ability of a household members to assure themselves sustained access to a sufficient quantity and

quality of food to live active, healthy life."

b) The UN Food and Agriculture Organization (FAO, 1983 in Maxwell and Frankenberger 1992:68) defines 'food security' as "Ensuring that all people at all times have both physical and economic access to the basic food they need."

c) The World Bank (1986) defines the term 'food security' as "Access by all people at all times to enough food for an active, healthy life" (Maxwell and Frankenberger 1992:68).

The USAID (1995), defines food security from another perspective. "**Food security:** *When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life"* (quoted in Bonnard Patricia, 1999:2). This definition has three fundamental elements of food security:

1 **Food availability** is achieved when sufficient quantities of food are consistently available to all individuals within a country. Such food can be supplied through household production, other domestic output, or commercial imports or food assistance.

2 **Food access** is ensured when households and all individuals within them have adequate resources to obtain appropriate foods for a nutritious diet. Access depends on income available to the household, on the distribution of income within the household, and on the price of food.

3 **Food utilization** is the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water and adequate sanitation. This aspect, thus focuses more on nutrition, and in this it differs from the normative definition by the World Bank. Effective food utilization depends in large measure on knowledge within the household of food storage and processing techniques, basic principles of nutrition, and proper childcare and illness management.

Household level food security is very important in so far as the household is the basic unit of analysis and which determines the production and consumption level for its members. At the household level, food security is often equated with sufficiency of household entitlements that bundle of food production resources, income available for food purchases, and assistance (through aid or other social bonds) sufficient to meet the aggregate needs of all members of the household. Achieving food security at this level is largely determined by an assumption of the minimum nutritional need (minimum calorie required for a person per day) principle. Thus, not only has the concept of food security been redefined but also the issue of food security has to consider the food needs and availability with an emphasis on the household.

However, some definitions are more frequently cited than others are. The World Bank's (1986) definition of 'food security' as: *"Access by all people at all times to enough food for an active, healthy life"* has been widely accepted and quoted since the late 1980's in the food security literature. According to Maxwell and Frankenberger (1992) and Debebe (1995), this definition clearly focuses on four core concepts: (a) sufficiency, (b) access, and (c) security and (d) time. As briefly noted by Maxwell, " 'Sufficiency' (defined as the calories required for an active, healthy life), 'access' to food (through production, purchase, exchange or gift), 'security' (defined by the balance between vulnerability, risk and insurance) and 'time' (where food insecurity can be chronic, transitory or cyclical) (Maxwell and Smith, 1992).

The concept of sufficiency or 'enough food' is confusing, ambiguous and problematic. In the literature it is presented in different ways as a: "minimal food consumption;" "target level;" "the basic food (needed);" "adequate to meet nutritional needs;" "enough (food) for life, health and growth of the young and for productive effort;" "enough food for an active, healthy life" and "enough food to supply the energy needed for all family members to live

healthy, active and productive lives" (Maxwell and Frankenberger, 1995:8). In general, the concept concentrates more on calories required not only for survival, but also for an active and healthy life.

Moreover, as the shift in the level of analysis from global and national to household and individual levels got momentum with emphasis on access, entitlement and vulnerability, the issue of sufficiency becomes more complex subject of food security. Thus, as defined by Zipperer (1987) "Always having enough to eat" (in Maxwell and Frankenberger 1992:68) is not enough by it self, rather it requires adequate calorie for an active and healthy life on a sustainable manner.

The second of the core concepts is "access," which is the pioneering contribution of Amartya Sen (1981) on "the entitlement approach." The issue is about whether the household or individuals are able to acquire sufficient food or not. One of the most commonly accepted definitions of food security is adequate access to food at all times (throughout the year and from year to year). Access in this sense can definitely be ensured if all the households and their members have sufficient resources to acquire adequate food. It is dependent on the level of household resources (capital, labour, and knowledge) and on prices. Access can be achieved without households being self-sufficient in food production, what is more important here is the ability of households to generate sufficient income which, together with own production, can be used to meet food needs.

Sen's entitlement analysis begins with the legal means of acquiring food in the society. Thus, according to Amartya Sen (1981:45), the basic idea of the entitlement approach is described as follows:

> The entitlement approach to starvation and famine concentrates on the ability of people to command food through the legal means available in the society, including the use of production possibility, trade opportunities, entitlements vis-à-vis the state, and other methods of acquiring food. A person starves either because he does not have the ability to command enough food, or because he does not use this ability to avoid starvation. The entitlement approach concentrates on the former, ignoring the latter possibility.

In Sen's entitlement analysis the vulnerability assessment is defined systematically. The analysis concentrates on each person's entitlements to different commodity bundles including food, and view insecurity/starvation as resulting from a failure to have adequate bundle with enough food. "An individual's entitlement is rooted in his/her endowment __ the initial resource bundle_ which is transformed via production and trade into food or commodities which can be exchanged for food. If the entitlement set does not include a commodity bundle with an adequate amount of food, the person must go hungry; in Sen's terminology, the individual has suffered an entitlement failure" (Maxwell and Frankenberger, 1992:10-11).

Amartya Sen (1981), identified four major categories of entitlements in explaining the legitimate ownership relations:

1) *Trade-based entitlement* that describes about the entitlement of an individual where he/she can buy with the commodity and/cash one own.
2) *Production-based entitlement* describes the ownership of what one produces using one's owned resources, or through hiring from others by mutually agreed trade conditions.
3) *Own-labour entitlement* explains about the sale of one's own labour power, and hence trade and production-based entitlements that are related to ones own labour.
4) *Inheritance and transfer entitlement* refers to one's right to own resources that are willingly given by others in the form of inheritance, remittance, gifts, food aid and transfers from the state in the form of pensions, food rationing or social security.

'Secure access to enough food' is the third main concept and it related to 'risk'_ the issue of entitlement failure as mentioned in the above. Risks to food entitlement could originate from a number of sources such as: weather variability, food production and supply variability,

variability in price and market, health hazard and morbidity causing risks, employment and wage variability. In general, it could be environmental, natural, political, social, cultural and economic.

'Securing' access to sufficient food, as suggested by Maxwell and Frankenberger (1992) and Debebe (1995), is also associated with the existence of risk which vary from natural to man-made factors. Deterioration in natural resources, disruption in food systems, and distortion in state policies and social ties are some of the risk conditions that contribute to the worsening of food entitlement.

'Secure access to enough food at all times' is the final main concept in understanding food security, and it indicates the duration over which a household could face food shortage/insecurity. "All times" shows the ability of the household to secure food throughout the year, even during the hungry season. And it also entails securing access to food for the future, on a sustainable basis. Otherwise, households would go short of food or get food insecure.

Food Insecurity, thus, unlike food security can be defined as, *'Lack of access by all people at all times to enough food for an active, healthy life.'* It signifies access failure for enough food due to lack of entitlements. Phillips and Taylor (1989), as quoted in Maxwell and Frankenberger (1992:69), explains the existence of food insecurity as: "Food insecurity exists when members of a household have an inadequate diet for part or all of the year or face the possibility of an inadequate diet in the future."

Food insecurity, as often mentioned in food security literature, can be **'chronic'** or **'transitory.'** According to Maxwell and Frankenberger (1992), the World Bank (1986), Debebe (1995) 'chronic food insecurity' is a continuously inadequate diet caused by the inability to acquire food by a household; while 'transitory food insecurity' is a temporary decline in a household's access to enough food.

Chronic food insecurity is a long term phenomenon affecting households that persistently lack the ability either to buy or produce enough food. Poverty in general, is a major determinant of chronic food insecurity. Transitory food insecurity, on the other hand, is often triggered by seasonal instability in food supply or availability, fluctuations in food prices and/incomes.

According to CIDA (1989), "transitory food insecurity focuses on intra_and inter_annual variations in household food access. It can be further divided into **cyclical** and **temporary** food insecurity" (cited in Maxwell and Frankenberger, 1992:15). Temporary food insecurity occurs for a limited time because of unforeseen and unpredictable circumstances (such as: drought or pest attack) that affects household's entitlements; cyclical or seasonal food insecurity when there is a regular pattern in the periodicity of inadequate access to food. This may be due to logistical difficulties or prohibitive costs in storing food or borrowing (Ibid., and FAO, 1996).

Food insecurity, however, from a wider perspective is a result of poverty. Households who have sufficient resources or adequate and legitimate entitlements have the ability to have access or command to sufficient food to their requirements. On the other hand, households with inadequate bundle of resources or who completely lack entitlements have no access to

their food needs and are suffering from food insecurity. Therefore, now days it is widely accepted that overall growth is a necessary condition for a sustainable solution both to poverty and food insecurity. The belief is that growth will raise incomes and welfare of the poor, and raise their access to food.

When food security concept is discussed, it is necessary to raise food security risks, which are affecting the household food insecurity. Risks to food insecurity are determined by the reaction of households against those risks that will prevail. Bohle and Watt and Alexander states that as "risk has three dimensions ... is a function of exposure to crisis or shocks, the magnitude or consequences of crisis and households vulnerability to these crisis" (cited in Debebe 1995:4).

Household vulnerability to crisis is an internal side of risk and is determined by the adequacy of households' capacity to cope with crisis. From this point of view households can be categorized into three groups; (a) 'enduring household' which maintain food security on a continuous basis, (b) 'resilient households' that suffer from the shocks but immediately recover, and (c) 'fragile households' which become increasingly insecure in response to shocks (Oshaug, cited in Maxwell and Frankenberger,1992).

In general, there are two approaches regarding risk factors that create food insecurity. The first one is related to looking into the characteristics of vulnerable groups in a society. The second is to examine the sources of risk to their entitlements. Both approaches, then give us useful insights in that the first one helps in identifying the vulnerable (the targets of food insecurity) and the second illustrates how that vulnerability may change over time (FAO 1996).

According to the same source, vulnerable groups can be classified into the following four areas on the basis of different criteria:

1. Geographic/regional-administrative Zone, urban, rural.
2. Ecological- by climatic conditions, accessibility.
3. Economic - occupation, level of income, formal or informal sector, size of land holding, types of crop grown, migrant laborer, female-headed household.
4. Demographic - male, female, pregnant, lactating, pre-school children, school-aged children, elderly.

With regard to the sources of risks as Maxwell and Frankenberger (1992) summarizes on a table, risks can be natural (such as drought resulted from climatic shocks, diseases- both human and livestock). Risks can be resulted from institutional or policy changes or inappropriateness (such as removal of subsidy programmes, tax impositions, changes in property rights). Market situations and price conditions and lack of employment opportunities also creates risks. Changes and failure in community obligations and traditions. Conflicts and the breakdown of the rule of law can definitely causes risks to those households and make them food insecure.

2.2 Measurement of Food Security

2.2.1 Classification of Indicators

The situation of household food security is determined by interconnected factors that vary from 'basic to immediate factors,' the former shows the influence on the 'overall economic system of a given country' while the latter affect 'food supply at a household level' (Debebe, 1995). Household food security situation is mainly determined by factors related to the process of food acquisition, household strategies of food procurement and the societies social mechanisms that backup households from periodic crisis/shocks. In this regard, the two major elements that are critical to household's food security are availability and stable access.

Due to this, data should be collected and analysis on factors that are determining availability and choices that households have to food access.

Since vulnerability to food insecurity is location specific, indicators are very important to measure supply and food entitlement changes at household level in localities. However, household food security being a very new concept, there is no universally worked out yardsticks. Therefore, assessment of household food insecurity is not only difficult, but also a complicated task. However, the existing literature notes about two categories of measurement: 'process indicators' (measures both food supply and food access) and 'outcome indicators' (that serve as proxies for food consumption).

Process indicators mainly include food supply and food access indicators. Food supply indicators are known to provide information on the likelihood of shock or disaster events that affects household food security. These indicators include agricultural production, access to natural resources, institutional development and market infrastructures. These indicators provide overall situation of a specific area in a context. However, such indicators are in most cases aggregated and hardly serve to monitor food stress at household levels (Debebe, 1995), because their application differs from area to area based on the resource endowment and the economic and cultural performances/traditions of the people in localities.

Food access indicators on the other hand, reflect various strategies used by households to meet their food requirement. In other words, it means availability of food for household consumption from either own production or from other meanses like off-farm income, community support and remittances. The application of these strategies, as mentioned by Debebe (1995) and Frankenberger (1992), varies among different regions, communities,

households, social classes, ethnic groups, gender and seasons reflecting various strategies in the process of managing the diversified sources of food.

Outcome indicators include all direct and indirect indicators of household food consumption. The types of indicators classified under outcome indicators are household budget and expenditure, amount and frequency of food consumption, subsistence potential, nutritional status, storage estimates, and household perception of food insecurity.

Another important indicator for food security is coping strategy, which is related to food access indicators. Household coping strategy is an index based on how households adapt to the presence or thereat of food shortages. Coping strategies involve diversification of income sources (between crop production, livestock, and non-farm employment), variations in degree of use of natural resources (farm land and common property resources), and social networks that serve as safety-nets during periods of crisis (Alem, 1999, in Aspen and Abdulhamid).

2.2.2 Choosing Indicators of Household Food Security

Indicator (measurement) is not only important, but also necessary at the outset to identify the food insecure, to assess the severity of their food shortfall and to characterize the nature of their insecurity. This helps for development interventions and monitoring and assessing the impact of the interventions on the food security situation of the beneficiaries. There are a number of alternate indicators of the level of food security at household and community levels. What is required is then "a refinement of the methodology for selecting and weighting of indicators of household and regional distress" (Webb and Von Braun, 1994) and adapting the indicators for use in area specific studies.

According to FAO/WHO (1992, cited in Debebe 1995), indicators of food demand and supply, and the import capacity of a country serve to measure food security at national level. On the other hand, indicators related to food availability for consumption and level and changes in food intake serve as measuring yardstick to define food security at household level.

In the literature, household level data can be generated using 'outcome indicators'-which describes food consumption in a relatively better way. It is the number of calories, or nutrients, available for consumption by household members over a defined period of time usually 7 or 14 days. As described by Haddad, et al (1994:332),

> At the household level indicators of food security and nutrition include demographic variables such as household size/composition, migration, ethnicity/religion, and/or age and gender of the individual. Factor market variables such as household income sources, changes and flows of income, access to credit, land ownership, and sale of assets including livestock have to varying degrees been used as proxy measures for household food security.

In general, indicators to be selected should be usable, relevant, reliable, timely, and cost-effective. Thus, in this study, household food insecurity will be measured mainly using household caloric acquisition. To this effect, data on food available (per capita food supply) for the household can be converted into calories using the nationally recommended level and grain calorie equivalent and adult equivalent conversion factors. Other indicators such as, non-farm income, food aid, livestock, land use and holdings, and coping mechanisms will be put into use. Furthermore, food access indicators, such as: land use practices, dietary changes and/coping practices, diversification of income/food sources, livestock ownership and sales, production and sales of production; 'outcome' indicators like the level and changes in consumption; and the amount of food in stores and other proxy indicators were used in collecting data and measuring household food security situations.

2.3 A Working Model for Household Food Insecurity

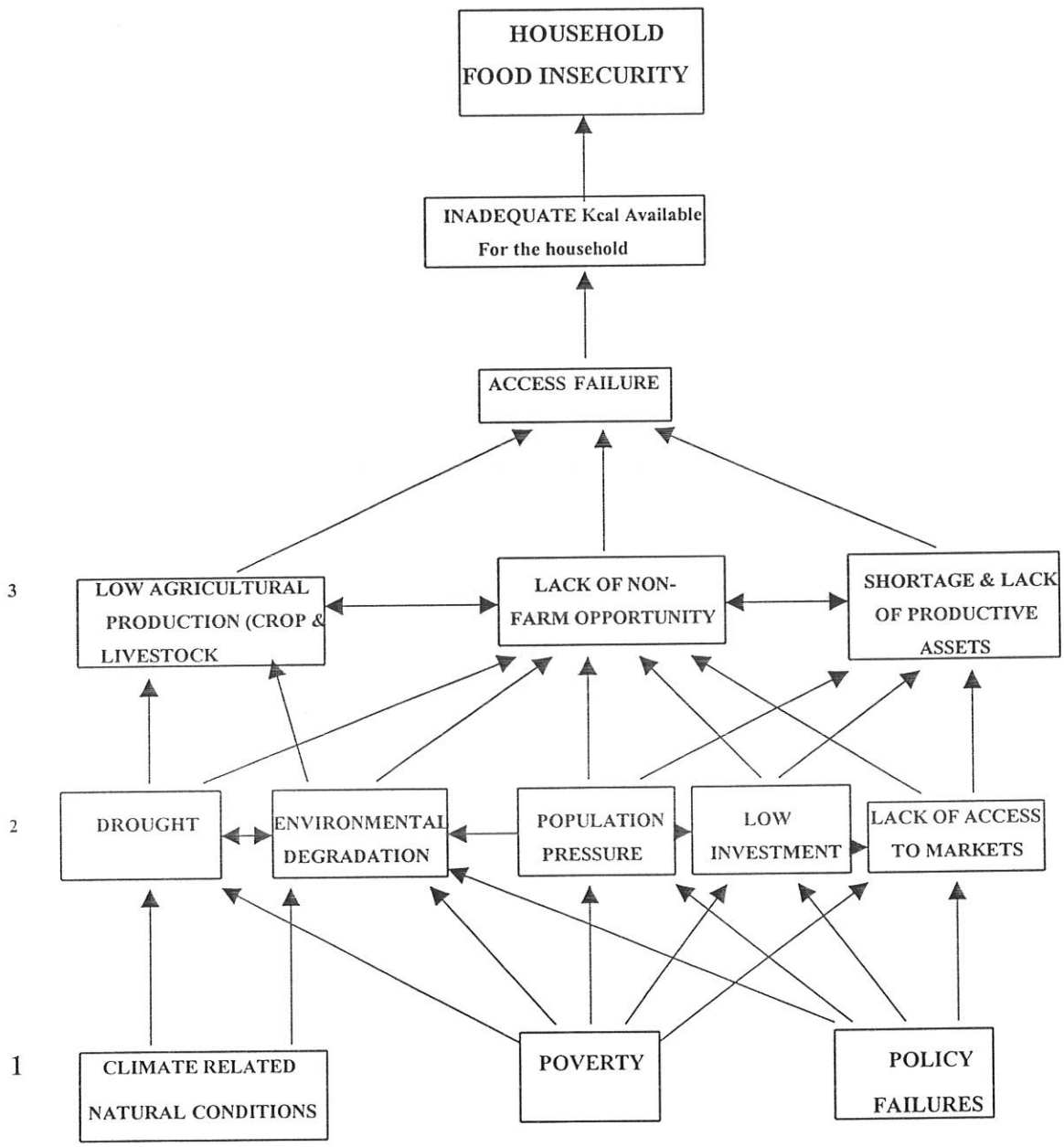
Household food security being determined by variety of interrelated factors, the following working framework is being developed to guide this study. Major variables that are assumed in causing household food insecurity are shown in figure 2.

As the figure (model) indicates the major causal factor that affect food security at household level is poverty. Poverty is the root cause for drought and vulnerability to food insecurity. Low level of investment on social services and infrastructure facilities and drought coupled with the increasing number of population are affected by the extent of poverty and hence aggravate household food insecurity. Poor households do not have enough access to agricultural production resources to produce their own food, nor sufficient income from other sources. All the underlying causes (such as: lack and insufficiency of land, lack of oxen and credit, and lack of non-farm opportunities) low agricultural production and undesirable natural conditions (drought), are the results of poverty, and this together with policy failures (which is a cross cutting factor), in turn are affecting household food insecurity.

Since food security at the household level is the capacity of the household to secure adequate food either from its own production or through purchases, it is affected by major factors such as: sufficient and productive means of production (labour, credit, land and natural resources); agricultural production and productivity (which in turn is affected by decreased and unproductive factors of production,); and non-farm opportunities. Factor like-education, training, extension, credit, irrigation and access to market, mainly determine non-farm opportunity and efficient utilization of improved technological inputs and this requires public and private investment in the rural development programmes. Failure to access in the above mentioned major factors leads to inadequate Kcal (kilo calorie) consumption for the household, which is the major indicator (measurement) of household food insecurity in this context.

Thus, as indicated in the figure, mitigating household food insecurity problems requires, policy attention in the areas of population control, environmental conservation, developing market access and infrastructure, as well as investing in social services and infrastructural facilities in the rural areas and above all in diversifying the rural economy.

Figure 2 A working model for causes of household food insecurity



Note: 1 = Basic Causes

2 = Areas of public Action (intervention)

3 = Underlying Causes

4 = Micro level conditions (consequences)

CHAPTER III

REVIEW OF RELATED LITERATURE

Although food security is a relatively recent development, there are some studies on the area particularly regarding household food security and insecurity in different parts of the developing countries. Yet, in Ethiopia only few attempts have been made particularly at micro levels. However, the existing literature and works in other parts of the world indicate the types of food insecure households and general causes. Moreover, though the underlying causes of household food insecurity has not been undertaken explicitly at household level in the Ethiopian context, several researches carried out in other countries on assessing and analyzing the determinants of household food security or insecurity, directly or indirectly shows almost similar results.

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. But, these conditions solely reflects the national level food insecurity, at the local and household levels the causes are varied and complex.

At the household level food security is affected by several interrelated factors. Food security, as the results of several studies suggests, at the household level is determined by household occupation, economic assets, demographic factors such as number, gender and age composition of households, educational level, socio-cultural factors, access to credit and inputs, and rainfall variability and shortage (drought in general) etc.

As noted by FAO (1997), the following types of households are likely to be most vulnerable to food insecurity:

- subsistence farmers who produce marginal or inadequate amount of food;
- landless wage earners lacking adequate resources to produce food or income to obtain food;
- households headed by women;
- households with a large number of dependents;
- households situated on marginal lands (e.g. drought prone areas or steep slopes adversely affected by erosion);
- households with insufficient income to enable continued access to adequate supplies of safe and good-quality food.

