POVERTY AND ITS NATURE IN ETHIOPIA

By

KEBEDE Assefa Demeke

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

MASTER OF PUBLIC POLICY

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Professor YOU, Joing-Il

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1. Introduction

The most important goal for development efforts is to reduce poverty. A pro-poor development strategy certainly must focus on economic growth, but it also needs to take distributional impacts into account. The character of the relationship between growth and inequality is therefore important from a poverty alleviation perspective.

The debate on the link between per capita incomes and inequality was initiated by Simon Kuznets (1955), who found an inverted U-relationship between them in a cross-section of countries; i.e. growth leads first to rising inequality and then to falling inequality. He argued that this pattern was generated by structural change in a dual economy setting, in which labor was shifted from a poor and relatively undifferentiated traditional sector to a more productive and more differentiated, modern sector.

This hypothesis has been exposed to many cross-country tests, which initially tended to give it some support, but it was also obvious that inequality largely depended on other factors (Anand and Kanbur, 1993). Deininger and Squire (1998) then used (reasonably consistent) time-series data for individual countries over recent decades, but failed to find any systematic link between per capita incomes and inequality.

Ravallion and Chen (1997) distributed country observations into four quadrants, according to the direction of change in mean consumption and the poverty rate

Virtually all observations fell either in the quadrant with rising poverty and falling average consumption or in the quadrant with rising average consumption and falling poverty. Dollar and Kraay (2000) found that the average income of the poor increased at the same rate as average income overall, and that growth thus was good for the poor. There is thus, in general, a strong correlation between per capita income-growth and reduction of poverty.

In a strategy to reduce poverty, economic policy aimed at rapid growth is thus fundamental. Still, the strength of the poverty-reducing effect of growth will depend on the characteristics of the growth process. Since poverty is most prevalent in Ethiopia, and none of the studies above focused especially on Ethiopia, it is particularly important to investigate the extent to which experiences there are consistent with those in other Third World regions, and there is now a trickle of better quality data from Ethiopia that starts to make it possible to investigate relationships in greater detail than previously possible. With access to panel-data sets, it is also possible to investigate income mobility, i.e. movements in or out of poverty.

Moser and Ichida (2001) showed that there was a significant link for African countries between economic growth and improvements in non-monetary poverty indicators. Using household survey-data for 16 African countries, Ali and Thorbecke (1998) found that rural poverty tended to be more responsive to growth than urban poverty, while the latter tended to be more responsive to changes in income distribution.

1.1 Problem Statement

Most of the rural people in developing countries elsewhere are subject to famine, Malnutrition and generally to food insecurity. Food insecurity is a problem stemming from poverty and deprivation of productive assets like land, draft animal, farming tools, etc.

The problem of poverty has many factors it is not only dependent on crop failure due to unsuitable weather but also animal epidemics and the resulting loss of yield. The problem can be expressed widely as the food_ poverty_ population problem. This intern can be explained as the problem of food and income.

Hanger, massive population growth, and poverty are among the most critical problems in Ethiopia, in general and in north Wollo zone (study area) in particular. Most part of the problem lies in the poor performance of agriculture. To meet the growing good needs from traditional crops is unattainable and complementary improvements are needed in the technology of production, processing and storing local crop in the study area.

The growth rate of food production and the rate of population growth in Ethiopia have not gone side by side. This indicates agricultural production has failed to meet the minimum requirement of 2100 K cal per person per day. For these reasons poverty is an over whelming problem in North wollo Zone (study area)

1.2 Objective of the study

The main objective of this paper is to analyze the problems that define being poverty subsequently the paper need to look at the causes of poverty dynamics in the context of changing realities in Ethiopia. In addition, to comment on the national poverty reduction strategy questions could be raised by people such as: what are the strategies and instruments, channels directed at poverty reduction? What are it's strengthen and risks and so on.

To assess the source of income and to study the level of poverty and income inequality for the sample house hold in the zone.

To discuss the severity and to identify factors that influences poverty: and to measure the extent to which the level of poverty in the various methods and to picture out the characteristics of poor in Ethiopia.

To establish food balance sheet in the zone for the period of 1996-2000

To estimate the probability of food shortfall occurrence based on the monthly-based rainfall data.

And finally to present summery and conclusion of the future what kind of attention should be given to implement and achieve the objective of the strategy.

1.3 Methodology and data source of the study

The data are mainly collected from source on time series basis. Some data are collected from cross sectional studies, surveys, reports and books etc. Which are primarily based on a fresh data.

The data for cereals out put is collected from the zonal department of agriculture for the years 1996-2000.

The same sources are used for the data of livestock, fertilizer utilization and data of population is obtained from projections made based on 1994 housing and population census.

The methodology engaged in this study is primarily the descriptive one. To support some empirical evidence I have estimate the logistic probability Model / logit/ to show the relationship between the dependent variable; which are in the qualitative and quantitative form.

1.4 Organization of the paper

The paper is organized in to five chapters, the first chapter is an introductory portion where general background, Objectives, Methodology of the study and organization of the paper.

The second chapter is deal with review of literature part, which gives a theoretical insight and highlights on the conceptual framework of the topic under study that assess definitions of poverty, and characteristics of the poor in Ethiopia.

The third chapter is deal about the general features country profiles such as socio-economic conditions, the extent of poverty in Ethiopia that is prevailing now: by compare and contrast with other developing countries based on the given data.

The fourth chapter is devoted to analytical approach to the problem statement. In this section efforts are made to show the extent and severity of the problem stated. The analyses is both in the form of descriptive method and causal of explanatory methods. The relation ship between the problem of vulnerability and factors affecting it are tried to be traced in this chapter.

The last chapter is devoted to assess and give some comments on the national poverty reduction strategy: by analyzing its strengths and risk: and to forward some possible solutions for the problem will discusses so far and will presented as "recommendations" and conclusion.

Chapter Two

2.1 Conceptual framework

2.2 Definition of poverty

There has been no consensus on the actual definition of poverty in scholarly writing. This can be attributed to the fact that poverty is a complicated phenomenon that cuts across social, economic, political cultural and gender aspects of life. Chigunta, Masiye, Chisanga (1998) argue that poverty is country specific.

In fact, when one analyses the poverty situation in Ethiopia one can further argue that poverty is location specific and is perceived as insufficient access to food, education, health care, adequate shelter, adequate income, clear surrounding, sanitation and safe drinking water and lack of power.

According to Chigunta et al this kind of poverty is what is known as absolute poverty. As president of the World Bank, Robert MacNamara define Absolute poverty as a condition of life so limited by malnutrition, illiteracy, disease squalid surrounding, high infant mortality and low life expectancy as to be beneath any reasonable definition of human decency.

The Ethiopian National Poverty Reduction Strategic Framework (1998) defines poverty in terms of the income and consumption approach, which assumes that the access to income through employment entitlement of other means is the main factor that determines consumption.

The poverty reduction strategy however, notes the limitations of such a definition arguing that the income and consumption approach pays insufficient attention to common property resources, state provided services and vulnerability. Other indicators of well being such as income and consumption (income perspective), indicators of well being (capacity perspective), basic human needs (BHN perspective) need to supplement the income and consumption approach of poverty.

The following definition of poverty applies for Ethiopia " low Life expectancy, low education opportunities, inadequate access to resources for a decent standard of living e.g. income and consumption, housing, health, clean water and sanitation, productive potential and other central dimensions of well being" and lack of freedom to exercise choice and participate in society.

2.3 Causes of poverty in Ethiopia

There are several factors that cause poverty. The majority of these factors are internal. These include political, Macro economic institutional and social factors. Other factors such as the external debt and unpredictable droughts are connected with external economic factors. Both internal and external factors interact in a complex way and present themselves as a fundamental, underlying and immediate cause of poverty.

The fundamental, underlying and immediate causes are influenced directly by the degree of political and economic stability, governance and transparency, which are directly influenced by external factors.

The huge debt burden in Ethiopia has been identified as one of the major causes of poverty and the most important. Today, the external debt of the country is about US7 billion. Half of the amount is owed to multilateral agencies particularly the IMF and World Bank. The other half of the external debt is owed to bilateral organizations. Debt repayment averages US$ 133 million per year, which represents 69.1% more than what the country spends on all the social sectors. It is there fore evident that debt servicing is given priority in the expenditure pattern of the country at the expense of the social sector.

On the other hand in rural areas poverty is closely related to agro-ecological conditions, while access to land and livestock ownership are considered important indicators of relative wealth (there are few non-agricultural sources of income). Particularly livestock ownership is telling in this respect, as land distribution is rather egalitarian in many parts of Ethiopia, though the incidence of land fragmentation is quickly increasing.

Harvest failure often leads to loss of (livestock) assets and a fall into poverty. Poverty in urban areas is related to access to employment as well as to business cycles. The urban poor are also likely to rely on household informal businesses predominantly run by women, activities by children and remittances.

In urban areas the poor face a specific problem in terms of lack of access to public services and facilities. While there is no noticeable difference between female-headed households and the probability of being poor, a close relationship between poverty, education, fertility, employment, food consumption and health exists.

The relationships are intricate, with poor people tending to educate their children less, and less educated people tending to be disproportional poor.

Enrolment rates vary with consumption patterns. Similarly, poor health can be seen as both a cause and a result from poverty. The continued economic growth during the 1990s suggests that some poverty reduction may have taken place. However studies are not conclusive about changes in poverty in Ethiopia in the 1990s, and further studies on the patterns and causes of poverty will need to be undertaken in order to get a complete picture of this multi-faceted phenomenon.

In the Interim Poverty Reduction Strategy Program (PRSP) the government mainly focuses on the opportunity (economic) dimension of poverty.

