REPORT ON THE ETHIOPIAN ECONOMY

Volume IV 2004/05

Transformation of the Ethiopian Agriculture: Potentials, Constraints and Suggested Intervention Measures

Ethiopian Economic Association
(EEA)

Printed in Addis Ababa, Ethiopia
December 2005.

The Analysis and policy recommendations of this Report do not necessarily reflect the views of the Ethiopian Economic Association, its Executive Committee or its members. The Report is the product of the team of experts in the Ethiopian Economic Policy Research Institute and external consultants and advisors.

Inquiries should be addressed to:

Ethiopian Economic Association/Ethiopian Economic Policy Research Institute
P. O. Box 34282
Tel: 011 416 2121 or 011 416 2122
Fax: 011 416 0967
E-mail: eea@ethionet.et
Website: www.eeaecon.org

Foreword

The Ethiopian Economic Association is happy to issue the fourth Report on the Ethiopian Economy, Vol. IV, 2004/05. Following the formats of the previous years the fourth Report has also got two parts. Part one focuses on a broader review of the macroeconomic situation and the performance of the economy at the sectoral levels for the reference period. The Report has tried to provide professional assessment of the existing policies and strategies and recommends new policy directions wherever appropriate.

Like the pervious two reports, the fourth Report has selected a thematic area, i.e. a sector with significant contribution to national development. The focus this time is on the Transformation of the Ethiopian Agriculture: potentials, Constraints and Suggested Intervention Measures, which is contained in Part two.

The focus on the Agricultural sector is necessitated by several factors. Agriculture has always been considered as the foundation of the Ethiopian economy. It provides the largest employment opportunity, generates the largest share of the national value of production, supplies food for the population, raw materials for industry and foreign exchange earnings. There are also environmental and other values but these are not yet well appreciated or valued because more attention has always been given to the commodity production role of the sector.

Nevertheless, agriculture in Ethiopia is marked by declining productivity due to low technological inputs, soil degradation, diminishing farm size and its dependence on the vagaries of nature. Agricultural production has always been subsistence oriented and rain–fed unable to ensure food security and lead the economy to a new and dynamic pathway. Transforming the

subsistence agriculture into a prosperous and commercialized sector should be the single most important development goal of the country. This Report attempts to shed some light on how that transformation could be achieved.

The Report reviews the agricultural resource potential and the performance of the different sub sectors over the past several years and the historical record of the development strategies, policies adopted and the institutions put in place over the past four decades. The Report also reviews the technological development and dissemination as well as the marketing, financial and infrastructural arrangements supporting agricultural development. Finally, the Report establishes the need for transformation and suggests mechanisms on how to achieve this objective.

We hope that the Report would be useful to all readers including policy makers, private business people, civil society organizations, the academia, the media, the international community and the general public.

Finally, I would like to express my appreciation to all those people whose contribution has made this Report possible.

Wolday Amha
President
Ethiopian Economic Association

Acknowledgment

The Ethiopian Economic Association (EEA) would like to appreciate the efforts and contributions of many people who participated in the preparation of the Fourth Annual Report on the Ethiopian Economy. The overall work is led by Assefa Admassie. In Part I, contributions on Macro-economic Development are from Haile Kebret, Zekarias Mamma, Abeba Siraj, Kassahun Tadesse and Melesse Minale. The chapters on the Manufacturing Industries and Trade, and Mainstreaming Trade in National Development Strategies are by Kibre Moges and Worku Gebeyehu. Getahun Tafesse and Daniel Assefa wrote the chapter on Urbanization, Poverty Challenges and Prospects. Part II of the report which deals with the *Transformation of the Ethiopian Agriculture: Potentials, Constraints and Suggested Intervention Measures*, has been written by Berhanu Adenew and Samuel G/Selassie, who are from the Agriculture and Rural Development Division. In addition, EEA would like to acknowledge the contributions of Eyasu Elias for his input on the Assessment of the Natural Resource Bases; Workneh Ayalew on Livestock Sub-sector; and Alemayehu Mengiste on Water Resources Development. In the planning phase of this report, various professionals in the field of agriculture and rural development drawn from government offices, NGOs and the private sector have participated in the workshop that was organized to generate and discuss ideas on the Transformation of the Ethiopian Agriculture. Their suggestions were very helpful for this Report. EEA would like to thank all of them for their constructive inputs.

We would also like to acknowledge the contributions of Wolday Amha, Mulat Demeke, Getnet Alemu, Abiy Hailu, Tadesse Birru Kersemo, Alemayehu Seyoum, Atsede Assefa, Workneh Denekew, Alemu Mekonnen and Yaicob Likke, who gave useful comments on the draft. Our thanks also go to Sahleselassie Berhanemariam for language editing, Rahel Yilma for preparing the manuscript for printing and Helen Kedir and Tigist Junyedin for typing the manuscript. The Finance and Administration Division provided valuable administrative and logistical supports towards realizing this Report.

Finally, we would like to forward our most sincere appreciation to our donors who are supporting the activities of EEA including the African Capacity Building Foundation (ACBF), Department for International Development (DFID), Swedish International Development Agency (SIDA), the Norwegian Agency for Development Cooperation (NORAD), The Netherlands Embassy, Development Cooperation of Ireland and Friedrich Ebert Stiftung (FES) for their generous financial support.

Table of Contents

CHAPTER 2

CHAPTER 3

CHAPTER 6

CHAPTER 7

List of Tables

List of Figures

List of Boxes

PART I

REVIEW OF ECONOMIC PERFORMANCE

Introduction to Part One

Part I of the Annual Report focuses on various sectors of the economy. More specifically, it examines the various sub-sectors of aggregate supply and the components of aggregate demand. In addition it evaluates the performance of the various sectors during the year in review. The aggregates will be examined in terms of their share in the overall economy, their growth performance and when appropriate in terms of their contribution to employment both relative to historical trends and relative to more recent years.

Chapter 1

Macro-economic Developments

1.1 Introduction

The purpose of this Chapter is to highlight recent developments in the Ethiopian macro-economy. This will include sectoral and aggregate growth rates, structural change and the overall performance of the economy. It covers all sectors ranging from the productive sectors to the service and financial sectors. While the focus is on the performance of the aggregate measures of the economy and the major sub-sectors in recent years, the analyses will attempt to anchor its evaluation in the context of the historical performance of the aggregates to help evaluate changes (or lack thereof) over time.

After this brief introduction, Section 1.2 analyses the performance of the total macro-economy and the specific supply side sectors that include agriculture, industry and the service sectors. Among the highlights worth noting from the outset include that, first, the aggregate performance of the Ethiopian economy is characterized by instability as measured by fluctuations in the major aggregates, particularly agriculture. Second, the dominance of agriculture in the composition of total output remains intact. Third, the industrial sector has been stagnant over the years as measured in terms of output and employment. And, fourth, a relatively significant increase in the share of services, particularly what are referred to as 'other distributive services', have below noted in recent years in terms of their contribution to total output. A brief outline of this first chapter is described below.

Section 1.3 examines the rate of investment and the size of saving mobilized relative to the total required investment funds. The total investment that took place is further disaggregated into domestic and foreign investment sources and its distributions by region and economic activity. It also reports the number of new investment projects approved the size of their capital and expected employment creation potential of these projects. And finally, the chapter evaluates the share of projects implemented relative to those approved.

Section 1.4 analyses the foreign sector. The structure of exports and imports and their growth rates including the composition of the total aggregates are examined. It further discusses the resulting current account balance and the overall balance of the external sector.

Section 1.5 of the chapter examines the performance of the monetary sector during the year in review. In particular it evaluates the behaviours of monetary aggregates, the interest rate structure, and the overall intermediation activities carried out by the banking sector.

Among others, it examines the growth of broad money supply and its components. In general, it summarizes the National Bank's monetary stance in terms of credit facilities and other monetary aggregates that measure the extent to which monetary aggregates are in tune with the activities of the real sector.

Section 1.6 explores the structure of government revenues and expenditures and the sources of financing of government deficits. That is, the chapter focuses on the uses and sources of government finance. Accordingly, the relative change in both revenues and expenditures, the sectoral focus in allocating expenditures (capital and recurrent), the main sources of revenues (tax and non-tax) and the external assistance received to fill any financing gaps are examined in detail.

Section 1.7 the chapter evaluates price movements during the year in review. It explores changes observed and the main determinants of inflation. In particular, it highlights that inflation in Ethiopia is more influenced by what happens to agricultural output, which in turn depends on rainfall, rather than by other nominal aggregates like the growth in money supply.

And finally, Section 1.8 briefly concludes by highlighting the main salient features of the macro-economy.

1.2 Economic growth performance

In terms of the overall performance of the macro-economy, the last fiscal year (2003/2004) was one of the better years. Owing to the favourable weather conditions, the economy recorded a significant improvement reversing the decline in GDP that was registered in the year that preceded it (i.e. 2002/2003). The recent performance of the Ethiopian macro-economy again highlighted the instability that has characterized it over the last few decades. This instability mainly emanated from the dominance of agriculture and the vulnerability of this sector to the vagaries of nature. And this instability coupled with the almost stagnant performance of the non-agricultural sector has led to a weak average growth, despite the sharp yearly fluctuations. For instance, as Figure 1.1 and Table 1.1 show, the growth rate between 1960/61 and 2003/2004 averaged about 2.6 percent while individual years varied between double digit in the positive territory to negative values.

The variability in growth rates is not, however, similar across the sectors. For instance, growth in the agricultural sector varied between negative 12.6 percent in 2002/03 to positive 18.9 percent in 2003/04. Unlike the agricultural sector, the growth rates of the other sectors have been relatively stable. As Table 1.1 shows, the growth rates of industry, distributive services and other services averaged about four percent over the last four decades. However, despite the relative stability of other sectors, due to the dominance of

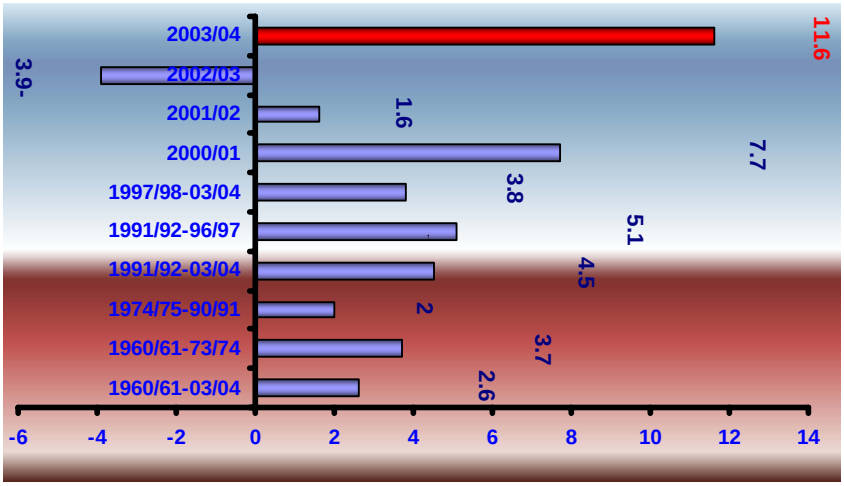
agriculture in the economy, the variability in the growth rate of the agricultural sector has influenced the growth performance of the overall economy.

Table 1. 1: Sectoral growth performance

	1960/61-03/04	1960/61-73/74	1974/75-90/91	1991/92-03/04	1991/92-96/97	1997/98-03/04	2000/01 Estimate	2001/02 Estimate	2002/03 Estimate	2003/04 Pr. Estimate
Agriculture & allied activities	1.4	2.1	0.6	1.9	3.5	1.5	11.5	-2.3	-12.6	18.9
Industry	3.3	7.0	3.6	5.6	7.4	5.0	5.0	5.8	4.6	6.9
Distributive services	3.5	7.8	2.5	6.3	8.2	5.3	5.2	4.4	3.2	7.6
Other services	5.6	6.9	4.7	7.6	6.4	7.2	4.5	4.6	1.8	6.3
GDP	2.6	3.7	2.0	4.5	5.1	3.8	7.7	1.6	-3.9	11.6
Per capita GDP	0.1	1.4	-0.5	1.6	2.3	0.9	4.8	-1.2	-6.7	8.7

Source: Ministry of Finance and Economic Development and staff calculations.
Note: Values for 1991/92-96/97, 1997/98-01/03, and single years are simple arithmetic means while other values are computed using time trend.

Figure 1. 1: Growth rates in real GDP



Source: Ministry of Finance and Economic Development.

What is worth noting is that, owing to the high population growth rate (about 2.5 percent); the growth rate of GDP has not been high enough to improve the standard of living of the population. GDP per capita grew by a mere 0.1 percent, on average, over the last four decades. Needless to say, this is too small a change for an economy that is at a subsistence level. It has to be noted also that due to the variability in the growth rates of GDP, the gains made in good years tend to be lost in bad years. For instance, the losses of personal income in agriculture registered in 2002/2003 were offset by the gains in 2003/2004. Due to such swings in agricultural output the net effect was an average reduction of 1.2 percent in agriculture per capita during the last four decades. Similarly, due to the almost stagnant growth and due to the population pressure, per capita income in the non-agricultural sub-sector only grew by less than one percent, on average, over the last four decades (Table 1.2 and Figure 1.2, for details).

Table 1. 2: Total and sectoral per capita income – (growth rate - %)

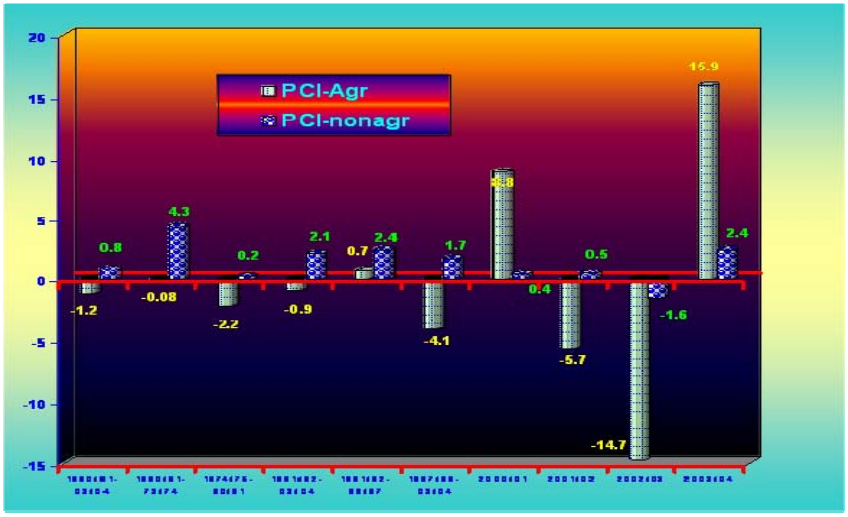
Period	GDP – total	PCI	PCI-agriculture	PCI-non-agriculture
1960/61-03/04	2.6	0.1	-1.2	0.8
1960/61-73/74	3.7	1.4	-0.08	4.3
1974/75-90/91	2	-0.5	-2.2	0.2
1991/92-03/04	4.5	1.6	-0.9	2.1
1991/92-96/97	5.1	2.3	0.7	2.4
1997/98-03/04	3.8	0.9	-4.1	1.7
2000/01-02/03	1.7	-1.2	-3.9	-0.2
2000/01	7.7	4.8	8.8	0.4
2001/02	1.6	-1.2	-5.7	0.5
2002/03	-3.9	-6.7	-14.7	-1.6
2003/04	11.6	8.7	16.0	2.4

Source: Ministry of Finance and Economic Development, Central Statistical Authority, and staff computations.

And as has been the case in the last several years, the composition and the structure of the economy showed no appreciable change. As noted in Figure 1.3,

agriculture still contributes the largest share to total output, and hence employment, even though it declined slightly from as high as 68 percent of GD to about 47 percent of GDP in recent years. No reliable employment data are available in Ethiopia. However, it is conventionally believed that agriculture and related activities are the largest employers in the economy. This conventional wisdom emanates from the fact that most of the population increase takes place in the rural areas (both due to size and higher fertility rate), and the rate of rural urban migration is too small to have any significant impact on the size of the rural labor force. Further, institutional constraints (such as loss of cultivable land following even temporary change of residence from rural to urban areas and the limited job opportunity in urban areas) are also likely to discourage some potential migrants. Both these and related factors are likely contributors to the relatively high concentration of the active population in the rural areas.

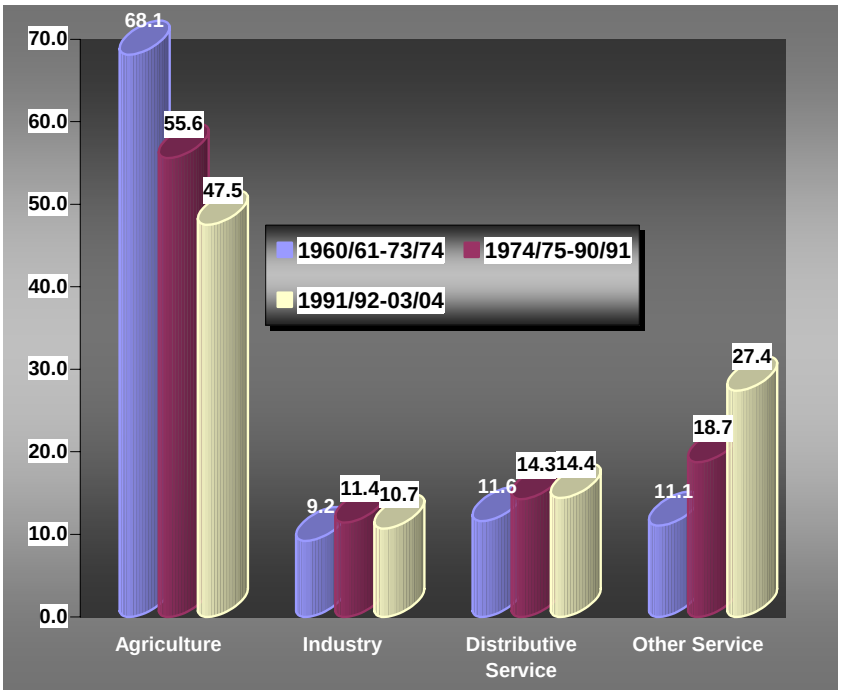
Figure 1. 2: Growth rates in per capita income



Source: Ministry of Finance and Economic Development.

As Figure 1.3 shows, the Ethiopian industrial sector has been stagnant over the years both in terms of its share in GDP and growth performance. Its share has not changed much from the 10 percent mark as a ratio of GDP over the last four decades and its growth rate only moved within the 3 to 7 percent range during the same period. This ratio will even be smaller if one excludes some of the traditional activities (such as handicrafts) which do not accord well with the modern definition of an industry in terms of the technology and other know-how they employ in the production process.

Figure 1. 3: Composition of real GDP



Source: Ministry of Finance and Economic Development.

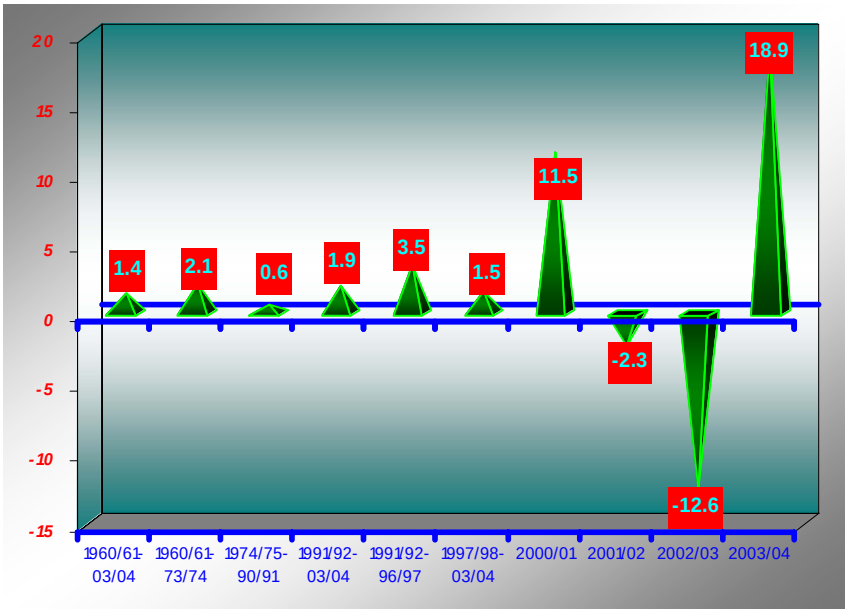
The service sector, on the other hand, exhibited some appreciable changes over the last four decades. The distributive services sector has registered a slight increase from about 11 percent to about 14 percent of GDP during the same period. The sub-sector which registered a significant increase is, however, the “other services” sector. This category includes, banking and insurance, public administration and defense, education, health, and domestic and other services. Mainly due to the liberalization policies that have been implemented beginning at the early 1990s, the average share of this sub-sector in GDP increased to as high as 27.4 percent in the 1990s compared to 11.1 percent of GDP in 1960/61 to 1974/75. The detailed historical performance of each sub-sector and its more recent movements will be examined below. Before ending this over-view, however, it is worth underlining the two salient features of the Ethiopian economy. These are: the continued dominance of agriculture and the unstable growth performance of the economy that mainly follows from it.

1.2.1 The agriculture sector

As noted above, agriculture is the mainstay of the economy and the most volatile sector as exhibited in its recent growth patterns. This is mainly owing to its dependence on rain and the seasonal shocks that are frequently observed. Consequently, as Figure 1.4 shows, its value added varied between -12.6 in 2002/2003 to 18.9 in 2003/2004. There is no noticeable change in the application of technology, land area cultivated, or any other shocks that are likely to affect agricultural productivity in the last few years. The only factor that varied between the periods in question is the availability of rainfall and its spread over the relevant months. Hence the causality between rainfall, agricultural output, performance of the Ethiopian economy and improvement (or there lack of) in the living conditions of Ethiopians seem unmistakably intertwined. And it follows, until a fundamental transformation of agriculture such that, at least, its dependence on rain is minimized and factor productivity is increased, the Ethiopian economy will continue to be a “hostage” of the vagaries of nature.

It has to be noted that, as will be dealt with in detail in later parts of the Report, there have been various attempts to improve the performance of the agricultural sector in recent years. Such attempts included various extension packages that range from introduction of selected seeds, various irrigation schemes via water harvesting, to relative widespread use of fertilizers. There is no officially compiled data regarding the number of selected seeds introduced and amount of water harvested and effectively used at a national level, but the amount of fertilizer imported and used shows that there was a significant increase in recent years. For instance, the imports of dap and urea fertilizers increased by 3 and 11 fold, on average, between 1991 and 2001. And the average amount of fertilizer sold to farmers increased 5 fold during the same period.

Figure 1. 4: Growth rate in the value added of the agricultural sector



Source: Ministry of Finance and Economic Development and staff computations.