Causes of food insecurity although varies among households and localities, the common ones as 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; loss of waged labour or other sources of income. These conditions together thus explains the issues related to entitlement. Entitlements are the legal means by which an individual or households gain access to his/her basic requirements.

Another study, actually a breakthrough to the food security issues, by Sen A. (1981) was then focused on entitlement failure as a cause for food insecurity. He argued that an individual or a household starves either because of the inability to obtain various bundles of resources, which is determined by the individual's 'endowment' ('original bundle of ownership') and the 'exchange' conditions. The term 'exchange' viewed widely comprises both exchanges with nature, i.e. a direct entitlement to food through production by the household and an indirect entitlement through the exchange of labour, factors of production or goods for food (trade entitlement). The inability to command a bundle of commodities which includes sufficient food leads to food insecurity or what Sen calls 'entitlement failure'.

This failure as Geier (1995) points out include, a change in the original endowment (e.g. the loss of land or cattle or the inability to work) and a change in exchange relationships (e.g., a change in relative prices when food prices rise and wages fall, the loss of employment opportunities, a decline in subsistence production). Thus, Sen's argument, focuses on the household's or individual's endowment of legally owned bundle of resources and views famine as a failure resulting from lack of adequate bundle under the control of the household. This bundle of resource or entitlement to adequate food can normally be ensured from a reliable stock of capital/ assets, labour/skill or social resources (includes remittances and gifts).

Chavas, and et al, (1999), noted also that household food security is determined by access to resources, including in particular, physical capital, human capital, and social capital. Therefore, households those who do not have access to land, active and healthy labour, and health, education and other social facilities, etc. can not have the ability to satisfy households food security.

In Sub-Saharan Africa, according to many authors, the causes of food insecurity equated with poverty and mainly include, faulty rural development policies, war, lack of technological changes, institutional weaknesses and lack of basic infrastructures, and drought. For instance, Kyereme and Thorbecke (1991, as cited in Tegene, et al, 1999) showed that as the calorie gap (defined as the difference between the recommended and the reported calorie intake) at household level is affected by a set of demographic and household characteristics in Ghana. The results said to have revealed as the calorie gap declines with age of household head, educational level of the household head, income, and assets owned by the household. On the other hand, lower calorie gaps are proved to be associated with male headed households and calorie gap is widened with dependency ratio.

A very recent study by Ashimogo (2000) in Tanzania disclosed that as household food security is positively influenced by total household asset disposal and income. As the results of his descriptive analysis revealed that, households with more land and cultivated plots, higher literacy status of the heads, ownership of oxen and farming tools, young farmers and those with few dependents were found to be more food secure than otherwise. The result further proved as food insecure households are engaged in food/cash for work, off-farm businesses, sale assets including livestock, and etc. as coping strategies during crisis.

Wangia (1999) in Kakamega region of Kenya also completed his Doctoral dissertation on food security among farm households in four agro-ecological zones for the 1995/96-crop year to determine factors influencing household food security. In his study, household food requirement was measured using the number of persons in a household to estimate adult equivalents. As a result, the farmers in the low midlands and upper midlands had limited production resources and were found to be food insecure. Households in other agro-ecologic zones had sufficient food from farm production. Supplemented with livestock possession and off-farm wages, most households were food secure. He therefore, found that agro-ecological zones, total land size, number of livestock, permanent off-farm employment, and total labour used for farming were influencing household food consumption and security.

In Malawi, where there was a serious food shortage and widespread food insecurity even during years of good harvest, Quinn V., and et al, (1990) carried out a study on 'Malnutrition, household income and, food security in rural Malawi,' have identified small landholdings, low soil fertility, low income levels and limited employment, and labour constraints in agricultural production as the underlying causes of household food insecurity.

These authors further suggested that addressing these problems required more policy options that could increase food security. This policy interventions that are thought to affect the household food security situation in other similar areas in the continent at the household level by the governments, among other things, include access to land, support crop research on high value and yield variety crops, non-farm opportunities, extending access to credit and inputs, labor-saving devices with particular focus on women.

Studies undertaken in the Ethiopian context also revealed similar results in different instances as were found out elsewhere. Getachew (1995) had undertaken a study in six rural areas in Ethiopia on Famine and Food Security at the household level and found out interesting results that are corresponding to other study results elsewhere in Africa with similar situations. According to the study, farming systems (agro-ecology), land size, production (output), livestock, household size, and fertilizer use are all determinants of household food security/insecurity.

The results of his logit model analysis 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 with little land holding households. Increased production output also tested as reducing the risks of household food insecurity around the sample areas. Moreover, livestock ownership found out to be serving as an insurance against food insecurity in normal years. However, it seems that production outputs and livestock ownership is highly affected by drought. Drought as noted by Dagnew (1997) has also been considered the major immediate cause of the alarming level of food insecurity in many parts in Ethiopia.

The results further suggests that in an economic environment where resources for food production are inadequate, increase in number of household size increases the risk of household food insecurity. With regard to fertilizer application, during a non-drought year the application of fertilizer on the households farm decreases a likelihood of household food insecurity. In general, he concluded his work by recognizing that household risk of food insecurity and famine were increased by and large by the declining trends of households resource endowment and unfavorable policy interventions.

Markos (1997) also carried out a study on 'Demographic Responses to Ecological Degradation and Food Insecurity' based upon a household survey collected from eight *weredas* of three administrative zones (*Tigray, Wollo,* and *Shewa*). The purpose of his study among other things was to assess and present in descriptive terms the determinants of food insecurity in the study areas at the household level. The rest of his study was more devoted to the demographic variables and land degradation.

In his study land resources and means of farming, crop and livestock production, non-farm incomes, expenditure and household assets are said to be the determining factors of household food security or insecurity situations. As the results suggest land holding, the major basis for the livelihood of farming communities is very scarce in all of the survey areas. This scarcity coupled with its fragmentation and infertility resulted in food insecurity for those with landless and small plot size owner households.

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

also revealed that households who had no valuable assets and off-farm income have less expenditure capacity and were food insecure than those who have these things. In almost all of the study areas households' annual production was not compatible with food needs and also for the majority there was no off-farm employment. Household size was also found to be negatively influencing food insecurity of the households.

A study conducted in East *Wellega, Anger Gutin* resettlement area on household food security situation by Reta (1998) revealed interesting findings. Calculating calorie required and available and analyzing it in descriptive terms in *Anger Gutin* resettlement villages at household levels, he found that a household in the resettlement areas on the average could only fulfil 73 percent of his/her annual food requirement during the year 1998. It seems interesting because the location of the resettlement area in a relatively food secure and surplus producing zone had little contribution to the household food security situation.

This was mainly due to households lack or very little access to basic resources such as: land, livestock, oxen, farm implements; lack of access to off-farm employment and credit; marketing problem; high illiteracy rate and family size. Therefore, in addition to soil fertility, factors like credit, family planning, extension, market infrastructure, and asset possession seems imperative for household food security.

Tegene, Mulat and Roth (1999) studied food availability and resources situation in 9 *weredas* of East *Gojam* and South *Wollo* zone (in the *Amhara* region). They realized that 48 and 67 percent of the households in East *Gojam* and South *Wollo* respectively did have per capita calorie below 2000. In South *Wollo* particularly households receiving below 2000 calorie ranged between 76 percent in *Sayint* and 60 percent in *Legambo weredas.* They further analysed the variation in food availability was due to differentials in resource endowment, demography, access to services and non-farm activities.

The results of their regression analysis suggests as expected the increase in land holding, oxen holding, fertilizer and seed application showed significant increase in food availability. Among these land and oxen were found the most important determinants for access to household food security. Moreover, attainment of formal education and proximity to urban centers were found to be positively contributing for household food availability. Dependency burden and age factors negatively affected household food situations. More dependents meant less labour available to produce food required and less calorie supply and 'food availability decreases with age up to a certain limit and rises thereafter.' Non-farm activities, according to the authors had negative impact for East *Gojam* and positive and significant effect for South *Wollo.*

In South *Wollo,* participation in off-farm activities signified increases in calorie supply. While in the other zone, East *Gojam,* agriculturally potential area, non-farm was insignificant, which might be due to productive nature of the agriculture, majority of households probably heavily relied on farming than non-farm businesses. One interesting result was that female-headed households did show better food status than male headed ones. Overall, food poverty among other things can be controlled if the possession of productive assets; improving educational and other physical infrastructure; and improving health and family planning provisions are given emphasis.

In the current literature (as argued by Maxwell 1990), cited in Parikh (2000) it is argued that in stabilizing and planning rural development activities, food insecurity can be considered as a proxy for poverty, and that food security indicators can also serve to measure changes in poverty. Getaneh (1999) for instance had also carried out a study on Measurement and Determinants of rural poverty in three rural villages. His study results signified that families

with larger family size have higher probability of getting into the poverty trap. Land, which is said to be the most important asset for the rural households as usually assumed was directly related with poverty. Households with larger land holding have better chance to escape poverty and vice versa.

Another interesting result was that formal education in all of the areas found to have no significant effect on the poverty of households. With regard to gender the result indicates that being male headed does not guarantee escaping poverty. Technology adoption and livestock holding on the other hand were found to have direct bearings on poverty. In two of the villages non-farm businesses also appeared to have a significantly effect on the households income. Increased household size was again proved to have an increasing chance for the study households to remain under poverty.

Beyene (2000) in his study around two rural areas in Ethiopia on Agricultural technology adoption proved that adoption of improved technologies is required to improve food security and quality of life of households. The result of his research suggests that education 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 for down payment are affecting farmer's adoption decision and household food security.

Recently, Martha (2000) also in her study of 'Environmental depletion as a way-out to seasonal food insecurity' in two of the *Weredas* of North *Wollo* (*Habru* and *Meket*), indicated the importance of resource access to balance seasonal food shortfalls. Her study results show that sample households in the two of the *weredas* have very little mean annual income and low average land and cattle holdings. Thus, 30 and 20 percent of the farmers in *Meket* and

Habru weredas respectively were unable to satisfy the food demand of their family for more than 5 months in the year 1999/2000. To offset the gap the farmers collected, stored and sold firewood and dung to urban markets as important source of income. But, she tried to argue that as these kind of permanent as well as seasonal practices of collecting firewood and animal dung will expose the farmlands for soil degradation and erosion.

Though the author did not mention about food aid, majorities of the *wereda* residents, particularly in *Meket* and in general in other *weredas* depend on relief food and known for seasonal migration. Furthermore, other wage income and retail income (from grain, livestock and non-food items) was identified as sources of household income. In general, household's strategies to cope with seasonality are determined by personal performances and resource endowments. On top of this, creating different off-farm season employment opportunities and facilitating alternative energy sources would definitely smooth the problem in such areas.

In general, the risk of constrained access to food as can be understood from variety of studies can arise from several directions. As argued by Weeb and Von Braun (1994), risk of access failure, for instance can arise from the supply side through a collapse in food production. Alternatively it can also come from the income side, such as when price explosions occur or terms of trade between key commodities are sharply altered. Therefore, household food crisis is related with all aspects of livelihood, socio-economic, environmental, political and cultural set-ups. Those households, who have better access to bundle of resources and infrastructure, education, and benefiting from a sound policy environment, as proved by several studies either in Ethiopia or elsewhere in Africa are more food secure than the opposite category of households.

One other concept that is related to household food security, is 'coping strategy'. What do different households do during food crisis or risks by their own? Households are not passive victims of food insecurity or drought. But based on their capacity, every household undertakes different activities to cope with crisis and to minimize it. This capacity however depends and varies on the level of households' entitlement and vulnerability to crisis. '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".

Coping strategies, though vary from place to place and household to household, the main ones as indicated in different literature, Desalegn (1991); Maxwell and Frankenberger (1992); IFPRI (1992); Webb and Von Braun (1994); Getachew (1995); CRDA (1997); Yared (1999) includes: change 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 of inter-household transfers and loans, sale of possessions (e.g. jewelry), sale of fire wood and charcoal, food aid consumption, sale of productive assets, breakup 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).

Coping strategy is a variety of trade-offs that people make during stress, and the need to protect livelihoods in time of crisis, not just protect life. Frankenberger and Coyle (1993) as cited in Ndung'u and Maxwell (1999) observed that "poor people balance competing needs for asset preservation, income generation, and present and future food supplies in complex

ways...and may go hungry up to a point to meet other objectives."

These coping strategies are adopted in sequences beginning with those that involve relatively little discomfort to the households. This succession of responses to increasingly severe food shortages, as Webb and Von Braun (1994:56-57) points out,

> ...does not represent an overnight awakening to danger, rather a progressive narrowing of options that leads from broad attempts to minimize risk in the long term through actions designed to limit damage caused by a crisis, to extreme measures aimed at saving individual lives, even at the expense of household dissolution.

For analytical purposes, according to the same source, these different actions can be grouped under three broad categories: risk minimization; risk absorption; and risk taking. The first stage involves measures of savings, investments, accumulation and diversification. It involves insuring against crisis using the limited credit and insurance markets. The next stage of coping involves the drawdown of investments, calling in loans, and searching for new credit. At this stage food and non-food consumption will decline and restrictions are often made, stored food declined and other potential sources of income become crucial for the households. The last stage, is severe one if drought continue to exist and food aid does not arrive, will definitely result in the "collapse of normal systems and adoption of abnormal ones" (Webb and Von Braun, 1994:57). At this stage people start eating unusual food items (such as: wild animals and plants or 'famine foods'). The final resort in this stage is selling off their last assets including houses and farmlands and breaking up the family and distress migration.

The above sequences as different studies (Desalegn 1991; Getachew 1995; Dagnew 1997; and Yared 1999) indicate are also practiced by the Ethiopian farming households as coping mechanisms during food shortage and drought. But, all households are not equally vulnerable to food shortages and are not responding uniformly. Destitute households are more vulnerable to disasters than relatively better off households. The destitute are often forced to immediately collapse and get engaged in unusual and marginal kinds of economic activities (such as: sales of grass, wood, leaves, and eating wild food and of course migration).

In Ethiopia, one study (by Dagnew 1993 and 1994) revealed that, as people particularly in disaster prone areas (like in Wollo, Tigray, and Wolaita) have used to practice the following strategies during food crisis:

- temporary migration in search of wage-labour as an income stabilization measure;
- high dependence on income from secondary and marginal economic activities;
- begging and intensifying dependence on collection and eating wild foods;
- sales of household possessions (including dwelling houses);
- distress migration, family separation and abandonment.

CHAPTER IV

DATA AND METHODOLOGY

4.1 The Data

This study uses primary data collected from rural household survey in three different *Kebeles* (formerly known as Peasant Associations) from *Legambo wereda. Legambo wereda,* was selected mainly for the reason that it is highly drought prone and food insecure. In the *wereda* rainfall is often erratic and insufficient. Farmland is highly scarce resource and agricultural outputs and productivity are declining increasingly. There is also no adequate off-farm employment opportunity in the *wereda.* Due to the inability to feed household members from own production, many households have been and are dependent on food aids. Overall, the *wereda* is proved to be food insecure. Thus, based on this background, the study *wereda* was selected on purpose.

The information and data required for the study was collected by employing a combination of different methods (triangulation method). These methods are not alternatives; rather they were used to supplement each other.

To properly answer the research questions and fulfil objectives of the research, this study is based on both primary and secondary sources of data. The primary data were obtained from the sampled rural household heads. It was also substantiated by the group discussions with different community representatives and key informants. The community representatives were selected with the help of the key informants and development agents. The community representatives selected for group interview and discussion included: women, elderly, religious leaders, local grain traders, *kire* leaders, *kebele* representatives, Development Agents (DA's), farmers and local teachers. The group discussions were held with three

different groups from all the three selected *kebeles*.

For the collection of both qualitative and quantitative information, from the household heads and focus group discussions, structured questionnaire and semi-structured interview questions have been employed as instruments. The questionnaire was designed to include, inter alia, data on ten major areas that are thought to be pertinent for the study purpose.

These ten general areas (parts) were: general information; composition and demographic characteristics of all the household members; farming system (which includes land use and fragmentation, crop production, inputs, and livestock production); asset possession and off-farm employment; consumption; expenditure; marketing; coping mechanisms; food aid; and general questions (see Appendix I for summarized contents of the questionnaire).

Moreover, efforts were made to make group and individual interviews and observations in three big weekly market days in the *wereda* (*Genete*, *Chiro*, and *Akesta*, two of the first ones are located at 30 km and 12 km away from the *wereda* center and the third one is in the town center). During the market appraisals farmers, traders and urban customers were interviewed about terms of trade (grain Vs livestock comparing last year and the current season), types and sources of major commodities in the market, etc.

In addition to reviewing various institutional reports, research results and documents and relevant literature, secondary data was also collected from national, regional, zonal and *wereda* level pertinent offices. These offices included, AAU libraries, CSA, MEDaC, DPPC for the *Amhara* region, ANRS-IFSP coordination office, South *Wollo* DPPC, Zonal department of agriculture, Zonal Department of Planning and Economic Development, SCF-

UK in *Dessie, EECMY* in *Tenta & Legambo* (*washera* project office), *Legambo wereda* administration, and *wereda* office of agriculture.

4.2 Sampling Technique and Sample size

For this study, a two-stage sampling technique was used to select the households. In the first stage, three *Kebele* administrations [*Ermeti* (08), *Tach Akesta* (029), and *Segno Gebeya* (023)] were chosen purposively and in the second stage, 30 household heads were selected from each *kebele* using a simple random sampling method. The three *Kebeles* were chosen after classification of all the rural *Kebeles* in the *wereda* on the basis of agro-ecology and production seasons practiced. This was basically done to identify variations among households in places of residence and to see climatic effects and comparisons. At this stage the *Wereda* administrators, experts from the *wereda* office of agriculture and finance office were consulted to identify the three *kebeles*.

On this basis, since the *wereda* is fully dominated by *dega* and *woinadega, Ermeti* (08) and *Segno Gebeya* (023) are found in *woinadega* and *dega* agro-ecologies respectively, while *Tach Akesta* is from a mix of *dega* and *woinadega* climatic set-ups. Totally 42 households from *dega* and 48 from *woinadega* areas were selected, of which 18 were found to be females while the remaining 72 were male heads of the households (see the details in Table 4.1 below).

Table 4.1: Sample *Kebeles* and households by agro-ecology and farming seasons

Kebeles selected	***Dega***	***Woinadega***	**Season**	**M**	**F**	**Total No. of Hhs interviewed**
Ermeti (08)	-	30	*Meher*	23	7	30
Tach-Akesta (029)	12	18	Meher & Belg	24	6	30
Segnogebeya (023)	30	-	Belg	25	5	30
Total	42	48	-	72	18	90

As shown on figure 1b (the location map of the study area), the distance between the *kebeles* was also considered in the manner that the selected *kebeles* are representing all others in terms of agro-ecology and spatial distribution of the households. The household heads were selected from all the *kebele* administrations using random sampling procedure from a list of taxpayers obtained from the *wereda* office of finance. The number of households selected for the purpose of this research seems small as compared to the total number of households

living in the *wereda.* However, since the socio-cultural, farming systems, agro-ecological, economic characteristics of the households, and other related variables are almost similar across the households in the *Kebeles,* the sampled number seems adequate to be taken as a representative sample size. In other words, since there is homogeneity among *Kebeles* in the same agro-ecologic set-ups and this is well taken care in representing the *Kebeles* from each climatic zone, the selected number does not affect the reliability of the final outcomes.

4.3 The fieldwork and Data collection

Before the actual survey was conducted, preliminary field assessment was conducted at the beginnings of January 2000. It actually helped in gathering overall situations and designing and sharpening the research instruments. Moreover, secondary data from regional level was collected during this time. Preparation of the questionnaire was finalized after this preliminary field visits.

The fieldwork started almost in the middle of January. Six professionals (two of which were employed from *Dessie Zuria* and four from *Legambo wereda* offices of agriculture) with long time experience in agriculture in the survey area were recruited and given training on how to handle and administer the interviews and questionnaire, the essence and objective of the research, approach, and so on. Professionally, the enumerators were composed of an agro-Economist, agro-Forester, Agronomist, Plant protectionist, Crop protectionist, and agricultural Engineer. This composition and background helped them to easily understand and conduct the survey. Afterwards, pilot test was carried out from non-sampled 12 households for a day. At the end of the pilot test, discussions were held with all the enumerators to share experiences and on problems encountered during approaching and interviewing households' further improvements and training were given.

The actual survey started from 26 January up to 7 February, 2000. Two enumerators were placed in each site and the whole activity was supervised and co-ordinated by the researcher. Some eight more days were spent in collecting secondary data from *Dessie.* It was completed 16 February 2000.

5.4 General Hypothesis

In this study attempts were made to test the following general hypothesis: household food security is determined by variety of factors. Among other things, those households who have

livestock and diversified (mainly non- agricultural) activities have better household income and are food secure than those who are fully dependent on farming. On the other hand, households with less assets (land, labour, oxen, etc.); households headed by women; and landless households are assumed to be highly food insecure.

4.5 Data Processing and Analysis

All the data collected was coded and entered into the computer using Statistical Package for Social Scientists (SPSS) software. As it has been mentioned earlier the secondary data collected is being used in analysing the macro-level issues and backgrounds. Data results, are organized, summarized, and presented into different tables, and graphs. On this basis descriptive and linear regression analysis (OLS econometric model) were employed and meaningful interpretation of results are made using SPSS 9.0 and Limdep 7.0 softwares and ultimately conclusions and implications were drawn.