Examination of other aspects of poverty, like the capability dimension measured for instance through indicators of malnutrition or the security dimension e.g. increased vulnerability to food insecurity, infectious diseases and conflict may well lead to the conclusion that the quality of life has not improved in recent years for large vulnerable
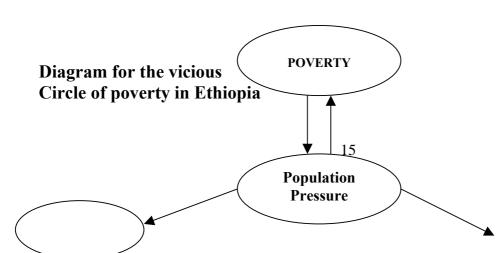
2.4- Characteristics of the poor in Ethiopia

There are different ways in which people experience poverty and this has a bearing in the manner in which they perceive. There are some common characteristics, Which people commonly identify with the poor who are illustrated bellow:

Personal and physical conditions	Economic status	Social status	Political Participation
Lack of food Inadequate food Lack of decent shelter Lack of access to health care Lack of access to education Poor clothing Disabled	Lack of money Inadequate income Lack of productive-assets	Landlessness Inequality Low self esteem Female headed HH Single women	Lack of political-participation Powerlessness Lack of access to legal -institutions Lack of political voice

Diagram for the vicious Circle of poverty in Ethiopia

POVERTY

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Population Pressure

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                    ┌──────────────┐
                    │ Scarce grazing│
                    │     land      │
                    └──────────────┘
                         │    ╲
                         │     ╲
                         │   ┌──────────────┐
                         │   │ Soil erosion │
                         │   │ & degradation│
                         │   └──────────────┘
                         ▼      ╱
                    ┌──────────────┐
                    │  Unreliable  │
                    │  livestock   │
                    │  production  │
                    └──────────────┘
                            ╲
                             ▼
                        ┌──────────────┐
                        │ Unproductive │
                        │  agriculture │
                        └──────────────┘
                          │        ▲
                          ▼        │
                        ┌──────────────┐
                        │   POVERTY    │
                        └──────────────┘
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Scarce grazing land

Soil erosion & degradation

Unreliable livestock production

Unproductive agriculture

POVERTY

Chapter Three

3.1 Socio-Economic Conditions in Ethiopia

By all available indicators, Ethiopia is one of the poorest countries in the world. GDP per capita is around USD 110, while life expectancy, educational enrolment, and other indicators of well-being are all extremely low. Agriculture continues to dominate the economy, contributing 45% of GDP (Table 1), but since it accounts for 80% of employment, its level of productivity is obviously very low. The country suffers spells of drought, with resulting famines, and such conditions have a strong influence on the performance of the whole economy. Over the last thirty years, life expectancy has shown little improvement, food production per capita has declined, and school enrolment has changed little (Table 2).

Table 1: Basic economic indicators, 1992/93-1998/99

	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/9
Real GDP (annual % change)	12.0	1.6	6.2	10.6	5.2	-0.5	6.7
Real per capita GDP (annual % change)	9.8	-0.6	4.0	8.4	3.0	-2.7	4.5
Consumer Prices (annual % change)	10.0	1.2	13.0	4 0.9	-6.4	3.7	3.6

As a percentage of GDP

Agriculture	53.8	51	49.7	51.5	50.7	45.7	45.6
Industry	10.4	11	11.2	10.6	10.8	11.6	12.1
Distribution and Other Services	27.1	28.5	28.6	27.9	28.4	30.1	30.6
Public Administration and Defense	8.7	9.4	10.5	9.9	10.1	12.6	10.7
Consumption	97.9	94.6	92.0	95.3	91.4	93.7	95.5
Gross Domestic Investment	14.2	15.2	16.4	19.1	19.1	18.2	18.6
Gross Domestic Savings	2.1	5.4	8.0	4.7	8.6	6.3	4.5
Resource balance	-12.1	-9.8	-8.5	-14.4	-10.5	-11.9	-14
External Debt	–	-77.4	81.1	71.6	65.3	143.5	142.4
Government Revenue	12.0	13.9	17.4	18.4	19.0	18.7	19.0
Grants	1.7	3.5	3.3	2.9	3.6	2.8	2.2
Expenditure and Net Lending	19.6	25.2	24.8	27.0	24.3	25.5	25.7

Source: IMF, 1999

Table 2: Basic social and demographic indicators

	1970-75	1980-85	1990-97
Total Population (million)	33	43.4	59.9
Urban population (percent of total)	9.5	11.7	16
Population Growth Rate (%)	2.6	2.8	2.2
Life Expectancy (years)	47	48	52
Index of Food production per capita (1987=100)	114.2	99.3	99.4
Population per physician (thousands)	86.1	78.9	-
Population per hospital bed (thousands)	3.5	3.4	4.1

Labor force:

Agriculture	90	83	80
Industry	2	2	2

Education:
Gross Enrolment Ratio (percent of relevant age group)

Total Primary	24	37	38
Total Secondary	-	9	12
Total Tertiary	-	13	19

Pupil-teacher ratio

Primary	44	48	30
Secondary	34	43	32

Source: IMF, 1999

During the 1990s there were significant changes in the political and economic landscape of the country. The regime that had ruled for nearly two decades was

ousted from power in 1991 leading to the end of the civil war. In 1992/93 the

government adopted an Economic Reform Program with the support of the

international financial institutions. So far, four Policy Framework Papers have been

agreed between the Ethiopian government, the International Monetary Fund, and the

World Bank.

A ten-year development strategy, known as Agricultural Development-Led

Industrialization (ADLI), was laid out. Major objectives are promotion of economic

growth and poverty reduction. Helped by the restoration of peace, good weather, and

changes in macroeconomic policies, the economy registered increased rates of growth

during 1992/93-1996/97. Nevertheless, domestic savings, a mere 5% of GDP in

1998/99 (Table 1), are not sufficient to meet investment needs. The resource gap (14%

of GDP) led to a rise in external debt to 142% of GDP in 1998/99.

3.2 The extent of poverty in Ethiopia

As it is explained on the socio-economic condition of the country, Ethiopia is among

the bottom of the least-developed countries. Its per capita income is among the lowest

of the least-developed countries, and its reliance on agriculture among the highest in

the group.

Poverty in Ethiopia is widespread and multi-faceted. Measured mainly in terms of food consumption, set at a minimum nutrition requirement of 2200 calories per adult per day, and also including non-food consumption requirements, an estimate of 1995/96 shows that 45.5 per cent of the population was below the poverty line. Poverty was prevalent both in rural and urban areas, with coverage of 47 and 33 per cent of the respective population. Since the rural areas account for about 85 per cent of the country's population, poverty is primarily a rural phenomenon.

The urban areas account for only 15 per cent of the total population, but also have a high rate of incidence of poverty. Here the root cause is under-and unemployment, which is generally felt to be quite high, though data are lacking.

Socio-economic indicators also reflect poverty to be widespread in the country .In 1994, life expectancy at birth was 50.6 years of age, and infant mortality rate and child mortality rates were 118 and 173 per 1000 respectively, and maternal mortality rate was 700 per 100,000. Illiteracy rate in 1995 was about 77 per cent for females and 55 per cent for males, and gross enrolment ratio at the primary level of education was 34 per cent in 1993.

While the magnitude of poverty is immense, there is an indication of a significant decline during the 1995. A panel data based on a survey of six below average villages at two different periods in 1989 and 1994/95 show a decline of absolute poverty measured in terms of food consumption from 61.3 per cent to 45.9 per cent.

Although some of this decline could be the result of better climatic conditions in 1994/95, the data provides a strong indication of improvement in the underlying conditions of poverty. Similarly there has been a steep improvement in primary education, with the gross enrolment ratio increasing from a peak level of 35 percent in 1987/88 to 45.8 percent in 1998/99. Incidentally, the enrolment ratio had severely fallen down during the end of the 1984 and the beginning of the 1995, and started at 35 percent in 1991/92 at the start of the transitional government.

Availability of data on poverty in Ethiopia is relatively satisfactory. A detailed survey of household income, consumption and expenditure (HHICE) conducted in 1995/96 has generated considerable amount of information on the status of poverty in the country.

A wide-range of data on sources and levels oh household income, pattern of expenditure, levels of consumption, assets of households and demographic characteristics have been collected. In general, the survey found that the per capita income was $167(weighted average), and that it was $217(15%) for the urban areas and $159(85%) for the rural areas.

Significant variations were also shown among the different regions of the country. It was also found that about 60 per cent of the household income was spent on food, and that the average daily intake per adult was equivalent to 1954 calories. Information generated from a health and nutrition survey in 1998 revealed that 52 per cent of all children aged 3- 5 months were stunted, and acute malnutrition or wasting ranged from 6 per cent among children aged 3- 5 months to 13 per cent among those aged 12-23 months. Based on the 1995/96 HHICE survey data, a report on "Poverty Situation in Ethiopia" was produced by the government in March 1999.

3.3 Ethiopia's income poverty in the wider context

'Ranked at 210th out of a total of 210 countries in GNP per capita terms and 208th in terms of GNP per capita measured at Purchasing Power Parity (PPP) by the most recent World Bank World Development Report.

Ethiopia is, by any measure, one of the poorest countries on earth' (EEA, 1999:1). However, Table 3, which shows the GNP per capita and the proportions living below $1 and $2 a day in a number of developing countries, demonstrates Ethiopia's achievements with regard to individual poverty; while ranking definitively lowest in terms of GNP per capita (although not in GNP per capita PPP$) it is sixth (out of nine) in terms of the incidence of poverty (measured as having less than $1 a day). Namibia, with a GNP per capita more than 18 times that of Ethiopia has a larger proportion of its population (although a much smaller number of people) living below $1 a day than Ethiopia has.