Conclusive studies regarding the net impact of these recently introduced production inputs on agricultural productivity and hence the net benefit to users has yet to be established, even though the government claims its trial on sample plots and the experience of those farmers who adopted these techniques have been encouraging. Clearly, as could be seen in Figure 1.4, no clear pattern emerges in the value added of agricultural output despite the increase in the introduction and adoption of the above outlined extension packages over the last few years. In particular, the variability in value added seems to be more related to other random (mainly natural) shocks than to the relatively stable flow and application of extension packages. Part II of the Annual Report will have more detailed analyses of both the potential and the actual performance of the agricultural sector.

1.2.2 The industrial sector

Conventional wisdom has it that industry is the engine of economic growth mainly because it has the largest potential to adopt technology and hence its ability to create forward and backward linkages with the other sectors. The precedents of industrial revolution, the present day dominance of industrial goods in world trade and the economic upper-hand of countries whose economies have carried out industrial transformation attest to the validity of this observation. On the other hand, countries whose economies are at a lower stage of development tend to have a weak industrial sector both in terms of its contribution to GDP, employment and in the composition of traded goods.

The Ethiopian industrial sector exhibits all the characteristics of an undeveloped economy. The share of the industrial sector in GDP has hovered around the 10 percent mark and its overall sectoral growth rate between five and seven percent since the 1960s. Hence such a small share and weak long-term growth is unlikely to absorb the huge growth in the labor

force (flowing from natural increases and rural urban migration) and improve trade balance. It could not even supply basic industrial goods for domestic consumption. In fact, almost all the raw materials and intermediate inputs used in the production process are imported since the sector is incapable of providing such goods.

The biggest sub-sector within the industrial sector is the large and medium scale industries which accounts for about 39 percent of the total sectoral output followed by construction which constitutes about 24 percent since the early 1990s. The Small Scale Industries & Handicrafts sub-sector contributed about 18 percent to the sector's total output during the same period. The smallest sub-sectors in this category are electricity & water and mining & quarrying which, on average, contributed about 15 and 4 percent, respectively, to the sector's output during the last decade or so.

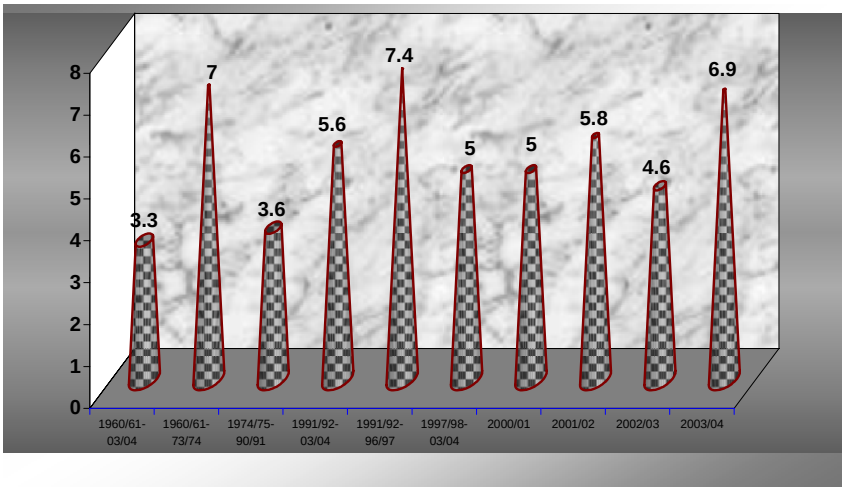
As could be noted from Table 1.3, the two dominant characteristics of this sector are its small and stagnant contribution to GDP and its stable growth rate over the years. Hence, the growth rates in output in individual years are not significantly different from the decade average. Or, as Figure 1.5 shows, the average value added created by the sector during 1960/61 to 1973/74 is identical to that created in 2003/04 (or about 30 years later). This is a clear indication that the industrial sector has not gone any structural transformation that could enable the sector to increase its share in total GDP and kick off dynamic growth. Therefore, while the yearly performance of the sector in 2003/04 is slightly better than both the average for the last ten years and the individual years, the percentage increase is too small to significantly alter the value of total output or employment.

Table 1. 3: Growth performance in the industrial sub-sectors

	Share in sector	Share in GDP	Growth				
	1991/92-2003/04	1991/92-2003/04	1991/92-2003/04	2000/01-03/04	2001/02	2002/03	2003/04
Industry	100	10.7	6.1	5.6	5.8	4.6	6.9
Mining & Quarrying	4.4	0.5	7.1	7.1	9.0	4.1	6.5
Large & Medium Scale Industries	39.0	4.2	8.2	4.8	5.0	5.0	6.0
Small Scale Industries & Handicrafts	17.9	1.9	4.4	3.6	2.2	0.1	7.0
Electricity & Water	14.7	1.6	3.8	5.5	7.1	4.3	7.1
Construction	24.1	2.6	6.4	8.0	8.4	7.4	8.2

Source: Ministry of Finance and Economic Development and staff calculations.

Figure 1. 5: Growth in the value added of the industrial sector



Source: Ministry of Finance and Economic Development.

1.2.3 The service sector

The major components of this sub-sector are the distributive services and the other services sectors. The total service sector constitutes about 42 percent of GDP, making the second largest sector in the economy (following agriculture). And owing to the liberalization measures undertaken since the early 1990s, it has had the highest growth relative to the other sectors of the economy (close to about 7 percent on average between 1991/92 to 2003/04).

The distributive services sub-sector is composed of trade, hotels & restaurants and transport & communications. Both constituted about 14 percent of GDP, on average, between 1991/92 and 2003/2004 and grew by about 7 percent during the same period. And its performance during the year in review (2003/04) slightly increased to 7.6 percent which is an improvement relative to historical averages and relative to recent years.

Table 1. 4: Growth performance in sub-sectors of the distributive service sector

	Share in sector	Share in GDP	Growth				
	1991/92-2003/04	1991/92-2003/04	1991/92-2003/04	2000/01-2003/04	2001/02	2002/03	2003/04
Distributive Services	100	14.4	6.6	5.1	4.4	3.2	7.6
Trade, Hotels, & Restaurant	57.0	8.2	6.5	3.9	3.4	0.6	6.5
Transport & Communication	43.0	6.2	7.2	6.7	5.8	6.7	8.9

Source: Ministry of Finance and Economic Development and staff calculations.

The other component of this sector is what is referred to as the "other services" sector which includes services provided by both the public and the private sectors. The services in this category include: banking & insurance, public administration & defence, education, health and domestic & other services.

The share of this sector in GDP averaged about 27.4 percent between 1991/1992 to 2003/04 while it grew by about 7 percent during the same period. Public administration & defence is the largest component of this sub-sector, constituting about 44 percent of the total, followed by banking & insurance (24.4 percent).

Due to the Ethio-Eritrean border conflict, public administration & defence had the highest average growth (close to 9 percent) between 1991/92 to 2003/2004 while that of education was higher in the last five years (200/01 to 2003/04), which averaged about 12 percent. What is also interesting in this respect is that, while the growth rate of public administration & defence has been relatively volatile, that of education and health seem more stable over the years (see Table 1.5 for details). During the year in review (2003/04), public administration & defence expenditure recovered to 6.5 percent from a negative 1.8 percent last year; both education and health expenditures grew by 12 and 8 percent, respectively, surpassing their historical average growth rates.

Table 1. 5: Growth performance in sub-sectors of the "other services" sector

	Share in sector	Share in GDP		Growth rates			
	1991/92-2003/04	1991/92-2003/04	1991/92-2003/04	2000/01-03/04	2001/02	2002/03	2003/04
The "Other" Service Sector	100	27.4	6.9	4.3	4.6	1.8	6.3
Banking & Insurance	24.4	6.6	5.6	3.7	-0.3	4.6	4.9
Public Administration & Defence	44.4	12.3	8.9	3.3	6.1	-1.8	6.5
Education	9.2	2.5	6.6	12.3	10.9	13.0	12.0
Health	4.2	1.1	7.7	6.0	7.1	0.8	8.0
Domestic & Other Services	17.7	4.8	4.6	3.6	3.5	3.2	3.8

Source: Ministry of Finance and Economic Development and staff calculations

1.3 Saving and investment

This sub-section will examine the behaviour of savings and investment during the review period relative to historical performance of the aggregates. The importance of saving, and hence, investment in influencing the accumulation of capital and the influence of the latter on economic growth has always been emphasized in the economic growth literature. And due to this presumed causality, saving and investment have occupied a central stage in economic policy (particularly growth) analysis. Regardless of the direction of causality (which the economic literature at times casts doubt) between saving, investment and economic growth, a synchronized movement between these aggregates is vital to close both internal and external gaps in order to ensure a sustainable path of economic activity by mobilizing resources. In light of this presumed importance of these aggregates, the following discussion will examine the historical evolution of these aggregates, their current growth rates and the policy changes that have been that are related to these activities.

1.3.1 Saving

The saving rate has been low in Ethiopia relative to similar economies and has become even lower in more recent years. For instance, saving as a ratio of GDP averaged about 2.4 percent during the last five years (2000/01-2003/04) which is about half of the 5.4 percent average figure for 1993/94-1999/00. In particular, it is interesting to note that saving rates almost collapsed since 1998/1999 in contrast to an upward movement of investment in recent years. For instance, gross fixed capital formation during the last five years was 20 percent of GDP compared to a 17 percent of GDP, on average, for 1993/94-1999/00. Consequently, a corresponding average resource shortfall of about 18 percent and 11 percent of GDP were recorded during the above sub-periods. During the fiscal year in review (2003/2004), both saving

and investment as a ratio of GDP recorded a slight increase (0.5 and 2.1 percentage points, respectively). But due to the uneven increase in the aggregates, they ended up increasing the resource gap to almost 20 percent of GDP from 18 percent of GDP recorded the year before.

One of the implications of such imbalance between saving and investment is that the economy will become dependent on foreign sources to finance its basic investment needs. The effect of such a predicament for a country that does not have any access to borrow from the international financial market is beyond the usual resource shortfall that some countries face. This is because such dependence entails political dependence as well in addition to the standard economic constraints it imposes. As indicated in Table 1.6, on average foreign sources financed about 88 percent of Ethiopia's resource gap.

This gap or the inadequate size of saving is also reflected in the size of consumption. Total consumption expenditure almost exhausts total GDP. For instance total consumption expenditure averaged almost 99 percent of GDP in the last five years. This meant that what is produced in a given year is almost all consumed with no or little left for capital formation. As was noted in relation to saving, this situation got worse in recent years even though it had exceeded 90 percent of GDP for more than a decade. Such low saving or high consumption clearly indicates either an inadequate increase in production, a more than proportionate increase in population, or a combination of both. The data attests that the main culprit is the last factor.

The attendant resource gap could also be looked at from another angle, the degree of indebtedness of the economy. As the last column of Table 1.6 shows, the size of external debt as a ratio of GDP has been high since the 1970s, exceeding 100 percent of GDP in some years. Even after receiving some partial debt relief under the Highly Indebted Poor Countries (HIPC) initiative in the last

few years, the average external debt as a ratio of GDP for the last five years stood at 98 percent. And due to the huge size of the debt, the debt service ratio averaged about 19 percent of GDP during the same period.

The above discussion clearly indicates the size of the resource gap that the Ethiopian economy has faced. In particular, the saving investment gap and the huge ratios of consumption and external debt to GDP demonstrate lack of balance (or equilibrium) in the economy. Even the relatively inadequate (compared to other poor countries) rate of investment is financed from foreign sources.

Table 1. 6: Gross domestic savings (GDS), gross fixed capital formation (GFCF), and the resource gap (as share of GDP)

Year	GDS	GFCF	Resource gap	Share of GFCF financed from foreign sources	Consumption			Debt service ratio	Gross external debt
					Total	Gov.	Private		
1993/94	5.03	15.16	-10.1	66.6	95	11.1	84	56.9	90.8
1994/95	7.43	16.44	-9.01	54.8	92.6	11.9	81	30.2	81.8
1995/96	6.99	16.88	-9.89	58.6	93	11.2	82	34.9	71.4
1996/97	7.71	17	-9.29	54.6	92.3	10.9	81	49.8	63.9
1997/98	7.73	17.15	-9.42	54.9	92.3	13.9	78	15.1	62.2
1998/99	2.14	16.94	-14.8	87.4	97.9	18.7	79	18.2	64.7
1999/2000	0.9	15.85	-15	94.6	99.1	23.8	75	25.2	83.9
2000/01	2.65	17.79	-15.2	85.4	97.4	20.1	77.3	22.2	85.35
2001/02	1.8	20.4	-18.6	91.2	98.2	22.3	75.9	15.4	102.04
2002/03	2.3	20.5	-18.2	88.8	102.1	23.8	73.9	22.3	102.65
2003/04	2.8	22.6	-19.8	87.6	97.2	21.8	75.4	17.04	102.65
Average (1993/94-1999/00)	5.4	16.5	-11.1	67.4	94.6	14.5	80.0	32.9	74.1
Average 2000/01-2003/04	2.4	20.3	-18.0	88.3	98.7	22.0	75.6	19.2	98.2

Source: Ministry of Finance and Economic Development, National Bank of Ethiopia, and staff compilations.

1.3.2 Investment

As was noted in our last report, the government has introduced some policy changes to boost investment. Among the notable policy changes carried out in this regard are the reductions in both deposit and lending interest rates. It has to be noted that this policy has the potential to depress savings and boost investment by reducing returns and lowering costs of borrowing, respectively. Though it is difficult to ascertain that the low saving reported above is directly a result of such reductions in deposit rates, but it definitely makes it a primary suspect.

On the investment side, during the year in review, a total of 2278 new projects with a total capital of Birr 21,694,014 were approved. These are expected to create 159,212 permanent and 149,784.5 temporary jobs. About 84 percent of these projects and about 57 percent of the capital is from private domestic investors while the respective figures for foreign investors are 15 and 33 percent. The remaining share is contributed by public investment.

Out of the total employment that these projects are expected to create, the private domestic sector is expected to create about 70 percent of the total permanent and 78 percent of the temporary jobs. The respective shares of foreign investment are 29 and 21 percent. Clearly, foreign financed projects seem to be relatively larger and more capital intensive than projects initiated by domestic firms. For instance, on average, the planned capital outlay of domestic firms is about Birr 6,627 per project while that of foreign firms is about Birr 20,819. And in terms of employment, domestic firms intend to create about 59 permanent and 61 temporary employees per project while the respective figures for foreign firms are 135 and 92 employees (see details in Tables 1.7 - 1.9).

Table 1. 7: Number, investment capital & employment creation of domestic private investment projects approved by sector, fiscal year 2003 - 2004 (1 Hamle 1995 – 30 Sene 1996 Eth. c.)

	No of project	Capital	Permanent employment	Temporary employment
Agriculture	197	1596661.67	17227	72500
Mining & Quarrying	8	70834	746	188
Manufacturing	695	4931355.504	51070	20465
Electricity Supply	3	301516.4	124	109
Construction	123	621598.97	6994	9204
Construction machinery leasing	359	2148524.797	6407	1463
Real Estate	97	830002.21	4566	4108
Trade	37	177020.333	2947	2220
Hotel & Tourism	105	593221.64	4238	1168
Transport & Storage	8	37432.7	90	26
Education	181	850067.07	9144	2814
Health	50	251918.73	1870	362
Other Businesses	56	306012.4	5428	2199.5
Grand Total	1919	12716166.42	110851	116826.5

Source: Ethiopian Investment Commission.

Table 1. 8: Private domestic investment number, investment capital & employment creation of foreign investment projects approved by sector, (1 Hamle 1995 - 30 Sene 1996 Eth.c.)

Sector	No of project	Capital	Permanent employment	Temporary employment
Agriculture	74	2682420.96	27239	16736
Mining & Quarrying	1	900	20	180
Manufacturing	132	2297289.57	12443	5665
Electricity Supply	2	391800	10	30
Construction	18	788332.24	1981	3071
Construction machinery leasing	17	76696.5	271	76
Real Estate	7	147003.8	557	561
Trade	12	246305	934	4212
Hotel & Tourism	34	212673.42	1874	650
Transport & Storage	1	2500	16	0
Education	6	16610.47	118	23
Health	10	231779.58	637	210
Other Businesses	29	46500.17	354	249
Grand Total	343	7140811.71	46454	31663

Source: Ethiopian Investment Commission

Table 1. 9: Number, investment capital & employment creation of total investment projects approved by sector, 1 Hamle 1995 - 30 Sene 1996 Eth.c.

Sector	No of project	Capital	Permanent employment	Temporary employment
Agriculture	272	4283303	45344	90236
Mining & Quarrying	9	71734	766	368
Manufacturing	839	8831871	64487	26320
Electricity Supply	7	881505.5	169	244
Construction	141	1409931	8975	12275
Construction machinery leasing	376	2225221	6678	1539
Real Estate	104	977006	5123	4669
Trade	49	423325.3	3881	6432
Hotel & Tourism	139	805895.1	6112	1818
Transport & Storage	9	39932.7	106	26
Education	187	866677.5	9262	2837
Health	60	483698.3	2507	572
Other Businesses	86	393912.6	5802	2448.5
Grand Total	2278	21694014	159212	149784.5

Source: Ethiopian Investment Commission

The above tables reveal the following characteristics of the investment flow. First, the manufacturing sector dominated in attracting large number of projects, relatively more capital and in creating more permanent jobs than any other sector. Second, the agricultural sector was a distant second in attracting investment flows. Probably due to the seasonal nature of the activity, it only dominated all the other sectors in creating more temporary employment. Third, the sector that attracted the third highest number of projects and investment capital is construction and machinery leasing, while it lagged other sectors in creating both permanent and temporary employment. Fourth, during the year in review, foreign investment seems to have flown more to agriculture, on the margin, than manufacturing while domestic investment exhibited the reverse behaviour. This phenomenon could partly be explained by the new interest in exporting flowers, meat and related agricultural goods.

Table 1. 10: Number, investment capital & employment creation of investment projects under implementation and operation by sector, 1 Hamle 1995 - 30 Sene 1996 Eth.c.

	Implementation				Operation			
	Number	Capital	Permanent employment	Temporary employment	Number	Capital	Permanent employment	Temporary employment
Domestic	1265	10439870.81	72385	92996	2177	12793398.14	83844	289280
Foreign	123	6732903.34	15028	9372	100	3052006.71	16061	6370
public	12	5826869.5	2822	407	14	2379602.3	855	271
Total	1400	22999643.65	90235	102775	2291	18225007.15	100760	295921

Source: Ethiopian Investment Commission.

During the year in review, a total of 1400 projects were at the implementation stage while about 2291 were reported to have started operation. These projects created about 190,995 permanent and 398,696 temporary or about half a million employment opportunities in total. In terms of the contribution of domestic and foreign firms, at the implementation and operations stages, about 82 percent of the permanent and 96 percent of the temporary employment were created by domestic investors. In other words, about 68 percent of the total jobs created were temporary while the remaining 32 percent were permanent. In general, public investment tends to create more permanent jobs in the share of its total employment created (84 percent), followed by foreign investment (66 percent) and then private domestic investment (29). On the other hand, private domestic firms tend to create more temporary jobs (71 percent of their employees) compared to 34 percent by foreign firms.

The total capital of the projects that were at the implementation and operation stages during the year in review was Birr 41, 224, 651. Out of this total, 56

percent of the capital expenditure was contributed by domestic firms while foreign and public investment contributed the remaining 24 and 20 percent, respectively. These figures indicate that about 76 percent of the capital outlay was from domestic sources (both private and public). This suggests that despite the repeated revision of the investment code to boost investment in general and attract foreign investment in particular, the role of foreign investment in the country has been marginal to date (see Annex 1.1 for further details).

1.4 The external sector

In the following sub sub-section, the performance of the foreign sector will be examined. This will include the performance of exports and imports and hence the balance of the merchandize trade. It will further evaluate the composition of both exports and imports and the overall balance of the external sector during the period in review.

The value of coffee exports recovered in 2003/2004 and recorded a growth rate of close to 36 percent. This is partly due to the improvement in international coffee prices and partly due to an increase in the volume of coffee exported during the year. The exports of non-coffee items also increased during the year, resulting in an overall growth in the value of exports by about 27 percent. This is a badly needed recovery as the two categories of exports, particularly the value of coffee exports, recorded a dismal performance in the last few years.

In terms of the composition of exports, the dominance of coffee seems to have lessened in the last five years. For the first time, the share of coffee in total exports was below 50 percent in 2000/2001 and has not recovered since. And given the attendant attempt to diversify exports, it is unlikely that it will recover the dominant position it has enjoyed over the years. The new entrants and those that increased their share in the export market (animal and related products, flowers, oil-seeds and related products, for instance)

are likely (and hopefully) to end the mono-dominance of coffee by continuing to expand their share. The recent aggressive investment drive in the flower business and the market expansion for animal and animal products are few examples that support this observation.

Table 1. 11: Growth rate and structure of exports

Year	Annual growth rates of exports (value)		Percentage shares		
	Coffee	Non-coffee	Total	Coffee	Non-coffee
1995/96	-4.2	-14.8	-8	66.1	33.9
1996/97	33.8	79.4	49.3	59.3	40.7
1997/98	25.2	-21	6.4	69.8	30.2
1998/99	-26.9	21.8	-12.2	58.1	41.9
1999/00	1	19.7	8.8	53.9	46.1
2000/01	-28.8	28.6	-2.3	39.3	60.7
2001/02	-8.3	5.3	-0.1	36.1	63.9
2002/03	1.8	10.3	7.2	34.2	65.8
2003/04	35.8	21.8	26.6	36.7	63.3

Source: National Bank of Ethiopia

On the import side, the major components of imports have been items that are directly or indirectly related to production. Consequently, more than half of the imported items are composed of capital goods, semi-finished goods and raw materials. During the year in review, capital goods constituted about 32 percent, semi-finished goods about 18 percent, fuel about 12 percent and raw materials about 1.3 percent of total imports. The other category which constitutes a major share in total imports is consumer goods, which accounted for about 35 percent of total imports during the year in review. It is worth noting that, in terms of individual categories, the composition of imports seems to have slightly tilted in favour of consumer goods in recent years. For instance, capital goods had the highest share in total imports between 1995/96 to 1999/00, but as a single category, consumer goods accounted for the largest share since then (see Table 1.12 for details).

Table 1. 12: Percentage share in total import value

Year	Raw materials	Semi-finished goods	Fuel	Capital goods	Consumer goods	Miscellaneous
1995/96	2.5	17.5	12.9	35.9	27.1	4.1
1996/97	2	19.2	18.4	38.8	20.6	0.9
1997/98	2	16.4	24.4	29.8	19.7	7.7
1998/99	1.7	16.8	11.4	33.7	28.1	8.3
1999/00	1.2	12.7	15.5	29.2	26.8	14.5
2000/01	1.5	18.3	18.8	28.6	30.1	2.8
2001/02	1.8	17	15.8	28.3	34.6	2.5
2002/03	1.2	14.8	15.5	29.6	35.2	3.7
2003/04	1.3	18.1	12.2	31.6	35.1	1.5

Source: National Bank of Ethiopia.