Moreover, all the grains available for the households from all the possible sources were converted into grain calorie equivalent and calculated in terms of adult calorie equivalent to measure the food security status of households against the national standard (2100 Kcal). To this effect household's annual production, food purchases, relief assistance, off-farm income and inter-household transfers are added by netting out sales and gifts given out from the household, and seed requirements and losses [deducted by the national average].

In short one can generalize that; household food security/ insecurity can be determined in an equation form as:

HHFS = Y + FP + FA + R/G - S - SR - PHL*

Where, HHFS = Household Food Security status

Y = Own Food Production/stock

FP = Food purchase

FA = Food Aid (relief)

R/G = Remittance/Gift

S = Sales

SR = Seed Reserve (5%)

PHL = Post Harvest Loss (10%)

---

* Adopted and modified from Tegene, and et al (1999) food availability equation.

As can be seen from this simplified definition we can safely say that, this equation determines the principal inputs to a household's access to food or consumption function. In short, households' own production and purchasing power are the most important parts of household consumption access. Food aid and off-farm income including livestock, crop and other assets, and remittances in the process of social exchange, are additional entitlements for household's food security. Thus, along with other predetermined variables, these are the basic elements in estimating household's caloric consumption requirement in this micro-level research.

CHAPTER V

MAJOR FINDINGS AND DISCUSSIONS

5.1 Descriptive Analysis of the Sample Households

5.1.1 Discussion of Major Household Characteristics

This section of the paper is devoted to the analysis of basic household characteristics of *Legambo Wereda,* on the basis of the micro level survey data. Basic demographic, socio-cultural, and economic variables, such as: size, age, and sex distribution, dependency ratio, fertility and mortality, ethnicity and language, religious composition, marital status, and educational attainment are discussed. Furthermore, farm characteristics like land holding, livestock possession, patterns of agricultural production and input and extension use, major occupation, etc. will be discussed. Tables, graphs, and figures that are generated from the survey results of the study *Wereda* will substantiate the discussions.

a) Size, age and sex distribution of the sample household heads and members

Distribution of sampled household heads by age, sex and agro-ecology is presented in Table 5.1. When we look into the age and sex distribution, out of the 90 sampled household heads 72 (80 %) are males and 18 (20 %) are female. This shows that male heads dominate the households in the study area. The distribution of these households over spatial residence showed slightly more than half (53.3 %) as living in *woinadega* areas, and the remaining 46.7 percent in *dega* agro-climatic locations. Moreover, the majority of the household heads, around 70 percent were aged between 25 and 49 years (Table 5.1).

The overall size of the sampled population is 457 (of which 51.4 percent and 48.6 percent constitutes female and male population respectively), and out of this number 90 were heads of households and the remaining 367 were household members. The average household size for the sample population was almost 5. Average family size when seen in places of residence, both in *Tach Akesta* and *Ermeti* was slightly higher than 5 while it was below 5 in *Segnogebeya,* which is purely *dega* area. Interestingly, in *Tach Akesta,* which is a mix of both dega and woinadega agro-climate and nearest to the *wereda* center (where there is a hospital) there seems to be relatively higher household size. The distribution of sample household members by different demographic variables and place of residence (age group and sex, sex ratio, dependency ratio and average family size) is given in Table 5.2.

According to the survey result, in terms of age structure, 49.7 and 4.2 percent of the sample population was found to constitute children of under 15 years and old age persons of 65 years and above respectively. Hence, the working age population (i.e., 15-64 years old) accounted for 46.2 percent of the sample and this as indicated in Table 5.2 signifies a higher dependency ratio. The presence of a large number of children in the 0-14 age group also indicates a high reproductive potential, that seemed to follow the normal age structure of the country and it is almost similar in all of the study areas. In general, the age structure shows a declining trend as one ascends along each age group. The reason for this seems that there is a high birth rate at the beginning (earlier ages) and increase in out migration and mortality increases with advances in ages.

With regard to the sex structure, the overall sex ratio, that is the proportion of total males to total females in the population is 94.5 males per hundred females, which indicates a slight excess of female population. Sex ratio of the sample population in accordance with their

areas of residence is found to be 108 for *Tach Akesta, 95* for *Ermeti* and 81 for *Segnogebeya* (Table 5.2). This shows a significant variation in sex composition of the *weredas'* population on the basis of variations in agro-climatic locations. In this regard, except in *Tach Akesta,* where male population outnumber the female population, in the remaining two *kebeles (Ermeti* and *Segnogebeya)* there was an excess number of female population over the male population.

b) Dependency Ratio

The estimated dependency ratio, which is the proportion of the economically active and non-active population, of the sample by place of residence, is presented in Table 6.2. According to the survey result the sample population has a young dependency ratio, i.e., proportion of those between ages 0-14 to 15-64 years multiplied by 100 in the sample area was 108. Similarly, the old dependency ratio, i.e., the number of population aged 65 years and above as the proportion of population between 15-64 years multiplied by 100 in the sample area was 9 percent. Hence, the overall dependency ratio, i.e., the sum of young and old dependency in the sample area reaches 117. This means, every 100 persons in the economically active population groups (15-64) supports not only themselves, but also supporting additional 117 dependent (non-productive) persons with all basic necessities. This clearly shows a high dependency burden in the rural areas of the survey *wereda.*

However, as practically seen from the study areas and the *wereda* as a whole the conventional dependency ratio do not show the real dependency load in the population. The fact that all persons in the working age group (of those who are not included in the sample) were not working for variety of reasons, and those in the young age (below 15) and those above 65 (who are especially healthy) were economically contributing to the households. According to CSA (1995) data unemployed population of the *wereda* for 10 years and over was 1,111 with 5.6 unemployment rate.

Table 5.1: Distribution of sample household heads by sex, age and agro-ecology

Adjusted age group	*DEGA*						*WOINADEGA*						TOTAL					
	Male	%	Female	%	Total	%	Male	%	Female	%	Total	%	Male	%	Female	%	Total	%
20-24			1	14.3	1	2.4	1	2.7	1	9.1	2	4.2	1	33.3	2	66.7	3	3.3
25-29	4	11.4	2	28.6	6	14.3	1	2.7	1	9.1	2	4.2	5	62.5	3	37.5	8	8.9
30-34	6	17.1	1	14.3	7	16.7	11	29.7	1	9.1	12	25	17	89.5	2	10.5	19	21.1
35-39	5	14.3	1	14.3	6	14.3	5	13.5	1	9.1	6	12.5	10	83.3	2	16.7	12	13.3
40-44	2	5.7	1	14.3	3	7.1	6	16.2	3	27.3	9	18.8	8	66.7	4	33.3	12	13.3
45-49	5	14.3			5	11.9	6	16.2	1	9.1	7	14.6	11	91.7	1	8.3	12	13.3
50-54	3	8.6			3	7.1	2	5.4	1	9.1	3	6.3	5	83.3	1	16.7	6	6.7
55-59							2	5.4			2	4.2	2	100			2	2.2
60-64	3	8.6			3	7.1	1	2.7			1	2.1	4	100			4	4.4
65+	7	20	1	14.3	8	19.0	2	5.4	2	18.2	4	8.3	9	75.0	3	25.0	12	13.3
Total	35	83.3	7	16.7	42	46.7	37	77.1	11	22.9	48	53.3	72	80.0	18	20.0	90	100

Source: Computed from the survey data, 2000.

Table 5.2: Distribution of sample population by age group, sex, sex ratio, average family size and dependency ratio in relation to Their residential area

Age group	*TACH AKESTA*			*ERMETI*			*SEGNO GEBEYA*			TOTAL			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	%
0 - 4	11	11	22	10	17	27	6	15	20	27	43	70	15.3
5 - 9	19	18	37	13	19	32	15	15	30	47	52	99	21.7
10 - 14	12	7	19	13	8	21	7	11	18	32	26	58	12.7
15 - 19	13	3	16	8	4	12	5	7	12	26	14	40	8.7
20 - 24	1	6	7	4	4	8	1	5	6	6	15	21	4.6
25 - 29	-	7	7	2	9	11	5	8	13	7	24	31	6.8
30 - 34	5	5	10	7	4	11	6	1	7	18	10	28	6.1
35 - 39	3	5	8	5	6	11	3	6	9	11	17	28	6.1
40 - 44	4	5	9	7	3	10	-	2	2	11	10	21	4.6
45 - 49	8	3	11	3	1	4	2	2	4	13	6	19	4.2
50 - 54	3	2	5	1	1	2	3	-	3	7	3	10	2.2
55 - 59	1	1	2	1	1	2	-	3	3	2	5	7	1.5
60 - 64	1	1	2	1	-	1	3	-	3	5	1	6	1.3
65+	3	4	7	1	3	4	6	2	8	10	9	19	4.2
Sex Ratio			108			95			81	94.5		457	100.0
Average family size			5.4			5.2			4.6			5.1	
Dependency ratio	Young = 108			Old = 9					Overall = 117				

Source: Computed from the survey data, 2000.

Table 5.4: Distribution of sample household heads by agro-ecology and sex in relation to marital status.

Marital status	*DEGA*						*WOINA DEGA*						TOTAL					
	M	%	F	%	T	%	M	%	F	%	T	%	M	%	F	%	T	%
Married	34	97.1	2	28.6	36	85.7	37	100	7	63.6	44	91.7	71	98.6	9	50	80	88.9
Single	1	2.9	1	14.3	2	4.8							1	1.4	1	5.6	2	2.2
Divorced			1	14.3	1	2.4			3	27.3	3	6.3			4	22.2	4	4.4
Widowed			3	42.9	3	7.1			1	9.1	1	2.1			4	22.2	4	4.4
Total	35	100	7	100	42	100	37	100	11	100	48	100	72	100	18	100	90	100

Source: Computed from the survey data, 2000.

Table 5.5: Literacy Status of household heads by place of residence and sex

Educational status	*DEGA*						*WOINADEGA*						TOTAL					
	M	%	F	%	T	%	M	%	F	%	T	%	M	%	F	%	T	%
Illiterate	13	37.1	3	42.9	16	38.1	11	29.7	10	90.9	21	43.8	24	33.3	13	72.2	37	41.1
Read only	2	5.7	1	14.3	3	7.1							2	2.8	1	5.6	3	3.3
Write only	2	5.7	1	14.3	3	7.1	3	8.1			3	6.1	5	6.9	1	5.6	6	6.7
Read & write	6	17.1			6	14.3	9	24.3			9	18.8	15	20.8			15	16.7
1 – 3	3	8.6			3	7.1	5	13.5			5	10.4	8	11.1			8	8.9
4 – 6	4	11.4	1	14.3	5	11.9	4	10.8			4	8.3	8	11.1	1	5.6	9	10
7 – 9	5	14.3	1	14.3	6	14.3	4	10.8	1	9.1	5	10.4	9	12.5	2	11.1	11	12.2
10 - 12							1	2.7			1	2.1	1	1.4			1	1.1

Source: Survey data, 2000.

c) Fertility and Mortality

The sampled households also reported, as there is high fertility and mortality rate in the *wereda.* Asked about the changes in the size of their household during the past five years, more than 75 percent reported an increase while some 17 percent said it has decreased. The major reason, as pointed out by the respondents, for the former category is more births (which accounted for 77 percent) while for the latter it is increase in death rate (4 percent, which is mainly due to the recurrent drought). The latter for instance is further confirmed by the data from the *wereda* council. As disclosed by the social sector head of the *wereda* council and also as clinically confirmed, 30 persons (14 children and 16 elderly, out of which 18 were females) had died due to the recent (1998/99) famine.

d) Places of Origin and Migration

Attempts have been made to assess the level of migration by asking the respondents to indicate their place of birth. Accordingly, more than 92 percent of the respondents reported their respective *kebeles* as their birth places whilst only 7 household heads claimed to have been in *Legambo* and other *weredas* of south *Wollo.* Marriage and other related familial reasons were given for migrating to their current place of residence. Moreover, asked whether the household heads had ever experienced migration during food crisis, 35.6 percent responded that they did. Out of this group, 61 percent said only the heads migrated while the remaining 39 percent reported the migrants included spouses, sons, daughters, and other household members (excluding the heads).

According to data from the *wereda* council, some 4,866 people migrated to different places of the country during the 1998/99 drought. Households and key informants also confirmed that migration is common and widely practiced by most households in the *wereda.* Is also seasonal with short duration, often limited to dry and non-agricultural seasons of the year.

e) Ethnicity, Language and Religion

The major ethnic group in the whole *wereda* is composed of *Amhara* people and their language is *Amharigna.* According to the survey results, all of the respondents claimed as their ethnicity is *Amhara* and they are speaking *Amharigna* language.

As presented in Table 5.3 below, 95.6 percent of the total surveyed population was Muslim. Orthodox Christians constitute only the remaining 4.4 percent. Hence, Amhara ethnic group with predominantly Muslim religion and culture inhabits the wereda. The spatial distribution of religious belief seemed almost uniform across the agro-climatic zones (see Table 5.3).

Table 5.3: Distribution of Household Heads by Religion, Agro-ecology, Sex and *Kebele*

Place of residence	CHRISTIAN				MUSLIM				TOTAL					
	Dega		Winadega		Dega		Winadega		M	%	F	%	T	%
	M	F	M	F	M	F	M	F						
Tach Akesta		1			10	1	14	4	24	33.3	6	33.3	30	33.3
Ermeti			2				21	7	23	31.9	7	38.9	30	33.3
Segnogebya	1				24	5			25	34.7	5	27.8	30	33.3
Total	1	1	2		34	6	35	11	72	100	18		90	100

Source: Computed from survey data, 2000.

f) Marital Status

As presented in Table 5.4, high proportions of the household heads (89 percent) are married. On the other hand, the number of persons who have never been married (single) was very low, constituted only 2.2 percent of the sample population. According to the survey result, about 8.8 percent of the population are living in broken families because of divorce and death of the husband. As the result further suggested all of the 8.8 percent divorced and widowed household heads were women (Table 5.4).

g) Literacy Status

It is obvious that education plays a significant role in affecting demographic, health, household income and the overall socio-economic status of the family. However, among the

sample respondents, illiteracy is found to be quite high. More than 41 percent of the surveyed household heads are not able either to read or write. Of these, 57 percent are living in *Woinadega* areas and the largest (72 percent) among the female household heads are found to be illiterate. Some 26.7 have reported that they can either read, or write or both. The remaining 32.3 percent claimed to have attended a certain level of formal education. From these household heads, 9, 10, and 12 percent reported that they have attended from grades 1-3, 4-6, and 7-9, respectively, while only 1 percent attended 10-12 grade level (see Table 5.5 for details). Regarding the distribution of those who attended formal schooling, there is no variation in terms of agro-ecological residences.

Moreover, 21 percent of the household members who are 6 years and above were attending informal education programmes. With regard to formal schooling, almost equal proportions of both sexes [male (39%) and female (37%)] reported participating in formal schools.

Asked about the reasons for children (aged 6 years and above) not attending school, 61 percent of the heads of the households mentioned lack of capacity to cover the costs required for sending children to school. Other reasons include, needed for work (24%), lack of interest (6%), disability (5%), and long distance of schools (4%). Therefore, generally household poverty seems to be the major factor affecting educational attendance in the study areas.

h) Major Activities of the Study Population

Table 5.6, below displays the major activities in which the heads and members of the households in the study area have been engaged in. As shown in the table, almost 97 percent of the household heads and 11 percent of the household members from the sampled population were engaged in agriculture as their major livelihood activity. Agro-ecologically, more people (60%) from the *woina*-dega areas were engaged in farming activities. This is

due to the fact that this climatic regime is more suitable for farming. Furthermore, as the result suggests, 3 (3.3%) of the heads (all of whom were females) and 18 percent of the household members have reported that they are engaged in home making (household) activities. In addition to the whole burden of child rearing and preparation of the family food, the responsibility of collecting fuel and water fall largely to women. Less than 1 percent of the members said to have been engaged in working as domestic servants and almost an equal proportion reported as engaged in trading business at local level.

Out of the total family members 36.8 percent were found to be economically non-active due to very young age (34.3%) and physical disability (2.5%). Moreover, 11.2 percent of the members whose age was 6 years and over were tending livestock. Proportionately a large number of the male population, 73.4 and 78 percent are engaged in farming and livestock rearing, respectively. On the other hand, homemaking and domestic services were found to be almost female dominated activities (see Table 5.6).

Table 5.6: Major Occupation of household heads and family members by place of residence

Activity	Member ship status	DEGA						*WOINADEGA*						TOTAL					
		M	%	F	%	T	%	M	%	F	%	T	%	M	%	F	%	T	%
Farmer	HHH	35	87.5	5	12.5	40	46	37	78.7	10	21.3	47	54	72	82.8	15	17.2	87	19
	Members	7	58.3	5	41.7	12	29.3	15	51.7	14	48.3	29	71	22	53.7	19	46.3	41	9
Home maker	HHH	-	-	2	100	2	67	-	-	1	100	1	33.3	-	-	3	100	3	0.7
	Members	-	-	36	100	36	54.5	-	-	30	100	30	45.5	-	-	66	100	66	14.4
Livestock tending	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	6	85.7	1	14.3	7	17	26	76.5	8	23.5	34	83	32	78	9	22	41	9
Trading	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	-	-	-	-	-	-	1	25	3	75	4	100	1	25	3	75	4	0.9
Student	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	23	57.5	17	42.5	40	52.6	16	44.4	20	55.5	36	47.4	39	51.3	37	48.7	76	16.6
Domestic Servant	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	1	50	1	50	2	50	-	-	2	100	2	50	1	25	3	75	4	0.9
Too Young	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	19	34.5	36	65.5	55	43.7	29	41	42	59	71	56.3	48	38.1	78	61.9	126	27.6
Disabled	HHH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Members	3	75	1	25	4	44.4	1	20	4	80	5	55.5	4	44.4	5	55.5	9	2
Total		94	47.5	104	52.5	198	43.3	125	48.3	134	51.7	259	56.7	219	48	238	52	457	100

Source: Computed from the survey data, 2000.
HHH: Household Head

5.1.2 Farm Characteristics

In farming households, productive resources, such as land, livestock and crop production inter alia, are the major characteristic variables that determine household food security. This section is, thus, devoted to the discussion of basic resources to farming households and their access and contribution to household food security. Particularly, farmland, crop production, farm inputs, draft animals, farm tools and livestock are examined here.

a) Farm Land

Framing activities, particularly crop production, require primarily the availability of suitable farmland. Farmland, as indicated elsewhere in the preceding parts of the paper, is a very serious issue in *Legambo,* as almost all the available farmland is already cultivated and there is no possibility for further expansion. According to the *Wereda* Office of the Agriculture, the average household land holding is estimated at 0.76 hectares. This holding is far below the national average per capita holding of 1 ha and also below the nationally recommended average hectare of 1.53, which, according to MoA, is said to be sufficient to produce household food requirement.

Table 5.7 presents distribution of total land size owned by the sample households by agro-ecology. As the table shows, the size of individual land holding varies from the landless to those owning up to 1.75 hectares. This gives an average land holding only 0.81 hectares. Sizes of holdings also show variation between the sample PA's and agro-ecology. As shown in Table 5.7 relatively better land holding is observed in *woinadega* than in *dega* ecological areas of the *wereda.* Moreover, landlessness also has further exacerbated the land shortages in the *wereda.* Some 5.6 percent of the sample households were found to be landless, and thus work as sharecroppers to earn their livelihood.

As the result suggests, only 13.3 percent of the sample households had relatively, better land possession, which ranged between 1 and 1.5 hectare. On the other hand, only 1 percent of the sampled farmers holds slightly higher than 1.7 hectares of land (which is the single highest holding observed in the sample). For nearly 38 percent of the sampled population, individual holding ranged from the lowest 0.51 to the largest 1 hectares per household. The remaining great majority, 42.2 percent of the households subsists on 1.2 percent of the total land in the area with holding per household ranging from 0.25 to 0.5 hectares.

Table 5.7: Distribution of total land size owned by the sample households by agro-ecology

in hectare

Adjusted land size	*Dega*		*Woinadega*		**Total**	**Percentage**
	No.HH	%	No.HH	%	No.HHs	
0.00	2	4.8	3	6.3	5	5.6
0 - 0.5	18	42.8	20	41.7	38	42.2
0.51 - 1.00	16	38.1	18	37.5	34	37.8
1.01 - 1.50	6	14.3	6	12.5	12	13.3
1.51 - 1.75	-	-	1	2.1	1	1.1
Total	42	100	48	100	90	100

Source: Survey data, 2000.

Because of smallholdings and shortage of land, there seems to be very small fallowing practice currently in use in the survey areas. This has a negative impact on the maintenance of soil fertility. Overall, the mean holding of fallow land is only 0.34 hectare (and few farmers who had more than 0.1 hectare for fallowing also affect this mean). Out of the average land totally owned by the households, 86 and 9 percent is respectively covered by annual and perennial crops, while the remaining 5 percent of the land owned is being used for gardening and private grazing. Table 5.8 below presents land size under cultivation by different ownership type.

Regarding land used for cultivation, the survey results show that owned, rented-in, and sharecropped-in plots constituted, on the average, 0.83, 0.25, and 0.83 hectares, respectively.

As the result suggests, only 13.3 percent of the sample households had relatively, better land possession, which ranged between 1 and 1.5 hectare. On the other hand, only 1 percent of the sampled farmers holds slightly higher than 1.7 hectares of land (which is the single highest holding observed in the sample). For nearly 38 percent of the sampled population, individual holding ranged from the lowest 0.51 to the largest 1 hectares per household. The remaining great majority, 42.2 percent of the households subsists on 1.2 percent of the total land in the area with holding per household ranging from 0.25 to 0.5 hectares.