Table 3: International poverty lines and GNP for selected countries

Country	Survey year	Population Below $1 A day	Population Below $2 A day	GNP Per capita $1999	Agricultural Growth rate % 1998-99	GNP Capita PPP$1999
Ethiopia	1995	31.3	76.4	100	4.8	599
Mali	1994	72.8	90.6	240	2.7	693
Tanzania	1993	19.9	59.7	240	3.1	478
Nigeria	1997	70.2	90.8	310	0.5	744
Uganda	1992	36.7	77.2	320	4.8	1136
Kenya	1994	26.5	62.3	360	0.1	975
Bangladesh	1996	29.1	77.8	370	3.3	1475
Ghana		_	_	390	2.1	1793
India	1997	44.2	86.2	450	4.9	2149
Namibia	1993	35.9	55.8	1890	0.6	5369

Source: World Bank Development Report 2000/2001 pp 274/5 and 280/1

3.4 Spatial aspects of household income poverty

Poverty is related to location; there are differences between rural and urban, and within the urban category there are differences according to area of residence. Within the rural category there are differences according to livelihood system, which in turn depends on topography, ecology, and history.

The most resent study of the poverty situation was done in 1999 by the Minster of Economic Development and Cooperation (MEDaC) and indicates that the absolute poverty line was Birr 1075.03 or 165.4 per adult per year in 1995/96. The poverty line expressed in terms of caloric intake was 2200/adult person/day. Accordingly, the proportion of the population of Ethiopian living below the poverty line was 45.5 percent. As show in table 4 the incidence of absolute poverty in rural areas was higher by 14.3 percent than the urban poverty. Thus, poverty is essentially a rural phenomenon accounting for 90 percent of the national figure in 1995/96.

The depth of poverty is 13 percent, suggesting that a substantial majority of the poor are close to the poverty line. The results of the Central Statistical Authority CSA surveys also indicate that the average annual spending per adult was Birr 1088 or $136. The breakdown shows that foodstuffs are the main expenditure items with a share of 60 percent.

Table4: Poverty indices of Ethiopia, 1995/96

Region	Per capita Income/expenditure 19 95/1996		Poverty Headcount Ratio	Poverty Gap Ratio
	Birr	USD		
National	1088	167	45.5	13
Urban	1411	217	na	na
Rural	1035	159	na	na
Tigray	904	139	57.9	18
Affar	1106	170	51.8	16
Amhara	917	141	56.7	17
Oromia	1184	182	34.7	8
Somali	1166	179	34.6	8
Bensi,G.	1027	158	47.6	14
SNNPR	945	146	56.5	18
Gambella	1223	188	41.8	12
Harari	1460	225	29.1	2
Addis Ababa	1569	341	30.0	11
Drie Dawa	1397	215	24.6	9

(Source: MEDaC, 1999)

Poverty has many aspects including demography. Being poor means having low income, which causes low purchasing power that means low capacity to obtain basic needs such as food, health and education, particularly, basic education for the child. The consumption of these goods and services constitutes the means towards achieving a better life for the family. Poor families are constrained from achieving this better life because of their low incomes. The poor lack access to basic services.

This is reflected in their greater exposure to various kinds of health hazards; they, especially their infants and children, are always exposed to the risk of untimely death. Many of poor families were found in agriculture had less land. Very few poor agricultural households have access to modern technology such as irrigation system, high-yielding variety seeds, pesticides and credit facilities. In the case of land, which is limited, rapid population growth leads to farm fragmentation; farms become smaller and smaller in size, divided among the children. The resource base of poor families is also deteriorating due to the excessive use of these resources; partly resulting from population pressure that aggravates the exploitation of forestlands.

4. 1 Empirical finding and results

4.1.1 Introduction

As it is noted by Philip raikes (1988): people die of starvation or go hungry not because there is no food in their country or region, but because they cannot afford it of lack access to food, they are in the state of food insecurity (Poverty).

Of course, food may be physically absent from areas; but if people have an aggregate effective demand to bring the food from surplus area to deficit area, then they will be in the state of food security.

Turning to the study area that is North Wollo Zone, most of its population (93 %) is rural who are engaged in agricultural activities. The livelihood of the people is farming and livestock rearing. The households engaged in agriculture are highly subsistent and they produce teff, sorghum,(in low land), wheat, and barley (in the highlands).During the time of famine induced by natural disasters, they are highly vulnerable to hunger and malniutrition even though the severity and occurrence varies seasonally across district of the Zone.

In the following sections of this chapter I would like to discuss poverty with respect to its determinant factors such as livestock holding, crop production, population growth, application of modern technology, settlement pattern and monthly base rain fall data and so on.

This chapter goes on discussing Poverty along with other determinants like peoples income, wealth, off-farm employment, price of grains, etc which determine the purchasing power of the society. Theses factors strongly affect food entitlement of households in particular and the community at large.

4.1Crop Production and Productivity In North -Wollo Zone

Increased income or food consumption by poor is unlikely in most developing countries unless agriculture production increases. Increased production not only raises the income of poor farmers, but also can lower the prices of food, making it possible for the poor to purchase larger quantities.

To increase food production, methods of increasing food production have crucial role to bring about hopes of feeding the needy people; improved input supply, increasing land productivity, improved marketing system, improved technology training services to farmer, effective management, roads, storages and irrigation are very important among the methods in increasing production.

Agriculture is the major economic activity in the study area with considerable emphasis on mixed farming. Peasants in North Wollo Zone grow cereals, root crops, cash crops and livestock, Production. About 95 % of the total population is engaged in agriculture and mostly grown crops are creases (such as maize, wheat, sorghum, teff, barly, etc..) and cash crops, (like coffee and chat); pulses (Such as horse bean, haricot bean, peas, chick peas, lentils, etc....) However, the most important food crops are cereals.

In the study area as can be seen from table below, not only production short fall persists, but also production methods, number of trained farmers, and number of peasants using modern inputs are low or very poor for the years 1996-2000.

Table 4-1 productions of Major Crops in North-Wollo Zone

Year	Cultivated land (Ha)	Cereal production in Qt	Productivity of land
1996	288181.50	1459673.60	5.07
1997	251118.85	1282458.40	5.11
1998	259615.90	1776493.94	6.84
1999	250033.05	1683711.33	6.73
2000	264877	1013519	4.05
Total	1313826.3	7215856.27	5.49

Source: North Wollo Agriculture Department.

4.1.1 Problems associated with cereals production

As it mentioned earlier, cereals are the most important food crops in the study area. However, there are countless problems associated with their production; the major one being the problem of productivity; to raise the yield per hectar for the cereals. North Wollo, modern farm inputs like fertilizer, herbicides, pesticides, fungicides, etc should be available and accessible for the framers through different mechanisms like credit delivery, etc.... The problem of cereal production is also the requirement of traction power. For this reason drought animals are needed! Another problem of cereal production in the irregularity of rain fall season and fluctuation in intensity of rainfall, which damages the crops and ultimate yield.

4.2   Livestock

4.2.1   Cattle: A total of 552,058 livestock units are found within the North Wollo Administrative Zone; all of them are indigenous undefined breeds. Cattle are

characterized by their late maturity, extended calving interval, low milk yield and short lactation period.

According to a recent survey, next to sheep, cattle are the major livestock Commodity; they are agro-climatic Zones as a source of traction power, milk, Meat, hides and manure for fuel.

4.2.2   Constraints in Cattle Production. The main constraints to livestock production in general and, for cattle production in particular are the shortage of feed. Generally, within the North Wollo Administrative Zone more than 90 % of the natural vegetation has been depleted; more over, the land holding area per family is very small. Additionally, what at one time was used grazing land-because of population pressure has been converted in to land; thus, cattle are almost totally dependent on crop residues.

4.2.3   Small Reminats. North Wollo has 89,396 and 66,560 sheep and goots, respectively. Like in any other part of the country, local breeds dominate sheep and goats in North Wollo; these do not belong to specific bread. The feed source of small reminats is generally constituted of a few grasses growing in areas unsuited for agriculture such as on hilly areas (too steep or rough for cultivation) and wet bottomlands. There is no additional feed supply except on stubble. The entire crop residue is used to feed cattle; small ruminates (shoot) Usually are not given any crop residues.

4.2.4   Poultry - The poultry industries characterized by small scavenging flocks of local birds kept by individual households. Data collected by the North Wollo Department of Agriculture and Natural Resources; suggest that there are 992,257 birds. The majority of birds are found in the mid-highlands between 1,500 and 3,000

m.a.s.l According to a survey, average household have about three birds, which can produce between 55 and 80 eggs per annum. Local birds are used as source of income to support the household. Women have a great role in poultry production.

Table 4-2 Livestock population by district -North Wollo Zone

District	Cattle	Sheep	Goats	Equines	Camels	Poultry
Habru	74,871	2,752	7,273	5,815	-	84,021
Delanta	49,772	17,034	3,688	10,211	-	132,319
Woldia	84,561	25,140	6,991	14,707	-	200,616
Bugna	97,105	19,310	28,596	8,820	-	126,048
Gidan	39,806	6,124	1,509	6,217	-	72,636
Kobo	79,836	5,075	5,230	5,619,	256	168,022
Gubalafto	46,953	3,112	2,663	5,619,	854	77,461
Meket	79,154	10,849	10,580	7,931	-	131,134
Total	552,058	89,396	66,560	64,939	1,110	992,257

Source: North wollo Agriculture Department

4.3.5 Livestock Population In North Wollo Zone

The livestock is measured in TLU (Tropical livestock unit). To do so I have used the conversion factors for each livestock depending National Parameter and on the average regional prices for caws, oxen, bulls, sheep, and goats and converted into TLU in terms of cattle equivalent.