And in terms of growth, total imports grew by 40 percent during the period in review. This is the highest yearly growth rate in at least the last five years and fourfold compared to the preceding year (2002/03). The capital goods sub-category recorded about 60 percent growth rate followed by semi-finished goods (59 percent) and consumer goods (38 percent). Raw materials and fuel grew by 19.5 and 8.4 percent, respectively, during the year compared to the year that preceded it. It has to be noted that the significant increase in almost all the components of some of the categories (raw materials and semi-finished goods, for instance) is a recovery from the negative growth registered a year earlier.

Consequently, due to the jump in imports relative to exports, the trade deficit increased to 25 percent of GDP during 2003/04 from about 21 percent of GDP in 2002/03. But due to the positive balance in net services and net transfers (both private and public), the current account deficit during the year was only about 7 percent and the overall balance was a positive 1.8 of GDP (see Table 1.13).

Table 1. 13: Balance of payment indicators as a percentage of GDP

Indicators	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Exports	9.4	9.2	7.5	7.4	7.1	7.5	7.3	7.6
Imports	20.5	20.8	24.2	24.7	23.9	28	28	32.6
Trade Balance	-11.1	-11.6	-16.5	-17.2	-16.8	-20.5	-20.7	-25.0
Net Services	1.6	1.4	1	1.5	1.2	1.7	1.8	3.1
Net Private Transfers	4	4.9	4.5	6.3	5.8	5.8	7.5	8.2
Net Public Transfers	3.5	4	3.3	4.5	6.1	7.2	9	7.1
Current Account Deficit *(Including Public Transfers)*	-5.5	-5.23	-11.1	-9.4	-9.8	-13.1	-11.4	-6.7
Current Account Deficit *(Excluding Public Transfers)*	-9	-9.3	-14.4	-13.9	-15.8	-20.3	-20.5	-13.7
Non-Monetary Capital	-2.5	1.3	3.6	2.1	4	8.4	4.6	3.0
Overall Balance	-6.2	-0.3	-0.7	-4.8	-0.8	5.1	4.6	1.8

Source: National Bank of Ethiopia.

1.5 Developments in monetary aggregates

This section briefly examines the performance of the monetary sector during the year in review. In particular it will evaluate the behaviours of monetary aggregates, the interest rate, and the overall intermediation activities carried out by the banking sector.

Broad money supply grew by 15 percent during the fiscal year in review which is about four percentage points higher than the preceding fiscal year of 2002/03. The two main components of broad money, namely narrow and quasi money, also grew by 15.9 and 14.3 percent, respectively. As indicated in Table 1.14, the growth of broad money seems marginally higher relative to the preceding year. However, despite the marginal growth, money multiplier and the share of broad money in GDP are of the same magnitude as the last few years. This suggests that the potential impact of money growth on inflation will be limited at best as the two ratios are not increasing simultaneously. In fact the growth of money supply is about the same as the rate of inflation that occurred during the year.

Table 1. 14: Determinants of money supply (in billions of Birr)

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Domestic Credit(Net)	20.1	26.3	24.6	27.5	28.8	31.1
Claims on Government (net)	*9.6*	*14.8*	*13.1*	*16.0*	*17.2*	*19.2*
Of Which : National Bank of Ethiopia	*8.2*	*13.0*	*10.0*	*9.0*	*9.4*	*9.4*
Of Which : Commercial Banks	*1.4*	*1.8*	*3.1*	*7.0*	*7.8*	*9.8*
Claims on Other Sectors	*10.5*	*11.5*	*11.5*	*11.5*	*11.6*	*11.9*
Net Foreign Assets	*6.1*	*4.8*	*4.7*	*7.8*	*11.0*	*13.0*
Other Items	6.8	8.9	-2.4	8.0	9.3	9.1
Broad Money Supply	19.4	22.2	31.7	27.3	30.5	35.0
Annual Percentage Change						
Domestic Credit (Net)	8.5	30.7	-6.3	11.9	4.6	8.1
Claims on Government (net)	*8.2*	*54.2*	*-11.5*	*22.2*	*7.8*	*11.4*
Claims on Other Sectors	*8.8*	*9.4*	*0.3*	*0.1*	*0.2*	*3.2*
Net Foreign Assets	4.4	-21.6	-0.8	65.3	40.1	18.6
Broad Money Supply	4.4	14.3	42.9	-13.8	11.5	15.0

Source: National Bank of Ethiopia

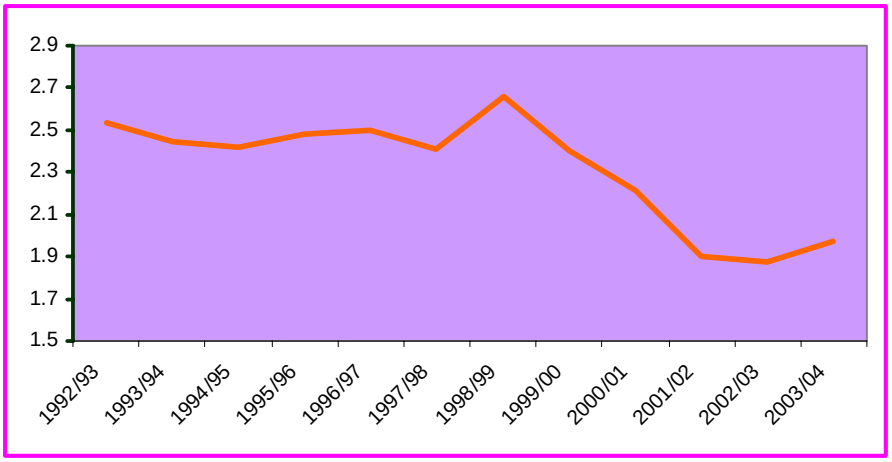
Further, the income velocity of money has not shown any increase since its peak in 1998/99. As could be seen in Figure 1.6, it had declined continuously until it started to exhibit a slight upward movement in the last two years. But it still remained below a decade average. This again ensured that the potential impact of monetary expansion on inflation in the Ethiopian economy has been absent for some time.

One of the volatile components of the monetary aggregates is domestic credit, particularly the credit claimed by the central government. Total domestic credit grew by about eight percent during the year in review from about 5 percent in the previous year. But the credit claimed by the central government grew by 11.4 percent during the same period. Further, more than half (62 percent) of the total domestic credit went to the central government while the remaining balance went to the private sector. It is worth noting that while the credit made available to the public sector has been, on average increasing, the credit offered to the other sectors has been declining and reached a very negligible level in recent years. In fact except for the 3 percentage points increase during the year in review, it was almost close to

zero in 2001/02 and 2002/03. This is another indication of the huge imperfections in the Ethiopian banking sector in that the amount of credit channelled to the private sector is negligible in the midst of huge excess reserves in the banking sector.

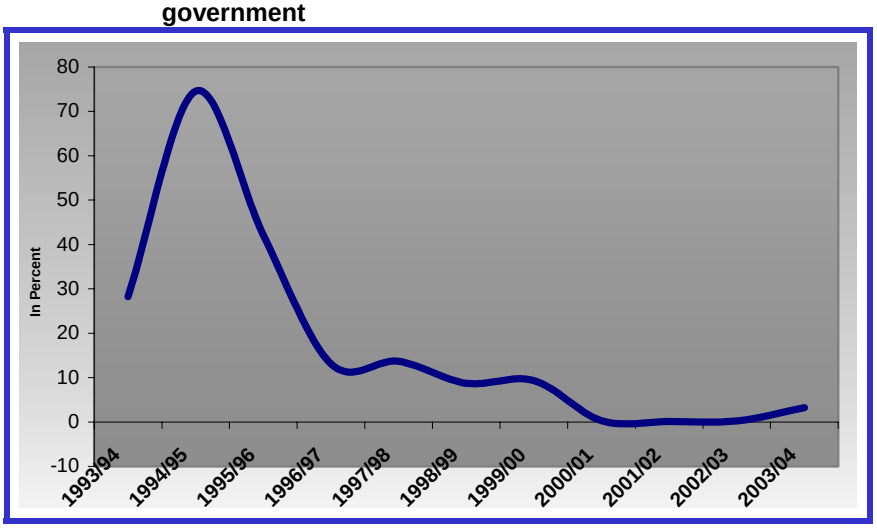
The reasons why the flow of credit to the private sector has been low and volatile are, as noted in our previous reports, related to asymmetric information and adverse selection problems that have typified the Ethiopian financial sector, as probably is the case in many developing countries. That is, the high incidence of default on the part of borrowers, the weak or absence of transparent information on the credit record of potential and actual borrowers, the low enforcement capacity of lending institutions, has resulted in a situation whereby banks hold huge excess reserves of loanable funds while on the other hand potential investors seem to face shortage of capital to carry out intended investment activities. Such a state of affairs has dominated the behaviour of the banking sector in Ethiopia in recent years.

Figure 1. 6: The income velocity of money



Source: National Bank of Ethiopia and staff computations.

Figure 1. 7: Growth rate in domestic credit to the non-central government



Source: National Bank of Ethiopia and staff computations.

Consequently, the ratio of bad loans to total loans and the share of excess reserves in total deposits have been high and increasing. For instance, in fiscal year 2003/04, the ratio of excess reserves to total reserves amounted to about 73 percent. Or to put it differently, banks had excess reserves which amounted to about 3 times what is required by law. In fact this is an improvement relative to a year before in which excess reserves stood at more than five times the required amount. What is probably more worrying is the average ratio of excess reserves to required reserves which averaged about 3.4 times of required reserves over the last ten years. This is high for a country that is starved of investment capital.

The structure of interest rates has not changed much in the last three years in nominal terms. And hence due to the relative appreciable increase in inflation in recent years, average real saving deposit and minimum lending

rates were negative in the last two years. During the year in review, only real maximum lending rate was positive.

The negative real interest rate suggests that savers were charged a premium while borrowers were rewarded with a positive return in real terms. Other things being equal, this is likely to discourage savers and encourage borrowers. Hence, this is likely to deter resource mobilization in general and saving deposits in particular.

Table 1. 15: Interest rate structure

Deposit Rate	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Saving Deposit	6.0	6.0	6.0	3.0	3.0	3.0
Time Deposits						
6 month	6.11	6.13	6.17	3.3	3.3	
6 -12 month	6.27	6.28	6.36	3.41	3.35	3.39
12- 18 month	6.3	6.41	6.53	3.51	3.62	
18-24 month	6.36	6.54	6.67	3.54	3.72	
Over 24 month	6.43	6.69	6.8	3.57	3.82	3.43
Lending Rates						
Maximum	13	13.5	15	13	13	14
Minimum	10.5	10.5	10.5	7.5	7.5	7.5

Source: National Bank of Ethiopia and staff computations.

The motive of the national bank in lowering nominal interest rates in 2001/02 is likely to encourage investment by lowering the cost of borrowing. But this could be a double-edged-sword if the negative real interest continues and reduces available loanable funds. In fact, even though one year event does not constitute a hard evidence, it is unlikely that saving deposits declined by about 15 percent in 2001/02 when deposit rates were reduced to 3 percent from a minimum of 6 percent.

1.6 Public finance

This section explores the structure of government revenues and expenditures and the sources of financing of government deficits. That is, the section will focus on the uses and sources of government finance. Accordingly, the relative change in both revenue and expenditure, the sectoral focus in allocating expenditures (capital and recurrent), the main sources of revenue (tax and non-tax) and the external assistance received to fill any financing gaps will be examined.

Total revenue and grants have exhibited a positive growth rate over the last five years. During the fiscal year in review it grew by about ten percent compared to 6 percent in fiscal year 2002/03. But as a ratio of GDP, total revenue and grants decreased during the fiscal year in review relative to the preceding year. This is because the growth of GDP surpassed that of growth in total revenue and grants, and hence the ratio is lower in relative terms though higher in absolute terms when compared to fiscal year 2002/03.

Among the three main sources of government revenue (tax, non-tax and grants), taxes are the dominant sources of revenue. This is the case both in terms of their share to GDP and in terms of annual growth. During the fiscal-year in review, total taxes (both direct and indirect) registered a growth rate of almost 28 percent and constituted about 15.2 percent of GDP. Within taxes, as has been historically the case, indirect taxes dominate both in terms of growth and their relative share in GDP. For instance, during the year in review, indirect taxes grew by 41 percent and their share in GDP was 11 percent while the respective figures for direct taxes were 4.5 and 4.1 percent.

On the other hand, as noted in Table 1.16, non-tax revenue and grants constituted 3.9 and 5.8 percent of GDP, respectively, during the fiscal year in review. Further, both non-tax revenue and grants registered negative growth

rates during the reporting year following a huge increase in the preceding year. The reason(s) why non-tax revenue decreased is not clear but the decrease in grants might be due to the uneven flow of foreign assistance on an annual basis.

Table 1. 16: Sectoral share of total capital expenditure (%)

Sectors	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Economic Development	58.4	60.0	63.2	54.3	52.9	54.2
Of Which: Agriculture and Natural Resources	21.6	21.9	20.0	17.8	12.1	22.9
Of Which: Transport Construction	24.3	23.2	29.5	24.9	24.9	22.7
Social Development	22.0	18.2	26.6	16.2	21.1	25.3
Of Which: Education	10.5	9.9	13.3	8.8	12.6	20.1
Of Which: Health	5.0	4.1	10.3	4.5	4.7	4.6
External Assistance	12.0	11.8	0.0	18.2	19.0	12.9
General Development	7.4	10.1	10.2	11.3	7.0	7.6

Source: Ministry of Finance and Economic Development.

As noted above, both total revenue and total expenditures declined during the year in review compared to the preceding fiscal year. But in relative terms, the decline in total expenditure was higher than that of total revenue. Consequently, fiscal deficits as a share of GDP also declined to 4.6 percent of GD including grants and to 10.4 percent excluding grants. The respective figures for the preceding fiscal year were 8.4 and 16.4. It has to be noted that the above reported deficit figures are probably on the high side relative to that of neighbouring countries (Kenya, Uganda, and Tanzania for instance[1]) and given that the government relies on grants to finance them rather than on

[1] According to African Development Bank's "African Economic Outlook", 2003/2004, the above countries either had a budget surplus or a deficit which is less than 5 percent of their GDP.

domestic revenue mobilization and/or expenditure adjustments. In fact, the deficit figures recorded during the fiscal year in review are much smaller than the average for the preceding five years, though still higher than similar economies.

Table 1. 17: Financing the budget deficit (percent of GDP)

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Total Revenue and Grants	23.0	21.1	2b3.6	24.8	27.5	24.8
Total Expenditure	29.8	32.3	29.1	34.1	35.9	29.4
Overall Balance						
Including Grants	*-6.8*	*-11.2*	*-5.5*	*-9.3*	*-8.4*	*-4.6*
Excluding Grants	*-10.5*	*-14.4*	*-10.3*	*-14.0*	*-16.4*	*-10.4*
Financing						
External Net	2.8	1.6	3.8	8.6	6.8	3.5
Of which :Gross Borrowing	*3.7*	*2.6*	*4.9*	*10.0*	*6.3*	*3.7*
Of Which: Amortization Paid	*-0.9*	*-0.9*	*-1.1*	*-1.3*	*-1.0*	*-1.0*
Domestic Net	3.1	9.4	0.1	0.6	2.9	3.0
Of which: Banking System	*1.8*	*10.3*	*-0.4*	*1.4*	*2.9*	*3.1*
Others and Residual	1.0	0.2	1.6	0.1	-1.3	-1.9

Source: Ministry of Finance and Economic Development.

1.7 Price developments

As noted in our previous Annual Reports, price movements in Ethiopia have largely been influenced by changes in agricultural output rather than demand pressures. This owes to the subsistence nature and low degree of monetization of the economy. Consequently, allowing for some persistence or lags, inflation tends to be higher when drought occurs and lower in boom years with minor or no influence from the growth of monetary aggregates.

In 2003/04, general inflation was 9 percent compared to 15.1 percent in 2002/03. This is consistent with the above observation in that during the year, agricultural output significantly increased and inflation decreased by 6.1 percentage points despite the 5 percentage point growth in broad money supply. In fact, if it were not for the significant increase (4.2 percentage points which is high in historical terms) in the prices of non-food items, the reduction in the general price level would have been larger (see the following table for details).

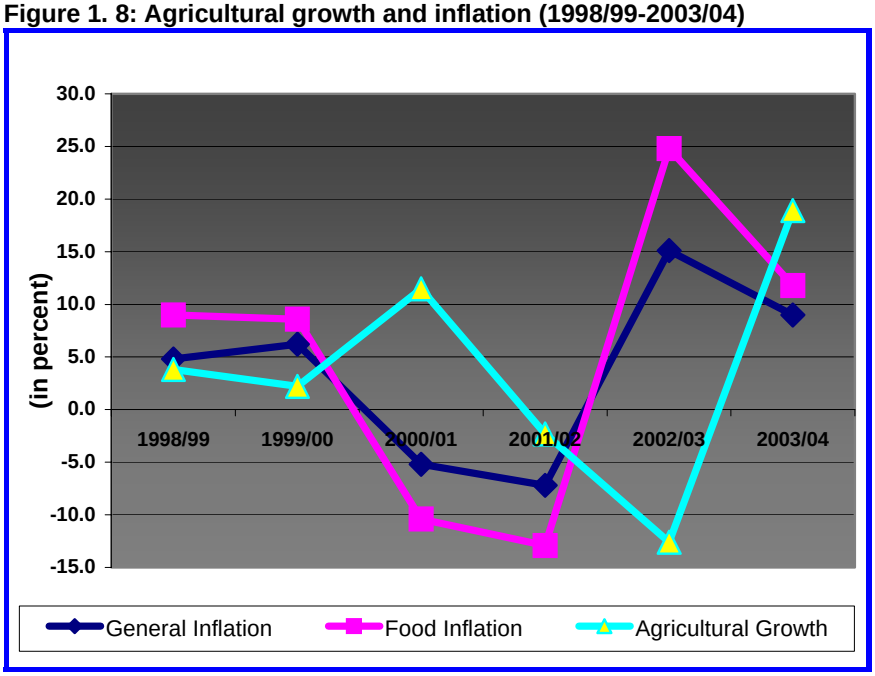
Table 1. 18: Trends in prices

Year	General CPI inflation	Food	Non-food	GDP deflator	Growth in agricultural output	Growth in broad money (M2)
1998/99	4.8	9.0	-1.3	3,7	3,8	4.5
1999/00	6.2	8.6	2.4	3,5	2,2	14.3
2000/01	-5.2	-10.4	1.9	-5,4	11,5	10.5
2001/02	-7.2	-12.9	0.9	-5,7	-2.3	11.4
2002/03	15.1	24.8	0.5	14.4	-12,6	10.2
2003/04	9.0	11.8	4.7	8.7	18.9	15.2

Source: Central Statistical Authority.

The strong inverse relationships between agricultural output and inflation and the weak influence of monetary movements on the latter could be further observed by looking at the quarterly figures of the following year. By the end of the first quarter of 2004/05, for instance, general inflation further decreased to 5 percent and price of non-food items increased to about 7 percent during the same quarter while there was no appreciable difference in the growth of money supply. As Figure 1.8 further shows, there is a clear inverse relationship between agricultural output and inflation, particularly in the last five years.

Figure 1. 8: Agricultural growth and inflation (1998/99-2003/04)

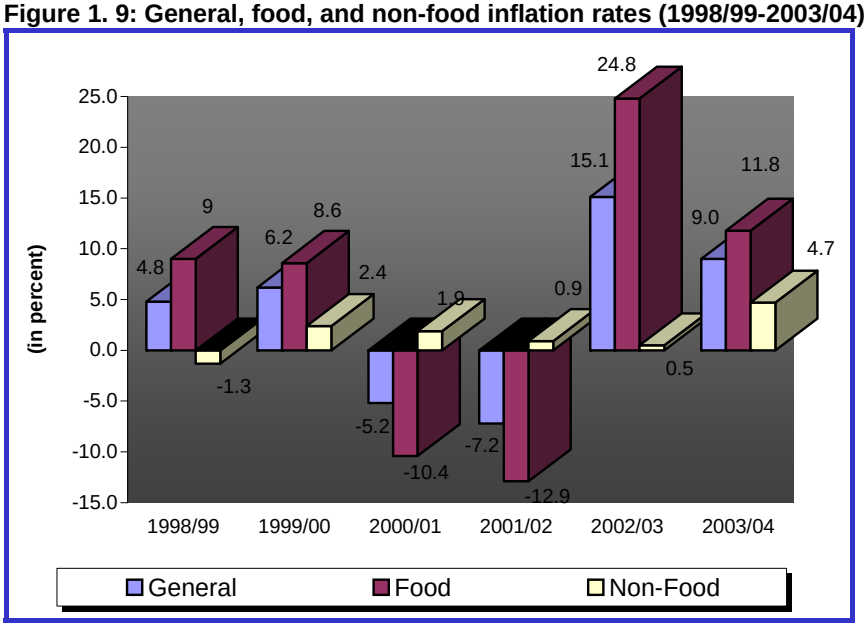


Source: Ministry of Finance and Economic Development and Central Statistical Authority.

In terms of the composition of prices, food inflation has a significant influence on the general price level and it is the most volatile component of the general inflation. This, again, is due to its dependence on agricultural output which in turn depends on rainfall and other natural factors. As noted in Table 1.18 and Figure 1.9, the recent movement of the non-food component of inflation is significant by historical standards. Between 2000/01 and 2002/03, it averaged about 1.4 percent but jumped to 4.7 percent in 2003/04 which is more than threefold of the average or about nine fold relative to the rate that prevailed in 2002/03. This upward movement has continued at least until the end of the first quarter of the following fiscal year which by the end of September 2004 reached about 7

percent. It is difficult to ascertain the exact sources of such a jump, but the most likely culprits will likely include the recent increase in the prices of fuel and construction materials such as cement and steel-related materials.

Figure 1. 9: General, food, and non-food inflation rates (1998/99-2003/04)



Source: Central Statistical Authority.

It is also worth noting that despite the relative jump in the price of food and non-food items and, therefore, overall prices in Ethiopia in recent years, the average growth rate in prices in Ethiopia is much lower than what is observed in neighbouring countries. For instance, according to World Development Indicators, 2003, the annual growth rates in the Consumer Price Index and Food Price Index in Kenya, Tanzania and Uganda averaged between 10 percent and 20 percent in 1990-2001. On the other hand, the respective figures in Ethiopia averaged 4.7 and -3.3 percent during the same period.