Table 5.7: Distribution of total land size owned by the sample households by agro-ecology

in hectare

Adjusted land size	*Dega*		*Woinadega*		**Total**	**Percentage**
	No.HH	%	No.HH	%	No.HHs	
0.00	2	4.8	3	6.3	5	5.6
0 - 0.5	18	42.8	20	41.7	38	42.2
0.51 - 1.00	16	38.1	18	37.5	34	37.8
1.01 - 1.50	6	14.3	6	12.5	12	13.3
1.51 - 1.75	-	-	1	2.1	1	1.1
Total	42	100	48	100	90	100

Source: Survey data, 2000.

Because of smallholdings and shortage of land, there seems to be very small fallowing practice currently in use in the survey areas. This has a negative impact on the maintenance of soil fertility. Overall, the mean holding of fallow land is only 0.34 hectare (and few farmers who had more than 0.1 hectare for fallowing also affect this mean). Out of the average land totally owned by the households, 86 and 9 percent is respectively covered by annual and perennial crops, while the remaining 5 percent of the land owned is being used for gardening and private grazing. Table 5.8 below presents land size under cultivation by different ownership type.

Regarding land used for cultivation, the survey results show that owned, rented-in, and sharecropped-in plots constituted, on the average, 0.83, 0.25, and 0.83 hectares, respectively.

Hence, the dominant tenure arrangement in the study area is found to be own land and sharecropping.

Land fragmentation, as measured by the number of cultivable plots, is found to be 2.3 plots per the sample households on the average. Thus, in addition to land scarcity, land fragmentation too is creating difficulties in management of farmlands, as it requires additional labour and time. As reported by key informants and realized from group discussions, the major cause of land fragmentation and smallholdings was redistribution of land.

Asked about the changes in the size of their farmlands during the last 10 years, almost all the respondents invariably reported to have observed decreasing holding size. Indeed the land holding size in the area has diminished, on the average, from 1.23 hectares in 1989/90 to 0.82 hectares since 1991(see Table 5.9 and figure 3 below for the declining trend in holding size). As mentioned above, the major reason for the diminishing change in the landholding size in the area is the land redistribution in the wereda during 1991. Furthermore, as some respondents reported, the extended family system has also contributed to the shrinkage in the size of their holdings. This shrinkage in farmland holding, thus, is one of the major factors that contribute to the insufficient production to meet household food requirements.

Table 5.8: Land size under cultivation by different tenure type (1998/99)

In hectares

Type of land tenures	Total			
	Mean	Standard deviation	Maximum	Minimum
Total land owned	0.86	0.29	1.75	0.25
Total land under cultivation	0.99	0.83	2.75	0.25
own land out of cultivated	0.83	0.30	1.75	0.25
Rented in land	0.25	0	0.25	0.25
Rented out land	0	0	0	0
Sharecropped in land	0.83	1.01	2.00	0.25
Sharecropped out land	0.61	0.32	1.00	0.25
Grazing land (own)	0.06	0.09	0.62	0.001
Fallow land	0.34	0.45	1.25	0.003
Average plots of land	**2.23**	**0.67**	**5**	**1**

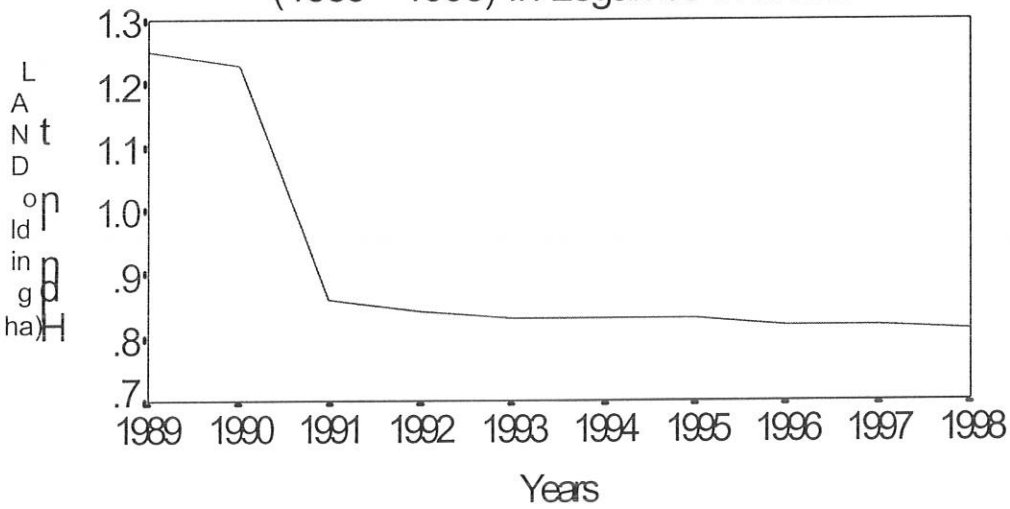
Source: Survey data, 2000

Table 5.9: Average size of farmland holdings during the past 10 years period (1989 - 1998)

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Land (ha)	1.25	1.23	0.86	0.84	0.83	0.83	0.83	0.82	0.82	0.81	0.81

Source: Computed from the survey data, 2000

Figure 3 Trends in land holdings for the past 10 years (1989 - 1998) in Legambo Wereda



Source: Computed from Table 5.9

b) Crop Production

Table 5.10 displays information on cultivated land by crop type and agro-ecology. Cropping pattern of the surveyed areas was dominated by the production of cereals and pulses, which account for 55 and 45 percent of the total cultivated land in 1998/99 respectively. With regard to production size cereals and pulses constituted 55 and 45 percent of the total produce, respectively. Barley is the dominant cereal in the *wereda* accounting for 27.3 percent of the total land and 33.2 percent of the total production both in the *meher* and *belg* seasons.

Major crops grown in *dega* areas of the *wereda* include barley, wheat, oat, and pulses. In the *woinadega* areas *teff*, sorghum, barley, wheat, and pulses are the major crops cultivated. In

general, in terms of area coverage of the total cultivated land, the distribution of crops was found to be barley 27 percent, wheat 10 percent, oat 8 percent, *Teff* 5 percent, sorghum 4 percent and pulses 46 percent and the corresponding production was 4.65, 3.6, 1.3, 2.1, 2.4 and 11.5 quintals respectively.

Table 5.10: Mean share of land ploughed and production obtained by crop type and Agro-ecology

Types of crop	*Meher*				*Belg*				TOTAL			
	Dega		*Woinadega*		*Dega*		*Woinadega*		Land		Production	
	Land	production	Land	production	Land	production	Land	production				
	Ha	**Qt**	**Ha**	**Qt**	**Ha**	**QT**	**Ha**	**Qt**	**Ha**	**%**	**Qt**	**%**
Teff	-	-	0.49	2.08	-	-	-	-	0.49	5.2	2.08	14.8
Barley	0.50	1.20	0.50	1.75	0.78	1.20	0.79	0.50	2.57	27.3	4.65	33.2
Wheat	0.50	2.14	0.48	1.45	-	-	-	-	0.98	10.4	3.59	25.6
Sorghum	-	-	0.33	2.4	-	-	-	-	0.33	3.5	2.4	17.1
Oat	0.25	0.50	0.53	0.80	-	-	-	-	0.78	8.3	1.3	9.3
Pulses	1.25	4.39	2.05	7.14	0.5	-	0.5	-	4.3	45.6	11.5	100.
Oil seeds	0	0	0	0	0	0	0	0	0	0		

Source: Survey data, 2000

Although due to persistent shortage and/or lack of *belg* rains households in the *wereda* often do not produce enough food, survey reports indicate that many of the households were particularly severely affected by the 1998/99 drought. During this production year, there was a complete rain failure resulting in acute shortage of food. As can be seen from Table 5.11, 32 households from *dega* and another 11 from *woinadega* (which together make up of nearly half of the sampled respondents) reported complete crop failure during *meher* and *belg* seasons. The remaining households too harvested only a very small amount of produce (Table 5.10). Among those households who have faced a complete loss of yield, many were from *dega* areas and had mainly cultivated barley. Of course a significant number of the households did not plant at all because of the lack of timely rainfall. Such shocks or crisis in food production resulting from drought were not new phenomena to *Legambo wereda.* As disclosed by the key informants and group discussants, there was a continuous drought for the past five years (since 1994/95 - 1998/99, with the exception of 1995/96). Thus, though

there was less effort in rescuing the chronically food insecure households, there was a widely recognized disaster in the *wereda* constantly threatening the lives of a large proportion of the population.

Table 5.11: Distribution of households by crop failure in agro-ecology and cropping seasons 1998/99

	meher				*Belg*				Total	
	Dega		*Woinadega*		*Dega*		*Woinadega*			
	Cereal	pulse	Cereal	pulse	Cereal	pulse	Cereal	pulse	Cereal	pulse
Households cultivated	6	5	43	42	20	11	5	4	74	62
HH produced	2 (33)	3 (60)	39 (91)	39 (93)	2 (10)	3 (27)	3 (60)	2 (50)	46 (62)	47 (76)
households faced complete failure	4 (67)	2 (40)	4 (9)	3 (7)	18 (90)	8 (73)	2 (40)	2 (50)	28 (38)	15 (24)

Source; Computed from the survey data, 2000
Note: Figures in pharantheis are percentages

Compared to the dega areas the *woinadega* areas have a relatively higher size of both cultivated land and produce. In the survey year (1998/99), the yield per hectare for almost all crops was insignificant or very low. According to the results, cereal and pulse production averaged only 2.72 and 2.67 quintals per hectare. It should be noted here that only those respondents who have managed to produce some grains were included in computing the average yield (Table 5.10). In the 1998/99 production season, on the average, only small land was put under cultivation (especially in the belg growing areas- due to lack of rains) which yielded an insignificant amount of produce. Although the *wereda* is mainly a *belg* growing area, of the total surveyed farmers only very few farmers in *dega* areas managed to plant and of those almost all have reported complete failure of area planted (Table 5.11).

Generally, the *wereda's* agricultural output is below the subsistence level of the population. As indicated by the survey data as well as by key informants and DA's traditional farming practices and small land holding exacerbated by high degree of rainfall shortage are the main causes of production decline and the resultant household food insecurity in the *wereda.*

In *Legambo* drought has created a declining effect on crop yields per unit of land. According to the *wereda* Office of Agriculture, average productivity that was 7.4 and 6.2 quintals/ha during normal harvesting year for the *meher* and *belg* seasons respectively, declined to an average of 3.5 and 1.5 hectares in 1998/99. Though there are also other factors that can explain the decline in agricultural production and productivity, drought was the single major underlying element for the serious production shortfall that occurred in the *wereda* in 1998/99. Households in the *wereda* as a whole and in *dega* areas in particular were seriously constrained with lack of food access. The major reasons for immediate inability to withstand a period of drought are also to do with the extent to which the production system is not only rainfall dependent, but also lack of income generating activities in the *wereda.* Therefore, the extent and depth of poverty in the *wereda* mean a large proportion of the population is highly vulnerable even to a single year of crop failure.

c) Farm Inputs and Extension

Table 5.12 shows the level of improved input use in 1998/99. The use of improved inputs (inorganic fertilizers, crop varieties, and chemicals) is believed to have a positive impact in increasing agricultural outputs. However, in the survey areas, only 14 percent of the farmers have reported using commercial fertilizer. The remaining 86 percent of the respondents reported as reasons for not using chemical fertilizers: very high cost (52.1%), not considered as a priority problem because of drought (42.1%), lack of supply (4.0%) and lack of knowledge (1.8%). Furthermore, 50 farmers (55.6%) reported to have used improved seeds of barley and wheat. A majority of them (with the exception of 16.7 % who had used improved wheat seed from local office of agriculture) have reported using their own local seeds.

Regarding the use of insecticides, almost all of the sampled farmers (86.7%) did say that it was not a priority problem in their farming areas while an insignificant proportion reported that insecticides are not affordable (10%) and do not know about their uses (3.3%). On the other hand, those who had reported to use modern inputs 91 percent indicated their sources, as were the local extension services, while the remaining 9 percent bought from whole sellers (6%) and local retailers (3%).

Table 5.12: Distribution of Improved Input users and non-users, 1998/99

Type of input	Users	Non-users	Total
Fertilizer	13	77	90
	(14.4)	(85.6)	(100.0)
Seed	15	75	90
	(16.7)	(83.3)	(100.0)

Source; Computed from the survey data, 2000

Note: Figures in pharantheis are percentages

Drought, as mentioned by more than 42 percent of the respondents was one of the main hindrances for not using improved inputs. For instance, 32 percent of the surveyed respondents have borrowed money from ACSI (*Amhara* Credit and Saving Institute) during the past two years and used the credit for purchasing agricultural inputs (55%), to undertake off-farm business (24.3%), for purchasing food (10.3%) and for buying farm implements (10.3%). As reported by the *wereda* office of ACSI and extension agents, however the farmers are not able to pay back their debts due to drought-induced crop failures. Moreover, as indicated by the key informants and DA's, most of the farmers are complaining about the high interest rate and arrears. Thus, the high interest rate (which is 12.5% of the principal) coupled with very low land productivity and continuous droughts, are not only limiting the use of improved inputs, but are also aggravating the food insecurity situation of the *wereda* as a whole and those households in the *dega* areas, in particular (see Table 5.13).

Table 5.13: Distribution of credit using households by type of spending (1998/99)

Type of expense	Number of credit using households				Total	
	Dega	Percent	*Woinadga*	Percent	Count	Percent
Agricultural inputs	4	55.00	12	80.00	16	55.17
Food	3	21.43	-	-	3	10.43
Off-farm business	4	28.57	3	20.00	7	24.13
Farm implements	3	21.43	-	-	3	10.34
Total	14	48.28	15	51.72	29	100.00

Source: Survey data, 2000

Only 24 percent of the sampled households have reported applying manure on their farm plots, even though it is the easily locally available fertilizer (particularly among the livestock holders). The remaining 76 percent who do not use manure as fertilizer said they use dung for fuel (43.5%), have no enough cattle (41.8%), difficult to transport to their plots and/or have no suitable land to apply manure (10%), and have no knowledge to use it as a fertilizer (4.8%).

On the other hand, only 31.5 percent of the sample respondents reported, to be participating in the new extension programme. As reported the selection criteria include among others, ownership of oxen, farm suitability for use of inputs and demonstrating as a model and ability of farmer to pay the credit. However, interestingly, 21 percent of the participating farmers reported that their agricultural output have declined rather than increased as a result of applying the extension packages.

Thus, even though the number of extension participants in the *wereda* is quite small, still the expected impact of input application in boosting the agricultural productivity was highly affected by such factors as drought. Since the return was negative, farmers expressed strong complaints during the discussions concerning the extension program. In addition to this, nearly 13 percent of the respondents have reported that the agricultural extension agents have

not advised them even about the regular farming activities. Therefore, it is evident that the attempts to disseminate the use of improved inputs seems to have faced with a multitude of difficulties including shortage of rainfall, soil infertility, and farmers' inability to pay credits obtained for improved inputs. The idea of increasing production and productivity then requires a shift of emphasis, especially in such *weredas* constantly threatened by drought as *Legambo.*

Attempts like input subsidization, appropriate targeting of the beneficiaries, provision of credit with low interest rate, facilitating the supply and distribution of inputs, introducing and/or upgrading irrigation practices, and diversification of the local economic activities, etc might help in challenging the effects of drought and thus improve the food security situation of the *wereda.*

Knowledge or human capital is also another important aspect in adopting improved inputs and ultimately improving the household food security situation. For agricultural households, the knowledge in using inputs, appropriate technology, proper utilization of credit, and diversifying the household income sources require a certain level of formal schooling, formal training in agricultural and non-agricultural activities, experience sharing, informal communication with development agents and model farmers, and so on. This knowledge can thus be productively utilized by the farmers in such ways as applying proper land use management, adopting agricultural and non-agricultural technologies, improved livestock management practices, etc so that to ensure households' food security.

d) Why Crop Production Decline in the Study Area?

Asked whether their crop yield per hectare from their farm plots increased during the last 10 years, 98 percent of the sample respondents said it has been decreasing. Different reasons were given concerning the declining trend in production. Drought was ranked as very serious problem by 83.3 percent of the respondents, serious by 4.4 percent, and less serious problem by 11 percent (see detail in Table 5.14).

Another problem mentioned was inadequate rainfall as very serious and serious problem in the area, which is chiefly responsible for drought and ultimately resulting in household food insecurity by 62 and 28 percent of the respondents respectively. Lack of oxen the third major problem, which was ranked by the respondents as very serious (31%), serious (21%), less serious (30%), and only 18 percent of the respondents said it is not a problem. Obviously the latter group constitutes those who own two or more farm oxen and consider other variables (like rainfall) more serious than oxen, otherwise the problem is serious for more than 80 percent of the farmers.

Shortage of land was also observed as very serious by 21.1 percent and serious by 40 percent of the respondents in the study areas. Significant proportion of the respondents indicated crop disease (22.2%) and weeds (15.6%) as very serious and serious problems. Finally, land degradation is found to be very serious and serious for 17.8 and 26.7 percent of the farmers in the study areas respectively.

However, as can be seen from the table, inadequate extension, shortages of labour, and farm equipment, and lack of inputs were not considered seriously problems for the residents. For *Legambo,* as the data presented above indicate, the top ranking problems for the declining trend in crop production are drought (shortage of rainfall), lack of oxen, shortage of land, and land degradation (see Table 5.14 for details).

In general, the traditional farming practice that has greatly affected the sustainability of production and productivity coupled with the erratic and inadequate rainfall has made the *wereda's* rural farm households more vulnerable and food insecure. From group interviews, key informants and DAs' reports it was understood that eventhough farmers have adequate

knowledge as to the benefits of inputs application, fallowing and land conservation, they are constrained by continuous lack of rains and shortage of land. Furthermore, they pointed out that extension is not their immediate issue, instead emphasis should be given to soil and water conservation activities with a view to facilitate regeneration of the damaged soils. In this regard, focusing on afforestation activities will have additional benefits as a source of cash income for the households, besides protecting soil erosion. It will also substitute the use of dung as source of fuel and thus shift more of its usage as manure.

Table 5.14: Reasons for the decline in crop production by type of responses

Reasons	RESPONSES											
	Very serious			Serious			Less Serious			Not a problem		
	Dega	W/dega	Total	Dega	W/dega	Total	Dega	W/dega	Total	Dega	W/dega	Total
Drought	41	34	75	1	3	4	2	8	10		1	1
Land degradation	7	9	16	13	10	23	10	21	31	9	8	17
Land shortage	11	8	19	15	21	36	11	9	20	8	7	15
Inadequate rainfall	40	16	56	11	14	25	-	6	6	-	3	3
Inadequate extension	2	1	3	3	1	4	3	5	8	37	38	75
Lack of inputs	1	1	2	2	3	5	11	6	17	27	32	59
Lack of oxen	16	12	28	9	10	19	9	18	27	10	6	16
Lack of labour	1		1	2	4	6	8	7	15	35	30	65
Lack of credit	1	3	4	7	4	11	17	13	30	20	25	45
Lack of farm equipment	1	1	2	7	5	12	6	8	14	29	33	62
Crop disease/weeds	15	5	20	11	3	14	3	5	8	15	33	48

Source: Survey data, 2000

e) Draft Animals and Farm Tools

Oxen play a very crucial role in the smallholder subsistence farming system. In *Legambo wereda* as a whole, in addition to oxen, horses, donkeys and cows are used as draft animals both for ploughing and threshing. The average draft animal holding per household is only 1.04 (Table 5.16). According to the *wereda* Office of Agriculture, in *Legambo* 52.6 percent of the farming households do not have any oxen. With respect to the sample households, 34 (37.8%) had no ox, 20 (22.2%) owned one ox and Only 36 (40.0%) have two (37.8%) and three (2.2%) oxen (see Table 5.15).

Large proportions of the sampled households (38%) have taken variety of traditional measures as alternative ways of solving the problem of draft animals. The reported measures include, '*mekenajo*' (pairing a draft animal with other person's ox or other draft animals), gift (obtaining) from relatives and friends during ploughing seasons, rent, and using human

labour constituted 24, 30, 9, and 6 percent respectively. The remaining 31 percent have either rented-out or sharecropped out their lands, or turned it into grazing land, etc. (see figure 4, which indicates *mekenajo* as an alternative ways for the problem of oxen).

Figure: 4 Traction with a horse and cow indicating the shortage of oxen for the households in the *wereda*

During the year 1998/99, 36 (40%) of the households sold their oxen mainly due to the drought and only 6 households reported to have bought oxen at the time. Out of those who sold their oxen and other live animals 93 percent reported that they have sold them due to drought and more than 90 percent of them used the money for buying food.

On the other hand, 71 households (79%) reported that they own a complete set of traditional farm implements while 19 (21%) said their implements are not complete. Even those who said they own a complete set of farm implements asked further about the change in their possession 15 (17%) of them confirmed as it has been decreasing over the last five years period.

Table 5.15: Distribution of oxen ownership by sample households

Number of oxen	Number of households	Percentage share
0	34	37.8
1	20	22.2
2	34	37.8
3	2	2.2
Total	90	100

Source: Survey data, 2000

f) Livestock Production

Next to crop production, livestock production is the main economic activity in the *wereda* as a whole. Table 5.16 depicts the distribution of livestock by type during 1998/99. The average holding of cattle, shoats (small ruminants), equines, poultry, and beehives per household was estimated at 2.8, 6.2, 1.17, 1.71, and 0.27 respectively. Agro-ecologically more livestock was reported in *dega* areas than *woinadega*. This is mainly because of the fact that the high land areas are mainly dominated by sheep than other livestock type.