For Example 6 or 7 sheep/goat (shoot) can be equivalent to an ox depending on the average regional price. Thus, the livestock populations depending on the available Zonal Agricultural department data will the following

Table 4-3 Livestock population In North wollo Zone

Type of livestock	Population in Number	Population in TLU*
Cattle	552,058	552,058.00

Sheep	89,396	13,409.40
Goats	66,560	9,984.00
Equines	64,939	60.609.73
Camels	1,110	1,609.50
Poultry	992,257	4,961.285
Total	1766320	642,631.915

Source: Own Calculations

TLU   Convention are used as follow

Cattle =   TLU

Shoat =   0.15 TLU

Horse =   1 TLU

Mule   =   1.65 TLU

Donkey=   0.65TLU

Camel =   1.45 TLU

Poultry=   0.005 TLU

TLU   =   Tropical Livestock Unit.

Source: CSA (Central Statistics autority)

4.2.5   Animal health - Animal health is one of the constraints, which cause poor performance in the livestock production system. Many of the problems are a result of the interaction between technical and non-technical constraints. Poorly feed, for example, have low disease resistance and low fertility; poor grazing land management causes mortality and morbidity from internal and external parasites. Many of the disease constraints that affect animal productivity are also consequences of non-technical constraints such as insufficient money to purchase veterinary drugs.

4.4 Food Aid and poverty

Food aid represents the most prominent form of external assistance that, by nature and intention, that is specifically designed to enhance food security.

In a broad sense, food aid can be understood as a resource transfer in kind of food to beneficiaries at concessional terms, i.e. better terms than available on the market.

Relief food aid is provided on a grant basis and distributed to targeted beneficiaries to address critical food needs arising from natural and man-made disasters.

The primary function of food aid consists in alleviating food insecurity resulting from temporary or structural food deficits. Which food aid approach, and whether any form of food aid, represents an appropriate intervention depends, to a large degree, on the nature of existing food deficits and their causes. The food deficits may apply to a country as a whole, to a specific drought prone of disaster-affected area, or to a particular vulnerable population group, and they can be the result of demand or supply based factors (e.g. shortfalls in income, or in food production and supplies).

Food aid has been channeled through different NGOs and government agencies in North Wollo Zone, the major ones being organization for Rehabilitation & Development in Amhara (ORDA), Save the children UK (SCF) and Ethiopian orthodox church (EOC) both of whom are NGOS and RRC (now DPPC) which is a government agency.

Table 4.5 Relief operation /1994-1998/ and population Assisted

District	1996		1997		1998		1999		2000	
	Pop assisted	Food distributed Qt	Pop assisted	Food distributed Qt	pop assisted	Food distributed Qt	Pop assisted	Food distributed Qt	Pop assisted	Food distributed Qt

Delanta	15,668	14,101	65,700	58,050	25,000	22,714	47,698	23m871	39,477	23,353
Habru	16,449	12,336	1,676	4,094	-	-	33,745	13,904	60,475	11,273
Kobo	1,023	644,45	68	23	25,000	19,279	28,194	16,808	102,054	24,959
Bugna	35,000	22,852	37,000	33,976	40,000	47,910	37,390	27,463	57,800	19,771
Gidan	23,000	20,700	14,400	21,870	25,000	22,619	28,170	9,098	45,298	14,618
Meket	28,459	23,098	71,600	65,665	30,800	26,340	67,142	16,666	54,427	19,501
Gubatafto	32,185	32,908	4,000	2,004	13,330	5,894	13,102	16,409	54,999	16,928
Woldia	5,860	5,274	49,175	33,546	20,000	18,935	17,050	7,521	20,025	6,777
TOTAL	157,644	131,915	243,619	219,228	178,330	163,691	292,491	131,738	434,555	137,182

Source: North Wollo Zone DPPC

4.5 Population Size and their Distribution in Settlement

According to the census result, the population of North-Wollo Zone as of October 1994 has been 1,260,317 of which 633,702 (50.28%) are male and 626,615 (49.72) are female. On the other hand out of the total population, 1,171,262 (92.93%) were living in rural areas while 89055 (7.07%) were living in urban area.

Based on the 1994 census the total population for 1997 (July 1) has been predicted to be 1,344,042 with 675,595 male and 668,447 females with estimated annual average growth rate 2.23% for rural and 4.11% for urban areas from this it is easy to calculate the annual average growth rate for total population i.e. 2.371%. The first two rates are estimated nationally and have been taken of calculate population projection for the next 6 years from 1994.

But the total population growth is calculated from the total population projected using the rates estimated nationally based on populations of 1984 - 1994.

Since the resulting projected population figures can be used for drawing development plans, for policy making and for monitoring and evaluation of the impact of the implementation of the development plans. I have tried to predict the population projection up to 2000 based on October 12,1994.

Table 4.6 Population projections predicted (forecasted) for 6 years next to 1994

S.No	Rural/Urban Population	October 12/1994	July 1/1995	July 1/1996	July 1/1997	July 1/1998	July 1/1999	July 1/2000
1	Rural Population	1,171,166	1,190,166	1,217,013	1,244,464	1,272,537	1,301,241	1,330,594
1.1	Male	592,621	602,184	615,768	629,658	643,863	658,388	673,243
1.2	Female	578,641	587,982	601,245	641,806	628,674	642,853	657,351
2	Urban Population	89,055	91,721	95,569	99,578	103,755	108,106	112,642
2.1	Male	41,081	42,310	44,086	45,937	47,862	49,868	51,960
2.2	Female	47,974	49,411	51,483	53,641	55,893	58,238	60,682
3	Total Population	1,260,317	1,281,887	1,312,582	1,344,042	1,376,292	1,409,347	1,443,236
3.1	Male	633,702	644,494	659,854	675,595	691,725	708,256	725,203
3.2	Female	626,615	637,393	652,728	668,447	684,567	701,091	718,033

Source: - The 1994 Population and Housing Census of Ethiopia.

Most of the people in North Wollo Zone are Amhara and speak their mother tongue-Amharic. Even if the majority of the people are Amhara, there are very small numbers of other ethnic members. This has clearly been reported by the 1994 census with total population of 1,11,262 in North Wollo Zone

The formula used to project population for 6 years next to 1994 is

$$Pt + n = pt\, e^{r\,n}, = r = \frac{1}{n}\, Ln\, \frac{(pt+n)}{pt}$$

Where pt = Population size at the base year (initial year)

Pt + n = Population size after n years

e = 2.718281828

 r = rate at which population is growing

n = number of years from the initial year.

4.6 Food balance sheet (FBS)

Food balance sheet, which is collected in most countries now, that shows the quantities of food commodities available for human consumption at the national level. By building up a picture of production, imports and exports, the FBS shows the average level of food supply in a country over a given period of time. Turning back to North Wollo Zone, cereals are the most dominant crops grown in the Zone accounting for at least 30% and 98% of the total cultivated land and grain production respectively. Crops are grown during the two major seasons that is, Meher (main) and Belg (small). The later season is restricted only to the high land districts of the western North Wollo Zone.

The total supply of food from the sources considered in the analysis for the post five years was about 1,485,023 quintals on the average. Though there was an erratic nature of the food supply in the analysis period, there were increases of production in the latest three cropping years. Except in 2000 production period.

In the five years development program of North Wollo Zone top priorities have been give to the agriculture sector to attain food self-sufficiency.

It is already stated that the food balance approach has a limitation for that it does disguise the food situation at the household level.

But one of the essential determinants of food security is availability of food. Access to food in another aspect of food security. The food balance therefore, has shown only the availability of food, which ensured that there were adequate supplies of food through domestic/local production or food aids for the analysis periods.

The availability of food remains to be only necessary pre-condition for the household food security. It is upon this context that ensuring households access to food through diversified efforts has been come the zonal administrative deep concern. We therefore, are aiming at securing households with food either they produce it themselves or they have the income to acquire it.

The next thing is to reveal the level of food insecurity that is the basic indicator of poverty in North Wollo Zone as a whole for the consecutive five production years based on the following national parameters

- **Off take rate of Cattle   7.5%**

- **Off take rate of Sheep   33%**

- **Off take rate of Goat   38%**

- **Off take rate of Poultry   41%**

- **Net carcass weight of cattle 109 kg meat**

- **Net carcas weight of sheep 10kg meat**

- **Net carcas weight goat 8 kg meat**

- **100 gram meat equivalent to 187 k calories**

- **1Qt cereal equivalent to 1.029 Qt Wheat**

➢ **Off take rate means, the probability of animals will be slaught.**

Table 4-7 Food Balance Sheet for North Wollo Zone in the period 1994-1998

S.N0	Particulars	Year					
		1996	1997	1998	1999	2000	Average
1	Supply of Production	1502004.00	1319649.00	1828012.00	1732539.00	1042911.00	1485023.00
2	Less 15 % post harvest loss	225300.60	197947.35	274201.80	259880.85	156436.65	222753.45
3	Less 6% seed	76602.20	67302.10	93228.61	88359.49	53188.46	75736.17
4	Net production (1-2-3)	1200101.20	1054399.55	1460581.59	1384298.66	833285.89	1186533.38
5	Food Aid Chinned by DPPC or NGOs	131915.00	219228.00	163691.00	131738.00	137182.00	156750.00
6	Total Grain available (4+5)	1332016.20	1273627.55	1624272.59	1516036.66	970467.89	1343284.18
7	Other food sources in cereal equivalent (meat)	28338.28	28338.28	28338.28	28338.28	28338.28	28338.28
8	Total Supply (6+7)	1360454.84	1301965.83	1652610.87	1544374.94	998806.17	1371622.46
9	Demand (population census and estimate)	1260317.00	1281887.00	1312582.00	134042.00	1376292.00	1315024.00
10	Total demand at 2.25 Qt	2835713.25	2884245.75	2953309.50	3001594.50	3096657.00	2958804.00
11	Food Balance (8-10)	-1475358.41	-1582280.12	-1300698.63	-1457219.56	-2097850.83	-1587181.54
12	Self-sufficiency ratio (%) 4+7/10	43.32	37.54	50.42	47.06	27.82	41.06
13	Food Availability ratio (%) (8/10)	47.97	45.14	55.96	51.45	32.25	46.36

Source: NWAD, CSA, DPPC, * Calculated by the author

4.6.1 Magnitude of Poverty North Wollo Zone

Food security results in human suffering. It produces unproductive labour force, reduces work performance and productivity, and diverts productive resources while trying to cope with it. Food security in the other hand may have also an implication for the environment and the use of natural resources. The foods insecure and poor often have to choose between short-term satisfactions of food needs with long term environmental degradation.