1.8 Conclusion

As detailed above, the overall performance of the macro-economy during fiscal year 2003/2004 was one of the better years. Due to the favourable weather conditions, the economy recorded a significant improvement reversing the decline in GDP that was registered in 2002/2003. It is worth emphasizing that one of the recurrent salient features of the Ethiopian economy over the last few decades is instability. This instability mainly emanated from the dominance of agriculture and the vulnerability of this sector to the vagaries of nature. And this instability coupled with the almost stagnant performance of the non-agricultural sector has led to a weak average growth, despite the sharp yearly fluctuations. The variability in growth rates is not, however, similar across the sectors. Unlike the agriculture sector, the growth rates of the other sectors have been relatively stable. However, despite the relative stability of other sectors, due to the dominance of agriculture in the economy, the variability in the growth rate of the agricultural sector has influenced the growth performance of the overall economy.

Similarly, owing to the high population growth rate, the growth rate of GDP has not been high enough to improve the standard of living of the population. GDP per capita grew by a mere 0.1 percent, on average, over the last four decades. Needless to say, this is too small a change for an economy that is at a subsistence level to improve the living conditions of the population. It has to be noted also that due to the variability in the growth rates of GDP, the gains made in good years tend to be lost in bad years. For instance, the losses of personal income in agriculture registered in 2002/2003 were offset by the gains in 2003/2004 as a reversal took place in other years. Due to such swings in agricultural output the net effect was an average reduction of 1.2 percent in agriculture per capita during the last four decades. Hence, due to the almost stagnant growth and due to the population pressure, per capita

income in the non-agricultural sub-sector only grew by less than one percent, on average, over the last four decades.

Another salient feature of the Ethiopian economy is that the composition and the structure of the economy showed no appreciable change over the years. Agriculture still contributes the largest share to total output, and hence employment, even though marginally declined in recent years. The Ethiopian industrial sector has been stagnant over the years both in terms of its share in GDP and growth performance. Its share has not changed much from the 10 percent mark as a ratio of GDP over the last four decades and its growth rate only moved within the 3 to 7 percent range during the same period. This ratio will even be smaller if one excludes some of the traditional activities (such as handicrafts) which do not accord well with the modern definition of an industry in terms of the technology and other know-how they employ in the production process. Consequently, it has not been able to absorb rural- urban migrants nor serve to attract potential migrants.

The service sector, on the other hand, exhibited some appreciable changes over the last four decades. The distributive services sector has registered a slight increase in terms of its share in GDP during the same period. The sub-sector which registered a significant increase is the “other services” sector. This is mainly due to the liberalization policies that have been implemented beginning at the early 1990s.

On the aggregates expenditure side, the Ethiopian economy is beset with various resource imbalances ranging from saving-investment to external gaps. The saving rate has been low in Ethiopia relative to similar economies elsewhere and has become even lower in more recent years owing to the subsistence nature of the economy. In particular, saving rates almost collapsed in the last decade in contrast to an upward movement of investment. One of the implications of such imbalance between saving and

investment is that the economy will become dependent on foreign sources to finance its basic investment needs. This in turn leads to indebtedness of the economy. Consequently, external debt as a ratio of GDP has been high since the 1970s, exceeding 100 percent of GDP in some years. And due to the huge size of the debt, the debt service ratio averaged about 19 percent of GDP during the last decade. Until the effect of debt cancellation, if and when it materializes, this will continue to put pressure on the ability of the economy to accelerate investment.

On the external sector, the Ethiopian economy has been dependent on few export items and imported most of its production requirements. During the year in review, the value of total exports grew by about 27 percent. This is partly due to the improvement in international coffee prices and partly due to an increase in the volume of coffee exported in addition to the increase in the exports of non-coffee items. Total imports also grew by 40 percent during the period in review. This is the highest yearly growth rate in at least the last five years and fourfold compared to the preceding year (2002/03). Consequently, due to the jump in imports relative to exports, the trade deficit increased to 25 percent of GDP during 2003/04 from about 21 percent of GDP in 2002/03. But due to the positive balance in net services and net transfers (both private and public), the current account deficit during the year was only about 7 percent and the overall balance was a positive 1.8 of GDP.

As was the case in previous year, the monetary authority was prudent in its monetary policy stance. The Broad money supply grew by 15 percent during the fiscal year in review which is about four percentage points higher than the preceding fiscal year of 2002/03. The growth of broad money seems marginally higher relative to the preceding year. However, despite the marginal growth, money multiplier and the share of broad money in GDP are of the same magnitude as the last few years. This suggests that the potential impact of money growth on inflation will be limited at best as the two ratios

are not increasing simultaneously. In fact the growth of money supply is about the same as the rate of inflation that occurred during the year. Similarly, the structure of interest rates has not changed much in the last three years in nominal terms. And hence due to the relative appreciable increase in inflation in recent years, average real saving deposit and minimum lending rates were negative in the last two years. During the year in review, only real maximum lending rate was positive. The implications of negative real interests on saving mobilization, on one hand, and investment, on the other, are obvious.

The performance of the public sector during the year in review also exhibited a marginal increase on the revenue side and a slight decrease on the expenditure side relative to GDP even though both increased in absolute terms. During the fiscal year in review, total taxes (both direct and indirect) registered a growth rate of almost 28 percent. On the expenditure side, total expenditure decreased to 29.4 percent as a share of GDP during the year in review from 35.9 percent in the preceding year. This was mainly due to a reduction in recurrent expenditures while capital expenditures were only marginally affected. Consequently, the fiscal deficit (both before and after grants) decreased relative to fiscal year 2002/03, but remained within the range of the historical average. In general, the performance of the public sector suggests that (a) the fiscal stance has been prudent in the sense that expenditures were in line with historical averages; (b) there seems to be a deliberate effort to make the economy more reliant on domestic revenue (as reflected in the increase in the tax component of total revenue); (c) domestic revenue covered , at least, recurrent expenditures, and consequently (d) fiscal deficits (both before and after grants) in the last five years are only slightly higher than the averages for the 1980s and the 1990s despite the significant increase in both in recurrent and capital expenditures.

With regard to price movements, as noted in our previous Annual Reports, price movements in Ethiopia have largely been influenced by changes in agricultural output rather than demand pressures. This is due to the subsistence nature and low degree of monetization of the economy. Consequently, allowing for some persistence or lags, inflation tends to be higher when drought occurs and lower in boom years with minor or no influence from the growth of monetary aggregates. In 2003/04, general inflation was 9 percent compared to 15.1percent in 2002/03. This, again, is due to the significant increase in agricultural output during the year. In fact, if it were not for the significant increase in the prices of non-food items, the reduction in the general price level would have been larger.

Chapter 2

Manufacturing Industries and Trade

2.1 Introduction

The theme of the last report on the Ethiopian economy, volume III, was on Industrialization and Industrial Policy in Ethiopia. The report analyzed the state of the manufacturing sector in Ethiopia, identified the underlying constraints and problems of the sector, assessed policy perspective in historical context, investigated countries' experiences of industrialization, overviewed the opportunities offered by and challenges encountered owing to the WTO regime and, based on these, drew an industrial policy framework for Ethiopia.

The analysis was based on an extensive survey of the manufacturing sector. It has shown that the manufacturing sector is too small and underdeveloped. Its structural linkages with the other sectors of the economy and within itself are weak, distorted and unbalanced. Within manufacturing, the structure of the industries is highly skewed. It is largely dominated by industries producing goods for domestic consumption, while intermediate and capital goods industries are least developed and, largely, missing. As a result, it is heavily dependent on imports for intermediate inputs and capital goods.

The socialist industrialization strategy of the *Derg* regime, which marginalized the private sector, and the Agricultural Development Led-Industrialization (ADLI) strategy, which by design gives secondary role for industrialization, arrested technological progress and improvement of entrepreneurial and labor skill in manufacturing for over three decades. As a result, total factor productivity and efficiency in most firms have been declining for long. With

the opening up of the economy for foreign competition, many firms were closedown, while others are forced to operate at very low capacity. Therefore, all hitherto pursued policies failed to induce industrial growth in the country, calling for a new and specific industrialization program to promote the economy at large.

In a country where massive population pressure on land prevails and where backward traditional farming techniques on fragmented pieces of plots (a family owning only half a hectare) are used, sustained food security cannot be achieved. It is only a sectorally integrated simultaneous growth strategy which accelerates industrial growth and guarantees agricultural transformation through the supply of improved implements, modern technical inputs and application of knowledge based modern techniques of production that could guarantee food security. It should also be noted that agricultural development is not necessarily a prerequisite for industrialization, witness the industrialization strategy of countries such as Singapore and Hong Kong.

The report concluded that lack of industrialization is due to policy failure, and if economic development is to be initiated in Ethiopia, an industrial policy with a central objective of building future dynamic comparative advantages (technological progress and qualified and skilled human resource base) capitalizing on existing (static) comparative advantages of the country (agricultural resource base) should be in place.

Neither structural change nor substantial improvement on the performance of the manufacturing sector can be expected in just a period of a year or so. Significant change in technology, skill, productivity, etc., could only be achieved over a fairly long period of time. To this end, the research report on industrialization and industrial policy suggests the required policy framework [EEA/EEPRI, 2005]. Therefore, this year's report focuses on short-term issues with particular attention on small scale industries.

This report has three sections. The first one is on the state of large and medium scale manufacturing industries, discussing short-term changes in production, employment, export capacity, etc. The second section deals with small scale industries. Based on the Central Statistical Authority's (CSA) recent survey, the section provides fairly detailed analyses of the problems and constraints that small scale industries are facing.[2] The last section raises issues of international trade, particularly focusing on the approach to formulating trade policy in the context of a least developed economy such as Ethiopia. It argues that international trade needs to be anchored to the national development strategy of the country, hence serving as a means to poverty reduction and development rather than being taken as an end by itself.

2.2 Performance of the large and medium scale manufacturing industries

As noted in the introductory remark, an extensive analysis of Ethiopian large and medium scale manufacturing (LMSM) industries is given in last year's report on 'Industrialization and Industrial Policy in Ethiopia'. So this section of the report covers a brief account of the 2002/03 performance of LMSM industries.

2.2.1 Share of manufacturing in national income

The Ethiopian economy is dominated by traditional agricultural activities and services. In 2003/04, agriculture accounted for about 42.1 percent of GDP, while the service sector contributed another 46.5 percent, of which administration and defence, the largest share in the sector, accounted for 14.7 percent (Table 2.1). The contribution of industry, composed of

[2] CSA's survey on Small Scale and Cottage & Handicraft manufacturing industries is to date carried out every five years.

manufacturing, construction, mining, and electricity, in general is very low; only about 11.4 percent.

Table 2. 1: The contribution of small scale and cottage industries - 2003/04 (million USD)

Sector/sub-sector	Value added[3]	Percentage share
Agriculture	931.1	42.1
Service	1030.2	46.5
Of which: Administration and defence	326.4	14.7
Industry	251.9	11.4
Manufacturing	141.5	6.4
Of which: Large and Medium Scale Industries	100.8	4.6
Small Scale and Cottage Industries	40.7	1.8
Total	2213.2	100.0

Source: National Bank, (2005).

On the contrary, the industrial sector had an average share of about 29 percent and 28 percent from GDP of Sub-Saharan African countries and the world at large in 2003. On the other hand, the contribution of the agricultural sector dropped as low as 4 percent globally and 14 percent in the case of Sub-Saharan-African countries [World Bank, 2005]. This shows that Ethiopia is one of the least industrialized economies in Sub-Saharan Africa and the world, where the primary sector still holds a dominant share.

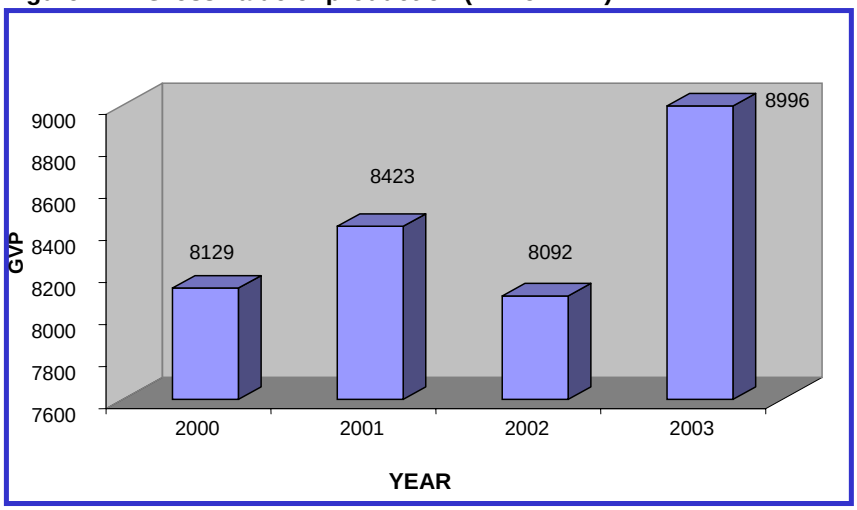
2.2.2 Production performance

Large and Medium Scale Manufacturing industries account for over 90 percent of the total production of small, medium and large scale manufacturing industries, while the remaining 10 percent is supplied by Small Scale industries. In 2002/03, the gross value of production (GVP) of LMSM

[3] Figures refer to US dollars equivalent of value added at the 1980/01 factor cost.

industries was birr 8996 ($1050) million [CSA, 2004 & Figure 2.1]. As a result of adequate supply of inputs spurred by a relatively high agricultural growth owing to a favourable weather condition, and also, a marked growth in the number of new establishments (by about 6 percent) GVP growth in 2002/03 was substantial. In real terms, it increased by 10 percent[4] [CSA, 2001-2004].

Figure 2. 1: Gross value of production (million Birr)



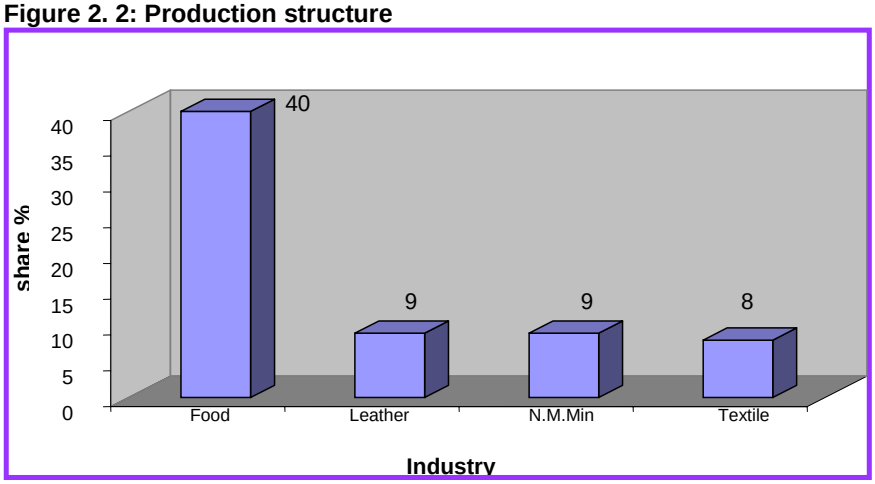
The manufacturing sector has a highly skewed production structure.[5] Over 68 percent of its production is generated by only four industries, namely food, non-metallic mineral products, leather and textile. The food industry alone accounts for nearly 40 percent of total manufacturing output (Figure 2.2).

On the other end of the scale industries such as wearing apparel, wood & wood products and machinery & equipment have each less than one percent share. Also, shares of other engineering industries including fabricated metal

[4] GDP deflator is used to convert GVP into real terms.
[5] Details are discussed in last year's report on the Ethiopian Economy [EEA, 2004]

products and motor vehicles have shares as low as 2.4 and 2.1 percent respectively. In fact the value of production of motor vehicles and trailers has been steeply declining since 2000, on average, by 39.3 percent. Its share precipitously fell from 11.9 in 2000 to 2.1 percent in 2003. Its fixed capital asset has also declined over the same period of time. The decline in the value of production of technologically leading industries such as engineering industries is of great concern from the point of view of industrialization.

Figure 2. 2: Production structure



Manufacturing in Ethiopia is still at its infancy. Per capita total production of manufactured goods in 2002/03 was only birr 143. This leaves a wide gap between demand and supply. As a result, birr 10.7 billion worth of goods (excluding fuel, which is equivalent to birr 155 per capita) had to be imported [NBE, 2005]. Therefore, the larger proportion of demand for manufactured goods is met through imports. Even excluding capital goods, import value of intermediate and consumption goods is as high as 60 percent of total output of domestic manufacturing.

Even by a developing country standard, a normally operating firm/industry generates, on average, a value added of about 60 percent of GVP [World Bank, 2003a]. Ethiopian manufacturing industries, however, have ratios much smaller than this average. The value added in 2002/03 was only birr 2,568 million (or $ 299 million[6]), which was about 42 percent of the GVP, indicating the inefficient status of the sector in general. Moreover, there has been no improvement over the years. In real terms, value added in 2002/03 increased by only 2.3 percent. While relatively efficient industries such as food, tobacco, and paper & paper products consistently generate a value added just above 50 percent of GVP, all other industries generate much lower than 50 percent. (Table 2.2) In fact, the value added in industries such as leather tanning, motor vehicles, and textiles is way below 30 percent of GVP [CSA, 2004].

Table 2. 2: Industry's value added share in GVP 2002/03

Industry	Share (%)
Wood and Wood Products	58
Tobacco	55
Food and Beverages	52
……	…..
Textiles	27
Basic Iron & steel	26
Motor vehicles & trailers	25
Leather & L. products	19
Average	42

Source: Calculated based on CSA, November 2004.

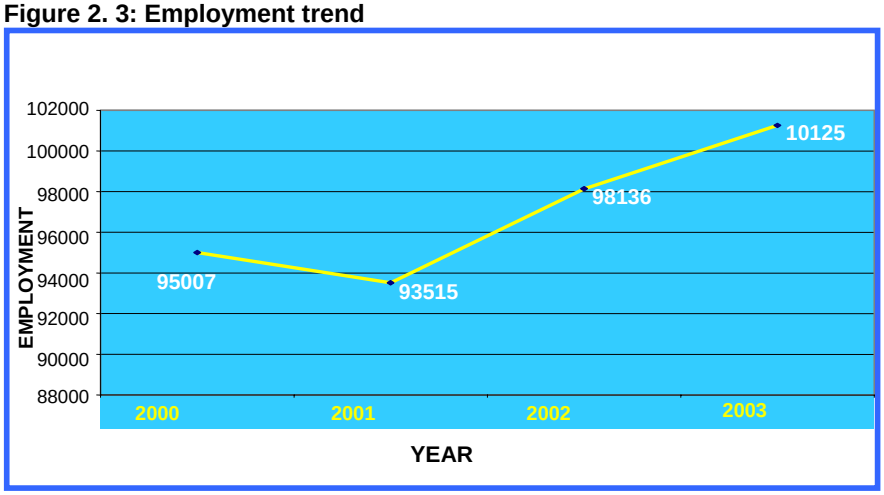
In terms of value added share by industrial group, the two industries, food and non-metallic minerals, alone account for 60 percent of the total. But textile, despite its relatively large share in GVP (just above 8 percent), has a value added share of only 4 percent. Moreover, its share has been declining in the last three years, indicating the deterioration of its productivity level. On the other side of the scale, engineering industries such as motor vehicles & trailers, machinery & equipment and other industries, including wood & wood

[6] Average marginal rate of exchange is applied. [NBE, 2004/05]

products and wearing apparel have least contributions to the total value added (each having a share of less than 2 percent).

Despite the fact that most industries, if not all, are labor intensive, job creating capacity of manufacturing is quite insignificant. In a country with a population of 70 million, the manufacturing sector as a whole (large, medium and small scale) provides employment for only 200,000 workers. This is about 0.3 percent of the population. Large and medium scale industries alone employ about 100,000 people only. Over the last three years, 2000/01-2002/03, annual employment increased, on average, only by 2.2 percent (Figure 2.3). The structural weakness of the sector is also reflected by its employment pattern. The same four industries, i.e., food, non-metallic minerals, leather tanning and textiles, which together contribute the largest proportion of GVP, also provide the largest proportion of employment in manufacturing.

Figure 2. 3: Employment trend



Though employment in most industries has either increased or remained constant, in a couple of industries, notably motor vehicles and textiles, it has declined not only in the relative shares but also in absolute terms.

2.2.3 Export capacity

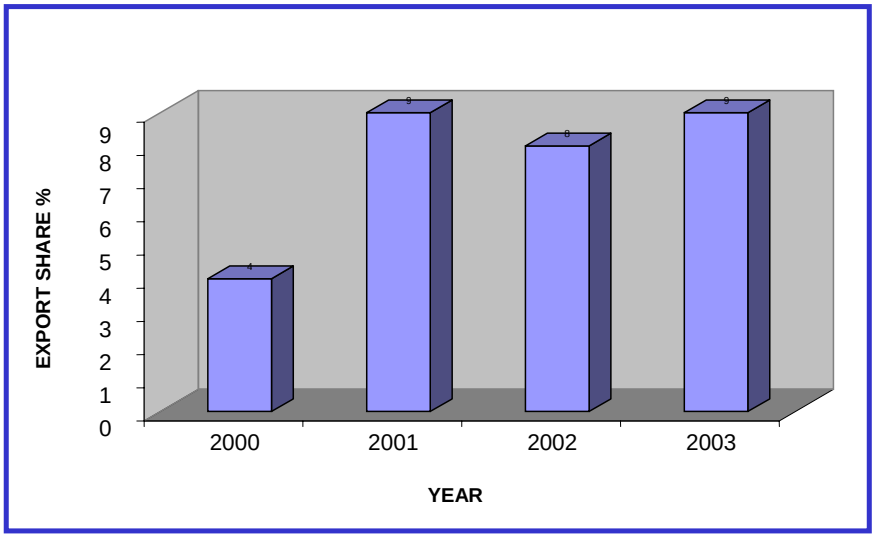
Most manufacturing enterprises in Ethiopia were not established to produce goods for export. In an early stage of industrial growth, manufacturing enterprises, naturally concentrate on processing raw materials (agriculture or mining). So initially, natural-resource-based industries, producing largely consumption goods for the domestic markets, inevitably gain dominance. This is the case in most developing countries. Manufacturing industries in Ethiopia are no exceptions to this. Production is mainly to satisfy the domestic markets demand for consumption goods, which is also encouraged by cheap and sustained supply of inputs from agriculture. Such industries include textiles and garment, sugar, leather tanning and leather products, food processing industries, etc.

As for the domestic industrialists, as long as domestic markets' demand remains adequate, through protection or otherwise, there is little incentive for them to actively seek external markets. On the part of the governments, to date, there has been limited policy drive for promoting export. Export has been, largely, a neglected activity. As a result, the export capacity of the manufacturing sector remained negligible, for long. In 2002/03, total value of manufactured exports figured about $ 98.7 million (birr 847 million) [CSA, 2004]. This is about 9.4 percent of manufacturing GVP, a testimony of the undeveloped nature of export activities (Figure 2.4).

As noted below, most manufacturing enterprises are producing consumption goods. Intermediate and capital goods requirements are satisfied through imports. This renders the sector weak in its export capacity and dependent

on imports for its intermediate inputs and capital goods, thereby creating a wide gap in the foreign exchange balance. Its foreign exchange earning covers, utmost, only 50 percent of its demand.