Livestock are the most important assets for the households in the survey *wereda.* Both the live animals and their by products serve as a source of cash to buy food and non-food requirements. However, the livestock sub-sector as pointed out by the sample households and key informants, is constrained by various factors. Major ones as mentioned by the sample households include lack of feed, lack of grazing land, lack of water, diseases, and drought induced mortality. It was reported that 63 cattle, 353 small ruminants, 31 equines and 37 chicken had died as a consequence of the 1998/99 drought in the area (figure 5 below, indicates the catastrophic livestock mortality during the 1998/99 drought).

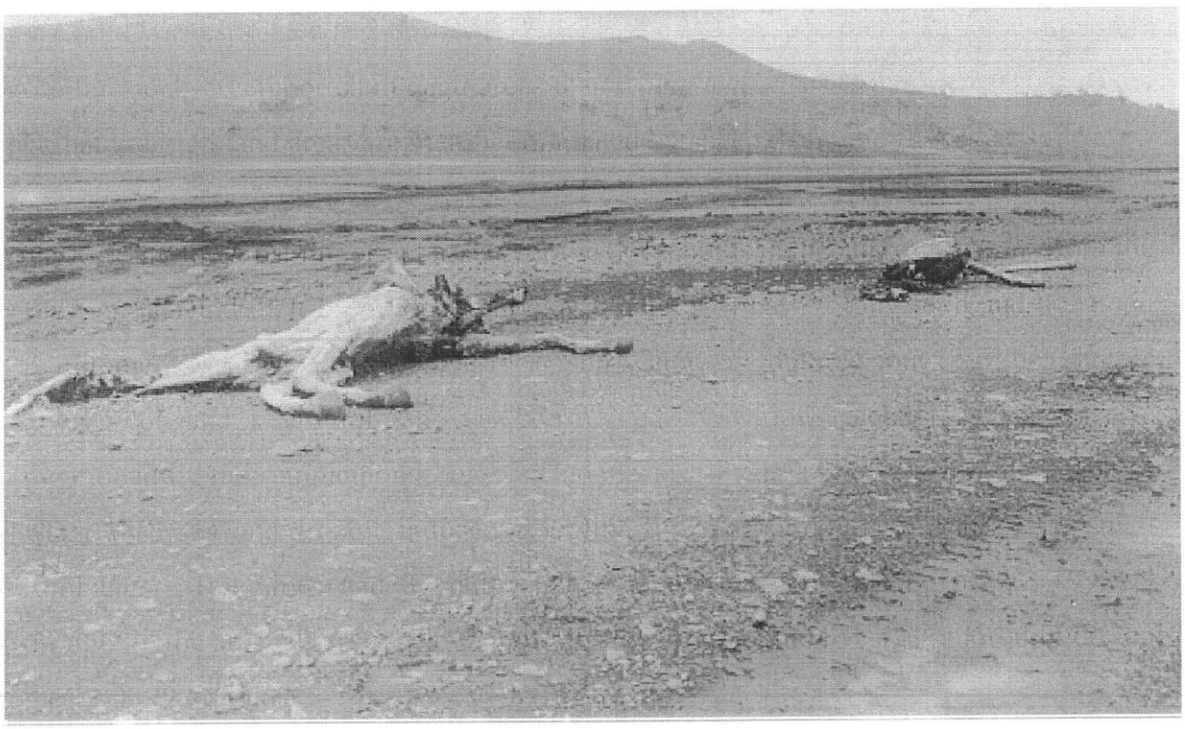


Figure 5: The 1998/99 drought has caused a catastrophic mortality of livestock, *Legambo.*

Moreover, according to data obtained from the *wereda* council and the zonal Office of Agriculture, 11,218 cattle, 40,114 shoat and 4,011 equines died in the whole *Wereda* during the 1999 drought. In general, recurring drought problems have greatly diminished the livestock of the area. Observation of prices of livestock during 1998/99 indicates that live animals were sold at very cheap prices compared to normal years. For instance, an ox, a cow and a sheep were sold for ETB 255, 103, and 29.6, respectively on the average. Thus, though livestock production and sells is thought to be a major means of supplementing income for food insecure households, the drought in 1998/99 brought a catastrophic mortality and price fall mainly affecting vulnerable households.

Livestock diseases were also reported by the *wereda* veterinary professionals as one of the major problems both during drought and normal years. Among the major diseases in the *wereda* diseases like black leg anthrax, pasteurellosis, liver fluke, and internal and external parasites are the most prevalent diseases affecting the cattle and sheep stocks. The failure of the short rains (*belg)* during the 1998/99 had also profoundly affected the livestock production through its impact on forage and water.

The recurrent droughts have also accelerated the deterioration of grazing lands. The feed sources in the wereda mainly consist of grazing and crop residues. Asked about the sources of feed for their livestock, 45 (51%), 32 (36%), and 12 (13%) of the sample households reported crop residues, communal grazing areas, and own pasture, respectively. Furthermore, due to further encroachment of grazing areas by crop production, 92 percent of the households said that the size of their grazing land has been continuously declining and currently is insufficient to keep their livestock. Asked, whether the size of their grazing land decreased over the last 10 years, more than 93 percent of the households confirmed as it did decrease. The main reasons for these decreases were population and livestock pressure (60%), conversion of grazing land into farmlands (21%), and recurrent drought (19%)

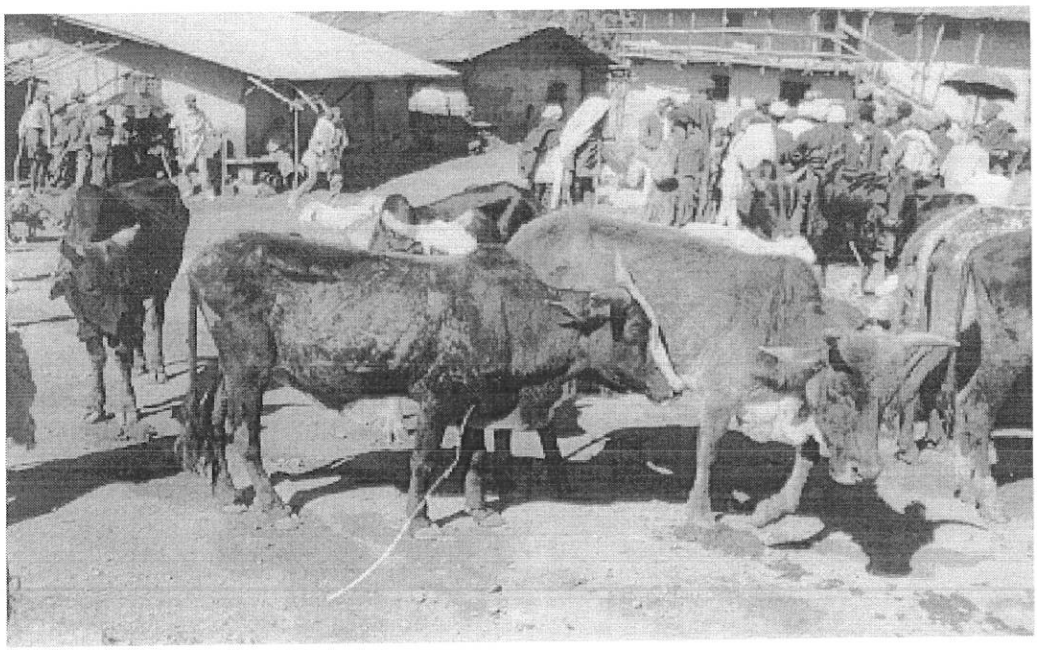


Figure 6: Poor conditioned livestock during the 1998/99 drought waiting for free medical care at *Gimba* clinic.

In general, poor livestock quality, lack of adequate feed, lack of water and lack of veterinary services have highly affected the potential of livestock production and contribution of its important functions in the wereda. Thus, improving the genetic make-up of the livestock in the area, improving the quality and quantity of feed supply and provision of adequate veterinary services need to be considered as a means of alleviating the problems of livestock production and hence improve the food security condition of households in the *wereda*.

Table 5.16: Number and mean Livestock Ownership of the sample households in 1998/99

Type of livestock	**Number owned**	Percent	Mean
Oxen	94	37.5	1.04
Cows	78	31.1	0.87
Heifers	27	10.8	0.30
Bulls	14	5.6	0.16
Calves	38	15.1	0.42
Total cattle	**251**	**100.0**	**2.79**
Sheep	533	95.5	5.92
Goats	25	4.5	0.28
Total shoats	**558**	**100.0**	**6.20**
Horses	32	30.5	0.36
Mules	65	61.9	0.72
Donkeys	8	7.6	0.08
Total equines	**105**	**100.0**	**1.17**
Poultry	154	100.0	1.71
Beehives	24	100.0	0.27
Total respondents	90	100.0	—

Source: Survey data, 2000

5.1.3 Other Variables of Food Access

In places like *Legambo* where drought-induced famine is endemic and food insecurity is widespread, Agriculture (both crop and livestock production) alone will not be sufficient indicators to measure household food insecurity. Therefore, in this part of the paper, other food access or entitlement variables, specifically, non-farm activities, food aid, and copping strategies will be discussed.

a) Non Farm Activities

As mentioned earlier, the sample farmers have indicated the fact that agricultural production in the *wereda* has been continuously declining for many years. Obviously, correcting the problems and reversing this trend will not be an easy task as the problems are complex and vexing. In this regard, problems such as variation of rainfall in distribution and intensity in particular, are factors, which can not be fully addressed at least at the present level of human capacity. Under such conditions where agricultural resources are quite scarce, non-farm activities are bound to be the most appropriate alternative to improve the level of poverty in general and that of food security in particular.

In response to types of non-farm activities undertaken by the sample households, as presented in Table 5.17, the majority of respondents (44%) mentioned to have participated in Employment Generation Scheme (EGS), as their main source of non-farm income. The Employment Generation Schemes were mainly government's capital budget financed rural development projects, such as construction of rural roads, health and education facilities, and other non-farm activities mentioned by the respondents include grain trade (18%), petty trading (11.5%) and wage employment (11.5%).

Grain and petty trade activities are practiced largely in *woinadega* areas than *dega.* Farmers nearer to *Akesta* and other small towns like *Genete* and *Keymeberat* have better opportunity to participate in such activities. From this it is possible to see the great advantages of proximity to urban centers which have easy access to large markets, and transportation facilities and ultimately have towards ensuring household food security. This argument also holds true with respect to the impact of daily wage labour (figure 7 shows some of the *woinadega* merchants engaged in petty trading activities).

Figure 7a & b: Petty-trading commodities displayed by rural merchants at *Akesta and Chiro* weekly market place

Other activities like seasonal migration, which accounted for 9 percent of all the non-farm activities, is mainly reported by respondents from *Dega* areas. Less frequently mentioned activity (6.4%), but still fairly practiced by women in particular was brewing local drinks for sale. Although blacksmithing and pottery were not mentioned by the sample households, from information provided by key informants and as it was observed in market days, are performed by few households in extreme *woinadega* areas (bordering low land *weredas*) of the *wereda*.

Furthermore, as can be seen from the table relatively better annual income on the average was generated from daily wage, petty trading, and EGS, while less income was observed

from migrant labour. Thus, this signifies that small-scale informal trading and creating off-farm employment opportunities can off-set both seasonal and permanent shortfalls in farming.

In addition to identifying types of non-farm activities, number of participants and income obtained, a question was also asked on what they spend their income obtained. The findings indicate that more than half (65.4%) of the respondents use the cash for purchasing food, while the remaining 34.6 percent use for the following purposes: purchase of household goods (18%), clothing (12%), farm implements (1.3%), payment of tax (1.3), and purchase of sheep for breeding (1.3). Except a very few of the respondents who gave their reasons as shortage of labour (11.5%), old age (7.1%) and disability (2.4%), the great majority (81%) reported lack of employment opportunity as their main reason.

Table 5.17: Type of non-farm activities practiced by size of participants and mean income received during 1998/99 by agro-ecology

Type of non-farm activities	DEGA			WOINADEGA		
	Number of participant	Mean income	Standard deviation	Number of participant	Mean income	Standard deviation
food/cash for work (EGS)	14	315	178.86	20	260.15	167.26
Daily wage labor (local)	4	142.5	113.88	5	726.80	883.45
Migrant labor (seasonal)	6	55.83	40.55	1	90	-
Brewing local drinks	2	106.2	39.88	3	188.0	48.50
Grain trading	5	254.8	113.29	9	143.33	51.56
Petty trading	3	556.0	587.92	6	177.0	83.75
Total	34			44		

Source: Survey data, 2000

b) Food Aid

In addition to level of food production and access to productive resources, the frequency of food aid distribution in the area is also a reasonably good indicator of food insecurity. Table 5.18 shows the amount of food aid distributed for the sample households during 1998/99. As the data shows the great majority of the sample households (84.4%) have been receiving food aid during the survey year. Agro-ecologically, aid recipients in dega areas out numbered

those in woinadega areas. More than 95 percent of the sampled households from dega and 75 percent from woinadega reported to have received relief assistance.

Both Sample households and group discussion participants were asked to indicate how the frequency of food shortages occurred in the area as well as the frequency of food aid distribution during the last five years. Almost all of the respondents invariably said that there was drought induced food shortage during each consecutive years with less magnitude in 1995/96. This was, mainly due to failure of the belg rains that consequently resulted crop failures. Accordingly, they reported that though the flow was not continuous there was relief assistance over the past five years for selected households.

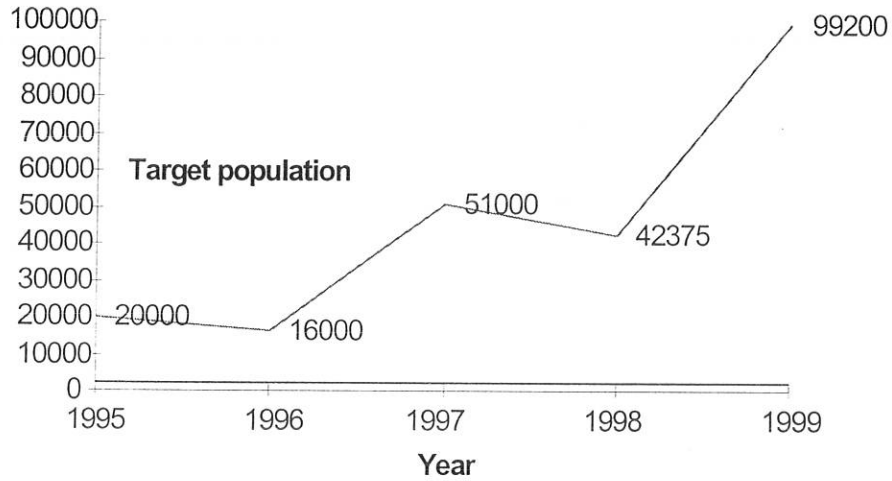
This was further confirmed by secondary data from Zonal and Regional DPPC offices. According to these sources 20,000; 16,000; 51,000; 42,375; and 99,200 people in *Legambo wereda* have been receiving relief food in 1995, 1996, 1997, 1998, and 1999 *belg* and *meher* seasons respectively. Similarly, as reported by the Zonal DPPC 80,400 people were targeted for relief assistance in the year 2000. However, most of the respondents both in group discussion and household interviews complained about the irregularities and amount of food provided per household and still other groups complain for not being screened. During the severe food crisis season of 1999 they reported that they received food aid only for 4 months (amounting 12.5 Kg/person/month for households whose size is less than or equal to 5) and was reported not adequate for some households with larger family size. In sum, as a result of repeated crop failures due to continued drought, a number of households in the wereda now are relying on food handouts. But since the flows of relief handouts were not adequate and consistent, there was high out-migration and conditions of food insecurity had actually escorted the lives of human being, for instance in 1998/99.

Table 5.18: Number of food aid Recipient households during 1998/99 by type and Amount of aid, Place of Residence and Agro-ecology

Type of aid item received	*Dega*						*Woinadega*					
	Tachakesta		*Ermeti*		*Segnogebeya*		*Tachakesta*		*Ermeti*		*Segnogebeya*	
	No. of HH	mean	No. of HH	mean	No. of HH	mean	No. of HH	mean	No. of HH	mean	No. of HH	mean
Grain (Kg)	12	16.6	-	-	28	57.93	18	55.76	18	7.11	-	-
Cash* (Birr)	12	0.04	-	-	-	-	18	63.33	18	3.2	-	-

Source: Survey data, 2000
*Emergency donation

Figure 8: Trends in Food Aid Distribution in Legambo Wereda during the last five years (1995 - 1999)



Source: Computed from secondary data obtained from Regional & Zonal DPPC offices

c) Coping Strategies

As indicated in the discussion so far, farmers in Legambo *wereda* have been affected by tremendous decline in crop yield, poor asset possession and drought induced food insecurity. In the face of such adverse conditions, farmers used various coping strategies to survive severe food crisis. Table 5.19 shows types of coping strategies practiced during food crisis by agro-ecology and sex of sample respondents in *Legambo*. Normally (during good agricultural seasons) people in the *wereda*, as mentioned by the key informants, have been deriving most of their consumption from domestic food production. However, the farmers have failed to achieve self-sufficiency in 1998/99. As a result, households had to rely on market and non-

market options for their survival. Market related practices in the *wereda* include sale of livestock, petty trading, selling different farming household equipment (assets), wage labour etc. The main available non-market practices are dependence on wild food staff.

The most commonly mentioned coping practices that are sequentially used during the 1998/99 food crisis consisted of reducing number of meals (83.3%), reducing size of meals (81,1%), sell of small ruminants (72.2%), sell of draft oxen (43.3%), consuming wild foods (35.6%), and borrowing of cash and/or food from better off neighbors and/or relatives (32.2%). Other less mentioned and used strategies were postponing wedding and other ceremonies (17%), distress migration (15.6%), sell of fire wood (15.6%), withdrawing children from school (13.3%), and eating toxic or taboo food (12.2) (figure 9 shows selling of firewood and grass as a livelihood mechanism for some of resource poor households).

Figure 9a and b: Indicates selling of firewood and grass as a livelihood strategy by the highlanders in *Legambo*

The survey results further revealed that food insecure household in the *wereda* practice selling farm equipment and household equipment, begging, selling of wood and iron sheets from the wall and roofs of the house, sending female members to urban areas for sending back remittance, and selling of jewelry. These categories were reported by fewer households and often practiced as a last resort (see Table 5.19).

As explained by the key informants coping practices have distinct patterns, and all farmers were not equally vulnerable to drought or food insecurity, rather they respond in different ways. Some households implement some coping strategies after all other options have been pursued and exhausted, while other households (especially those who are easily vulnerable) often collapse immediately and thus engage in unusual activities. For instance, among the sample households 10,10, 7.8, 3.3, and 2.2 percent said that they have been practicing reducing number of meals, reduce size of meals, eat toxic wild foods, borrow cash or grain, and sell of fire wood and grass respectively almost every year. While the relatively better off did not use these strategies immediately after a crisis.

With respect to the period when these practices are implemented the most reported months were March to August (31.1%), September to December 26.7), June to October (20.2), were respectively reported by 41.1, 31.7, 27.2, where food shortage reaches its highest peak. But, there is seasonal variation among the two agro-ecologies. In this regard, there is apparent food shortage in the mainly *Belg* growing areas from early January to late August and during the *Meher* season from early April to September and early October.

Reducing the size and number of meals per day was also used as a major coping strategy by most of the households during different seasons. In relation to number of meals consumed, specific question was presented to all respondents to indicate the frequency of meals per day during normal and deficit seasons. As presented in Table 5.20 by age categories of the sample households, the results reveal, there is a drastic decline in the number of meals consumed during seasons of food shortage. Children between the age of 0 and 5 eat 2 to 6 times a day during normal times, and from 1 to 5 times during deficit seasons. Moreover, children between the age of 6 and 15 were also reported by the respondents as consuming 2

to 4 and 1 to 3 meals per day during normal and deficit seasons respectively. The results further revealed that the elderly (aged 65 and beyond) people also eat 2 to 5 and 1 to 3 times a day during normal and deficit times respectively. Both adult males and females were used to consume 2 to 3 times and 1 to 2 times per day during normal and deficit seasons respectively. For some households there were lower meals per day even during normal seasons. Almost every household in the sample had two meals a day, which is below the normal meals for the normal consumption habit in the rural areas (normally the rural households consume food three times per day) (see Table 5.20).

In *Legambo,* as suggested by households and confirmed by key informants and group discussions, a number of people, especially vulnerable ones ate unusual foods (locally known as: *Astenagert, Aluma,* and *Sama*). They also further reported that excessive consumption of these plants (due to lack of other grains to mix with) caused toxicity and killed people, especially the children and elderly.

The households again reported it and key informants also confirmed as people have been out-migrating to different parts of the country during food crisis. Most frequently people from *Legambo* migrate to places like *Tepi, Jimma, Assayta,* and *Dera in search of wage labour.* Distress migration on the other hand, was only practiced during severe crisis, for example in 1999, 14 persons (16%) of the households practiced this kind of migration.

Generally, the coping pattern and strategies practiced in the study areas suggests, how most of the *wereda's* farmers are vulnerable and how food insecurity is serious. In this context, it is serious because there seem to be no mechanism to develop some of the useful coping strategies. Factors like poor marketing infrastructure, lack of local employment opportunities,

lack of irrigation support aggravated food insecurity and made households more vulnerable.