The nation-wide policy to attain food self-sufficiency; which is a pre-condition to food security, is being realized. Now comes ensuring food access to the ability of households in any either circumstance. Hence the next question is to ask what happens to food security.

The analysis presented in this section is based on the 2100 Kcal minimum nutritional requirement recommended for Ethiopia, which is equivalent with 225-kg.of cereals/person/annum. This amount is assumed to be equally applied to North Wollo Zone. According the table, domestic food production supply was only to cover 41.0 % and 46.36 % of the minimum nutritional requirements on the average respectively. In the five consecutive production periods shown in the table North Wollo Zone never exceeded to cover 56 % of their needs even in the normal cropping year 1998. High levels of imports mainly in the form of food aids have been exhibited in the table. The food insecurity, though, seems to be improving in the table; strenuous endeavor need to be exerted than the present level which otherwise undoubtedly signifies the seriousness of the problem.

Hence, the food supply side is only taken as the appropriate way of determing the level of magnitude of food in security in North Wollo Zone.

Determining the level of food insecurity from the viewpoint of income becomes very difficult due to lack of information. The food insecure are always the peasants and poor who lack the ability to acquire food ether by producing themselves or have the income to purchase it. In our context, the rural poor and landless farmers are the food insecure people and estimated to be about 561,00 households in 2000. This accounts around 40.76% of the total population of North Wollo Zone Districts. Which means head-count of the proportion of the total population undernourished in 40.76%

4.6.2 The Poor Year Situation Case Study

The case study made by SCF UK in North Wollo shows that the poor year households don't meet their household needs up to 35 %.

↔For the rich and middle class residents of low land and high land districts

- Crop purchase is very important source of food, hence marketing aspects of food is very important.

- Livestock is a source of income and wealth, and source of employment for the poor.

↔For the poor/very poor households

- Labour exchange is very useful source of income & Livelihood,
- Migration labour is major source of income for poor HHs

↔ For middle class:

- Petty trade is important source of income and hence non-farm income opportunities have to be expanded.

Table 4-8 Economic Condition of the Society in Wealth Group

	North Wollo-Low Land						North Wollo-High Land					
	Deficit	Purchase	Labour Exchange	Milk Meat	Wild Fruit	Crops	Deficit	Purchase	Labor	Milk meat	Wild fruit	Crops
Wealth groups												
V/poor	15.35	0	30.35	0	0.15	25-40	15.0	20-40	25-30	0	0.12	30.35
Poor	15.25	5.7	20-25	0.5	0.10	40-55	14	5-20	20-23	0	0.01	20-40
Medium	7.5	15-20	15-20	5.15	0.05	45-55	5	45-55	0	5-10	0	40-50
Rich	0	15-20	0	20.30	0	55-65	0	55-65	0	10-20	0	35-45

Source: SCF UK: Food and Economy Analysis: Tekeze low lands and North Wollo high lands.
Note *-With Relief

	Wealth Class		
Source of Income %	**Poor**	**Middle**	**Rich**
Cash crops	0-10	5-10	10-15
Petty trade	5-10	40-50	
Migration	60-70		
Straw of crops	5-10		
Local Labour	0-15		
Livestock production		5-10	10-15
Livestock		40-50	40-45
Crop sales		5-10	10-20
Donkey hire/trade			15-20

4.7 Drought occurrences in the study area

Agro-ecological zones The North Wollo Administrative Zone has four agro-ecological Zones, namely warm 38 % moderate 34%, cold 21% and verycold7 %

Most common crops grown across agro-ecological in the warm and warm area are: teff, sorghum, maize in warm; teff, sorghum, maize, wheat and barley are in moderate; Barley, lentils and Various types of legumes are grown in high land or cold areas: and the farming system of the study area is almost entirely rain feed. So it's performance in highly dependent upon the timeliness and adequacy of rainfall. The agricultural cycle is determined by two rainy seasons: the belg of short rainy season, which accrues, mainly, during the March-April period and the meher or long rainly season, which comprises, mainly, the June-September period.

The belg (miner) season main features are:
a)   Land preparation from January to February
b)   Planting season from February to April
c)   Rainly season from March to April
d)   Harvesting from June to July

The meher (main rain) season main features are:
a)   Land preparation from July to September
b)   Planting season from July to August
c)   Rainy season from July to September
d)   Harvesting from October to December

Based on the above Agro-ecological patterns to estimate the probability of drought occurrences in North Wollo Zone, Monthly basis rainfall distribution data is as follows:

Table 4-9 Monthly Basis Rainfall Data in north Wollo Zone.

YEAR	JAN.	FEB.	MAR.	APR	MAY	JUN	JUL	AUG	SEP.	OCT.	NOV.	DEC.	TOTAL
1980	0.00	0.00	0.00	0.00	0.00	0.00	95.50	242.20	0.00	63.00	23.50	4.00	428.20
1981	0.00	15.80	226.50	51.80	11.20	24.30	210.40	245.80	47.60	4.00	0.00	1.40	838.80
1982	52.90	160.40	89.20	71.90	44.50	0.00	78.30	178.60	78.80	147.60	56.80	8.50	967.50
1983	95.00	57.00	95.10	153.60	220.70	51.20	0.00	114.40	44.20	28.20	48.80	0.20	908.40
1984	0.00	24.70	26.20	53.20	123.20	10.50	25.70	50.50	67.30	0.00	14.80	58.80	455.10
1985	9.80	3.50	103.00	130.40	96.50	5.70	145.20	212.20	125.30	3.20	0.00	48.20	883.00
1986	0.00	94.80	48.90	181.70	0.00	75.20	130.10	178.20	177.70	7.00	1.20	66.70	961.50
1987	0.00	28.50	172.00	103.90	149.10	1.90	36.30	207.40	107.10	58.00	0.00	39.30	903.50
1988	21.40	208.00	5.80	155.10	12.20	11.00	299.20	250.20	110.40	29.90	0.00	0.50	1103.70
1989	15.20	68.00	173.40	133.00	64.40	7.60	134.50	0.00	92.40	0.00	0.00	0.00	688.50
1990	89.10	65.20	52.50	17.80	37.20	7.50	166.40	287.50	86.80	56.10	62.00	272.50	1200.60
1991	29.50	3.50	34.20	145.30	63.80	0.00	143.00	134.20	137.10	93.30	0.00	11.40	795.30
1992	0.00	0.00	76.20	52.20	36.90	5.50	259.40	406.40	115.00	1.70	44.40	5.80	1003.50
1993	0.00	62.00	112.50	271.20	29.20	44.70	280.30	275.00	69.90	23.40	0.00	87.10	1255.30
1994	78.60	1.70	163.70	115.90	199.00	72.30	113.00	329.80	60.00	37.10	51.50	6.30	1228.90
1995	32.50	1.80	219.90	83.80	71.50	129.00	206.90	184.30	103.30	329.60	106.00	0.10	1468.70
1996	115.20	118.90	100.40	63.50	36.10	0.00	362.50	323.30	73.50	93.00	0.00	0.00	1286.40

Source: SIRINKA RESEARCH CENTER

The Estimation on drought accurrences in North-Wollo Zone is based on rainfall data for the period 1980-1996. I consider the Probability of facing temporary food shortage is highly correlated with drought accurrences and this probability is estimated on the Zonal level, taking into account just the absolute level of rainfall, but rather the amount in relation to need for the dominant agricultural activity in each area.

Thus, 550mm per annum (p.a) is taken as a threshold for maize-growing areas in eastern parts of the Zone. 400mm, P.a for teff, and lentils grown and 950mm P.a for Barley, Wheat growing areas in the Western parts of North Wollo Zone.

On the basis of the given data the drought accurrences of North wollo Zone is 30 % assume the rain distribution of the future will the same or not significantly difference from the past 17 years data of rainfall.

4.8 Poverty and income inequality in the study area

Poverty is conventionally measured by the income or expenditure level that can sustain a bare minimum standard of living, poverty can be measured in relative or absolute terms world development report (WDR) 1990 used an upper poverty line of SU $370 (in 1985 purchasing power parity dollars) per capita as a cut off for absolute poverty.

People whose consumption levels fall below that level are considered poor. The WDR also used a lower poverty line US $275, people whose consumption levels fall below that level are very poor; and income inequality is an issue closely related to poverty and according to same, responsible for much of the observed social malaise in the area.

Closely related to the issue of income distribution is that of absolute poverty. While the former describes the relative distribution of income accruing to specific income groups, the latter is a measure of those individuals in the population whose welfare is less than some absolute standard.