Figure 2. 4: Export capacity



Moreover, export is largely a single industry affair, that of leather tanning, which accounts for 60 percent of total manufacturing export. The remaining is generated by food and textiles, with a share of 25 and 14 percent, respectively.

2.2.4 Low and stagnant productivity level

Past reports, particularly, Volumes I and III have shown that productivities in manufacturing have been declining since the early 1990s. Significant productivity change/recovery can only be secured over a long period of time

as it requires substantial improvement in technological capability of the sector as a whole. Between 1999/2000 and 2002/03, the efficiency of value added creation in manufacturing (i.e., value added as a proportion of GVP) has been quite low, about 40 percent for all the years. The absolute value of annual (physical) labour productivity (value added per worker at current factor cost), in the last four years, was on average, only birr 23.5 thousand. It increased, on average, only by 2.2 percent, annually. In fact, in real terms, labour productivity is stagnant. But productivity per wage bill declined on average, by 4.8 percent annually, showing that wages have been increasing more than the value added, indicating a deterioration in enterprises' competitive status.

2.2.5 Concluding remark

For the last 3 decades, manufacturing industries in the country have not shown fundamental structural change. The deep-rooted factor has been lack of policy drive. While development strategies of the previous and the current regimes claimed to have accorded top priority to agriculture (despite the claim, in practice it is the most backward sector even by Sub-Saharan standard and is always in deep crisis), they have simultaneously and systematically neglected manufacturing in general. As a result, not only that investment in manufacturing remains very low, but productivities of existing industries too deteriorated unabated because of technological backwardness, uneducated and unskilled labor force, and distorted as well as unbalanced structure.

This was further aggravated by the hasty and unplanned opening up of the economy for international competition, which led to the loss of domestic markets and thereby the closing down of many enterprises and capacity underutilization of others.

2.3 Small scale manufacturing industries[7]

It is common knowledge that Small Scale and Cottage manufacturing (SSCM) industries play an important role in the economies of developing countries such as Ethiopia. They create job opportunities for the vast majority of the people without requiring formal training, skill and large capital. Most of them are labor intensive. Their scale of operation is small usually geared to small and fragmented markets in their own localities. They mainly serve the low income group of the population by supplying low quality products at affordable prices. SSCM industries do not necessarily require well developed infrastructure facilities and usually use traditional technologies, indigenous knowledge and resources. Due to these attributes, they could be located in wide geographical areas. These industries serve as seedbeds for entrepreneurial development in rural and small urban areas.

A major challenge that is haunting SSCM industries is, however, the prospect of increasing their productivities progressively and move to higher value added techniques of production. Development of these activities requires sustainable growth in an integrated manner with other sectors of the economy and transformation to a higher technologically supported stage of production. Thus, the role of these industries should be seen in their dynamic rather than static perspective.

In the Ethiopian case, SSCM industries offer employment opportunities for quite a large number of people both in urban and rural areas. They concentrate on food processing, clothing, household utensils, and similar

[7] CSA defines cottage and handicraft industries as those establishments "producing goods primarily for sale and which preponderantly do not use power-driven machines in performing their main manufacturing activities", and small scale manufacturing (SSM) industries as "those manufacturing establishments, which engage less than ten persons and use power driven machines" [CSA (2003 (b)), and CSA (2003 (c))]. Since the focus of this study is on the manufacturing sector, CSA's definition is adopted.

other products largely meant for satisfying the demands of the rural and the low income urban population. SSCM industries face many constraints. This is a sector, which is unable to play its expected role due mainly to policy-related problems, as it is the case for LMSM industries. In this respect, it is worthwhile to study the state and underlying constraints of SSCM industries, and on that basis, propose possible measures to improve the performance and contribution of the sector.

The purpose of this section is, therefore, to asses the nature and actual contributions of SSCM industries, how progressive and sustainable that would be, how conducive is the prevailing policy environment for growth and, accordingly, propose what ought to be done. The main sources of information for the analysis are the 2001/02 Survey Results of the Central Statistical Authority for Small scale and Cottage & Handicraft Industries published in 2003[8].

2.3.1 The state of small scale and cottage manufacturing industries

As indicated in Table 2.1, SSCM industries have a share of only 1.8 percent of GDP or 28.8 percent of manufacturing value added. In value terms, this is equivalent to $40.7 million. Also, as shown in Table 2.3, the share of SSCM industries in total fixed capital asset is only 12 percent. However, their employment share is a massive 93.4 percent of total employment with cottage industries having the lion's share, about 87 percent. These industries are the second most important sources of employment in the economy, only

[8] CSA and Ministry of Finance and Economic Development (MoFED) are the two sources of information for SSCM industries. These sources have their own limitations. CSA surveys provide information on some key variables and yet such surveys were conducted only for 1995/96 and 2001/02. MoFED gives time-series data for a relatively long period and yet the information is limited only to value added. As a result, it is not possible to analyze the growth dynamics of SSCM.

next to agriculture[9]. However, the fact that labour in SSCM industries is not backed by adequate capital renders it less productive and uncompetitive as evidenced by its small share in the total value added of manufacturing. In other words, these industries are dominated by simple and unskilled labour activities. And owing to this, their growth prospect is highly limited.

Table 2. 3: Value added, employment and fixed capital shares (percent) [10]

Indicators	Large & medium scale	Small scale			Cottage industries	Total
		All	Grain mills	Others		
Value added	71.2	11.1	8.8	2.3	17.6	100
Employment	6.6	6.5	5.5	1	86.9	100
Fixed capital	87.6	10.6	9.4	1.2	1.8	100

Source: Central Statistical Authority (2003 (a) and (2003 (b)).

Focusing on small scale manufacturing (SSM) industries, this sub-sector is overwhelmingly dominated by a single activity – grain milling. Grain mills constitute about 85 percent of the number of SSM enterprises. As it could be observed from Table 2.3, the share of other SSM industries, outside grain mills, is extremely small in all respects. These industries account for 2.3, 1, and 1.2 percent of manufacturing value added, employment and fixed capital asset, respectively.

One of the characteristic features of SSCM industries in Ethiopia is their micro-size. In terms of the number of workers, LMSM industries are 36 and 81 times larger than SSM and cottage industries, respectively (Table 2.4). Moreover, most SSCM industries are run, largely, by unpaid family labour. For instance, while hired labour in LMSM industries constitutes about 99 percent of the total work force, it is only 4.5 percent in cottage industries.

[9] According to CSA (1999), agriculture and SSCM activities account for about 80 and 3.9 percent of the total employed population in 1999.
[10] Unless specified, all tables in this Chapter refer to the year 2001/02

Small scale industries, on the other hand, engage both hired and unpaid labor in the proportion of 45 and 55 percent, respectively. Similarly, the amount of fixed capital of a single LMSM firm can, on average, establish as much as 300 small scale firms. In the extreme case, cottage and handicraft industries barely use capital inputs. As shown in Table 2.4, this difference in firm size and factor intensity between LMSM and SSC industries is also reflected in labor productivity, i.e., value-added per worker.

In general, SSCM industries are very small in terms of firm-size, reflecting their limited ability to benefit from scale economies. Above all, cottage industries involve rudimentary activities. Albeit their size, SSM industries have much similarity with LMSM industries. Given adequate capital, SSM industries can easily be transformed to medium size industrial category. Cottage industries, on the other hand, never use power driven machinery. Activities of cottage industries are entirely manually executed. Cottage business is largely a family affair. Because of this the focus of this section hereafter will be on SSM industries only.

Table 2. 4: Firm size, factor intensity and productivities (values in 000 birr)

Indicator	Large and Medium scale	Small scale			Cottage Industries
		All SSM	Grain Mills	Others	
Persons/firm (No)	108.9	3.1	3.0	3.2	1.34
Hired labor[11]/total workers (%)	99.1	46.9	49.6	44.9	4.5
Fixed asset/firm	6809.4	23.5	24.3	18.5	0.13
Value added/firm	946.8	14.6	13.5	20.8	0.75
Value added/worker	8.7	4.7	4.4	6.5	0.56
Fixed asset/worker	62.5	7.7	8.0	5.8	5.7
Wage & salary/worker	7.9	1.1	1.05	1.57	0.7

Source: calculated based on Central Statistical Authority (2003 (a), 2000 (b), & 2003 (c)).

[11] This is the ratio of employees, who earn wages and salaries to the total persons engaged.

2.3.2 Structure and linkage conditions

2.3.2.1 Production structure

According to the 2001/02 CSA survey, there were 31863 small scale industries in the country, employing about 97781 workers (Table 2.5). The gross value of production of these industries in the same year was about birr 913.9 million. High level of concentration on a single activity with relatively low level of processing is the main feature of SSM industries. They are concentrating on processing non-durable consumption goods such as food and clothing. As noted above, grain-mills constituted the lion's share (80 to 90 percent) in terms of the number of firms, labour force, value added and fixed assets. Despite their dominance, grain mills provide simple milling service with little potential for vertical integration. They are mostly small in terms of size, employing 3 workers per firm with a fixed asset value worth birr 24324. Their firm-level gross income is about birr 23400 per annum.

The remaining industries are thinly scattered over 13 industrial groups. Other food industries, fabricated metal, and furniture are the other three relatively large industries next to grain mill, in terms of value added and employment. In the same year, these industries account for 4.6, 6.7 and 4.2 percent of the total value added in their respective order. Grain mills, food and furniture industries concentrated more on the production of consumption goods (both durable and non-durable), thus they have little or no forward linkages with other industries or sectors of the economy. Nonetheless, these industries are integrated with the domestic economy, predominantly with agriculture, for their primary inputs. On the other hand, fabricated metal industries could produce goods for intermediate use, such as windows and doors for construction and traditional farm tools, thereby creating (though limited) better forward linkages with other sectors of the economy.

Apart from their employment generation, it is argued that SSM industries serve as a spring board for modern industrial activities, hence creating entrepreneurial skill. However, the prevailing structure of SSM industries in Ethiopia may not guarantee this. As it has been observed, most of them are traditional consumption goods producers. The existing SSM industries, except fabricated metals, could not supply intermediate inputs and improved tools, let alone machinery, which could help transform the traditional agricultural activities.

Table 2. 5: Distribution of small scale industries by industrial group (value in 000' Birr)

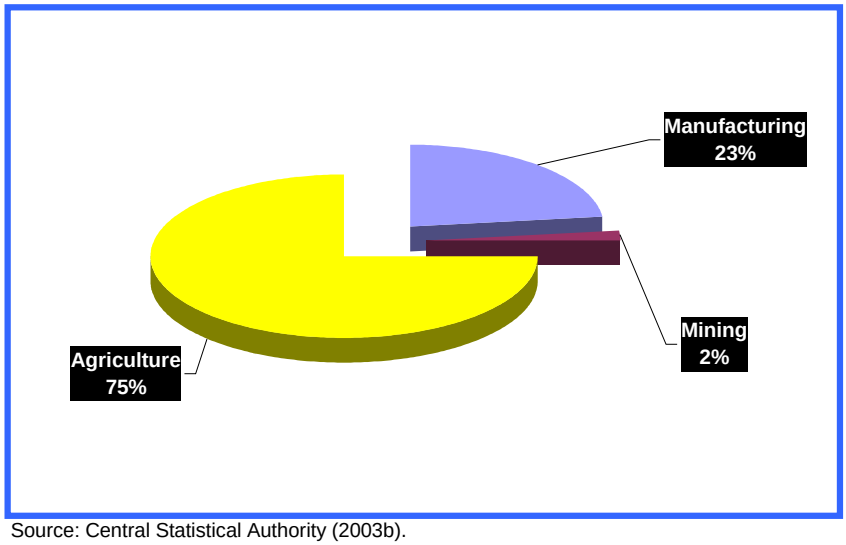
Industrial group	No of firms	Workers	Fixed assets	Value-added
Grain mills	27223	82868	662174	367408
Food except grain mills	693	2593	29682.6	21399.9
Textiles	23	81	1215.3	1079.2
Wearing apparel, dressing and dyeing of fur	962	1996	3497.9	8791.6
Luggage, handbags and footwear	15	59	311.3	140.4
Wood and cork, articles of straw & paints materials	167	663	5350.9	2203.3
Paper products	4	31	377.1	1056.9
Publishing, printing and recording media	228	694	12604.3	5975.8
Chemicals	2	11	66.7	267.6
Non-metallic mineral products	106	480	2582.1	3943.1
Fabricated metal	1306	3898	11806.8	31223.4
Accessories for machinery and equipment, nec.	30	106	302.7	461.3
Accessories for motor vehicles	5	26	730.4	117.7
Furniture	1099	4275	17498.1	19748.7
Total	31863	97781	748200	463817

Source: Calculated based on CSA's data, CSA (2003 (b)).

2.3.2.2 Sectoral linkages

SSM industries used birr 126.9 million worth of inputs in 2001/02. Of this, about a quarter, or birr 33.1 million, was acquired from imports (see next section). As noted above, SSM industries are dominated by grain mills whose inputs constitute agricultural products, largely cereals. Food processing, textile, wood and, partly, furniture acquire their major inputs from agriculture. Such inputs accounted for about 75 percent (Birr 93.8 million) of total domestic inputs (Figure 2.5). Other inputs, from manufacturing and mining sectors, accounted for about 23 and 2 percent, respectively. This is typical of manufacturing activities at a very low level of industrial development. The relative role of the agricultural sector in terms of supplying inputs declines as manufacturing expands and production of intermediate and capital goods increases rather than simple processing activities.

Figure 2. 5: Sources of inputs (% share)



Source: Central Statistical Authority (2003b).

2.3.2.3 External linkages: import and export

Imports account for about 26 percent of total inputs (Table 2.6). The dependency rate of small scale industries on imported inputs is relatively lower than LMSM industries. However, since SSM industries focus largely on primary processing and have not yet developed their export capacity, their external linkage is unbalanced. The export earning of these industries cannot even meet their foreign exchange needs. Though the overall import intensity (i.e., share of imports in total inputs) is low, considerable variation exists among industrial groups. As shown in Table 2.6, industries such as wearing apparel, paper products, publishing & printing, machinery and equipment, etc., import over two-third of their inputs. These are high import intensive industries. This reveals the structural weakness of the manufacturing sector, in terms of its internal linkages, to produce intermediate and capital goods.

Small scale industries were only able to export goods worth about birr 395900 (or $46342) in 2001/02, which was less than 0.4 percent of their gross value of production. The export earning covered only about 1 percent of the cost of total imports of SSM industries. In fact, only a couple of industrial groups, namely fabricated metal and furniture, are attempting to export. In 2001/02, the value of their export amounted to only birr 230800 and 120100 (i.e., $ 27016 & $ 14058), respectively. These are equivalent to 43 and 26 percent of their respective gross value of production (Table 2.6). Most SSM industries target local markets only.

Table 2. 6: Import intensity export performance of small scale industries (values in 000' Birr)

Industrial Group	Total inputs	Import inputs	Import intensity %	GVP	Export	Export/ GVP %
Grain mills[12]	24337.9	2747.1	10.1	691370.9	0	0.0
Food except grain mills	46716.6	1876.3	4.0	73499.2	2	0.0
Textiles	1019.2	362.3	35.5	2272.8	0	0.0
Wearing apparel, dressing and dyeing of fur	3957.3	3251.4	82.2	16619.8	18.8	0.11
Luggage, handbags and footwear	146.9	28.3	19.2	363.4	0	0
Wood and cork, articles of straw & paints	1497.5	95	6.3	4952.7	4.4	0.09
Paper products	136.7	108.1	79.1	1302.6	0	0
Publishing, printing and recording media	3105.0	2530	81.5	12911.8	0	0
Chemicals	324.0	97.0	29.9	521.7	0	0
Non-metallic mineral products	5142.3	70.6	1.4	9481.9	19.8	0.21
Accessories for machinery and equipment	270.0	210.4	77.9	924171	0	0
Fabricated metal	18523.8	11734.8	63.4	53826.6	230.8	0.43
Accessories for motor vehicles	42.3	14.4	33.9	213	0	0
Furniture	21656.4	9990.7	46.1	45660.9	120.1	0.26
Total	126876	33116.2	26.1	913921.3	395.9	0.04

Source: Central Statistical Authority (2003).

2.3.3 Growth trend

Every year, on average, about 1910 SSM enterprises were established over the six year period between 1995/96 and 2001/02. This implies an annual growth rate of about 9 percent, creating an equal growth in employment (8.9 percent)[13] (Table 2.7).

[12] Grain is the major raw material input for grain mills. However, CSA does not include the value of grain as part of raw material inputs. As such it is likely that the value of raw materials and production of grain mills would be underestimated.

[13] This figure does not account for grain mills, since the 1995/96 CSA survey excludes it.

Table 2. 7: Growth trend of small scale manufacturing industries (1995/96 -2001/02)

Indicators	1995/6	2001/2	Annual growth rate-%
Value added (000 birr)	60605	81226	5.0
Firms	2731	4640	9.2
Number of workers	8929	14913	8.9
Fixed capital (000 birr)	84512	86026	0.3
Fixed capital per firm – 000 birr	30.9	18.5	-8.2
Fixed capital per labour – 000 birr	9.5	5.8	-7.9
Value added per worker – 000 birr	6.8	5.4	-3.6

Source: Central Statistical Authority (1997) and 2003 (b).

However, despite this seemingly high rate of growth of employment, the value added generated over the six year period is quite low. In real terms it increased only by 5 percent annually. Not only the rate of growth, but its absolute value is quite small. Its annual production is below 10 million USD, which also implies a level of labour productivity of only $640 in 2001/02. The low productivity level can be explained not only by the lack of labour skill, but also by lack of new investment. As shown in Table 2.7, the level of capital stock over the six years period is literally stagnant. In fact, capital intensity (fixed capital asset per worker) has steeply declined over the same period by about 8 percent annually. So, literally, de-capitalization is what is taking place.

Moreover, even the seemingly high employment growth is in absolute terms quite insignificant. Only about 1000 new jobs are created by the sub-sector. In a country of 70 million people where unemployment is already rampant, and also every year over 2 million people adds to the labour stock, the role of SSM industries in creating jobs is too insignificant.

2.3.4 Technological status

The technological status of these industries may be examined using investment rates and also workers' skill and educational background.

2.3.4.1 Investment

Small scale industries use simple and traditional technologies. Frequent breakdown of machinery and shortages of spare parts are also serious problems [CSA, 2003]. It might be argued that SSM industries are appropriate for poor countries such as Ethiopia, which lack capital. However, the kind of technology employed may not allow these industries to be competitive even in the domestic market. Thus, there need to be adequate investment, particularly meant for technological upgrading and expand the scale of operation.

As shown in Table 2.8, in 2001/02 investment for expansion and replacement was birr 143 million, of which grain mills accounted for about 88.5 percent – Birr 123.4 million. For grain mills, this is equivalent to birr 4534 (about $531) per firm, which is quite insignificant to induce technological change in these firms. The remaining birr 19.6 million (11.5 percent of the total) was distributed among 13 industrial groups. In 1995/96, these 13 industrial groups invested birr 20.2 million. Despite the increase in the number of enterprises, however, annual investment per firm in 2001/02 was actually lower than the level in 1995/96. While in 1995/96, investment per firm was about Birr 7409, it was only birr 4216 in 2001/02, excluding grain mills.[14]

[14] Note that this value is in nominal terms. It is obvious that in real terms the decline is much more conspicuous.

Table 2. 8: Investment in small scale industries (1995/96 & 2001/02) in 000' birr

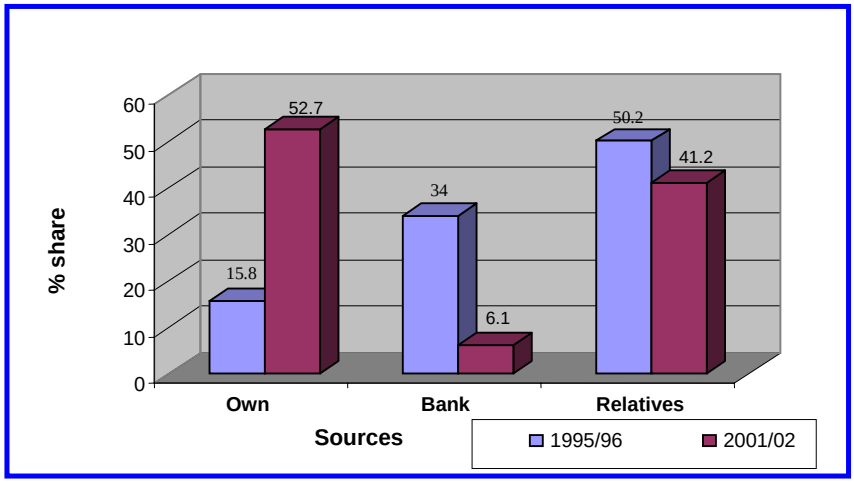
Industrial group	1995/96		2001/02		2001/02	
	Total	Share (%)	Total	Share (%)	Number of firms	Investment/ firm
Grain mills	NA	NA	123435.3	88.5	27223	4.5
Food except grain mills	10521	52.00	4307.70	3.01	693	6.2
Textiles	47.3	0.23	40.60	0.03	23	1.8
Wearing apparel, dressing & dyeing of fur	357.3	1.77	915.80	0.64	962	0.95
Luggage, handbags and footwear	84.6	0.42	53.20	0.04	15	3.5
Wood and cork, articles of straw & paints	170.1	0.84	1750.90	1.2	167	10.5
Paper products	0	0.00	17.50	0.01	4	4.4
Publishing, printing & recording media	1382.9	6.83	2936.80	2.05	228	12.9
Chemicals	769.2	3.80	0.00	0.00	2	0
Non-metallic mineral products	2009.3	9.93	510.50	0.36	106	4.8
Fabricated metal	1716.8	8.48	3609.40	2.52	1306	2.8
Accessories for machinery & equipment	527.7	2.61	164.20	0.11	30	5.5
Accessories for motor vehicles	71	0.35	720.10	0.5	5	144.02
Furniture	2575.9	12.73	4534.00	3.17	1099	4.1
Total	20234	100	142996.0	100	31863	7.7

Source: Calculated based on Central Statistical Authority (2003b).

Examining the distribution of investment outside of grain mills, a significant proportion of it goes to food, furniture, fabricated metal and publishing & printing. These industries together accounted for 80 and 79 percent of the investment in 1995/96 and 2001/02 respectively. But including grain mills their share is quite small. In 2001/02, it was only 8.4 percent. All other industries have little importance in aggregate investment. However, firm-level investment by industrial group reveals a different picture. In relatively capital intensive industries such as motor vehicle parts and accessories, average firm-level investment was as high as Birr 144000 in 2001/02, for instance.