Table 5.19: Types of Coping strategies practiced during food crisis by agro-ecology and sex of sample respondents (1998/99 and before)

Strategies Practiced	*Dega*		*Woinadega*		Total		No. of HHs practicing every year
	M	F	M	F	M	F	
Sell of small ruminants	28	1	32	4	60	5	13
Sell of drought oxen	14	2	19	4	33	6	-
Sell of jewelry	-	-	-	1	-	1	-
Consume wild foods	17	1	11	3	28	4	7
eat toxic & /taboo food	2	1	4	2	6	3	-
reduce number of meals	27	5	32	11	59	16	9
reduce size of meals	28	4	31	10	59	14	9
borrow cash or food from neighbors/relatives	9	1	18	1	27	2	3
sell farm equipment	2	1	3	1	5	2	-
sell household equipment	1	-	1	1	2	1	-
distress migration to find work	8	1	4	1	12	2	-
sell fire wood & charcoal	4	2	3	3	7	5	2
Withdraw children from school	5	1	4	1	9	2	-
Postponing wedding & other ceremonies	3	2	8	2	11	4	-
send female members to urban areas for sending back remittance	-	1	-	1	-	2	-
sell of wood & iron sheets from the walls &roofs of the house	2	-	1	-	3	-	-
Begging	2	1	1	1	3	2	-

Source: Survey data, 2000.

Table 5.20: Number of meals per day during normal and deficit seasons by different age categories of the sample households

Different members of household by age category	Normal period						Deficit period					
	1	2	3	4	5	6	1	2	3	4	5	6
0 - 5	-	1	25	26	11	24	5	36	38	8	1	-
6 - 15	-	10	62	14	-	-	23	58	5	-	-	-
16^{+} males	-	24	62	-	-	-	53	32	1	-	-	-
16^{+} females	-	28	61	-	-	-	60	27	2	-	-	-
65^{+} (elderly)	1	14	35	17	6	-	28	37	6	2	-	-

Source: Survey data, 2000

In conclusion, as explained in the preceding parts, in the study areas, inter alia the combination of repeated crop failures, poor access to resources, lack of access to non-farm activities, and weak coping strategies have brought about extremely awful conditions for the study population. The sample households in almost all of the kebeles reported a declining trend in yield per hectare, poor livestock production, shortage of farmland and oxen, lack of non-farm opportunities, continued food shortage as main cause of food insecurity, even though drought brought about a drastic fall in households production and food supplies in the year of the study. But drought is also a continuous phenomena in *Legambo,* and persistent drought by it self is a good cause of food insecurity in the *wereda.*

5.2 Measuring Household Food Security status

The preceding parts of this chapter discussed the major determining factors of food insecurity mainly related to food access and entitlement to productive and non-productive resources of the farming households. This section of the paper relates to food availability and is devoted in identifying food secure and insecure households in the *wereda.*

Food availability is one of the major factors that determine household food security situation. As it was argued by Tegegne and et al (1999), food security is dependent on food availability. However, household's food availability is affected by different factors. Among other things, household food availability depends on households food production, purchasing, and other capabilities (in short, it is influenced by production, marketing, social, and other supply conditions) and other food sources or entitlement.

During the survey, set of questions such as food consumed from different sources, purchase, food aid, remittance, and grains sold and so on were asked and data was collected on the standard recall basis. The level of calorie intake being an important household food insecurity indicator, the data collected in relation to food availability were computed into calorie equivalents. The food security level was estimated by comparing the food supply and food needs and also the minimum daily calorie intake in agro-ecologic set ups and different residential localities within these ecologies.

Converting the data into calories passed through different stages: converting all grain quantities into quintals, converting this quantity into calorie equivalent and on this basis all cereals and pulses were converted into kilo calories and averaged to 357000 Kcal per every quintal using the ENI's (Ethiopian Nutrition Institute) conversion tables. Furthermore, a minimum food intake, 2100 calories per adult per day being the benchmark that is adjusted into adult equivalent averaging for different household size, is used in converting grains and measuring the size of calories available. In this regard, since almost every household in the study areas were found to be consuming cereals and pulses; 85 percent of the minimum recommended calorie (2100), which is 1785 Kcal/per day/person is taken as food poverty line (in addition to literature review and calculations, MEDaC and ENI were consulted to arrive at this food poverty line).

The model [equation] used here in calculating food availability [household food security status] is: **HHFS = Y + FP + FA + R/G - S - SR - PHL**, which was explained in chapter four. In this process, once the list of food grains that were reported by the households as consumed from different sources (or considering consumption from own production/stock at family level; food purchase, food aid, remittance/gift, and by netting out seed reserves, and post harvest losses) were obtained and identified, then the corresponding quantities were

calculated using the above mentioned procedure and this formulae.

Table 5.21 shows the mean per capita calorie available by the sample households in different agro-ecologies. Overall, households in the study *wereda* fulfils only 87 percent of their daily food requirement from all the available sources even in the lowest energy level recommended for the country. Thus, using the 1785 Kcal of grain equivalent of the per capita food consumption and deducing crop sale, post harvest loss and seed reserve, the average food crop available for consumption at household level is 1552.6 kilocalories per person per day on the average. In other words, a household in *Legambo* subsists on the average only on 7763 Kcal per day for five of its members, which is very much below the subsistence level.

However, there is a visible difference between various *Kebeles* and agro-ecologies, in terms of calorie availability, for instance, an individual residing in *Ermeti* (which is *woinadega kebele),* on the average gets 2021 Kcal per day. This level is even higher than the minimum average requirement by some 13 percent. While on the other extreme, a person in the *dega* areas, for example in *Segnogebya* had only 1036 Kcal per day, which is 42 percent below the minimum requirement. Thus, it seems that households living in *woinadega* areas have better chance to resist food insecurity than the *dega* dwellers (see Table 5.21 for details).

Table 5.21: Mean daily per capita calorie available by the households in the study *Wereda*, by agro-ecology and sample *kebeles*

Agro-ecology/places of residence	Mean	Minimum	Maximum	Standard deviation	Number of Households
Dega	**1116.28**	105.36	**3580.71**	**899.50**	42
• *Tach Akesta*	1316.14	168.58	3580.71	1108.00	12
• *Segnogebeya*	1036.33	105.36	3287.38	809.38	30
Woinadega	**1934.37**	40.46	4450.60	997.92	48
• *Tach Akesta*	1789.40	40.46	3763.62	924.40	18
• *Ermeti*	2021.35	556.33	4450.60	1045.06	30
Legambo	**1552.59**	**40.46**	**4450.60**	**1032.99**	90

Source: survey data, 2000

When we see the distribution of calorie available among the sample households, only 30 percent of the total surveyed households have per capita calorie that is above 2000 Kcal per person per day. Actually, only 32 (35%) of the households meet the requirement of 1785 Kilocalorie and above per person per day. As can be seen from Table 5.22, 38, 17 and 16 percent of the reporting households respectively gets only below 1000, between 1001 and 1500, and between 1501 and 2000 calories per person per day. Interesting enough among those who had less than 1000 Kcal 29 (32%) of the households receive even less than a half of the minimum requirements (1785) per person per day, which is not only very much below the requirement, but also inadequate for an active and healthy life of an individual.

A very great majority (78.6 percent) of households in *dega* areas (particularly those households residing in *Segnogebeya* and parts of *Tach Akesta)* obtain calories less than 1500 per person per day. Whereas 42 percent of the people in *Woinadega* (those who live in *Ermeti* and parts of *Tach Akesta)* areas gets fairly enough per capita daily calorie, which is more than 2000 Kcal per day per person. The remaining households get only below this level, but better than those in *dega* agro-ecologies (see Table 5.22).

Table 5.22: Distribution of Actual levels of Calorie available by the households in the *Wereda*

	<= 1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-3500	3500+	Total HHs
Households	**34**	**15**	**14**	**9**	**8**	**4**	**6**	90
%	37.8	16.7	15.6	10.0	8.9	4.4	6.7	100
Dega	26	7	2	2	2	2	1	42
-Tach Akesta	6	2	1	1	0	1	1	12
-Segnogebea	20	5	1	1	2	1	0	30
Woinadega	8	8	12	7	6	2	5	48
-TachAksta	3	3	5	3	3	0	1	18
-Ermeti	5	5	7	4	3	2	4	30

Source: Survey data, 2000

Table 5.23 below presents mean per capita calorie requirements and availability in the study area. Households were asked their annual calorie requirements and actual level of available calories during the survey. As can be seen from this table, mean daily energy requirement on the average for a household is 1898.5 Kcal. This level of requirement indicates slightly (only 6%) excess Kcal than the lowest recommended per capita calorie level. With regard to agro-ecological variation, still there is a slight difference in per capita requirement. For instance, in *dega* areas the requirement is 1953 Kcal per person per day. While the calorie requirement for those in *woinadega* areas is 1845 Kcal per person per day.

The actual average calorie available for the whole of the study area is 1553 (which covers only 87 percent of the lowest calorie recommended) per day per person. But there is a significant variation among the agro-ecological areas. For example, the average energy available for *Ermeti* is 2021 Kcal which is far greater than the average lowest recommended requirement. On the other hand, in *Segnogebya* the per capita food availability covers only 58 percent of the minimum requirement. In other words, on the average households in this area have only 5182 (1036 Kcal per person per day) calories per household per day.

There are also differences when we compare the actual (or available) and required level of calories. The per capita available calorie has shown average deficit of 22.2 percent. While in *woinadega* areas in general, and in places like *Ermeti* in particular there is a surplus calorie available, the deficit reaches as high as 75 percent in *dega* areas. Furthermore, if we compare the average available calories at the household level against the minimum recommended level, the results reveal similar conditions. There is 60 percent deficit in *dega* areas and 15 percent overall deficit in the study areas, whereas there is 8.4 percent excess calorie from the minimum requirement in *woinadega* areas of the study *wereda*. In general, there is 30 and 15 percent calorie deficit comparing the actually reported availability with both required by the households and minimum level recommendation, which actually signifies as the households

were persistently affected from serious food security crisis through out the year in 1998/99 (see also appendix V for food and non-food expenditure of the dega and woinadega households in the study areas. The pattern clearly shows as the households in the woinadega areas had better purchasing capacity than those in dega areas).

Table 5.23: Mean per capita calorie requirements and availability by agro-ecology and places of residence

Agro-ecology/*Kebele* Administration	Per capita Kcal required per person/day	Per capita Kcal available per person/day	Differences between the required and available Kcal	Differences compared with the low Kcal level (1785 Kcal/day/person)
Dega	**1952.55**	**1116.28**	**(836.27)**	**(668.72)**
• *Tach Akesta*	2046.80	1316.14	(730.66)	(468.86)
• *Segnogebya*	1858.38	1036.33	(822.05)	(748.67)
Woinadega	**1844.52**	**1934.37**	**89.85**	**149.37**
• *Tach Akesta*	1870.28	1789.40	(80.88)	4.4
• *Ermeti*	1818.72	2021.35	202.63	236.35
Legambo (Total)	**1898.53**	**1552.59**	**(345.9)**	**(232.41)**

Source: Survey data, 2000
Figures in parenthesis show deficits.

When we look into the issue of availability from gender perspective, as can be seen from Table 5.24, female headed households both in *dega* and *woinadega* areas have low calorie available than the male ones. This might be mainly due to lack of adequate access to productive assets. The female-headed household members acquire only 57.3 and 95.8 percent of the minimum daily calorie per capita intake in *dega* and *woinadega areas* respectively. Moreover, here also households with female headship living in *woinadega* agro-ecologies have better calorie acquisition than those in *dega* zones (see Table 5.24).

Table 5.24: Distribution of mean available calorie by sex and agro-ecology of household heads.

Sex of the household heads	Mean	Minimum	Maximum	Standard deviation	No.of households
Male	1580.03	1341.87	4450.60	981.39	72
Female	1442.83	40.46	3803.24	1244.17	18
Total	1552.59	40.46	4450.60	1032.99	90

Source: Survey data, 2000

Table 5.25; below displays several factors that are influencing household food security or calorie availability. As has been discussed earlier household food insecurity in the study

areas is mainly caused by lack of access to productive and non-productive asset possession, lack of non-farm opportunities, and increase in population and drought. Here also while all the households were affected by drought, the level of food security status varied by households according to their asset base, access to non-farm income, access to urban centers and other characteristics of the households.

As can be seen from the table, per capita calorie available increase with an increase in the size of land under cultivation in the study areas, this is particularly highly significant during normal seasons. The average calorie per person per day for landless households was only 738, while on the other hand, it was 1973 Kcal for those cultivating 2 hectares and above. Though the mean per capita calorie available was less than the recommended level, those households who have cultivated between 0.5 and 2 hectares have received fairly better energy for survival than those who had no land at all.

Oxen holding also revealed a positive and strong contribution for calorie availability. For instance, household with no ox had only 932 per capita calorie, and those who owned two and three oxen achieved more than the minimum daily-recommended level. In general, these show that land and oxen among others are the most crucial assets for crop production dependent households.

Distance from the *wereda* capital again is found to be affecting calorie availability. As shown in the table, the general increase in distance from the center resulted in decrease in per capita calorie available. Among several reasons, market related factors (such as selling and buying of food items, selling income generating activities- like sale of firewood and labour, sales of livestock) and transport access can explain this reality. As argued by FAO (1997), increased market integration can offer possibilities of greater income, increasing entitlement and greater household food security. Average distance traveled by the sample households in different agro-ecologies to obtain different services and infrastructure is presented in appendix V.

Increase in family size, as expected shows a decreasing trend in food availability. Households who have less than 5 family members had better calorie intake than those with more than 5 family members. This negative relation in places like *Legambo,* where there is no alternative for food acquisition other than traditional farming, higher family size means high dependency burden on the heads of each family. This as noted by Tegegne and et al (1999), is an indication of the fact that the labour effect of family size is less than the consumption effect in the study *wereda.*

Non-farm income contributed positively to the household and per capita calorie available in the study area. As can be seen from Table 5.25, increase in non-farm income level showed a resultant increase in per capita calorie available for consumption. This shows that non-farm income is very crucial in improving household food security situation where agricultural production has constantly been constrained by drought.

Other factors like age and level of education had non-linear relation with food availability. In any case while the younger heads (aged below 35) obtained low calorie, those household heads aged between 30 and 50 years achieved above the food poverty line. With regard to level of education households who have attained primary level of education and above and the illiterate had relatively better calorie acquisition. These results, thus, reveal that under serious drought and lack of other alternative sources of household income, the conventional assumptions that the younger and literate household heads have a chance to escape food poverty seemed unworkable. The devastating production shortfalls caused by the drought of 1998/99 in *Legambo,* therefore, indiscriminately affected the livelihood and food security situation of almost all types of households, although the extent and copping capabilities varied among the agro-ecologies and households.

Table 5.25: Mean per capita daily calorie availability by different variables

Total cultivated land	Kcal	Number of oxen	Kcal	Age of the household	Kcal	Non-farm incom (Birr)	Kcal	Ddistance in hour	Kcal	Family size	Kcal	Litrecy status	Kcal
0.00	738	0	932	20 - 35	1091	<=100	1310	< 2hr	1742	<= 2	1611	Illitrate	1916
< 0.50	1381	1	1587	36 - 50	1924	101-200	1749	2:01-4:00	1880	3 - 5	2025	Read & write	1555
0.51-1.00	1416	2	1855	51 - 65	1683	201-300	1897	4:01-6:00	1554	6 - 9	1377	Primary	1749
1.01-1.50	1654	3	1996	65^{+}	843	301-400	1960	> 6:00	1340	10^{+}	1241	Above primary	1917
1.51-2.00	1717					401^{+}	1976						
> 2.00	1973												

Source: Computed from the survey data, 2000

Generally, calorie intake taken as a basic measurement of household food security situation, there is high level of food insecurity in Legambo wereda. Nearly 64.4 percent of the farming households do not have the capacity to fulfil their dietary requirements even at the lowest caloric recommendation level. Out of all of the sampled households of the study areas, only 32 (35.6%) households were found food secure (at 1785 Kcal/day/person level). For the remaining majorities, the supply that is reported from different sources including food aid has not satisfied the existing demand of households. There is also a wide discrepancy among agro-ecologies and sex of household heads. In this regard people in *woinadega* areas found to have better calorie availability than those in dega areas. Moreover, women heads of households were found to be more food insecure both in *dega* and *woinadega* areas, than the male heads. Overall, the reasons, as realized from the study results, field observation and discussions are obviously associated with entitlement failure. Those households who have less or no access to productive assets, living far away from the *wereda* center, higher dependency burden, and lacking non-farm income were proved to be more food insecure than otherwise.

Thus, households who depend solely on food crop production for their consumption, among other things, seems to be at greater risk of food insecurity than those who have alternative sources of income to buy food. As discussed earlier, since households in *Legambo* were characterized by small land holding, large family size, inadequate farm oxen, low and variable rainfall, few livestock holding and no/insignificant off-farm income, a number of households can not be able to feed themselves. Thus, the food availability and household's food security status depends on the ecology, weather condition, and resource endowment of a particular household.

5.3 Econometric Analysis

For the discussion in this part of the paper, OLS regression is estimated using the Limdep 7.0 software for all the households in the sample to measure whether the selected variables determine household's food status (security or insecurity) positively or negatively.

5.3.1 The Variables

Dependent and different independent variables that are believed to affect household food security situation were selected. The following are major variables selected to analyze whether they explain household food security positively or not.

Dependent variable is per capita caloric availability: KCALAVAL

Independent variables include:

1. SEXHHH:	1 = If household head is male
	0 = Otherwise
2. FAMSIZE	Number of family members in a given rural household
3. EDUCHHH	Level of educational attainment of the household head
	1 = If the head has completed grade 6 and over
	0 = Otherwise
4. CULTLAND	Land size cultivated by a household
5. FERTUSE	1 = If the household uses fertilizer
	0 = Otherwise
6. NUMBOXEN	Number of oxen owned by the household
7. OWNLVSTK	Number of livestock owned by the household
8. AGROECZN	Agro-ecologic zone
	1 = If *Woinadega*
	0 = Otherwise
9. NONFRMIN	Non-farm income obtained
10. FOODAID	Food Aid received
11 PROXYTWN	Proxy to town center (distance of the household from the urban area)
	1 = If the household is nearer to *Akesta* town (<=2 hours distant)
	0 = Otherwise

5.3.2 The Hypotheses

The list of selected variables enlisted above believed to have different impacts on households' likelihood of being food secure or insecure. These impacts on the households' food security status (caloric availability) will vary positively or negatively depending on the basis of the bundle of resources that the household is endowed with. Therefore, the following

hypotheses are being made as to what result each variable is expected to have on the likelihood of the households food security status (to determine whether the household is food secure or not).

SEXHHH: Households headed by males are expected to have better access to maintain household's food security.

FAMSIZE: In *Legambo*, where there is a persistent drought, the expectation is that households with larger number of members will face food insecurity because of high dependency burden. Thus, large family size affects household's food security situation negatively.

EDUCHHH: Education is expected to have a positive effect on household's food security status. Households with primary education or better are believed to have a chance to diversify household's income sources and better manage their farm and agricultural activities.

CULTLAND: Shortage of farmland is a serious problem in *Legambo wereda.* Thus, those heads who did manage to cultivate their farmlands had relatively better chance to feed their households than others. Then, it is hypothesized that those households with cultivated farmlands during 1998/99 had escaped food insecurity and an increased farmland mean an increase in Kcal available.

FERTUSE: Fertilizer use has often been perceived as improving productivity per unit area. Households using fertilizer are expected to have better food security status than the non-users.

NUMBOXEN: Oxen is one of the basic farm assets. Households who own oxen have better chance to escape serious food shortages.

OWNLVSTK: Better possession of livestock is expected to have a positive impact on households' food security situation. Since households with more livestock can sell them off for food during food crisis, households with relatively more number of livestock have a chance to cope with food insecurity.

AGROECZN: Households living in *Woinadega* agro-ecologic zone are better off than those in *Dega* areas in terms of access to resources and suitability of the climate for agricultural production.

NONFRMIN: Households engaged in non-farm activities are better endowed with additional income to purchase food. The success of households and their members in managing food insecurity is largely determined by their ability to gain access to non-farm opportunities in the study areas. Thus, non-farm opportunity (income obtained from NONFRMIN) is expected to have positive influence on household food security status.

FOODAID: Emergency food aid creates access to food for vulnerable households. Therefore, since *Legambo* as a whole is known to be food insecure, households who have been receiving food aid are expected to escape serious food insecurity than otherwise.

PROXYTWN: Proximity to urban centers creates access to additional income by providing non-farm employment opportunities, and easy access to extension, inputs and transportation. It is therefore, expected that households nearer to *Akesta town (*comparing those who are within the range of 2 hours distance and those beyond this distance) have better chance to improve household food security than who do not have a proximity to urban centers. Proximity to urban centers affects household food security positively.

5.3.3 Econometric Results

Multivariate regression (OLS model) was used to estimate the effect of selected variables on per capita calorie available. As a result, though some variables showed unexpected signs (which is mainly due to the devastating drought during the study year) most of the results are quite relevant and indicative of the existing reality. The findings are presented in Table 5.26 below. The adjusted R^2 which is an indicator for goodness of fit in a cross-sectional data analysis (Rodriguez and Smith, 1994), is 57 percent, which shows a strong fitness.

Among the demographic variables, FAMSIZ appeared to be insignificant in determining household's food security status in the *wereda*. This may be explained in that households with large or small sizes could be affected equally during crisis seasons. SEXHHH is significant, but negatively signed. This negative sign, other things being equal may show that the food status of female-headed households is relatively better than the male headed ones. Because, women often tend to inject their resources primarily into their family's food basket and/or they could have benefited from food aid than males.

EDUCTION also showed negative sign and found to be insignificant in determining food availability. Under normal circumstances, education can significantly increase calorie supply as hypothesized, but it seems to have a very minimal contribution in influencing the per capita food availability under drought conditions, where there was no access to non-farm and off-farm employment. Under such condition even the illiterate heads of the households might have the advantage to go for low status and 'untouchable' kinds of opportunities (such as begging) in the near by and urban areas for mere survival. However, further study seems to be imperative to dig out the tangible reasons why education is negatively related with calorie availability.