4.8.1   The Lorenz Curve and the Gin Coefficient

The Lorenz Curve is a cumulative distribution of income across the population; wile the Gini Coefficient is a measure of income inequality, which is derived from the Lorenz Curve.

The Gin Coefficient is an inequality index which is defined as the ratio of the area enclosed between the 45 degree line and Lorenz Curve (Let area A) to the area of the entire triangle enclosed by the 45 degree line (Let area B). When a large percentage of total national income is concentrated among a relatively small percentage of individuals, the overall Loren Curve tends to be wider with a sharp rise in income share at the top of the income

distribution. Therefore, in general, the Gini Coefficient will increase when the distribution of income become more skewed.

The Gin Coefficient is a numerical representation of the degree of inequality in a distribution and can be derived directly from the Lorenz Curve. Thus, Gini Coefficient is simply the ratio of area A to the sum of areas A and B. Denoting the Gin Coefficient by G, We have

$$G = \frac{A}{A+B}$$

And it should be obvious that G must lie between 0 and 1. When there is total equality the Lorenz Curve coincides with the 45 ^{0} line, area A then disappears, and $G=0$ With total inequality (one household having all the income), area B disappears, and $G=1$ Neither of these extremes is likely to occur in real life, instead one will get intermediate values, but the lower the value of G, the less inequality there is One could compare a group of individuals, for example, simply by examining the values of their Gini Coefficients. The Gin coefficient can be calculated from the following formula for area A and B:

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$$B = \frac{1}{2} \quad \{(X_1-X_0) * (Y_1+Y_0)$$

$$+ \quad (X_2-X_1) * (Y_2+Y_1)$$

$$-$$

$$-$$

$$+ \quad (X_K-X_{K-1}) * (Y_K+Y_{K-1})\}$$

Where $X_0=Y_0= 0$ and $Y_k=Y_k=100$ (i.e. the coordinates of the two end-points of the Lorenz Curve) and the other X and Y value are the coordinates of the intermediate points. K is the number of classes for income in the frequency table. Area A is then given by A=5,000-B.

The value of 5000 is calculated as $100*100*\frac{1}{2}$, the area if the triangle

Thus, to estimate the Gini Coefficient of North Wollo Zone on the basis or the sample observations, the data of income distribution are as follows:

Range of Income	No. of Households
0 -500	27
501 _ 1000	28
1001 _ 1500	21
1501 _ 2000	19
2001 _ 2500	22
2500 _ 3000	25
3001 _ 3500	18
3501 _ 4000	9
4001 _ 4500	6
4501 _ 5000	5
	180

4.8.2 Income generating activities of North Wollo Zone

The main income generating activity for the whole area is agriculture. The average monthly income of a farming household has been estimated to range between 80 and 180 Eth.birr. ($ 9.5 and $ 21) Occasionally, a farmer may work as a daily labourer for other farmers with in or outside the district Within the Moderate and low land (warm) agro-ecological area of North Wollo, a farming day is paid to $ 0.75 plus lunch and dinner (if farmer has work out side their local residence he usually asks for $ 1 per day); within kind the high land agro-ecological area a farming day is paid with four Kg.of barley plus lunch and dinner.

Further income generating activities for men comprise: carpentry and house building, blacksmith tanning, trading of farming products and livestock, wearing and embroidery of traditional clothes. Main income generating activities for women include trading of farming products, pottery making, and preparation of local drinks, weaving and spinning.

Table 4-10 calculating of Lorenz co-ordinates

Range of Income (1)	Mid-point x (2)	f (Households) (3)	f x (4)	% f HH (5)	Cumulative (6) %	% Income (7)	% Cumulative Income (8)
0-	250	27	6750	15.00	15.00	1.95	1.95
500-	750	28	21,000	15.56	30.56	6.05	8.00
1000-	1250	21	26,250	11.67	42.23	7.56	15.56
1500-	1750	19	33,250	10.56	52.79	9.58	25.14
2000-	2250	22	49,500	12.22	65.01	14.27	39.41
2500-	2750	25	68,750	1389	78.90	19.81	52.22
3000-	3250	18	58,500	10.00	88.90	16.86	76.08
3500-	3750	9	33,750	5.00	93.90	9.73	85.81
4000-	4250	6	25,500	3.00	97.23	7.35	93.16
4500-	4750	5	23,750	2.78	100.00	6.84	100.00
TOTAL		180	347,000	100.00		100.00	

From the above table we can see that 15 % the poorest population have about 1.95 of total income; the poorer half have about 25 % of income; and the top 3 % have about 7 % of total income.

Thus based of the data in table 4-8 we have

$$B= ½ *\{(15.00-0) *(1.95+0)$$

$$+(30.56-15.00*(8.00+1.95)$$

$$+(42.23-30.56) *(15.56+8.00)$$

$$+ (52.79-42.23)*(25.14+15.56)$$

$$+(65.01-52.79)*(39.41+25.14)$$

$$+(78.90-65.01)*(59.22+39.41)$$

$$+(88.90-78.90) *(76.08+59.22)$$

$$+(93.90-88.90) *(85.81+76.08)$$

$$+(97.23-93.90) *(93.16+85.81)$$

$$+(100.00-97.23) *(100.00+93.16)$$

$$B = \underline{3171.50}$$

There fore, area A= 5000-3171.50=$\underline{1828.50}$ and we obtain

$$G= \frac{1828.50}{5000} = 0.3657$$

$$G = 36.57 \%$$

4.8.3 Labor Pattern.

Women Labor pattern: Through out North Wollo Zone subsistence farming and animal husbandry are the main activities and women's role in the household and the village economy is highly significant. All agricultural activities pivoting around crop planting and harvesting see women share at least equally the labour requirements with their partners. Women participation is help during harvesting and weeding and care for the vegetables grown near the homestead; basically Women share with men all farming activities with the exception of polughing. It has been estimated that at least, women carry out 50 % of the whole agricultural work. Additionally, women have to fetch water, collect fuel wood and care for children.

Box 4-1
Women labor patterns are below ranked starting from the busiest month

Month (from busiest)	Activity
July and August	**'Meher' planting season, weeding, crop management, water fetching[*], grinding, fuel collection [*] ([*] home duties)**
June	**'Belg' harvesting season, weeding and home duties**
January	**Activities carried our in connection with the orthodox Christmas, home duties**
December	**'Meher' harvesting and trashing season, home duties**
February	**'Belg' planting season, teff weeding, home duties**
May	**'Meher' planting season, weeding home duties**
March and April	**Home duties**
November	**Beginning of ' meher' harvesting season and home duties**
September & October	**Harvesting and home duties**

Box 4-2

MEN Labour pattern. Men labour patterns are below ranked from the busiest month.

Month (from busiest)	Activity
March	'Belg' planting season, weeding
July and August	'Meher' planting season, weeding, crop management, hortic crops planting
April	Preparation for irrigation, weeding of 'belg'crops, crop management
May	Weeding of 'belg' crops, land preparation for'meher'crops
June	'Belg' harvesting season, weeding, land preparation for 'meher', fuel collection
November	'Meher'harvesting and threshing season
December	'Mehe' threshing season, beginning of land preparation for belg
February	'Belg' planting season
September & October	Harvest protection activities
January	Holiday season activities

4.9 The model

4.8.4 Dummy dependent variable

In DDV we consider regression models in which the dependent or response variable it self can be dichotomous in natures taking a 1 or 0 value, and point out. Suppose we want to study a family either food secured or in secured (Vulnerable). Therefore the dependent variable, household status, is dummy variable taking on values of 0 or 1; 0 nearing Vulnerable and 1 meaning Survival.

A unique feature of this model is that the dependent variable is of the type that elicits a yes or no response; that is, dichotomous in nature.

How do we handle models involving dichotomous response variable? That is, how do we estimate them? Are there special estimation and/or inference problems associated with such models? Or, can they be handled with in the usual) lease square set up?

To answer these and relate questions we consider in this paper the three commonly used approaches to estimating such models:

1. The linear probability model (LPM)

2. The Logit Model

3. The Probit Model

4.8.5 Problems with the OLS estimation of the regression of DDV

With out going in to technicalities, it can be shown that the DDV Model, if estimated by OLS, suffers from the following problems.

1) The error term u in the model of DDV does not follow the normal distribution; rather, it follows the binomial (Probability) distribution. Although we do not need the assumption of normality if the objective is the estimation of parameters only, We need it for the purpose of hypothesis testing, in reality; however, the fact that the error term in the DDV model follows the binomial distribution is not a great handicap if the sample size is large. This is because, as the statistical theory shows, as the sample size increases, the binomial distribution converges to the normal distribution.

2) Another problem with the OLS estimation of the DDV model is that the error term u is hetcroscedastic. But this is not a serious problem in practice because; we can use appropriate transformations to make the error term homoskedasticty.

3) The real problem with the DDV model is that since it gives the probability that the event Y=1 will occur; the probability of necessity must lie between the limits of 0 and 1. Although this is true a priori, when we obtain it by the regression of
DDV, there is no guarantee that the estimated will in fact lie between these limits. If an estimated pi is negative, it has no practical meaning, just as if it is greater than 1 it too has no meaning.

4.9.3 The linear probability model (LPM)

To fix the ideas, consider the following simple model:

$Yi = B_1 + B_k X_{ik} + ui$ ---- (4-1-1)

Where:

  B_1 =   Unknown Constant

  B_k =   Unknown Coefficient

  X_k =   for k=1--- 6= k are independent variables

  Y   = 1 If the Household is survival

  Y   = 0   If the Household is vulnerable

Models such as (4-1-1), which express the dichotomous Yi as a linear function of explanatory variables X_{ik} are called Linear Probability models (**LPM**) since E (Yi/X_{ik}), the conditional expectation of Yi given X_{ik}, can be interpreted as the conditional probability that the event will occur give X_{ik}; that is, pi ($Yi=1/Xi_k$). Thus, in the preceding case, E (Yi/X_{ik}) gives the probability of household or veinerable as the value of Xik vary.