A critical constraint for investment is access to credit. CSA's survey indicates that 40 percent of the industries claimed lack of access to credit for initial capital as their major problem [CSA, 2003(b)]. In 2001/02, about 52 percent of the total investment was sourced from own fund. Bank loan contributed only about 6 percent, while relatives and informal sources accounted for the remaining 42 percent (Figure 2.6). In another study on micro and small scale enterprises (MSEs), it has been found that about 79 percent and 81 percent of MSEs identified saving/retained earnings as their primary source of investment and working capital respectively. Formal borrowing, both from commercial and micro-finance institutes, accounted only for about 7 percent and 4 percent respectively [Gebrehiwot and Wolday, 2004].[15] Most SSM industries are forced to look for informal sources, if they cannot raise sufficient capital by their own.

Figure 2. 6: Source of finance for SSI (% share)



Source: Calculated based on CSA (2003b).

[15] The study includes micro and small scale enterprises engaged with, not only manufacturing, but also other diverse activities. The sample proportion of small scale manufacturing enterprises, which this discussion is interested with, is not identified by the study. But it likely that the sample proportion of SSM manufacturing industries is very low. Hence caution needs to be taken regarding the extent of relevance of the conclusion of the study for SSM manufacturing enterprises.

Formal financial institutions usually consider these industries as risky partners because of low capitalization, lack of collateral, absence of a documented and research based project plan to justify their creditworthiness, etc. Banks also claim that facilitating loans to SSM industries is administratively costly because of the need to follow similar procedures and guidelines to process small loans as they do for large loans.

Some studies indicate that the loan appraisal procedures and the long waiting time that the banks take to sanction loans escalate cost of lending and also discourage SSM enterprises. In other words, unit cost of processing a birr worth of loan to SSM industries, given equal lending rate, would be higher than the case for LMSM industries [Solomon, 2004].

The other problem relates with financial management. With the exceptions of few, most firms do not keep proper financial records. They do not maintain business records separate from personal accounts, which create difficulty for financial institutions to deal with proper credit management. Most industries have limited marketable assets to satisfy collateral requirements (which exceeds 100 percent of the loan amount) of formal banks. Also, lack of financial intermediaries to address the interests of SSM industries in particular, is an additional problem.

In the same study on MSEs, noted above, about 93 percent of MSEs did not formally apply for credit [Op cit, p59]. Many of them may be considered as discouraged potential borrowers (i.e. firms that need credit but are discouraged from applying by the, perceived or real, high collateral requirement, high cost of borrowing, difficulty of the process involved, ineligibility or concern about their repayment ability) and some others are unaware of the availability of such facilities.

2.3.4.2 Workers' educational background

Apart from the level of investment, the educational background/qualification and technical skill of workers and managers also determine industrial technological capability. Industries need managers capable of designing a system to effectively guide operational routines and strategic plans to visualize their long term development. They also need technical workers capable of operating machines and equipments at best practices, modifying hard wares and improving product quality to remain competitive in the market. However, human resource status in SSM industries is by far below standard to meet such requirements. Most workers do not have adequate educational background. As shown in Annex 2.2, only 1.8 percent of the workers attended higher education (above grade 12) and considered to have some sort of skill. Another 27 percent attended grades 9 to 12, but most of these had no skill before they joined the firms. The majority, however, only know how to read and write (grades 4 to 8). So, given this background, only a small proportion of the workers could be capable of operating industries at best practices.

However, there is a marked variation by industrial groups. Chemicals and paper products industries have relatively higher proportions of better educated workforce (30 and 24 percent, respectively) than other industries. The majority of the workers in these two industries have attended high schools. At the other end of the scale, Grain mill industry has a relatively large proportion of least educated workers.

Besides formal education, on-job training programs could have useful role to improve the quality of human resources. However, in this respect too, of the total 97781 workers only 2777 (2.8 percent)[16] have had some kind of training relevant to their activities. Hence, SSM industries have made little progress to improve their technological capabilities.

[16] The CSA (2003 (b)), estimated the total number of workers trained to be about 22584, but does not indicate the kind or duration of the training for 19807 (87.7%) of the workers. [CSA, 2003b]

2.3.5 Productivity and market condition

2.3.5.1 Labor productivity

Average labour productivity (value added per wage bill) in 2001/02 (6.5) was much lower than its 1995/96 value (6.8).[17] This implies a productivity decline of 4.5 percent over the 6 year period (Table 2.9). Except for four industries, including fabricated metals and non-metallic mineral products among them, productivities of all other industries have declined. Particularly, industries such as accessories of motor vehicles, accessories of machinery and equipment, chemicals and footwear, steep declines are recorded over the same period of time.

Table 2. 9: Labor productivity by industrial group

Industrial Group	Value added/wages & salaries		
	1995/96	2001/02	percent change over (1995/96-2001/02
Grain mills	NA	6.1	*Na*
Food except grain mills	11.33	8.36	*-26.2*
Textiles	7.76	9.03	*16.4*
Wearing apparel, dressing and dyeing of fur	6.46	5.81	*-10.1*
Luggage, handbags and footwear	8.34	4.68	*-43.9*
Wood and cork -except furniture, straw & paints	3.59	3.13	*-12.8*
Paper products	NA	17.89	*NA*
Publishing, printing and recording media	8.42	7.88	*-6.4*
Chemicals	10.09	3.48	*-65.5*
Non-metallic mineral products	5.04	6.73	*33.5*
Fabricated metal, except machinery & equipment	3.81	9.97	*161.8*
Accessories of machinery and equipment	9.49	4.18	*-55.9*
Accessories of motor vehicles	8.47	2.68	*-68.3*
Furniture	3.13	3.89	*24.3*
Average	6.8	6.5[18]	*-4.45*

Source: calculated based on CSA (2003 (b)).

[17] Excluding grain mill and paper products industries for which data is not available.
[18] For comparison, grain mills are excluded. If included, the figure would have been 6.2.

Though it is not quite straightforward to establish a one to one correspondence between investment and education on the one hand and productivity on the other, the positive correlation between them is quite visible. For instance, industries with relatively high level of investment and/or educated manpower, such as food, publishing, printing & recording media and fabricated metal products, also show relatively high labour productivities.

Most SSM industries employ less educated workers with no skill or adequate background. Creating job opportunities is one of the central objectives of a developing economy. However, this should be so without compromising efficiency. In the Ethiopian context, SSM industries are only capable of creating very limited job opportunities and that at minimum (survival) wage rate. As such it is likely that some workers might have taken up the job in the absence of other alternatives. One might infer from their actual performance that persons engaged, at least, in some of these industries, could be considered as if they are taken into a refuge in activities that provide only minimal subsistence because of the failure of the economy to provide productive jobs [Liedholm and Mead, 1999].

2.3.5.2 Market conditions and capacity underutilization

SSM industries excluding grain mills had a production potential of about birr 510 million in 2001/02 [CSA, 2003 (b)]. However, they were only able to use about 36 percent of their capacity and produced birr 185.9 million worth of output. Only four of the 13 industries, namely textiles, paper products, chemicals and accessories of motor vehicles were able to use more than half of their production capacity (Table 2.10). On the other end, three industrial groups, i.e., food except grain mills, publishing, printing & recording media, and wood operated below one third of the designed capacities of their machineries. Several factors are attributed to this – the major one, for 58 percent of cases, being lack of demand [CSA 2003 (b)].

Table 2. 10: Capacity utilization of SSM industries in 2001/02[19]

Industrial group	Capacity Utilization (%)
Food except grain mills	32.0
Textiles	69.0
Wearing apparel, dressing and dyeing of fur	42.0
Luggage, handbags and footwear	34.4
Wood and cork, except furniture, articles of straw & paints	27.9
Paper products	78.0
Publishing, printing and recording media	24.7
Chemicals	62.9
Non-metallic mineral products	40.8
Fabricated metal, except machinery & equipment	41.9
Machinery and equipment, NEC.	35.9
Accessories of Motor vehicles and their engine parts	57.8
Furniture	41.5
Total	36.5

Source: Calculated based on CSA (2003 (b)).

Another 28 and 16 percent of the industries regarded lack of demand as the second and third major constraints, respectively. Lack of demand is partly due to information gap in terms of identifying viable activities, lack of access to appropriate type of machineries, and lack of appropriate training.

The responses of the survey focused only on the demand aspect of the market. However, market problems should also involve supply aspects. As noted above, 85 percent of the firms in SSM industries are grain mills, providing milling service on demand. They don't engage in extended activity such as milling different grains and packaging flours in a small and portable size for sale to various income groups and to distant geographical areas of the country. As a result, they have very skewed distribution, concentrating largely in urban areas, thereby creating unnecessary supply competition. So, the market problem may be partly due to excess supply of the service only in certain localities or areas.

[19] CSA (2003 (b)) does not have an estimate for the production capacity of grain mills.

Moreover, with respect to the other (non-grain mill) SSM industries, the central problem is inefficiency rather than lack of demand per se. Competitiveness, taken from the supply point of view, is largely determined by productivity levels. As noted above, these industries rely upon a very crude and outdated technology. The capability of the workers to operate these industries at best practices and to regularly improve their efficiency is extremely poor. As a result, not only they have little or no capacity to exploit external markets, but they are also incapable to compete with medium and large scale industries in the domestic market too.

2.3.6 The policy environment

In 1997, the Ministry of Trade and Industry (MTI) came up with a strategy for developing micro and small enterprises[20] [Ministry of Trade and Industry, 1997]. The objective of the strategy was primarily to create an enabling environment for the development of micro and small scale enterprises (MSEs) engaged in different socio-economic activities. It aimed at upgrading the skills of workers, strengthening linkages between MSEs and promoting export. According to this strategy, the criteria for supporting enterprises include local resource use (raw materials and labor intensity), industrial and sectoral linkages (particularly linkages with agriculture), import substituting capacity and export potentials. It envisages the promotion of special banks and non-financial institutions to cater services. It emphasizes the need for providing vocational, technical and business skills. It also plans to address problems related to market, information, technology and infrastructure. In order to implement this strategy, Micro and Small Enterprises Development Agencies have been established both at the federal and regional levels.

[20] The strategy document entitled 'Micro and Small Scale Enterprises Development Strategy" (MSSEDS) refers to not only SSM manufacturing enterprises but to all micro and SSM enterprises engaged in diverse activities.

The importance of MSEs is also duly articulated in another document recently published by the government – Industrial Development Strategy (IDS) [Ministry of Information, 2002]. IDS identified wood, metal works, textiles, and food processing as focus areas in micro and small scale industrial activities. As in the precious document, it emphasizes the need for technical and vocational education and on-job training to gradually address the skill gap prevailing in these enterprises. Market problems are to be tackled by improving price and quality competitiveness through training and technical support, promoting sub-contracting between SSM industries on the one-hand and LMSM industries or public projects such as construction and other services, on the other.

IDS proposes traditional ways of mobilizing financial resources, such as "Ekub" to meet the financial demand of MSEs. It also suggests mitigating working capital constraints through sub-contracting government projects with advance payments to the enterprises. All banks are to make contributions in availing capital for start-up and expansion projects of MSEs. Construction of industrial sites and the establishment of machinery leasing corporations are proposed to minimize the burden of initial start-up capital for new entrants at micro and small levels.

The proposal outlined in the strategy document potentially has positive implications to the growth of MSEs. However, these proposals may not be strictly taken as viable strategies to promote MSEs. One is that it might be difficult to promote MSEs engaged in different activities such as agriculture, manufacturing, transportation, construction, and other services under a single program, as different activities require different strategies, policy framework, regulatory provisions, etc. Hence, a one jacket fits all approach may not produce the desired positive result.

Moreover, the proposals are direct derivatives of the Agricultural Development Led Industrialization (ADLI) strategy. All proposed strategies for the different sectors and industries (LMSM, MSSDE, etc) are meant to serve the success of ADLI and considered as sub-sets of ADLI. According to the latter, ADLI, no industrialization or development of the economy would be realized before the transformation of agriculture. So, the strategies are not meant to develop sectors other than agriculture, at least in the short to medium term. But as has been noted in other studies, such as various volumes of the reports on the Ethiopian economy, the success of ADLI to date has been, to say the least, disappointing in practice [EEA 1999/00, EEA/EEPRI 2000/01 and EEA, 2004]. There are also strong arguments against the theoretical validity of ADLI. [EEA, 2004] Therefore, as it stands now, the strategies for promoting MSEs, apart from serving as an expression of good intention, may not be practically feasible

From countries' experiences (such as, for example, Singapore, Hong Kong, etc.) it is possible for non-agricultural sectors such as manufacturing, micro and small scale enterprises, services, etc., to develop without being tied to agriculture [Lall, 1996]. The problem of the agricultural sector is basically more of structural and requires fundamental agricultural policies to be in place. The central problem of agriculture is a supply side constraint. In this regard, a critical role of the industrial sector, particularly manufacturing, is to supply modern farm implements and intermediate inputs. Agriculture cannot be transformed without these inputs. To realize this, however, the manufacturing sector itself has to develop simultaneously, rather than fall behind agriculture.

In line with the ADLI strategy, for industries to be given due priority, they need to be natural-resource-based and employ labour intensive techniques of production. Accordingly, textiles, food, intermediate inputs supply industries for construction and the like are given priority for promotion. Wood and metal

works are also selected on the ground that they may create employment for fresh graduates from preliminary vocational and technical schools, hence meant to give validity for the “new education policy”. Selection of industries for promotion either to secure short-term advantage or to realize other non-economic objectives may not produce sustainable economic gain. The strategies should have been designed primarily for the sake of the development of the industries themselves, rather than for their catalyst role in the realization of other objectives.

The strategy to promote MSEs based on the criteria of labour intensiveness and linkages with natural-resource-based activities is very restrictive and technologically prohibitive. It does not address the long-term industrialization objective of the economy. In today’s global environment, enterprises have to achieve a minimum level of efficiency to remain in the trade. This implies the need to catch up with the fast advancing technological capability of other countries, at least developing ones. In this respect, industries making their utmost effort to remain efficient and competitive, such as for instance fabricated metal and paper products, should also be encouraged and promoted, as such performances are exemplary for other industries. Such industries could easily expand to medium and large-size firms and need to be rewarded for their achievements.

A related issue raised in the IDS is the provision of incentives. A blanket approach is employed to the provision of incentives to targeted enterprises. There are no criteria outlined for claiming support. This sort of incentive provision has been attempted in many African countries during the 60s and 70s and has proven less successful in introducing efficiency, simply because it has been considered as a free gift with no obligation attached to it. On the other hand, the East Asian modality of granting support upon specified and measured performances or achievements has proven successful for accelerating economic development. Perhaps, it might be worthwhile to learn from such experiences.

The above mentioned study on MSEs stated that not only the policy governing small enterprises has its own limitations, but also "there is divergence between policies and directives issued and their actual implementation on the ground. Concrete and coordinated institutional supports (infrastructure facilities like business premises, water and power, financial services, extension services, aid in the transfer of technologies, promotion of marketing facilities and provision of training on sustainable basis) have not been provided" [Op cit, p10]. Thus, efforts should be exerted to realize intentions into practice.

It is shown that SSM industries are very small in size and do not have the advantage of scale economies. As a result, they face fierce competition from LMSM industries and imports. Organizing industries through cooperatives, networking or merger might help them to expand their capacities, and thereby maximize their benefit from relatively larger scale operation. The legal framework for such formations may exist. However, it requires enlightening owners of SSM industries about the economic significance of large scale operation and facilitating and supporting industrialists wishing to form share companies or cooperatives.

Municipalities have started demarcating industrial villages with necessary infrastructure facilities to minimize entry deterrence for MSEs. This is meant to benefit, largely, technical and vocational school graduates and some other new entrants into the sector. This may be a positive intervention in terms of creating job opportunities and solving the acute shortage of skilled manpower in the sub-sector. However, MSEs already operational are facing a number of difficulties which are still unresolved. The idea of providing support for new entrants while simultaneously existing ones are closing down because of lack of support is less meaningful. This is a contradiction in the approach. The first move of the government should be to help resolve the outstanding problems and constraints of existing enterprises, as this would encourage new entrants to follow suite, make adequate preparation on themselves before they launch

their enterprises. This would make it less burdensome for the government, economize its resources and enable it to reach more support seekers.

There are many problems facing MSEs which government has to resolve. For instance among the 2812 SSM enterprises which responded to the survey, 42 percent complained about the long process required to secure licenses and another 32 percent identified obtaining land (working premise) as a major obstacle to improve and expand their activities [CSA, 2003 (b)]. The same study noted that about 13 percent of the respondents also considered tax regulation as a serious problem. The tax system is also arbitrary and subjective [Solomon, 2004].

Besides constraints related to the policy environment, it is also shown how serious are market, finance, skill, and other constraints. Although it is clearly shown in the 1997 Strategy that different stakeholders would participate in addressing these problems, the support has been found extremely low. The same study noted above on MSEs shows that only about 17 percent of MSEs had a chance of getting support from one or the other of the different support providers. Many stakeholders are involved and yet no one provides tangible support. Government, supposed to assume the leading role in supporting MSEs, is dragging its feet. Only 2.5 percent of the randomly selected MSEs has benefited from government support. Banks and micro-finance institutions managed to address the financial needs of only about 4.6 and 2.8 percent of the surveyed firms[21] [Op cit, p9]. Other actors such as donors, NGOs, training institutions and business associations contributed very little. Therefore, there is a need to create synergy among the different development stakeholders in order to provide a coordinated and effective support for MSEs.

Most workers of SSM industries, and even owners and some managers lack adequate and relevant educational background and training. As discussed

[21] For details, see Annex 2.4.

above in this section, few workers attended high school education and took technical and vocational training. This limits their capacity to properly manage routine financial transactions, plan future development of the enterprises, etc. Although they may not have enough financial resource to cover the full cost of a relevant training for upgrading the skill of their staff, some of them are willing to cover part of the cost. For instance, about 62 percent of small enterprises covered in the study have shown their willingness to cover as much as 42 percent of the cost of their training [Op cit, p34]. This suggests the sort of intervention the government can launch to address the technical and managerial skill gaps of SSM manufacturing industries. Recently on-going efforts by the government are quite essential. However, such efforts would be effective if demand-driven training packages addressing firm-level problems are undertaken. In this respect, government and other stakeholders should support SSM industries by providing demand-driven training on product design and development, quality assurance, and creating market channels through various mechanisms including organizing trade fairs.

With respect to financial resources, limited access to formal banks arises from three different angles: actual constraints related to policies and practices of banks, negative perceptions of banks about SSM industries – not necessarily substantiated by actual practice, and lack of knowledge on the part of the SSM industries regarding available services. To address these problems, the government should facilitate conditions for accessing credit to viable SSM industries at a project or operational stage. This may include institutional support for project design, special fund, government credit guarantee scheme, extension services, particularly on the provision of technical supports that might help improving their productivities, etc. The relevant government institutions should also work on creating awareness of managers of SSM industries about available opportunities and services thereby facilitating the link between the small scale manufacturing industries and financial institutions.

Lastly, there is a need to anchor the strategies for large, medium, small-scale and micro-manufacturing enterprises and other sectors to the overall industrialization strategy of the country. SSM industries cannot sustainably develop on their own. After all, these same industries will soon expand to medium and large-size industries. The central weakness of the current strategy basically lies on the unconventional style of economic management where on the one hand government controls and owns the major means of production while at the same time attempting to develop a market-oriented production and exchange arrangement. On top of this, the politically motivated priority setting, which calls for the development of agriculture first and foremost, keeping at bay all other sectors (manufacturing and services), led not to the growth of agriculture but to an economy-wide degeneration. The application of ADLI resulted in mass starvation and poverty of the rural population as well as deindustrialization. There is, therefore, a need for an economy-wide integrated development plan, which appreciates the linkages between economic sectors and simultaneous growth reinforcement.

Chapter 3

Mainstreaming Trade in National Development Strategies[22]

3.1 Introduction

While the positive impact of trade on economic growth is perhaps not debatable, its significance is less substantiated, even theoretically. As such, the analytical approach to the relationship between trade and development (or poverty), particularly the causal impact of trade on development, remains fluid and far from settled. This section discusses the need for anchoring LDCs trade strategies in their national development agenda.

3.2 The current analytical approach to trade and poverty

One of the striking features of the current (neo-liberal) policy debate on trade and poverty is that its central focus is actually trade liberalization and poverty, rather than trade and poverty. The current approach emphasizes the direct impact of changes associated with trade liberalization on poverty, which is conceptualized as a policy shock, and the short-term dynamics of that change. The theoretical premise of the analysis of the link between trade liberalization and poverty is the efficiency and welfare gains that can be achieved from encouraging export production away from import-competing activities and from non-tradables towards exportables. This restricted or narrow version of the theory is meant to trace at the national level the various

[22] This discussion heavily draws on 'UNCTAD, 2004'.

channels through which price changes resulting from the removal of boarder trade barriers (tariff and non-tariff barriers) affect the income of households in developing economies. Accordingly, trade liberalization, seen as a price shock, may have a number of effects. Changes in the prices of goods consumed entail expenditure effects. It also has income and employment effects, which arise because of changes in the remuneration of factors of production. Finally, it has effects on changes in tariff revenues and taxes, which affect transfers and the provision of public goods, thereby affecting the risk and uncertainty that low income households face.

However, from the point of view of a developing economy, this approach has theoretical shortcomings as well as practical limitations. The possible short-term impact of liberalization, i.e., reduction or removal of export taxes and import tariffs on agricultural-commodity-exporting countries, such as Ethiopia, is an increase in the prices received by commodity exporters and reduced prices of imported goods for consumers. But this effect materializes only if there is domestic market integration such that price increases are passed on to producers and consumers. However, in LDCs, this is hardly the case. The very small farmers are most likely to see the benefits from the price increases captured by middlemen, unless specific measures are introduced to provide such farmers with inputs, credit, market information and competitive channels for market access.

Many of the poor in the agricultural-commodity-exporting LDCs live in rural areas and are engaged in subsistence-oriented farming of traditional food crops rather than in export activities. In fact, in most LDCs agricultural production is primarily meant for own consumption. Improved export prices can reach this group if they shift their production mix to exportables. But, largely, such a production shift is not always possible owing to risk aversion, uncertainty, and particularly, structural constraints. Often a given agro-climatic zone is suitable only for the production of a specific crop type, which

may not be exportable. Even if it is exportable, in light of the technologically backward production technique, commodities may not be competitive even in the domestic markets. Moreover, if liberalization leads to a substitution of the traditional, home-produced food by cheap, imported food, then the traditional food producers may face declining demand and prices for their produce.

A particular problem for agricultural-commodity-exporting LDCs is that the widespread adoption of trade liberalization and export-oriented polices has been associated with falling world prices for agricultural commodities. As a consequence, the potential benefits that agricultural producers can gain through higher prices at the national level can be offset by lower prices at the international level. A typical example of this is the case of coffee growers in Ethiopia, where the margin between farm gate prices and production costs happen to be negative as given by the diagnostic trade integration study [World Bank, 2003b]. Ethiopian coffee producers receive only 6 percent of the consumer price of coffee in foreign markets [Eyob T, 2005].