Though all of the households were not equally vulnerable to a drought-induced food crisis, the 1998/99 drought in *Legambo* has indiscriminately affected most of the poor and weaker households irrespective of their sex, family size and educational attainment. It is also possible to say that lack of non-farm opportunities and access to other assets might have equally affected educated and male heads of households like those in female and illiterate categories.

As expected AGROECZN has a positive and very significant influence on households' food availability. This strongly supports the results obtained in the descriptive and calorie availability analysis. Since households in *dega* areas were worse affected by the drought, the magnitude of food insecurity increases for the households in the *dega* agro-ecologic zones compared with the *woinadega* areas. Thus, households in *woinadega* agro-ecologies had better chance to escape food poverty than those residing in *dega* zone, mainly due to better resource endowments and a relatively favorable weather condition in 1998/99.

This result is indicative of possible policy instruments needed to change the food security situation in *dega areas (belg* dependent farming households). As insisted by many of the reporting heads of the sample households, a well-targeted and studied resettlement programme might be a good policy option. This could help both in maintaining the households' food security status and rehabilitating the degraded land by both biological and physical regeneration mechanisms. It should be noted that farmers in *dega* areas in addition to lack of access to adequate productive resources, are challenged with the problem of land degradation and highly dependent on *belg* rains hence, agriculture seems to be almost an impossible task in the area.

CULTLAND, as expected has a positive sign and highly significantly affect household's food security status. This strong relation at 99 percent confidence level signifies, as cultivated land is a crucial factor for the household's food security status in the study area. An increase in the size of cultivated land was meant an increase in per capita calorie available for the household. As has been mentioned in 1998/99 production season there was a complete failure of *belg* rains, but for those households who have managed to cultivate from the main season and/or from the scarcely existing traditional irrigation schemes had relatively

better household food security status than those who did not have cultivated or owned farmland.

As hypothesized PROXYTWN has a positive sign and highly significant in influencing household's food security at 1-% level. This result, other things being equal, may indicate that households nearer to small urban centers had chances to get involved in petty trading and other income generating activities and daily wage labour to survive food shortfalls than those who are far away from the centers.

NUMBOXEN and OWNLVSTK have positive, but insignificant coefficients in affecting household's food security condition. Though these variables as hypothesized affect the household's food availability, they seem to have very weak contribution in influencing the per capita energy availability, under drought conditions (like that in 1998/99). The weaker influence of these variables during the study year may indicate the catastrophic cattle mortality during the drought. As a result of which ownership of cattle did not help much in fulfilling household's food requirement. Moreover, since most of the sample households (38%) had reported no ox, food security achievement from this resource was not significant. Getachew (1995), for instance, in his study on famine and food security (in *Habro wereda)* had found even a negative relationship between the number of oxen owned and food security. Positive signs of the variables in this study, however, indicate the importance of these resources in influencing food security during normal seasons in *Legambo wereda.*

FOODAID found out to be significant at 10 % level but negatively correlated with per capita caloric availability. As mentioned by most of the households, since food assistance was made only three to four times during the whole year and was very small in quantity it probably

brought no significant change compared with those who have not been receiving aid (may be due to lack of inappropriate targeting). It can also be argued that a complete reliance of the screened households on free handouts might have made them more vulnerable to food insecurity than the non-receivers (mainly because of dependency syndrome). Because the latter category of households might have opted for other survival mechanisms, like involving themselves into non-farm activities or seasonal wage migration to cope with the food shortage.

FERTUSE, have come out to be insignificant in contributing to the food availability. Though it is highly significant in increasing household's food security during normal seasons, the drought and very low level of fertilizer utilization culture in *Legambo* affected its influence. Yet, its positive sign is probably an indicator of its influence in affecting food security status of households.

NONFRMIN has positive signs and highly significantly affects the food security status of households at 1- % level. In the study *wereda* where farm income is insignificant and unreliable due to bad weather conditions, households who managed to supplement their income with non-farm income had highly better chances of securing access to food than those who had not. This result thus suggests that the creation of non-farm opportunities could help in offsetting households' calorie requirements in the *wereda* where agricultural production seemed to have no hope.

Table 5.26: OLS Regression estimates of major household food security determinants in *Legambo wereda* in 1998/99 (results corrected for heteroskedasticity).

Independent variables	Coefficient	Std. Error	t-value	Sig. t
Constant	1522.3742	415.0843	3.668	0.0004
SEXHHH	-488.8992	251.6105	-1.943	0.0556***
FAMSIZ	61.4564	53.5259	1.148	0.2544
EDUCTION	-144.1904	180.6838	-0.798	0.4273
CULTLAND	1.0605	0.1818	5.832	0.0000*
FERTUSE	0.1565	0.1884	0.831	0.4087
NUMBOXEN	0.1336	0.2083	0.642	0.5230
PROXYTWN	1.3060	0.3131	4.171	0.0001*
FOODAID	-0.3766	0.2083	-1.808	0.0744***
AGROECZN	614.1912	167.3451	3.670	0.0004*
OWNLVSTK	0.1036	0.3478	0.298	0.7666
NONFRMIN	0.4342	0.1406	3.087	.0028*
Adjusted R^2	0.571			
Dependent variable is per capita calorie available (KCALAVAL)				

Note: * and *** indicate significance levels at 1% and 10% respectively.

Source: Computed from the survey data, 2000

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

6.1 Summary

The usual way of illustrating the problems of food security starts with national level food production and self-sufficiency. The current way of looking at the problem suggests reversing this order, to start with vulnerable areas and households. However, this shift in emphasizing household as a major unit of analysis in food security is a very recent acknowledgment, the existing literature dates only since 1980s [historical development and synoptic assessment of food security debate is attached in appendix II].

Although the issue of household food security is invariably accepted as a top agenda by governments and policy makers, the problem is still severe in many developing countries. It is particularly severe in countries like Ethiopia, where more than half of its population lives below the food poverty line. The causes are complex, interrelated and varying from place to place. Unless governments and different stakeholders in rural development address the multifaceted causes of underlying food insecurity, the number of hungry people will remain high in many places of the country, particularly in places like south *Wollo* and more specifically in *weredas* like *Legambo.*

This study has focused on the western part of south *wollo* zone, *Legambo wereda* where food insecurity is becoming virtually a continuous concern of most households. Food insecurity is now a mounting problem in *Legambo wereda.* Most of the farming households belonging to the *wereda* have difficulties to cope with the situation even during normal seasons. Drought induced food insecurity has been a recurrent phenomenon exacerbating the vulnerability of

the resource poor farming households in the *wereda*. The majority of households in the *wereda* do not have enough access to agricultural production resources to produce their own food nor sufficient income from other sources. Thus, many households who depend directly or indirectly on agricultural production have faced severe food shortages in almost every season during the past five years and they were highly dependent on food aid during these years.

The major objective of this study was to investigate the underlying causes of household food insecurity and identify coping strategies of rural households in *Legambo wereda*. To this end, assessment of the households' socio-economic situation to provide a brief and clear picture on the food security situation of the study area; identification and examination of major causes of food insecurity and measuring food security status of households; identification as to what kinds of households are more food insecure or secure and why? Furthermore, assessment and analysis of the copping strategies of the households in the *wereda* was made in this study.

Since *Legambo* is categorized as one of the food insecure *weredas* of the region, repeatedly affected by drought and poorly endowed with natural resources it was purposively selected for this study. The study used primary data collected from three different *Kebeles* and 90 households (30 from each *kebele*) in the *wereda*. It was also supplemented by group discussions with several community representatives and key informants and secondary data collected from various levels (Federal, Regional, Zonal and *Wereda* level government and non-government offices). The data collected was analyzed by using descriptive, food availability and regression (OLS model) methods with the help of SPSS 9 and Limdep 7 computer softwares.

The study looked at the household characteristics and the descriptive results revealed that the study population is characterized by households dominated by male heads (80% of the sample); residing in midland and high altitude areas (*woinadega* (53.3%) and *dega* (46.7%), and predominantly headed by younger (70%) ones. According to the results of the study, average family size, the overall dependency ratio, and sex ratio for the study population were 5.1, 117, and 94.5 respectively. The study *wereda* is also found out to be inhibited by an *Amhara* ethnic group with predominantly Muslim religion and culture. Furthermore, almost 90 percent of the household heads were married (during the survey), there was relatively high fertility and famine mortality, and low literacy attainments in the *wereda.*

With regard to economic conditions of the study households, 97 and 3 percent of the heads were engaged in farming and other small trading and household activities respectively. The study further revealed that the *wereda* has faced a severe food crisis as a result of production failure that mainly occurred during the 1998/99 drought. Lack of adequate access to productive assets, such as shortage and degradation of farmland, lack of oxen and other livestock, and lack of access to non-farm activities were found to be the underlying causes of household food insecurity in the *wereda.* Mean yield, land and oxen holdings in 1998/99 were 2.25 quintals, 0.76 hectares and 1.04 respectively. Evidences derived from this study also indicate that households in *woinadega* areas were relatively better off than those in *dega* areas in terms of resource endowment. In addition to the diminishing farm size (which now reached to a level where it can no longer is adequate for sustaining the household's need), drought resulted in complete failure of crops and massive death of the livestock in the study *wereda.*

The problem of both drought and access failure is more serious in *dega* areas. For instance, in 1998/99, nearly 80 percent of the respondents from the *dega* areas reported as faced a complete loss of crop due to failure of *belg* rains. Therefore, while all households studied were affected by the drought, the impact of food insecurity varied according to food purchasing power, asset base, and agro-ecology. People in *woinadega* areas, for instance, showed a better survival capability in many respects.

In the *wereda,* in addition to lack of productive assets, all of the existing farmlands (including the marginal areas) were cultivated and fragmented, fallowing is almost a forgotten practice, with very low fertilizer application practice animal dung were used as fuel, there is poor tree planting practice and the land is highly degraded. These coupled with the recurrent drought in the *wereda* resulted in drastic decline in agricultural production and the resultant food insecurity constantly threatened the lives of the rural households.

Furthermore, the results suggested that EGS, daily wage labour, small trading and seasonal migration were practiced by some of the sample population and the money generated through non-farm was largely used for food purchase. The serious food insecurity also required frequent distribution of food aid for the past five consecutive years in the *wereda*. According to the results, 95 and 75 percent of the households both from the *dega* and *woinadega* areas respectively have been receiving food aid during the year 1998/99. However, since the flows of relief handouts were not adequate and consistent, there was high out-migration and conditions of food insecurity had actually affected the lives of human beings during the study year.

Household survival/copping strategy during the 1998/99 famine is related to reducing number and size of meals, sell of small animals and draft oxen, consuming wild foods and borrowing food and cash from relatives and friends. These short term coping strategies which are used in times of food insecurity are also supported by out-migrations. In general, the problem in this regard is not only lack of strong coping mechanisms during food shocks, but also there is no mechanism to develop some of the useful survival strategies.

Nearly 64.4 percent of the households in the *wereda* were unable to fulfill their dietary requirements even on the basis of the lowest calorie recommendation level (1785 Kcal). In other words, households in the *wereda* fulfills only 87 percent (1553 Kcal/person/day) of their per capita energy requirement from all available sources of food (including food aid). Overall, only 36 percent of the households were found food secure at the minimum level of survival consumption rate.

The findings of this study in general, recognized that food insecurity in the *wereda* is largely manifested by the combination of continuous and devastating drought, decline in resource endowment and lack of non-farm opportunities for the resource poor and vulnerable households. Food poverty, as found out from the study results is again highly correlated with agro-ecology, non-farm income, nearness to urban centers and possession of productive assets. In general, as revealed by the multiple regression results, among other factors, agro-ecolgy, cultivated land size, proximity to urban centers and non-farm income as hypothesized were found out to have positive coefficients and highly significant impact on the households food security status. Thus, the underlying causes of household food insecurity as revealed by this study, in *Legambo wereda,* are mainly associated with shortage and lack of cultivable lands and other assets (such as oxen), *dega* agro-ecology, lack of access to non-farm income, access to urban centers and drought.

6.2 Recommendations

The results of this study, as discussed in the foregoing parts of the paper underlines that the underlining causes of household food insecurity are complex and interrelated, requiring a multifaceted and all rounded interventions for improving the severity and ultimately eradicating the problem. Since food insecurity, is perceived as a poverty problem, integrated poverty eradication programs are essential to improve access to food. Therefore, this study believes that food insecurity could be eliminated by broad-based and multi-pronged efforts against poverty that is through development programs in all sectors.

Such development programs, as the key in preventing food insecurity, obviously necessitate a combination of integrated sectoral development and policy priorities particularly in the rural settings. Thus, the following recommendations are suggested in line with this thinking:

Shortage and lack of access to farmlands was found to be a very serious problem in the *wreda* as a whole. As a result, households were forced to encroach to the marginal lands for survival, but this alternative has negative consequences on the environment and long term sustainability. Due to constant drought and severe decline in soil fertility, the sustainability of production and productivity also showed a very poor performance particularly in *dega* areas. Thus, in addition to physical and biological conservation measures for the degraded farming environment, a well designed and targeted resettlement programmes to other parts of the region will enable the households to maintain their food security status. In this regard, during the survey, more than 65 percent of the respondents from the *dega* areas recommended resettlement programme as the only way out to the problem of continued drought and soil infertility and the resultant food crisis in their areas.

Agriculture, particularly in the *dega* parts of the *wereda,* seems almost impossible to sustain the livelihood of the farming households. Thus, this challenge calls for changes in policy instruments aimed in supporting the sustenance of lives in the area. One of such efforts should include livestock development. As mentioned in the discussion parts, since the *dega* areas of the *wereda* were found suitable for livestock breeding in general and small stock (sheep) in particular, if genetically appropriate breeds are introduced and supported by targeted credit and extension packages, would improve household food security. With this, the already existing wool production practice (which is now being supported by EECMY around *gimba* areas) should be given attention and expanded to other areas of the *wereda* in order to generate additional income for the households.

To this effect, proper forage development programmes should be introduced to increase livestock production and productivity. A wide range of tree, shrub and herb legumes, grasses and root crops have potential to be useful for forage development. Particular emphasis should be given for agro-forestry development program, which in the long term will increase productivity of fuel and construction wood, fodder, food crops and animal productivity. To put this into effect and create sense of ownership, mountainous and non-productive marginal lands should be distributed to individual households, group of farming community and private investors.

This recommendation will have multiple results: increases livestock feed and production so there will be more manure to fertilize the farm fields, improve firewood supply and decrease land degradation and ultimately improve household's food security status. Along with the problem of livestock feed, land degradation was identified as one of the severe problems in the *wereda* during this study. Thus, public, private and non-government organizations

engaged in rural development programs in the area should encourage and help the farming households to cultivate ecologically viable fodder and tree spices which would help in generating cash for the household, in preserving and maintaining the fertility of the endangered land and in increasing the availability of domestic fuel and livestock feed requirements. However, all these (introducing sheep and other highland cattle varieties, fodder and tree species), for their suitability and success (genetic resistance) requires research approval and continuous extension support.

The relationship between the agro-ecology, rainfall distribution and timing, and the crop production system and out put, which seems very complex, should be supported by agricultural research. The locally existing research and technology centers (such as *Sirinka* and *Sheno* agricultural research institutes, and *Kombolcha* technology center) should take time in testing and releasing agro-ecologically viable, drought resistant, and short maturing crop varieties and improved farm implements, introducing improved livestock breeds and conservation-based trees and forage development that can rescue the vulnerable households from recurrent food shortfalls.

Other policy instruments that are aimed at improving households' employment opportunities will have greater impact in *Legambo* (especially in *dega* climatic regions), where expansion of agriculture has no more hope and coping possibilities are very limited and affected by recurrent drought.

Therefore, policy instruments such as credit and skill training could help develop more diversified non-farm and off-farm income, which would serve in reinforcing the existing local coping strategies and absorb those who are resource poor households. In this regard, ACSI and other NGO's operating in the *wereda* and surrounding places should consider closely relating their financial services to household food security by diversifying their credit schemes into off-farm income generating activities. This attempt also requires careful study and intervention modalities into different agro-ecologies and households to bring desirable and sustained results.

The current rate of population growth in such a resource poor and food insecurity stricken *wereda* is frustrating. Thus, the government, particularly at the local levels should design sound implementation instruments to put the already endorsed population policy into effect. To this end, a focus on family planning and integrated health service and education (IEC) provisions must catch the attention of decision-making bodies.

Rainfall, as evidenced from the study results, is erratic and insufficient in *Legambo*. Thus, promoting and developing small scale and traditional irrigation programmes in general, with particular attention to relatively potential areas will reduce rainfall dependability and enhance the level of household food security.

The very low farm productivity, the lack of household assets, the very low-income levels and a dramatic shortage in caloric availability in the study areas do reflect partly a lack of adequate investment in the rural development. In *Legambo* though there is a good attempt in addressing the rural development programmes, the situation still requires more effort. This effort, among other things, will have substantial effect on households' food security. It can facilitate growth in the rural area and create employment opportunity for the households on the other. These efforts also should focus on social and economic infrastructures (such as: rural roads, health and education, water, and market).

Developing market infrastructure, market information system, training and awareness creation along with improving transport and communication systems can offer possibilities of greater income (or means of livelihood) for the resource poor households in the *wereda*.

Above all, directing all rural development efforts towards household food security in a well-planned and integrated manner (particularly at lower levels) would help to attack food

insecurity. Hence, this in turn needs institutional strength and responsibility in coordinating and integrating all partners in rural development in relation to micro-level food security.

Lastly, the livelihood of many households in the *wereda* was and is seriously affected by 'entitlement failure' and drought in the *wereda.* Thus, although food assistance may not be a long-term solution to the underlying causes of household food insecurity, it seems imperative for the local DPPC to continue the relief handout for some time to keep alive those who have no access either to produce or buy food. But, the link with the EGS system would help both in reducing dependency syndrome and contributing to the local development.

REFERENCES

Alderman, Harold and Garcia, Marito (1993). *Poverty, household food security, and nutrition in rural Pakistan*. IFPRI, research report 96.

Alemayehu Mengistu (1997). *Conservation-Based Forage Development for Ethiopia.* Self-help Development International Institute for Sustainable Development. Addis Ababa, Ethiopia.

Anderson, P.P (1989). "*Government Policy, Food security and Nutrition in sub-Saharan Africa*", PEW/Corneal Lectures series on food and Nutrition policy, Corneal Food and Nutrition program Division of Nutrition Sciences, Corneal University, New York.

ANRS, (1997). "*Integrated food security program for the year 1988-2002 draft 0.*" *Bahir Dar,* Ethiopia.

Aspen, Harald and Abdulhamid B.Kello (1999). *Poverty and resources: Ethiopia rural realities*. Working papers on Ethiopian Development, IDR (AAU) and Norwegian university of science and technology, Dragvoll campus, NTNU, N-7491, Trondheim, Norway.

Aspen, Harald (1994). *Spirits, Mediums, and Human Worlds: The Amhara Peasants of the North Ethiopian Highlands and their Traditions of Knowledge*. Universiy of Trondheim, Norway

Ayres, W.S. and Alex F. McCall (1996). "*Rural development, Agriculture and Food Security*", in Finance and Development, Quarterly publications of the IMF and the WB, Vol. 33, No. 4, Washington D.C., USA

Bender, David L. (1995). *Hunger: Current controversies*. Greenhaven press, USA.

Bereket Kebede and Mekonen Taddesse, (1996). *The Ethiopian Economy and poverty Alleviation*, in the proceedings of the fifth Annual conference on the Ethiopian Economy AAU & EEA, Addis Ababa.

Befekadu Degefe and Berhanu Nega, eds., (2000). *Annual Report on the Ethiopian Economy*. The Ethiopian Economic Association, Volume I, 199/2000. Addis Ababa, Ethiopia.

Besley, Timothy, and Kambur, Ravi (1993). *The Principles of Targeting*. The World Bank, N.W, Washington, D.C. including the poor: Proceedings of a symposium organized by the World Bank and IFPRS.

BoPED, (1997). *Report on Household income and expenditure sample survey of Bahir Dar and Gondar.*Regional Income Accounting team, Bahir Dar.

Bohele, H.G. (1993). *The Geography of Vulnerable food systems* in (eds.) Bohel, et al, Copping with Vulnerability and Centrality, Freiburg.

Booth, David and Holland, Jeremy (1998). *Participation and Combined Methods in African Poverty Assessment:* Renewing the Agenda. Department for International Development (DFID), London, UK.

Clay, C. Daniel, and et al, (1997). *Food Aid Targeting in Ethiopia*. Grain Market Research Project, MEDaC. Addis Ababa, Ethiopia.

Charles H. Southwick, (1996) "*Global Economy in human perspective*," Oxford university press.

Chamber, R. (1992). *Rural Appraisal: Rapid, relaxed and participatory*. IDS, Discussion paper .311. University of Sussex, Brighton, BN1 9RE, England.

Chamber, R. (1983) "*Putting the Last First*" Rural Development, Longman, and Malaysia.

Chapman, Cassandra and Haile Kiros Desta (1999). *The North Wolo North East Plain Food Economy Zone*. Bbaseline Report. SCF (UK), Addis Ababa, Ethiopia.

CRDA, (1997). "*Training program on food security and vulnerability*" presented and conducted by International development consulting firm, Dessie, Ethiopia.

CSA (1995). *The 1994 Population and Housing Census of Ethiopia*: Results for *Amhara* Region. VolumeI: Part I Statistical report on Population Size and Characteristics. Addis Ababa, Ethiopia.

CSA (1995). *The 1994 Population and Housing Census of Ethiopia*: Results for *Amhara* Region. VolumeI: Part II Statistical report on Education and Economic Activity. Addis Ababa, Ethiopia.

CSA (1998). *Revised report on the 1995/96 Houshold Income, Consumption and Expenditure Survey*. Addis Ababa, Ethiopia.