The justification of the name LPM for model (4-1-1) can be seen as follows.

Assuming E (ui)=0, as usual (to obtain unbiased estimators) we obtain

E (Yi/X_{ik})=B_1+Bix_{ik} .... (4-1-2)

Now letting Pi= probability that Yi=0 (that is, that the event of velnerability occurs) and 1 - pi=Probability that Yi=1(that is, the event of survive occurs the variable Yi has the following distribution.

Yi   Probability

0   Pi

1   1-pi

Total   1

Therefore, by definition of mathematical exception, we obtain

E (Yi) = 1 (1-pi) + 0 (pi) = pi -------------(4-1-3)

Comparing (4-1-2) with (4-1-3), we can equate

E (Yi/X_{ik}) = B_1+B_kX_{ik} = pi------ (4-1-4)

That is, the conditional expectation of the model (4-1-1) can, in fact, be interpreted as the conditional probability of Yi.

Since the probability pi must lie between 0 and 1, we have the restriction.

$0 \leq$ E (Yi/Xik) ≤ 1 ------(4-1-5)

That is, the conditional expectation or conditional probability must lie between 0 and 1.

4.9.4 The logit model

A Bernoulli response variable, which has an association with its parameter, says p, that represents the probability of observing a response Y=1 (where Yi, is a dichotomous dependent variable), depends on values of K independent variables. The solution of the equation for unknowns requires that each equation not be an exact linear combination of any of the others. What this means is that the independent variable are not perfectly collinear. Since the Xik (the independent variables) are presumed to vary across observations, the parameter also changes, so that we would say that each Yi follows the different Bernoulli distribution. This means the mean of Y is a function of only K included variables;

E (Y) =f (Y$_{il}$-----Xik)

And the second, this function happens to be linear

E (Y) =f (X$_{il}$------Xik) = $\sum$ Bkxik- (4-2-1)

The above specification shows that there are tremendous of reasons why the assumption that a probability model is linear in the independent variables is, in most cases unrealistic. Further if we incorrectly specify the model as linear, the statistical, in general, hold.

The obvious solution to this problem is to specify a nonlinear probability model. The problem with the linear probability model specification is that $\sum Bk\ X_{ik}$ is used to approximate a probability number

Pi [Pi=p (Yi=1)], constrained to be from 0 to 1,

While Bk $_{Xik\ is}$ not constrained.

One way of approaching this problem is to transform pi to eliminate one or both constraints. For the dichotomous case, we eliminate the upper bound, pi =1, by looking at the ratio pi/(1-pi).

This ratio must be positive (since 0 < pi <1), but there is no upper bound (this explicitly rules out the possibility that pi equals one or zero exactly). As pi approaches one pi/(1-pi) goes towards infinity. We can eliminate the lower boundary of zero by taking the natural logarithm; log [pi/(1-pi), the result of which can be any real number from negative to positive infinity. It can be assumed that this transformed dependent variable is a <u>linear function of x:</u>

$$Ln\ \frac{P}{[1-p]} \quad = \quad \sum Bx_{ik} \text{-----------(4-2-2)}$$

What we want here is an expression for pi; the solution can be obtained by using antilogarithms of and algebraic manipulation of equation (4-2-2). The natural logarithm has a base number of e; an irrational umber, where log $(e^x)=x$ and thus, the antilog of x is e^x,this is expressed as
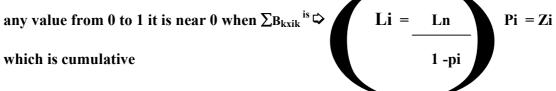
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$$Pi \;=\; \frac{e^{\Sigma\;(B1+Bkxik)}}{1+e^{\Sigma\;(B1+Bkxik)}} \qquad \text{-------------------(4-2-3)}$$

This can be-rewritten as follow in the form of Cumulative Distribution Function CDF

$$Pi \;=\; \frac{1}{1+e^{\Sigma\;-\;(Ba+Bkxik)}} \qquad \text{.......................(4-2-4)}$$

<u>Where</u>

Pi   =   **Probability that Serious Poverty occurs**

B_i =   **Unknown constant**

B_k =   **Unknown coefficient**

X_k =   **for k+1----6,k are the independent variable and i denotes the ith**
Observation from the sample size N

k_1 =   **Land size**

k_2 =   **Live stock owned in the Tropical livestock unit(TLU)**

K_3 =   **Cereal production out put**

K_4 =   **Household size**

K_5 =   **Fertilizer consumption**

K_6 =   **Education level of HH head in the form of dichotomous.**

This expression (equation 4-2-2), logistic function, is continuous and can take on any value from 0 to 1 it is near 0 when $\Sigma B_{kxik}{}^{is}$ ⇨ $\left(Li \;=\; \dfrac{Ln}{1-pi} \right)$ $Pi = Zi$ which is cumulative

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Or <u>logistic distribution function</u> is near negative infinity, and it increases monotonically with $_{\sum B\ kxik,}$ and it goes to 1 as zi goes to positive infinity (the, 'S' shaped curve).

Unlike linear specification, it satisfies the 0-1 constraints in pi without also constraining Zi. This characteristic of the logistic function makes it an attractive alternative to the linear probability model for dichotomous dependent variables.

    I.   The Model is based on the following basic assumptions on the relationship between velnerability and Household resources. These assumptions are; the variation in the independent variables is not the same at least the variation of one or more independent variables must be different from the other.

    II.   The constant of the equation (B1) is hypothesized to have a positive value, which means that if the independent variables are assumed to be zero, the mean values of poverty and velnerability are greater than zero.

    III.   The sign of coefficients (B_k) of livestock, production out put, land size, education with=1 is to be positive.

    This means that

a) An increase in a unit of livestock, production, and land size, expenditure in fertilizer and education; decreases the threshold for poverty and velnerability by a corresponding one unit.

b) An increase the number of family size will proportionally increase the threshold of poverty and vulnerability

4.9.5 The probit model

As we have noted, to explain the behavior of a dichotomous dependent variable we will have to use a suitable chosen cumulative distribution function (CDF). The logit model uses the cumulative logistic function, as shown in

$$Pi = E\left(Y=\frac{1}{X_k}\right) = \frac{1}{1+e^{-\Sigma B1+BKXK}}$$

But this is not the only CDF that one can use. In some applications, the normal

CDF has been found useful. The estimating model that emerges from the normal

CDF is popularly known as the probit model, although sometimes it is also

Known as the normit model. In principle one could.

Substitute the normal CDF in place of the logistic CDF in (4-2-2) and

proceed as in section 4-2.

But instead of following this route, we will present the probit model based on utility theory, or rational choice perspective on behavior, as developed by Mc Fodder.

To motive the probit model, assume that in our Suruvial concept the position of the family to survival or not depends on an unobservable condition that is determined by an explanatory variables(s), say X_k, in such a way that the larger the value of the Index the greater the probability of the family can Suruive. We express the index Ii as:

$Ii = B_1 + B_k K$ ------------(4-3-1)

Where:

$X_k =$ K= 1---------6 K are the independent variables

$B_1 =$ Unknown Constant

$B_k =$ Unknown coefficient

Consider the data refer to a study on the Survival cases in the primary data are cross sectional observation for 180 Households. There are two dummy variables in the data. El, which in literate dummy, is clearly and explanatory variable and Do in Illiterate dummy explanatory variable.

In the case of dependent variable; it is also dichotomous

For   FY= 1 represents a household can survive while

FY= 0 represents a household is suffer with serious poverty

Three models are estimated: the linear probability model, the logit model and the probit model. The explanatory variables are.

F_s = Household size in number standardized based on their Nutritional requirement

L_s = Land size in Hs

C_p = Cereal Production out put measure in kg

E_d = Dummy variable 1 for literate, 0 for illiterate for HH head

L_v = Livestock owned in (TLU) which is standardized by national Parameters and prevailed price

F_c = Fertilizer consumption in kg

Table 4-11 Comparison of the probit, Logit and Linear Probability Models on food insecurity

Variable	Linear Probability Model	Logit Model	Probit Model
CP	-0.0001923	-0.0045905	-0.0026494
	-4.8779478	-2.9726743*	-2.9693006*
ED	-0.1194236	-1.3678679	-0.7357168
	-2.5733545	-1.695914***	-1.6839123***
Fc	-0.0019056	-0.0348195	-0.0181229
	-4.2303207*	-2.5044034**	-2.5562998*
Fs	0.2027365	1.5735330	0.8735824
	8.0347882*	4.3085769	4.5624817*
Ls	-0.4424294	-2.5024824	-1.8909264
	-4.1647524	-1.6265848***	-1.5640955
Lv	-0.0341921	-1.0582047	-0.6078174
	-2.034766**	-3.2566326*	-3.4453448*
Intercept	-0.2461240	2.6935556	0.932542
	-4.1260445*	1.1596914	1.1894329
R^2	0.65		
R^{-2}	0.64		
Log Likeli hood	35.71827	27.670730	27.466301
f-statistic	53		
ChI-Squired		11.72	

4.9.6 Selection of the model

In this section we discussed three Models that are **LPM, Logit and Probit**. From these Modes I have selected the One, which is known as **Logit Model**: for such Reason, first I wish to explain the nature of these modes.