The short-term adverse impact of trade liberalization in LDCs is also felt at urban centers. Cheaper imports will affect the import-competing industries adversely, which can have a deflationary effect in the urban economy. Factories that cannot compete with cheap imports will close down. Witness what Ethiopian manufacturing firms faced right after the deep liberalization measures (sharp tariff reduction) under the SAP. Not only that many firms closed down, but most of them too sharply reduced their production capacity [EEA/EEPRI, 2000/01]. In the absence of social security, the unemployed workers from factories forced to close down add to the numbers of urban poor. Even those who managed to keep their jobs would be adversely affected as a result of a decline in salary increment to compensate for the inflationary pressure.

There is a particularly sharp distinction between commodities and manufactures exports. Commodity exports, constituting the main exports of LDCs, are subject to short-term supply and demand fluctuations, as well as having episodes of medium-to-long-term terms-of-trade decline. Commodities are also subject to intense price competition, as a result of which productivity gains are normally passed over to the consumers rather than the producers. Because of the involvement of fixed factors of production such as land, they can be also subjected to diminishing returns. In contrast, manufacturing is subject to substantial static and dynamic economies of scale. There is often higher income elasticity of demand for manufactures exports than for commodity exports.

As noted above, a large proportion of the poor work in agriculture and live in rural areas. This has led to the view that agriculture is the key issue for trade and poverty reduction, particularly in international negotiations. But from a dynamic development perspective, poverty reduction does not depend simply on agricultural productivity growth and improved employment prospects in agriculture; productivity growth and employment expansion in non-agricultural sectors are also important. Indeed, historically, most successful cases of sustained poverty reduction have involved a shift in the occupational distribution away from agriculture towards industry and services. In these cases productivity growth has occurred in agriculture and other sectors in a balanced and integrated way.

Moreover, in practice, the export response to trade liberalization has been smaller in the LDCs than in other developing countries. This is likely to be related to weaknesses in domestic productive capacities and the least integrated domestic market economy. But at the same time, the import response is also lower in the LDCs, partly owing to the fact that the trade liberalization episodes in the LDCs have occurred along with higher aid

inflows, which have slowed down after the economy has liberalized. The overall effect is that the trade balance in LDCs has worsened.

The fact that the impact of trade liberalization on import growth is higher than its effect on export growth implies that liberalization exacerbates the problem of sustainable financing of the trade deficit, which LDCs always face. The deterioration of the balance-of-payments after trade liberalization in developing countries proved that a liberalized economic regime is no guarantee for converting unemployed domestic resources into scarce foreign exchange. In addition, given the continuing marginalization of the LDCs with respect to private capital flows after economic reforms, the process of trade liberalization has exacerbated aid dependence.

In least developed economies which depend on a narrow range of low-value-added primary commodities and have deep mass poverty, there is a strong tendency for vicious circles of domestic stagnation and persistent poverty to be reinforced by external trade and financial relationships. In this situation trade can be part of an international poverty trap in which low and unstable commodity prices interact with unsustainable external debts and debt servicing system. In contrast some relatively more advanced countries which have managed to upgrade their exports and diversify into exporting manufactures have been able to use international trade to achieve high rates of economic growth.

In practice, it is evident that “the incidence of poverty has increased unambiguously in those economies that adapted the most open trade regimes and in those that continued with the most closed trade regime” [UNCTAD, 2004]. Though the volume of exports in many countries that have undertaken trade liberalization increased, trade liberalization has worsened the trade balance and the current account. In general, “there is little correlation between trade liberalization and poverty reduction” [UNCTAD,

2002]. And of course there is no significant causal impact of trade on poverty or economic growth. Lack of trade is not the root cause for poverty.

3.3 The WTO regime and LDCs

The theoretical approach to trade policy, particularly, trade liberalization, and development, discussed above, underlies the basis for the WTO regime. In practice, however, the underdeveloped economic and trade capacity of LDCs has proved that these countries were not enabled to benefit much from the opportunity created by the multilateral trading system. Most LDCs have become increasingly marginalized in international trade and have found it difficult to integrate into the multilateral trading system in a way which supports poverty reduction and development. Hence, there arises a strong case for special international support measures specially targeting the LDCs. This has led to the provisions for special and differential treatment (SDT).

3.3.1 Special and differential treatment

The provisions of SDT typically provide developing countries flexibility in the implementation or application of agreements, and encourage member countries to provide technical assistance and market access preferences to the former. These measures are exceptions to the Most Favored Nations (MFN) principle, a core principle of the multilateral trading system, which requires all members of the system to treat one another alike. The Enabling Clause and the Waver system permit countries to grant special treatment to some countries without granting the same treatment to other member states.

The provisions for SDT granted by the various WTO agreements to different WTO members are complex such that they differ in terms of their content, geographical domain, application and time limits. The majority of the

provisions are best-endeavor provisions that do not have a binding nature. The provisions that are binding generally include those that grant developing countries more flexibility in the implementation of WTO agreements and/or flexibility in their application. All other provisions, including market access preferences, provision of technical and financial assistance, provisions that encourage the special consideration of difficulties, actions to address commodity price problems, etc., are all non-binding.

Moreover, the majority of the provisions that are granted exclusively to the group of LDCs are provisions that encourage advanced WTO members to consider the interest of the least developed WTO members, rather than provisions that provide the least developed WTO members with exemptions from WTO rules and regulations in line with their level of development and enable them to use trade polices in the service of productive sector development. As noted above, many of the provisions are best-endeavor (not obligatory) clauses. They are by their nature transitory. Rather than being concerned with the development of productive capacities, they are intended to facilitate the implementation of the WTO agreements by the LDCs and other developing countries, and encourage these countries to design and implement trade policies in conformity with WTO agreements. As it stands now, it is doubtful that current provisions are sufficient to enable the LDCs to actively promote their economic development and reduce their international economic marginalization.

3.3.2 The scope of preferential market access

The provisions of SDT also encourage technical assistance and market access preferences. In some instances market access preferences are granted through the multilateral agreements directly, but in most instances, they are granted by individual countries or group of countries. Market access preferences enable exporters from the LDCs to pay lower tariffs or even enter

markets quota- and duty-free. The potential commercial benefits depend first of all on the preference margin which exporters in the LDCs receive over other exporters. The market access preferences granted to the LDCs are typically more far-reaching than the market access preferences that they grant to other generalized system of preference (GSP) and global system of trade preference (GSTP) beneficiary countries. But there are some developing countries that benefit from even more extensive market access preferences. These are typically developing countries that are part of a regional trade arrangement that have special free trade agreements with the preference-granting country or countries. LDCs have to compete with such more favoured countries for markets in developed economies. In addition, most market access preferences also contain exceptions. For instance, Canada maintains restrictions on dairy products, eggs and poultry; Japan continues to maintain restrictions on selected agricultural goods; the United States maintains restrictions particularly on textiles and apparel; and under the European Union's Everything But Arms Initiative (EBA), there are still import restrictions on some commodities such as sugar, rice, banana, etc., which are yet to be phased out in the future.

3.3.3 Barriers to the effective utilization of market access preferences

Apart form the challenge that LDCs face from other exporters to industrialized markets, there are also various forms of barriers to the effective utilization of market access preferences. First, preference-granting countries do not make clear commitments with respect to the period during which the market access schemes themselves remain effective, and/or do not make clear commitments with respect to the products and countries that are covered by the market access preferences. All countries maintain the option to review the list of products and countries that are actually eligible for the initiative or to introduce ad hoc safeguards. While the list of products is generally

reviewed in the light of their economic sensitivity, the list of eligible countries is determined on the basis of non-trade-related concerns. This creates some hesitation on the part of preference-receiving LDCs to increase their investment and production on exportable commodities.

Second, rules of origin are regarded as a predominant cause of the underutilization of trade preferences. As preferences are granted unilaterally and non-contractually, preference-giving countries have consistently expressed the view that they ought to be free to decide on the rules of origin.

Third, overcoming non-tariff barriers to trade and complying with product standards, either related to technical barriers to trade (TBT) or to sanitary and phytosanitary standards (SPS) or other requirements, constitute a formidable if not more challenging market access problem than tariff barriers. The inability to adhere to strict health or environmental measures (e.g. pesticide residue levels, packaging requirements, eco-labeling, etc) is likely to cause the loss of shares in the market in question, and also, unlike tariff protection, may damage prospects for penetrating other markets. LDCs' benefits form preferential market access may, therefore, be seriously impaired by non-tariff barriers to trade (NTBs).

Finally, lack of technical knowledge, human resource capability and institutional capacity, which require in-depth knowledge of natural tariff systems in various preference-giving countries pause further limitations for developing countries from effectively benefiting by market access preferences. Countries must have at least a minimum base of production and supply capabilities to take advantage of such preferences. Improved market access is commercially meaningless if the LDCs cannot produce in the sectors in which they have preferential treatment and if they lack the marketing skills, information and connections to convert market access into market entry. Moreover, unless the new production stimulated by the

preferences also strengthens the development of national technological and entrepreneurial capabilities through learning by doing, the sustainability of the development process may be questionable. In this regard, experience with the Caribbean Basin Initiative has suggested that the fragmented type of industrialization process which follows from the nature of preferences may slow down the type of technological capacity-building and learning which are necessary for economic sustainability [UNCTAD, 2004]. Therefore, even assuming that all other non-tariff barriers were abolished, LDCs would not be in a position to effectively exploit available market access preferences owing to their weak productive capacity. Hence, to effectively benefit from market access preferences, LDCs have to primarily develop their productive capacity. In a way, trade expansion requires economic development, as a prerequisite.

3.4 Limitations of the analytical approach

Apart from the unrealistic theoretical assumptions and also practical constraints arising from the structure of the least developed economies discussed above, the analytical approach has major limitations with respect to the scope, priority setting, and most of all, issues of sustainability.

First, it should be underlined that while trade liberalization is an element of trade policy, the latter in turn is a sub-set of trade development. In this context, analyzing the relationship between trade policy (one of which is trade liberalization) and poverty is different from analyzing the relationship b/n trade and poverty. Conclusions about the former should ideally be based on the latter. To start by focusing on trade policy and poverty before examining the relationship b/n trade and poverty is likely to exaggerate the role of trade policy in trade development. This is because trade development depends on macro-economic policies, non-trade policies as well as trade policies. Particularly important in this regard are policies which promote the

development of productive capabilities through capital investment, skill acquisition, organizational change and technological modernization. This approach is also likely to exaggerate the role of trade liberalization within trade policy. Trade policy, which may be understood as the overall structure of incentives to produce and consume (and hence import and/or export), tradable goods and services, cannot be reduced to trade liberalization.

The current approach unrealistically attributes a central role to trade policy in development. Neither a well designed trade policy makes a poor country rich, nor a weak trade policy turn around a rich country poor. At its best, trade policy provides an enabling environment for development. It does not guarantee that entrepreneurs will take advantage of this environment, nor will private investment be stimulated.

Second, it prioritizes trade liberalization over poverty reduction as a policy objective. The importance of macro-economic and non-trade policies for trade development is widely recognized. But within the current approach to trade liberalization the question being asked is 'what are the complementary policies necessary for ensuring the expected positive effects of trade liberalization, in terms of economic growth and poverty reduction?' This is a very different approach to non-trade policies from one that asks: "what trade and non-trade policies are required in order to achieve growth and poverty reduction objectives?" In the former case, the best complementary policies are chosen subject to the constraint that trade liberalization is being, or has been, undertaken. In the latter case, the task is to find the best trade and non-trade policies that are likely to achieve growth and poverty reduction objectives. What the former approach does is to take trade liberalization as given and then see how to make poverty reduction goals compatible with it, rather than to make poverty reduction the priority and then ask how trade liberalization might fit into this. It requires an examination of the relationship between trade and poverty, how trade and non-trade policies affect the relationship between trade and poverty, and the role of trade liberalization in those trade policies.

Finally, it cannot address issues of long-term dynamics which are central to sustained poverty reduction. The current approach to trade and poverty attempts to understand the direct impact on poverty of changes associated with trade liberalization, which is conceptualized, as noted above, as a policy shock, and understand the short-term dynamics of that change. But it entirely failed to address the indirect impact on poverty of change in a country's level and pattern of trade, and the long-term dynamics of that change.

In short, the exclusive focus of the current approach is poverty alleviation during liberalization reforms. But the most important effects of trade on poverty are likely to occur through indirect impacts and long-term effects of sustained economic growth and development. In general, the approach basically assumes as if there is a causal impact of trade, particularly trade liberalization, on poverty and/or economic growth/development. While this is not supported empirically, the converse is a historically established fact.

3.5 The development approach

The essence of the development approach to trade and poverty is that it begins with an analysis of how development occurs, rather than an analysis of how trade occurs, examining the role of trade within the process of development and assessing the effects of trade on poverty from this perspective. The only way to reduce poverty sustainably is through the development of productive capacities. The advantage of this approach is that it can be built on existing policy analysis and research which examine international trade from a development perspective.

The development of productive capacities (i.e., accumulation of physical, human and organizational capital, structural transformation and technological progress) depends critically on the availability of a surplus for investment over basic consumption needs, and on adequate incentives for private

entrepreneurs, whose initiatives animate the development process. Institutions to deal with the multiple coordination failures which can arise in the development process are also important. At any moment in time, the level of development of productive capacities acts as a constraint on what goods and services a country can trade efficiently and also on the scale of trade.

But international trade may play an essential role in supporting the efficient development and full utilization of productive capacities. This occurs through both imports and exports. Trade can enable more efficient use of a country's resources by availing imports of goods and services which, if produced domestically, would be more costly. It allows increased capacity utilization and the realization of a "vent of surplus" if external demand enables the employment of previously idle (or surplus) labour and land resources which were previously not utilized owing to a dearth of effective domestic demand. It can lift a balance of payments constraint on sustained economic growth and improve the returns on investment by reducing production costs or enabling economies of scale. Exposure to international trade competition can act as a spur to greater efficiency. So, international trade affects the development of productive capacities through these elements.

In LDCs, characterized by generalized or mass poverty, sustained economic growth is a precondition for a significant poverty reduction. But it will be sufficient only if growth is of an appropriate form, i.e., if it is inclusive. But if a country focuses on policies to reduce poverty by purely re-distributional devices, to the neglect of economic growth, it is likely to be unsustainable in the long-run.

The development approach has two steps. Firstly the poverty reduction strategy is anchored in a national development strategy. Secondly, trade policies are integrated within the development-oriented poverty reduction strategy.

3.5.1 Anchoring poverty reduction in a national development strategy

The essence of anchoring poverty reduction strategy in a national development agenda is that priority public actions for poverty reduction strategies would be derived from an overall long-term national development strategy. A development strategy contains a long-term vision of national development objectives, the strategy elements required to achieve these objectives and their sequencing, and the policy measures and processes required to achieve the objectives.

The poverty reduction strategies to be in place should reinforce the realization of the long-term objectives. Within a development-oriented approach to poverty reduction strategies, short-term and medium-term issues of macro-economic stabilization and improvement of the efficiency of resource allocation would not be ignored. But poverty reduction strategies should be anchored in long-term development strategies rather than being dominated by short-term macroeconomic goals of stabilization together with perpetual economic reform aimed at increasing the efficiency of resource allocation. The approach would seek to achieve substantial and sustained poverty reduction through development rather than to ensure that during stabilization and adjustment poverty is alleviated.

Trade policy is an essential and integral component of the whole set of policies that are together designed to achieve the growth and poverty reduction objectives.

3.5.2 Integrating trade in development-oriented poverty reduction strategies

Mainstreaming trade within poverty reduction strategies takes a development approach that is founded on the view that substantial poverty reduction in the

LDC's requires sustained economic growth and the development of productive capacities. Its analytical focus is not on the process of adjustment, identifying the complementary policies which need to be in place to alleviate poverty during trade policy reform and to ensure that poor people benefit from the process. Rather it focuses on identifying trade development objectives that are important for sustained economic growth and long-term development, and the trade and non-trade policies (including trade liberalization) that can facilitate the achievement of those objectives.

The fundamental priority here is that governments formulate and implement national development strategies that integrate trade within them in a way that effectively promotes sustained industrialization and poverty reduction. This is critical because it is the area where the LDCs themselves potentially have the most leverage to make trade work for poverty reduction and development. The industrialization strategy of East Asians in general, and Japan, South Korea, and Taiwan in particular, is typical of this approach.

The methodology is based on the view that substantial poverty reduction in the LDCs requires sustained economic growth and that the balance of payments is a major constraint on achieving this. Increased efficient investment and associated change in technological capability and productivity growth are the basic sources of economic growth. But the sustainability of economic growth may be limited if export expansion is not sufficient to meet the import demand associated with faster growth. Due regard must thus be given to the foreign exchange productivity of investment.

What is important in this regard is that development and sustained poverty reduction are major motors for expanding international trade. On the one hand, the development of productive capacities enables developing countries to expand their export, and on the other, rising income per capita and reduced poverty leads to increased imports.

For developing countries, economic growth is not closely/strongly correlated with the trade regime (this also applies for the current developed countries during their pre-industrialization period). Open economies are not necessarily high growth performing or vice versa. Openness of the trade regime is not in fact a good indicator of the rate of import and export growth. Imports and exports grew at higher rates for high growth performing economies, but at low rate for low performing ones. This suggests that, in terms of the expansion of international trade, economic growth is much more important than trade liberalization.

3.5.3 Multilateral trade liberalization and the development of productive capacities

LDCs cannot be expected to gain much from further multilateral trade liberalization unless improvements are made to their productive capacities which could enable them to benefit from any subsequent global growth in trade.

Multilateral trade liberalization will only have poverty-reducing effects if LDCs increased their export supply owing to the opportunities created through multilateral trade liberalization. The problem here is that the ability of the LDCs to increase their exports is highly constrained by weak production capacities. The way to increase the effectiveness of trade as a mechanism for development and poverty reduction in the LDCs is the development of competitive productive capacities. This makes sense in that if multilateral trade liberalization boosts global trading opportunities, the LDCs can benefit. But they will only do so if they can sustain their share of world exports of goods and services, and this depends on the development of productive capacities. The export share of LDCs has been declining over time. These export losses are due to a range of national and international factors, including changes in the composition of global trade, and a decline in commodity prices since 1980 [UNCTAD, 2004].

There is little evidence to give optimism regarding the capacity of trade liberalization to induce development of productive capacities in the LDCs. Therefore, it is necessary to focus on developing productive capacities directly if LDCs are to avoid further marginalization (declining share) in world trade.

3.5.4 Policy implications of the development approach

A major concern which has arisen from an exclusive focus on trade liberalization and poverty is that integration into the global economy has come to be seen as a mechanism of poverty reduction in itself. But it is development, the long-term process in which the productive capacities and national income increase, which, in practice, is the key to poverty reduction. Trade liberalization is certainly part of the development process and a very important policy issue. But it is wrong to assume that trade liberalization, or increasing trade integration is, in and of itself, the same thing as development.

The approach adopted here implies that the national policies which best support poverty reduction should not be based on an integration strategy alone but rather on a national development strategy with an integration component. The aim of such a strategy should be:

- To create and sustain a dynamic process of capital accumulation, human resource development, organization change, structural change and technical progress in order to develop productive capacities,
- To ensure that development is inclusive, incorporating all socio-economic sectors/elements rather than focusing on an isolated sector or activity and
- To manage integration with the global economy, including both external finance and external trade, and technology acquisition.

It is in this context that the important policy questions of how trade liberalization fits into a development strategy and how integration with a world economy can best support national development and poverty-reduction arise. Linking international trade to poverty reduction is best achieved through national development policies that are pragmatic, inclusive and broadly outward-looking.

The development approach also has implications for international policies, and in particular for the design of international trade regime. The multilateral trade regime seems to be founded on two visions of global justice. The first, non-developmental, vision sees the purpose of the rules system as to provide stability and predictability for market participants, and to set certain restrictions on how national Governments may pursue their own diverse purpose. Economic freedom is seen as a good in itself, rather than as a means to development and poverty reduction. The second vision sees the rules system (and trade) as a means to an end rather than an end in itself, something which is instrumentally, rather than intrinsically, valuable. From this point of view, the purpose of the rules system is to facilitate positive development and poverty reduction outcomes. The critical question for negotiators designing the international trade regime would not just be “how do we maximize trade and market access?” but also “how we enable countries to grow out of poverty and head towards development?”

The design of the international trade regime should seek to incorporate both visions. Thus the concern to establish stability, predictability, market access and a level playing field for all participants need to be complemented by the concern that the system (WTO) be also designed in such a way that it contributes to the promotion of sustainable development.

If poverty reduction is taken as a priority goal, then the development approach to trade and poverty discussed above has important implications

for the design of the international trade regime. It implies that an international regime which facilitates the expansion of international trade is not sufficient for poverty reduction. Rather, it is necessary to have an international trade regime which does not constrain the national polices of poor countries for developing their technological capabilities. To be precise, the international trade regime should enable rather than constrain the efficient development and utilization of the productive capacities in a way in which the population of working age becomes more and more fully and productively employed. What this means in practice depends on the relationship between international trade, the development of productive capacities and poverty reduction.

Finally, the development approach to trade and poverty implies that the international trade regime is not the sole international policy issue, which needs to be addressed in order to link international trade more effectively with poverty reduction. Because the way in which trade is related to poverty is affected by how trade is related to aid, debt, private capital flows and technology acquisition, a central international policy issue should be the question of coherence between actions in the different domains. “Under this context, a slogan such as ‘trade not aid’ is misleading. The issue is not the one or the other. It is rather how to make any existing negative synergies between aid and trade be converted into positive synergies; how to use aid to build productive capacities and thus how, in the long-term, to reduce the need for aid. Similarly, it is necessary to link trade with external debt problems” [UNCTAD, 2004, p. 90].

This implies that although appropriate national development strategies are central for making international trade a more effective means of poverty reduction in the LDCs, success will not be assured unless there are other supportive international policies as well. The policy configuration that will do most to strengthen the relationship between international trade and poverty reduction constitutes,

- national development strategies that integrate trade issues as a central component,
- increased and effective international assistance to build productive capacities and trade capacities, and support private sector development and
- a more enabling rather than more constraining international trade environment.

These elements, together, can ensure that the major role which international trade could play in poverty reduction in the LDCs become a reality.

The current trade policy in Ethiopia is not, however, consistent with the development approach discussed above. The regime in power liberalized external trade in early 90s under the structural adjustment program even before thinking about a national development plan. Even after claiming ADLI as the overarching development strategy, exporting sub-sectors both in agriculture and manufacturing are considered as the leading activities which would be given priority for government support. Government argues that not only the direction but also the pace of development of agriculture and industry would be set by the respective exporting enterprises or activities [Ministry of Information, 2002]. This implies that domestic market-oriented enterprises, irrespective of their contribution to economic development in terms of food security, employment, productivity and efficiency, technological capability building, etc., are regarded as less preferable than exporting enterprises or activities. All other development policies have to be geared towards complementing and promoting export activities. The same industrialization strategy document of the government states that even if all other aspects of economic activities are successfully undertaken, no development can be achieved unless the export sector expands well and develops. This is precisely an approach much in line with the WTO regime

contrary to the development approach to trade discussed above. So, in essence, it is trade, not economic development that is taken as an end.