CSA (1999). *Report on the 1996 Welfare Monitoring Survey*. Statistical bulletin 205. Addis Ababa, Ethiopia.

CSA (1999). *The 1994 Population and Housing Census of Ethiopia*: Results at Country level. VolumeII: Analytical report. Addis Ababa, Ethiopia.

Dagnew, Eshete (1997). *Training programme on food security and Vulnerability*. CRDA, prepared and conducted by: International Development consulting firm (IDCoF) Dessie, Ethiopia.

Debebe Habtewold and Maxwell, Simon (1992). *Vulnerability profiles and risk mapping to Ethiopia*. MoPED, food and nutrition unit, Addis Ababa, Ethiopia.

Debebe Habtewold, (1997) "*Food Security A brief Review of concepts and Indicators*" A paper presented on the workshop on" Integrating Nutrition into Development plans, projects and programs" held at Bahir Dar, May 11-14, Bahir Dar. Ethiopia.

_____ (1999). *Food situation in Ethiopia*: Problems and prospects, December, 1999, Addis Ababa, Ethiopia.

Dessalegn, Rahmato (1988). *The crisis of Livelihood in Ethiopia*. Working paper No.4. Ethiopian Research programme college of Arts and Science, University of Trondheim, N-7055 Dragvoll, Norway.

_____ (1991). *Famine and survival strategies*. Printed in Sweden by Bohuslaaningens Boktryckeri AB,Uddevalla.

DoPED, South Wollo (1993). *A Priliminary Survey on Utilization of Natural Resources in South Wollo*. Dessie, Ethiopia.

DPPC (1995). *Guidelines for Early Warning System in Ethiopia*. Early Warning Department, Addis Ababa, Ethiopia.

Timberlake, lioyd (1986). *Africa in crisis: the causes, the cures of environmental bankruptcy*. New society publishers, an earthscan book, Llondon and Washington, DC.

Tschirley, David, and et al 91995). *Improving information and performance in grain marketing* : An assessment of current market information systems, and recommendations for developing a public grain MIS. Working paper1, Food security research project, MEDaC, A.A., Ethiopia.

UN, (1982). "*National Food Strategies*" to Eradicate Hunger. UN, World Food Council.

Valdes, Alberto (eds.), (1981). *Food Security for Developing Countries*. A Westview Special study. Westview Press, Inc. Colorado, USA.

Wangia, SM Mukoya (1999). *Household Production, Consumptio, and Food Security Status in Kakamega Region of Kenya*. University of Missouri, Colombia.

W. Ladd Hollist and F. Lamand, (1987*). Pursuing Food Security Strategies and Obstacles in Africa, Asia, Latin America and Middle East.*

Webb, Patrick, and et al (1992). *Famine and Drought Mitigation in Ethiopia*. Famine and food policy discussion paper, discussion paper7. Food consumption and nutrition division nternational food policy research institute, N.W. Washington, D.C. 20036.

_____ (1992). Famine In Ethiopia : *Policy implications of Coping failure at national and household levels*-IFPRI, research report 92.

Webb, Patrick, and V. Braun, Joachim (1994). *Famine and Food Security in Ethiopia*: Lessons for Africa. John Wiley and Sons Ltd., west Sussex PO19 1UD, England.

Yared Amare (1999). *Household Resources, Strategies and Food Security in Ethiopia.* A study of *Amhara* households in *Wogda,* Northern Shewa. The Department of Sociology and Social Administration, AAU press, Ethiopia.

Yerasswork Admassie (1995). *Twenty Years to No where.* Property Rights, Land Management and conservation in Ethiopia. Dept. of Sociology, University, 1995 Uppsala.

Young, Helen (1992). *Food Scarcity and Famine : Assessment and response*. Oxfam practical health guide No. 7. Printed by Oxfam print unit.

Yudelman, Montague (1987). Prospects for Agricultural Development In sub-Saharan Africa. Occasional paper by Winrock International, Institute for Agricultural Development, USA.

Mulat Demeke, et al (1995). *"Food Security, Nutrition and Poverty Alleviation in Ethiopia. Problems and prospects"*. Addis Ababa, Ethiopia.

MoPED, (1992). *Regional Food Balance Sheet and other Aspects of production distribution in Ethiopia*. Food & Nutrition Unit, AA

_____ (1994). *Integrating Population and Development Planning* (IPDP). Workshop Proceedings, December 1994. Addis Ababa, Ethiopia.

Pankhrust, Richard (1985). *The History of famine and epidemic in Ethiopia prior to the twentieth century*. Printed in London, H & L communications Ltd, England.

Pfettermann, Guy P., and Griffin, Charles C. (1989*). Nutrition and health programmes in Latin America:* Targeting Social Expenditures. The World Bank, N.W., Washington, D.C., USA

Pleskovic, Boris, and E.Stiglitz, Joseph(1997). *Annual World Bank conference on Development Economics.* World Bank, Washington, D.C., USA

Rempel, Henry (1998). *The interaction of non-agricultural employment, agricultural development and reduced chronic food insecurity*: sub-Saharan Africa, 1970 to 1990. African development review, vol.10, No.2.

Reta Asseged (1998). *A study of Household Food Security Situation in Anger Gutin Resettlement, East Wellega,Ethiopia*. University college of Dublin.

Rodriguez, Adrian G. and Smith, Stephen M. (1994). *Acomparison of Determinants of Urban, Rural and Farm Poverty in Costa Rica.* World Development vol. 22 No. 3, Great Brtain.

SCF-UK's 1999 NSP results -reports on South wollo and Oromiya zone.

SAERP (1996). *Household Level Socio-Economic Survey of the Amhara Region*. Volumes I and II, UNDP SAERP/WARDIS. Produced by the Cooperative Endeavours of the Amhara Regional Council and the United Nations Economic Commission for Africa (UNECA). Addis Ababa, Ethiopia.

Sen, Amartya (1981). *Poverty and Famines*: An essay on Entitlement and deprivation. Oxford university press, Delhi.

Tapsoba, EK (1990). *Food Security Policy Issues in West Africa*: Past Lessons and Future Prospects: A critical Review. FAO Economic and Social Development paper 93. Rome Italy.

Tegegne Gebre Egziabher, and et al., eds. (1999). *Aspects of Development Issues in Ethiopia*. Proceedings of a workshop on the Twenty Fifth Anniversary of the Institute of Development Research. Addis Ababa, Ethiopia.

_____ (1999). Food Availability and Resources: A Micro Perspective: The case of South Wollo and East Gojam in Ethiopia.

TGE (1993). *National policy on disaster prevention and management*. Addis Ababa, Ethiopia.

Thomson, Anne and Metz, Manfred (1997). *Implications of Economic Policy for Food Security*. A Training manual. Agricultural training materials for agricultural planning, 40. Rome.

Howard, Julie and et al (1995). *Toward increased domestic cereals production in Ethiopia*. Working paper3, food security research. MEDaC, A.A. Ethiopia.

IDR (1998). *Baseline Socio-Economic Survey in nine Weredas in South Wollo and East Gojam*. ANRS/Sida Cooperation in Rural Decelopment.

IDS, bulletin (1990*). Nationalizing the anti-poverty agenda*? IDS, University of Sussex, Brighton, UK.

IFPRI (1989). Food and Policy Issues in Ethiopia. Rome, Italy.

Ingor (1994). Loerbroks: *The Population*: Food Equation, in the proceedings of National workshop on Integrating population and Development Planning, MoPED, Addis Ababa, Dec. 1994.

Jalan, Jyotsna and Ravallion, Martin (1998). *Determinants of Transient and Chronic Poverty*; Evidence from Rural Chaina. The World Bank Research Development Group, working paper 1936.

Jayne,T.S. and Daniel, Molla (1995). *Toward a research Agenda to promote household access to food in Ethiopia*. Working paper 2, Food security research project. MEDaC, Addis Ababa, Ethiopia.

Jazairy, Idriss, and et al (1992). *The state of World Rural Poverty*: An inquiry into its causes and consequences. IFAD, New York University press, U.S.A.

Lipton, Michael, and Ravallion, Martin (1995). Poverty and policy. Hand book of development economics , vol 3, edited by J.Behrman and T.N Srinivasan. University of Sussex and the World Bank.

Markos, Ezra (1997). *Demographic responses to ecological degradation and food insecurity :* Drought prone areas in Northern Ethiopia. PDOD publication series (doctoral dissertation). Thesis publishers, prinseneiland, Amsterdam, The Netherlands.

Maxwell, S. and Frankenberger, R. (1995). *Household food security: Concepts, indicators, measurements.* A technical review, UNICEF programme publications, N.Y.

MEDaC (1997). *Highlight of Development Strategies for Selected Sectors*. Macro Economic Planning and Policy Analysis Department. Addis Ababa, Ethiopia.

_____ (1997). *Development and co-operation*. Quarterly magazine, Jan. 1997. Vol. 1, No. 4 Addis Ababa.

_____ (1999). *Survey of the Ethiopian Economy*. Review of Post-Reform Developments (1992/93 - 1997/98). Addis Ababa, Ethiopia.

_____ (1999). *Poverty Situation in Ethiopia*. Welfare Monitoring unit. Addis Ababa, Ethiopia.

Melese G/Tsadik and Ggebeyhu Goshu (1999). Livestock Status Under the 1999 Drought, South Wollo, Ethiopia. South Wollo Agriculture Department.

Michael P. Todaro(1989). *Economic Development in Third world*. Orient Longman Limited, 1989, Delhi.

Ege, Svein (1990). *Ethiopia: Problems of Sustainable Development*. A conference report. Ethiopia Research Programme College of Arts and Science University of Trondheim. Dragvoll, Norway.

ENI (1997). *Food Composition Table For Use in Ethiopia Part III*. Addis Ababa, Ethiopia.

Fassil G.Kiros (1990). *An Assessment of the Economic Consequences of Drought, Crop Failure and Famine in Ethiopia - 1973/74 - 1985/86*. IDR, Addis Ababa University monographs series No. 1.

FAO (1986). *Food security : objectives and traditional policies*. Training materials for agricultural planning 31, research report No.52, IFPRI, Washington.

____ (1996). *World Food Summit*: Rome Declaration on World Food Security and World Food Summit Plan of Action. Rome, Italy.

____ (1997). *Agriculture, Food and Nutrition for Africa*. Aresource book for teachers of agriculture. Rome, Italy.

FDRE (1996). *National Food security strategy*. Addis Ababa, Ethiopia.

Geler, Gabriele (1995*). Food security policy in Africa between disaster relief and structural Adjustment:* Reflections on the conception and effectiveness of policies : the case of Tanzania. Printed in Great Britain by FRANK CASS and co. LTD. Newbury house, London and in USA by FRANK CASS c/o ISBS, Portland, Oregon.

Getachew, Diriba (1995). *Economy at the crossroads: Famine and food security in rural Ethiopia*. CARE International in Ethiopia, Addis Ababa, Ethiopia.

Greeley, Martin (1994). *Measurement of poverty and poverty of measurement*. IDS Bulletin, Vol. 25 No.2. IDS at the university of Sussex, Brighton BN1 9RE, UK.

Grossfeld, S. (1993). *Wasting Away*: America's losing battle against hunger. Boston USA.

Haddad, Lawrence, Kennedy, Eileen and Sullivan Joan (1994). *Choice of indicators for food security and nutrition monitoring*- IFPRI, reprinted from food policy vol.19, No.3. Report 298. Washington, D.C., USA

Hadgu Bariagaber (1996) *Demographic Influences of Food Availability and Incidence of under nutrition and Malnutrition*. The case of private and co-operative Household in Arsi Region (Ethiopia) in the proceedings of the fifth Annual conference on the Ethiopian Economy, AAU and EEA, Addis Ababa.

Hagenaars, A.J.M. (1986). *The perception of Poverty*. Elsevier science publishers B.V., 100BZ Amsterdam, The Netherlands.

Hans G. Sanger, (1994). *Future of Rural Development Between the Adjustment of the project Approach and Sectoral Program*, design. GDI Book series Vol. 2

Hollist, W.Ladd, and Tullis, F.Lamond (1987*). Pursuing food security: Strategies and Obstacles in Africa, Asia, Latin America and the Middle East*. International political economy year book vol.3. Rienner publishers, Inc. USA

APPENDIX II: Main Features of International Debate on Food Security

Perception of food insecurity as	Supply Problem	Production Problem	Poverty Problem
Overriding Objective	Closing any food gaps through trade and aid	Growth of domestic food production	Increase in purchasing power
Indicator of Food Security	Domestic food supply per capita	Domestic food production per capita	- domestic real income per capita - real income per capita of various population groups (income distribution)
Specific Food Security Policies	No explicit food security policies (except in emergencies) - imports of food if needed for supplies to urban population - food aid (food aid convention) - establishment of national early-warning systems	National food strategies - increase in domestic food production (price policy; technical progress) - restructuring of grain markets - establishment of national emergency food reserves	National Food Security Action Plans, especially for African countries - **Short-term:** - poverty alleviation measures - analysis of rural and urban groups suffering from food insecurity - selective government action to reduce transitory and chronic food insecurity and general subsidies - **Long-term** - measures to increase economic growth - social security systems
General Development Strategy	- industrial development on the model of the industrialized countries (urban bias) - integration into the world market - promotion of cash crop production	- inward-oriented development - collective self-reliance - food self-sufficiency - at least partial delinking from the world market	-structural adjustment programs (reform of macro and sectoral policies) - promotion of productive investment in agriculture and industry - trade based on comparative advantages
Theoretical Debate	- modernization theories - economic growth theories and "trickle-down" - classical/neo-classical foreign trade theories	- dependency theories/theories of peripheral capitalism - dissociation concepts - terms of trade debate	highly controversial - neo-liberal concepts (get prices right) - growth with equity - entitlement approach (Sen) - employment-oriented concepts (ILO)
Context	- growth optimism in the 1950's and 1960's - optimism about ability to plan development - food security not on agenda as a problem	- world food crisis 1972-1974 - growing agricultural protectionism and self-sufficiency in industrialized countries - emerging pessimism about development - production successes achieved in "Green Revolution" - growing criticism of food aid - deterioration of terms of trade/ pessimism about trade	- African famine 1983/84 - worsening of debt crisis - disillusionment over trickle-down mechanism - limits to growth - pessimism about planning

Source: Geier (1995:22-23).

APPENDIX I

Household Food Insecurity and Coping Strategies Survey in LEGAMBO *Wereda, South Wollo Zone, Amhara Region* 1992 E.C./2000 G.C.

[SUMMARIZED HOUSEHOLD QUESTIONNAIRE FROM 16 PAGED QUESTIONS]

PART I: General information

1. Zone: 2.Wereda 3.KA Name & Code 4. Agro-climate 5.Household number:
6. Name of the household head 7. Ethnicity of the HHH 8.Language of the HHH
9. Religion of the

A) **Interviewer (name)** _____
B) **Date of interview**_____**1992/2000**
C) **Supervised and checked by** _____
D) **Finally checked by** _____
E) **Status: OK** _____ **Problem :**_____
F) **Comment (if any):** _____

PART II: composition and other demographic characteristics (to be asked about all family members)

2.1 Name of HH members, Marital status, relationship to the HH, Sex, Age, Literacy status, Major occupation, Place of origin and migration, etc.

PART III: Farming System 1998/99.

3.1 Structure and Size /use of land holding
3.2 Land fragmentation and tenure security
3.3 Crop production- type of crops produced in *Meher & Belg* seasons, trends in crop production, problems in production system, types of storage, major reasons for loss, etc.
3.4 Inputs used, Credit and Extension services in
3.5 Livestock Production & functions

PART IV: Asset possession and non-farm sources of Income

4.1 Ownership and changes of assets since 1995/96
4.2 Sources of Non-Farm income-in the last week, month and year (1998/99)

Part V: Consumption

5.1 Number and frequency of meals per day during normal and deficit period for different members of the household.
5.2 Monthly and yearly consumption requirements of the household.
5.3 Weekly consumption, expenditure and sources of money or grain

PART VI. Expenditure (non-food expenses)

6.1 Weekly, monthly and yearly expenditure on non-food items (1998/99)

PART VII: Marketing

7.1 Weekly and daily market places, distances, transportation meanses and types of major commodities
7.2 Amount of food grain purchased and sold by the HH during the last year (1998/99).

PART VIII: Coping Mechanisms.

8.1 Coping practices used during minor and major crop failures
8.2 Mechanisms in cases of sever food crisis and sequences of practices
8.3 Recent food shortage/drought (1998/99) and coping mechanisms in the area

PART IX: Food Aid

9.1 Food aid received during the last 12 months (1998/99)
9.2 Amount, frequency and type of items received in 1998/99 and last 5 years.
9.3 Involvement in Food/Cash for Work/EGS schemes in the area during the last couple of years
9.4 Other sources of income such as, remittances, gifts or other transfers in the last 12 months

Part X: General Questions

10.1 Gender issues, resource base, income generating activities, Drought recurrences, Environmental protection and Rehabilitation, and etc. issues
10.2 Major problems of the *kebele*, farmers perception about causes of food insecurity and solutions foreseen.

APPENDICES

APPENDIX III: Estimates of Food Insecure in Ethiopia

Study/survey	Measurement/ Indicator	Region	Social category and Size			
			social category	No.(ml)	% Total	%FI
IFAD poverty Analysis (1989)	socio-economic indicators (oxen ownership, input use, IMR, etc.)	Wollo, Illubabor, Sidamo, Hararghe, Gamo Gofa	-	18.9	43.0	-
Food aid & Food Security study (1992)	Anthropometric measurements (stunting)	Wollo, Shoa, Sidamo, Hararghe, Gondar, Gojjam	-	31.1	60.0	-
World Bank Food Security study (1992)	Data on physical resources and income	Tigray, N.Gondar, Wollo, NE.Shoa, Hararghe, Arsi, Bale	Rural, Resource poor, pastoralists, Farm settlers, Urban poor & Unemployed (disabled, aged, etc) **Total**	20.7 0.6 21.3	38.0 1.0 39.8	97.2 2.8 -
MoPED social Dimension of Adjustment (1992)	Ownership of oxen, size of land, physical productivity, income	All (with different proportion)	Rural, Very poor, poor Vulnerable Nomads Urban poor **Total**	 8.8 3.8 7.4 2.2 4.9 27.1	 16.0 7.0 13.4 4.0 9.0 50.7	 32.5 14.0 27.3 8.1 18.1 -
Vulnerability profile & Risk Mapping (1992)	Review on various evidences and interpolating data	Wollo, Tigray, Sidamo, Hararghe, Gamo Gofa	Rural Chronic Transitory Urban Unemployable Employed Others (Refugees, Displaced, etc) **Total**	 13.5 6.5 0.2 3.8 2.75 26.7	 24.5 12.0 0.4 7.0 5.4 50.0	 50.5 24.3 0.01 14.2 10.2 -
Food Aid Targeting(1998)	Food Availability	-	Rural	19.0	43.2	-
MEDaC, Poverty Study (1999)	Income and Expenditure	All (with different proportion)	Rural Urban **Total**	22.3 2.4 24.7	47.5 33.2 45.5	89.8 10.2 -

Note: '%total' and '%FI' refer to proportion of food insecure in the total population and concentration of food insecure respectively.

Source: Debebe 1993 & 1999; Clay, et al 1998; MEDaC 1999.

Annex IV: Average annual Food and non-food Expenditure of the sample households by type of items and amount of expenses according to agro-ecology

Items	*Dega*		*Woinadega*	
1. Food items	**(Birr)**	**Quintal**	**(Birr)**	**Quintal**
Teff	2584..30	10.31	11852.00	52.64
Barley	351.00	2.90	242.00	1.00
Wheat	1694.70	8.55	5781.00	25.78
Sorghum	4781.00	26.95	3274.00	16.89
Pulses	416.00	2.08	3427	19.26
Oil-seeds	-	-	-	
Total mean	1965.40	10.16	4915.20	23.11

	Dega	*Woinadega*
2. Non-food items	**(Birr)**	**(Birr)**
Coffe	117.10	131.00
Chat	11.10	4.42
Clothing	34.05	97.87
Transport	6.43	11.75
Wedding	2.26	28.52
'Maheber'	-	2.10
'Sedeka'	-	19.10
Taxes	19.83	24.05
Furniture	0.83	1.80
Farm inputs	6.60	14.91
Medical expenses	3.73	8.63
Education fees	3.68	8.60
'Equb'	-	-
'Ider'/ 'Kire'	15.62	33.42
Church/mosque contribution	0.40	1.10
Kerosene	19.75	31.25
Salt, pepper & spices	45.93	109.28
PA contribution	1.21	2.10
Total mean	19.23	35.33

Source: Survey data, 2000

APPENDIX V: Average distances traveled by the sample households in different agro-ecologies to obtain different services and infrastructural facilities

Types of services/infrastructure	*Dega*						*Woinadega*					
	Distances in hours						Distances in hours					
	<1	1 - 2	2 - 3	3 - 4	4 - 6	> 6	<1	1 - 2	2 - 3	3 - 4	4 - 6	> 6
Water point	7	30	3	2	-	-	3	29	16	-	-	-
All weather road	11	7	6	8	10	-	9	11	18	2	6	2
Main daily market	5	25	9	3	-	-	-	-	-	3	-	-
Main weekly market	5	16	21	-	-	-	8	10	16	10	4	-
Grazing area	27	15	-	-	-	-	8	10	16	10	4	-
Wereda center	5	6	1	1	28	-	8	10	8	7	4	11

Source: Survey data, 2000

DECLARATION

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

Name: ESHETU BEKELE YIMENU

Signature : _____

Place : Addis Ababa University
Date of Submission: June, 2000.
Addis Ababa, Ethiopia.

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

_____
Mulat Demeke (Ph.D.)

June 2000
Addis Ababa, Ethiopia.