The LPM is the simplest of the three models to use but it has several limitations namely

(1)   **Non normality of the error term**

(2)   **Heteroscedasticity and**

(3)   **The possibility of the estimated probability could be out side the 0-1 bounds**

Even if these problems are resolved, the LPM is logically not a very attractive model in that it assumes that the conditional probabilities increase linearly with the value of the explanatory variables. More likely, the probabilities will tend to taper off as the values of the explanatory variables increases or decrease indefinitely. Beside this On the Marginal effect of a unit change in the value of regress or; in a linear regression model the slope coefficient of a regress or measures the effect on the average value of the regress and for a unit change in the value of the regrssor. But Logit and probit models deal with the probability on some event Occurring. Therefore, what is need is a probability model that has 'S' shaped feature of the cumulative distribution function (CDF).

4.9.7 Logit Versus Probit

Now we have considered both the Logit and Probit model, which is preferable in practice? From a theoretical perspective, the logistic and probit formulations are quite comparable, the chief difference being that the logistic has slightly flatter tails, that is, the normal, or probit, curve approaches the axes more quickly than the logistic curve. Because, the logistic distribution is very similar to the t-distribution with seven degrees of freedom, while the normal distribution is a t-distribution with infinite degree of freedom. Therefore, the choice between the two in one of (mathematical) convenience and ready availability of computer. On this score, the logit model is generally used in preference to the probit.

With regard to this; in the interpretation of coefficient in logit, the rate of change in the probability is given by $B_{jpi}(1-Pi)$ where Bj is coefficient of the Jth regressor. In probit the rate of change in the probability is some what complicated and is given by $B_j \Phi (Zi)$, where $\Phi (.)$ is density function of the standard normal variable and where $zi= B1+B2x2+--- BKx, L---$ that is, the regression model used in the analysis. Thus, from the view point of economic principle the one should chosen simply applied if both Models have equal weight so therefore logistic and normal CDFs are chosen, the former giving rise to logit model.

4.9.8 Empirical result and interpretation

The empirical analysis for Survival study on a sample of 180 household in North-Wollo zone, there were 81 food secured and 99 households vulnerable

$$= \quad 1 = \text{if the household survival}$$

$$0 = \text{if the household vulnerable}$$

Based on the above dichotomous dependent variable the computer program came out with the logit result, which indicated in table 4-10

Y   = 2.693 - 0.0046cp - 1.3679Ed - 0.03482Fc + 1.5735 Fs - 2.5025Ls - 1.0582Lv

t   = (1.15) (-2.973) (-1.696) (-2.504) (4.309) (-1.627) (-3.257)

The above regression function help us to estimate the probability of vulnerability occurrence which means serious poverty existence in the North Wollo zone in the logistic function as follow.

$$Pi = \frac{1}{1+e^{-\Sigma B1+BKxik}} = \frac{1}{1+e^{0.70152}} = 33\%$$

33 % indicates that, there is a probability of 33 % that a household face seveior poverty problem.

The interpretation of the correlation values and regression coefficients of the above model are given as follows:-

1) Since R^2 as a measure of goodness of fit is not particularly well-suited for the dichotomous dependent variable models, alternative method is the x^2 Chi-square test, which is as follows.

$$X^2 = \sum_{i=1}^{G} \frac{Ni\,(p-p*)^2}{P^*(1-p^*)}$$

Where:

Ni = Number of observation

P = actual probability of the poverty existance occurring

P* = estimated probability of poverty existence

G = number of Categories

Thus $X^2 = \dfrac{18:(0.45-0.33)^2}{0.33*0.67} = 11.72$

X^2 (CHI-squared) Generally X^2 value above 6.635 in equivalent With 99 % confidence level for cross- section data indicators of good fit of the model. Based on this general conception, my data are Cross-section (of 2003 Year) and x^2 is 11.72 that is beyond the lower limit of good fit for the data indicating about 11.72 of the variation in the logit model.

2) The regression coefficients in this augmented logistic function are all the coefficients are associated with significant t-ratio. These significant t-ratios justify that all independent variables included in the model affect dependent variable significantly. More over, the coefficients of each independent variables are interpreted as follows at citrus paribus situation: that is

A 100 kg variation of cereal production in the household brings about a probability of 10 % decrease the problem of poverty in the household at 99 % C.L holding constant the other variables. As indicated by the negative sign of the coefficient, the variation of the dependent variable and independent variable, cereal production, is in the opposite direction of poverty

Likewise, when a household head transformed from illiteracy to literacy will result a probability of 30 % to decrease the problem of poverty at 90 % CL in the household holding constant the other variables.

The coefficient of the third variable is interpreted similarly, from the usual farming system; if a household increase his fertilizer consumption by 100 kg there is a probability of 77 % to decrease poverty the household at 98 % CL assuming other things are constant.

The fourth coefficient indicates that, as one person increase in the family size will brings a probability of 35 % increment serious poverty in the household at 100 % CL holding constant other variables.

The Fifth coefficient implies that a percent of hectare Variation in area of farming land brings a probability of 55 % decrease the problem of poverty in the household at the 91 % CL holding constant the other variables.

The last coefficient implies that, as one Livestock (which is measured by TLU) increases in the household there is a probability of 23 % to decrease food security problem in the 99 % CL holding constant the other variables.

4.10 Recommendations

The paper has tried to assess the severity and the nature of poverty in the study area and the following solutions, which perhaps mitigate the problems, are recommended as follow.

1) Increasing the yield and productivity of major cereal crops in the study area via increased use of modern farm inputs such as fertilizers, in proved seeds (HYV), pesticides, herbicides, fungicides, etc.

2) Yield increases is possible only through increase in productivity rather than through increasing the amount of land under cultivated. In this respect, attractive producer price, research development for variety crops, and extension services, and adequate input supply must be tailored to support these yield increases.

3) The respective line ministries of MOH, MOA, MOE, NGOs and other agencies to empower the people in food utilization should coordinate Mass education on nutritional issues. Basic literacy approach is justified only if it enables the farmer to use the improved technologies and delay marriage time and as such decreases pregnancy. Thus, through improvement of educational status the well-being of the society will rise.

4) Effective family planning programs should be given to peasants by education them about the implication of family planning and negative effect of rapid population growth on poverty reduction activities.

5) **Livestock production should be given due attention since it serves as a hedge against poverty; so that it should be provided at satisfactory level to farmers in the study area.**

6) **Rising the income and employment opportunities of the people, particularly the poor, through self- employment schemes, employment generating schemes (EGS) in micro enterprises.**

7) **Small irrigation schemes; The performance of agriculture in general and that of poverty reduction activities in particular is still highly dependent on weather conditions with most of the farmed area being rain fed. Thus, it becomes important to look in to irrigation potential and research in to irrigation technology to have a high return over year and to minimize out put and price rises associated with weather changes.**

4.11 Conclusion

These are the characteristics of the poor that define the field of battle, where policy makers should intervene to win the war on poverty. The field is wide with poor families as consumers of basic service, producers, and suppliers of labor, reproductive units, and migrants in search of opportunities. To win the battle, we have to make to sure that all these areas of battle are covered.

Therefore the war on poverty has to be fought on a broad front, taking each unit (including the demographic behavior of the poor) into consideration.

This should be our battle plan to kill our enemy, poverty, which hurts the majority of Ethiopians, particularly the rural women and children. For the poor to effectively fight poverty the following facts need to be understood.

a) Poverty is a complex and multi-dimensional in nature,

b) Poverty is not an abstract phenomenon. It exists objectively and can be measured, monitored and, therefore, minimized and eventually eradicated. So what should be done to break out of this deadlock? The answer lies, on our ability and capacity to adopt integrated development strategy giving prominence to crosscutting sectors.

Chapter Five

5.1 National Poverty reduction strategy

The key elements of the government's economic strategy aim to address the underlying causes of poverty in Ethiopia is known as agricultural development lead industrialization (ADLI) is undoubtedly a strong part of the government's poverty reduction strategy. This strategy is well explained, bringing to the fore the fact that in a country where 85 percent of the population live in rural areas, and most of them are engaged in subsistence farming, poverty reduction requires agricultural growth. The ADLI contains various components needed for agricultural growth, including technology, finance, rural infrastructure, internal and external markets and the role of the private sector. The strategy is also differentiated according to the requirements of ecological zones. ADLI, now in place for several years, has been already yielding significant gains in growth and poverty reduction. Actually, a large number of farmers have benefited, over the last five years, from the implementation of an ambitious program of extension services and the increased use of modern inputs (fertilizers and seeds). This has led to an increase in yields in areas covered by these programs, which has compensated for declining yields in other areas. The Government is addressing the problem of declining yields through .Dry Land Programs. Which combine soil conservation with use of improved inputs.

5.2 The major risks to the Ethiopia's poverty reduction strategy

It is Given that the prevalence of poverty among the population engaged in agriculture (especially manifested in food insecurity), as well as the unrealized potential of the sector, I agree with the government's emphasis on agricultural growth. However, there is a risk that the potential of agriculture will not be realized, unless further reforms.

  i)   Improve the functioning of agricultural input markets;

  ii)   Overcome implementation constraints encountered in developing irrigation and improving rural infrastructure; and last but not least

  iii) Streamline the land lease policy and improve legislation of agricultural land (including rights to use land as collateral).

Given the persistence of the structural food insecurity (affecting 2-3 million people every year), which is frequently exacerbated by severe drought conditions, I strongly recommending that a comprehensive food security strategy be developed in the full Poverty Reduction Strategy Program (PRSP).

II   There is also a risk that implementation of the reform program laid out in the PRSP will be slower than planned because of limited capacity in both the public and private sectors. This particularly applies to the health and education sectors, which in the past experienced difficulties with implementing programs. There is a risk that, without strengthening public expenditure management, reducing other institutional weaknesses, the programs might falter once again, and the targets will not be reached.

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