In a way, the development strategy of the country is, at least theoretically, export-led rather than ADLI which the government is claiming to pursue. Whichever model is claimed to be adopted, in practice, the performance of both agriculture and exporting activities, which are said to have been accorded top priority for support, has been disappointing, to say the least.

In line with the current government strategy, the country has applied for WTO membership, without making any preparation to stand-up to the forthcoming challenge that the economy would face from implementing WTO obligations (for the details see EEA/EEPRI, 2005). Further analysis on the trade regime in Ethiopia in the context of the development approach will be treated in forthcoming issues.

Chapter 4

Urbanization, Poverty Challenges and Prospects

4.1 Introduction

Ethiopia's current population size is 73[23] million, which is second only to Nigeria in Sub-Saharan Africa. According to a medium variant of the national population projections, the population will be 129 million by the year 2030, implying an average growth rate of 2.43 percent (CSA, 1999). Even under this favourable scenario, that assumes a steep decline in fertility to 3.32 by 2030, the population growth will continue to exert serious pressure on the environment, promotion of social services and will remain an enormous challenge to agriculture.

Urbanization is at its lowest level in Ethiopia compared to other African countries as only about 15 percent of Ethiopia's population live in urban areas. Moreover, 40 percent of the urban population is found in only one city - Addis Ababa (CSA, 1999). But, like any other country, Ethiopia is destined to become more urbanized and this is rapidly taking place due to ever increasing migration from rural areas, which is due to both pull and push factors. The effects of poor performance of the agricultural sector indicate a growing rural-urban migration, which is also fuelled by seemingly attractive livelihood prospects in urban areas.

[23] CSA (1999) The 1994 population housing census of Ethiopia Results at the country level, Analytical report, Vol., II June 1999, Addis Ababa. Note also that Ethiopia's population size is estimated to be 77.4 million in 2005, according to UNFPA (2005) in IoL East Africa News on 13 October 2005, which is second only to Nigeria in Sub-Saharan Africa.

The urban population in Ethiopia is growing at a rate of around 6 percent per year. In 1994, for instance, the proportion of the urban population was 13.7 percent, which increased to 15.5percent in 2003. This figure could go up to 17.5 and 29.7 percents in 2015 and 2030 respectively (CSA, 1999). Moreover, increasing urbanization pauses a major issue of concern not only in Addis Ababa but also among the secondary cities such as Nazareth, Awassa, Bahir Dar, Jimma, Mekelle and Dire Dawa.

Urban centers historically emerged as centers of dynamic economic activity and play great role in the socio-economic development process of any country. Yet, they are also sources of all types of 'modern' societal problems including destitution, homelessness, unemployment, exclusion, crime and so on. In Ethiopia, urban poverty is manifested in many different ways ranging from stark destitution observable along major roads and every corner of urban centers to somewhat hidden deprivations that are not easily discernable to casual and frontline observers.

The apparent poverty signs are everywhere - beggars, shanty homes, slim and malnourished individuals with dirt and torn clothes, scattered garbage, small item exchange sites, idle persons everywhere, and so on. These poverty symptoms are likely to aggravate with increased urbanization that the country is undergoing. The government's recent poverty estimate indicates that urban poverty has increased by more than 11 percent during 1995-2000 (MoFED, 2002).

Urban areas in Ethiopia, as in most parts of the world, are generally characterized, therefore, by a host of problems including unemployment, inadequate housing stock, insufficient solid waste collection and disposal, inadequate water/sanitation facilities, inadequate public transportation, traffic congestion, poor health services and inadequate education services. Violence, crime and personal insecurity are also urban livelihood features

although the extent of these problems is not as high as other parts of the world. The degree to which these problems affect residents of urban areas depends on the level of poverty in which one finds himself or herself.

Yet, the process of urbanization underpins the process of development as the former is usually the engine for the latter. The development experience we know so far occurs in tandem with increasing urbanization. Development by its nature means specialization/ division of labour that entails the concentration of people in one area. Hence, urbanization, regardless of its undesired social outcomes, is an opportunity and a mechanism to development. The urbanization process taking place in the country should definitely be taken, therefore, as an important development agenda from both angles of opportunity and challenge to address the problem of poverty in the country.

Ethiopia has yet also to undertake structural transformation in the process of which the urbanization process intensifies. According to Jean Marie Cour (EEA/EEPRI, 2003), the development of other sectors of the economy or urbanization in general is extremely necessary for the development of agriculture. The call for closer attention to urban growth arising from the seriousness and wide dimension of urban poverty should at the same time be capitalized to promote rural and agrarian transformation. There is a need, therefore, to maximize the opportunities of the urbanization process while at the same time addressing possibly worsening poverty situation in urban areas.

4.2 Urbanization as a development agenda

4.2.1 Urbanization theories

There are different theories underpinning urban growth. Most of them are in favour of urbanization process whereas there are some that are against it. Generally speaking increasing urbanization presents a major issue of

concern given that global trends indicate that the majority of the world's population will live in urban areas. It is estimated that a substantial proportion of this growth is expected to occur in developing countries.

Increasing evidence demonstrates that the challenges associated with growing urbanization in developing countries reflect an increase in population density whereby the locus of rural poverty shifts to urban areas. Conversely, it is well evidenced that the opportunities of urban growth provide potential for economic development and poverty reduction. Development approaches that focus on industrialization, such as one followed after Independence by many poor countries, generally favour and promote urban development.

The growth pole theory which is also referred to as the modernization theory is, for example, categorized in the family of pro-urban development. It emphasizes on the supremacy of urban life taking urban setting as a symbol of modernity, center of culture, technology and all modern world amenities. It points to the fact that industrial sectors, modern services and infrastructure are built in such areas.

However, this could lead to the neglect of the rural economies. Many argue that these theories exemplify today's African countries whose capital cities do have the western standard infrastructure and modernity in their capital but things drastically change as one travels just a few kilometres away from the city. Moreover, in the same cities that have sky rocketed buildings of western countries standard, it is very easy to find slums and squatters in various city corners. Many critics of these theories argue that these policies have been breeding ground for a new category of urban poor who suffer from unemployment, poverty, and homelessness.

Another theory is in favour of the *small and intermediate towns* arguing that they reduce the problem of primacy of one city and inequities between the

urban and rural areas. If national governments invest more funds in such secondary centers they can play important roles in balancing the distribution of urban population and economic activities, in stimulating rural development and in generating more socially and geographically equitable distributions of the benefits of urbanization (Rondinelli, 1983).

The agro-politan theory, on the other hand, advocates the introduction and adoption of some elements of urbanism into the rural setting. This theory argues that instead of encouraging the drift of rural people to cities by investing in cities, encourages people to stay where they are by investing in rural districts and altering existing settlements into a hybrid form or agro-polis. The agro-politan district is expected to be self-reliant and self-financing.

A competing stance in this strand is the urban bias theory. The exponents of this theory argue that urban bias leads to an excessive concentration of resources in urban areas (Lipton, 1977). This not only worsens inequality in the third world societies since a majority of the poor normally live in the countryside, but also slows down the pace of national economic growth. The theory also has a political economy premise that resource allocation decisions are made by the biased urban technocrats who do not have the heart to the rural people.

The theory has been influential in diverting resources to rural areas and to the adoption of rural development policies in most of the developing countries particularly in Africa after the 1960s. The consequence of this policy was that neither the rural areas nor the urban benefited from the shift of investment that was made to bring about equitable distribution of resources among the rural and urban population. Instead, the rural-urban migration increased as the rural economy was unable to pay off, and cities continued to bulge out horizontally with internal economic and social decay. Ethiopia's current state of affairs seems to fit well in this paradigm.

A related approach is based on the *equity with growth* mottos of development in the 1970s to 1980s, when most of the developing countries particularly in Africa adapted communist ideologies that directly or indirectly promoted the monopoly of the state in most of the economic, social and political issues of these nations. For urban areas, the complete monopolization of infrastructures and utility provision, and the low involvement of the private sector in all economic spheres further enhanced the deterioration of the quantity and quality of services. In most cases, while the growth with equity development policies called for rural growth, in practice, however, the urban centers benefited most in the form of low grain prices, subsidized services, etc.

Eventually most of the developing countries also started to adopt structural adjustment programs. Adjustment measures such as devaluation of local currencies, privatization and liberalization have resulted into inflationary prices for basic goods and services, housing, deterioration of urban infrastructure, and increased poverty as most of the poor were unable to enjoy anymore from subsidized services and commodity prices. For most of the urban population, purchasing power declined with deteriorating real income. The urban areas started to become centers of poverty and unemployment problems. With declining income per capita, the removal of subsidies, high taxation and continuously increasing migration to the cities, the provision of basic services in urban areas became very challenging for most developing countries. Given that Ethiopia has implemented this program in collaboration with the World Bank and the IMF, the desperate current urban situation is also partly explained by the implementation of adjustment programs.

4.2.2 Urbanization and socio-economic development in practice

As countries develop, increasing proportion of their people begin to reside in urban centers. In short, a process of urbanization underpins a process of

development. Development means changing lifestyle from dependence on what nature offers to livelihood earned through purposive reasoned human action that alters and subjugates nature to its needs. People are aided, in this process, by division of labour/ specialization and become, therefore, interdependent. This process by itself brings the concentration of people in specific areas, which gradually develop into modern urban centers.

Within nations and around the world people are, therefore, continually urbanizing. The world is expected to have, for example, 51.5 percent of its population in urban areas by 2010. Whereas high concentration of people occurs in big cities, the majority of urban dwellers could well be in small towns. In Africa, 60 percent of urban dwellers reside in cities of less than 0.5 million (Mitlin, 2004). Hence, understanding the dynamics of small towns in the urbanization process is also necessary.

Generally, urbanization is accompanied by growing new type of social problems and at times worsening poverty situation. In 5 of 8 countries, the absolute number of urban poor and the share of the poor people living in urban areas is said to be increasing over time (IFPRI, 2004 in Mitlin, 2003).

Urban centers historically emerged as centers of dynamic economic activity and the process of urbanization underlined the process of socio-economic transformation into higher state of wellbeing notwithstanding mushrooming new forms of societal problems and deprivations. Major cities in Europe, America including South Africa have their historical roots in coal mining, mineral exploration, and manufacturing activities.

In contrast, the majority of urban centers in poor countries such as in Sub-Saharan Africa have their roots as colonial administration seats, trade routes and resource transfer highway rest/maintenance points. Of course, following the Independence period many governments gave focus to industrialization

which gave rise to the development of urban infrastructure and urbanization in general. The urban centers that developed in poor countries are, however, de facto replica of the urban centers in the developed world without much of their underpinning economic life system.

In Ethiopia, for example, the principal economic activities of urban areas are not industrial but commercial in nature, associated with buying and selling (see Annex 4.2). Many secondary cities in Ethiopia also developed mainly as a result of being chosen as regional or zonal administration seats and/ or military[24] strategic significance rather than their own internal economic dynamism. Whenever there is a change in administration set up, these urban centers die quickly, as a result.

The middle class, i.e., virtuous and industrious entrepreneurs, is noticeably missing in Ethiopia. In a typical urban center, those in the relatively high-income group are very few in number and comprise successful businesspersons and/or those with substantial physical assets such as land and house. Civil servants and retail traders can be categorized as middle income. At the bottom of the ladder are those in the informal sector and those who earn their living from sale of their labour, which is typically unskilled. At the foot of the ladder are the destitute including homeless, street children, and orphans.

The poverty situation in urban areas is aggravated, therefore, due to the fact that the economy base of these areas is trade and service rather than production as such. Commonly, there is little internal economic dynamism that makes these areas self sufficient, growing and able to absorb migrant labour from rural areas. To the contrary, most urban towns located in far areas are likely to be markets, highly dependent on their surrounding rural economies.

[24] Note that the history of Ethiopia since early recorded historical periods has been a history of warfare and turbulence and as such lack of peace and security are important issues in understanding poverty in the country.

However, the process of urbanization if carefully planned and exploited will not only accelerate growth but is also likely to lead to improvement in social welfare of both urban and rural dwellers. As will be elaborated below, urbanization should be considered as a key component of Ethiopia's sustainable development strategy.

4.2.3 Urban rural inter-linkages

A comprehensive view about development leads to recognition of linkages among the different sectors of the economy and promotion of interdependent and complementary development process. Moreover, this approach ensures that the needs of all types of socio-economic groups and the poor are addressed.

In terms of the country's growth process, the creation of one economic space in which its different parts are very well interconnected and interdependent is critical. This has not only economic justification but also underpins justice and equity among the different segments of the society. One economic space ensures that resources everywhere are used in complementary way. High and rapid growth in one sector or area causes vibration throughout the economy or the country, and this in turn strengthens the solidarity and unity of the people.

There is a need, therefore, for an integrated rural-urban perspective. In fact, location is a dynamic concept and urban and rural areas should be seen as a continuum but internally heterogeneous. The usual linkage made between rural and urban areas is through migration. These two areas are, however, linked in diverse ways.

The argument in support of urbanization as an instrument for rural development is supported by history and the experience of other countries

(EEA/EEPRI, 2003). Different contributors in the study of the role of urbanization in socioeconomic development process in Ethiopia (Berhanu, Shumeye, Magrin, Cour (EEA/ EEPRI, 2003)), have stressed the view that the development of agriculture in Ethiopia is seriously constrained by the low level of urbanization. Using a preliminary Demo Economic Model, Jean Marie Cour (EEA/EEPRI, 2003) illustrates this point as follows:

> *A projection for the year 2025 using two urbanization scenarios (20% and 40 percent urbanization) shows that national per capita GDP would be US$468 under the 40 percent scenario compared with US$288 for the 20 percent scenario while rural GDP per capita will be higher by US$79 under fast urbanization. Equally interesting, the productivity differentials between urban and rural areas will decrease from 4.1 to 3.1 under a faster urbanization scenario.*

When urban economies grow, they impact in a positive way the economies of rural areas by providing market for rural produce. The movement of people from rural area will also reduce the burden of population pressure on limited farmland, thereby reducing landlessness, diminishing farm plots and associated land degradation and deforestation.

Increasing urbanization creates a potential market for a variety of high-value agricultural products and raw materials from the rural areas, and increases the incomes of rural producers. Increased rural incomes and purchasing power, on the other hand, create strong demand for industrial products and urban-based services as well as enhancing investment to increase agricultural production and productivity. This will have a positive spillover effect on overall economic growth in both urban and rural areas (UNDP, 2004).

4.3 Dimensions, levels and trends in urban poverty in Ethiopia

4.3.1 Demographic features

Poverty is a multidimensional issue and there is no unique way of measuring it. Similarly, the urban poor is a very diverse group with different needs and different levels of vulnerability. Urban poverty is often characterized by cumulative deprivations encompassing different dimensions such as income, health, education, security and empowerment. Moreover, each factor is interrelated as each dimension is a cause of one and a result of another dimension. Some of the poverty factors in urban areas are also interrelated with some demographic features.

An obvious demographic feature is the growing population pressure in urban centers. A number of urban localities are growing rapidly in Ethiopia even though the national capital - Addis Ababa - as a single primate city and as the main administrative, economic and financial center, dominates and accounts for nearly 40 percent of the total urban population. In 1984, there were about 320 localities with a population of 2,000 or more but within ten years, they increased by two-third and reached 530 in 1994 (NOP, 2003).

Table 4. 1: Comparison of urbanization trends

Year	World	Africa	Ethiopia
1980	39.2	27.5	10.5
1985	41.1	29.6	11.6
1990	43.2	31.9	12.7
1995	45.1	34.6	13.9
2000	47.1	37.1	14.9
2003	48.3	38.7	15.6
2005	49.2	39.7	16.2

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2003 Revision* and *World Urbanization Prospects.*

The fact that Ethiopia's current level of urbanization is low compared to Africa in general indicates the inevitable trend that this process will intensify in the coming period (see Table 4.1). Poverty in urban setting needs to be looked at, therefore, from population dynamics point of view and its associated features.

In high fertility setting, the structure of the population is largely dominated by higher proportion of the lower age group. For instance in 2003, out of the population 44 percent were under 15 and 3 percent more than 64 years (CSA, 2003). In this case we can see that the burden of the dependence ratio for the 53 percent active labour force (aged 15-64) would be 87 percent. The main characteristic of the Ethiopian population is, therefore, being dominated by the young population with children (0-14 years) and youth (15-24 years) together accounting for almost 65 percent of the total by 2000 (CSA, 2003).

Women in the reproductive age group (15-49 years) also constitute a large proportion (44.6 percent) of the population (UN, 2003). It is not surprising, therefore, that poverty in urban areas is said to have a gender bias. According to Addis Ababa University panel data collected between 1994-97, 48.4 percent of female-headed households were poor while male-headed households constituted only 36.4 percent (Mekonnen, Bereket and Abebe, 1998).

Although fertility level is said to be on the decline in Addis Ababa based on some studies, the city and other urban centers are still likely to share the main poverty features of the country. These features are generally reflected by persistently growing unemployment, poor quality dwellings and homelessness, increasing number of slums and squatter neighbourhoods, congestion, lack of basic services and infrastructure, lack of income and food insecurity.

The unemployment rate for urban areas, according to the 1994 Population and Housing Census, stood at 22 percent, with the highest rate recorded amongst the youth (15-29 years). It is now believed to be much worse than at the time of that Census.

Increased unemployment is also forcing the unemployed to seek employment in the informal sector. According to a 1996 ILO report, the informal sector accounts for 61 percent of total employment, 70 percent of this comprising women. The unemployed, the disabled, the self-employed and those engaged in the informal sector constituted, therefore, the bulk of the poor (EEA, Economic Focus, 1998).

Urban poverty features are aggravated, therefore, by increasing population pressure. The impact of population growth in urban areas includes inadequate social services provision, homelessness, unemployment, destitution and problem of environmental pollution. These features in turn can be summarized and seen in terms of income and capability dimensions of poverty.

4.3.2 Income poverty

Income is the most determining factor of well-being. However, it should be clear that monetary-based poverty lines are not enough to make conclusions about the extent of urban poverty (Mitlin, 2003). The concept of poverty, wellbeing or vulnerability is local, complex, diverse, dynamic, personal, and multidimensional. Still, there is no doubt that the linkage between income and poverty levels is quite strong. Income is usually approximated using expenditure level.

A major study by the government suggests that between the period 1995/96 to 1999/2000, poverty, based on consumption measure, increased in urban areas by about 11 percent (see Table 4.2 below). This finding is consistent with the findings of another study (Kedir and Mckey, 2004) which has used household survey information covering the period from 1994 to 1997. According to Kedir and Mckey, median consumption expenditure per adult in urban

areas declined for the total sample from 100.46 Ethiopian birr in 1994 to 73.4 birr in 1997. This decline was evident in all regions and time periods, but is particularly pronounced between 1994 and 1995 in the southern and northern cities. This contrasts with the expectation that this was a period of economic recovery.

Table 4. 2: Trends in absolute poverty and food poverty

A. Trends in poverty head count indices (Po)			
Location	**1995/96**	**1999/00**	**Percentage change**
Rural	47.0	45.0	-4.2
Urban	33.3	37.0	11.1
Total	45.5	44.2	-2.9
B. Trends in food poverty head count indices			
Rural	47	41	-12.6
Urban	32	47	43.7
Total	45	42	-6.7

Source: MoFED, Poverty Profile of Ethiopia, 2002, in UNDP (2004).

There are also a number of other small sample studies that have generated similar results. Dessalegn and Aklilu (2003), for example, indicated that urban poverty and unemployment have been growing at a disturbing rate in the last decade or so. Tesfaye (2004) also found that there was a 6 percentage decline in mean consumption per adult equivalent between 1994 and 2000 for urban Ethiopia.

As far as consistency of findings is concerned, it is instructive to consider the findings of Kedir and McKay (2004) and Bigsten et al (2003) regarding poverty trends in the mid 1990's. Both of these studies have used the same data set. Kedir and McKay's assertion of increased poverty is only partially supported by Bigsten et al (2003). Both studies have shown an increase in poverty between 1994 and 1995 but Bigsten et al (2003) indicated a decline in poverty from 1995 and 1997 while the opposite was advocated by Kedir and McKay (2004). Obviously, this is due to, *inter alai*, differences in the way the two studies make adjustments for regional price differentials, measurement of household welfare and definition of the poverty line (e.g. food vs. overall poverty) used.

Table 4. 3: Mean consumption per adult equivalent (in Birr)

	1994	2000	Change (%)
Urban Ethiopia	150.78	141.99	-0.058
Addis Ababa	148.90	144.88	-0.027
Awassa	162.30	187.77	0.157
Bahir Dar	169.10	134.22	-0.206
Dessie	151.04	113.63	-0.248
Dire Dawa	191.00	141.69	-0.258
Jimma	131.09	106.27	-0.189
Mekelle	109.31	154.19	0.411

Source: Tesfaye (2004): The Analysis of Urban Poverty in Ethiopia

There are also different poverty estimates for different parts of urban Ethiopia. The above table based on Tesfaye's (2004) analysis, using panel data collected by the Economics department of the AAU, has generated different results from the analysis made by MoFED based on the 1999/2000 household income, consumption and expenditure data. While both analyses confirm that poverty has generally increased in urban areas the level of changes in poverty incidence estimates across different towns made by the two studies is not consistent. See also Annex 4.1 that shows how the urban areas in the majority of the regions have been suffering in terms of decline in real expenditure per capita over the last few years.

Table 4. 4: Poverty levels in urban Ethiopia

Region	1994			2000		
	P_0	P_1	P_2	P_0	P_1	P_2
Urban Ethiopia	0.410	0.170	0.092	0.427	0.168	0.090
Addis Ababa	0.446	0.186	0.101	0.433	0.176	0.094
Awassa	0.479	0.224	0.135	0.258	0.100	0.054
Bahir Dar	0.303	0.111	0.058	0.411	0.127	0.059
Dessie	0.387	0.159	0.086	0.513	0.266	0.178
Dire Dawa	0.129	0.038	0.017	0.412	0.129	0.063
Jimma	0.424	0.158	0.079	0.523	0.204	0.108
Mekelle	0.505	0.230	0.138	0.356	0.104	0.050

Source: Tesfaye (2004): The Analysis of Urban Poverty in Ethiopia

4.3.3 Capability measures of poverty

According to Sen (1999), poverty must be seen as the deprivation of basic capabilities rather than merely as lowness of incomes, which is the standard criterion of identification of poverty. This does not, in any way, mean denial of the sensible view that low income is clearly one of the major causes of poverty, since lack of income can be the principal reason for a person's capability deprivation. What the capability perspective does in poverty analysis is to enhance the understanding of the nature and causes of poverty and deprivation by shifting primary attention away from means (income) to ends that people have reason to pursue, and correspondingly, to the freedoms to be able to satisfy these ends.

Poverty is, therefore, expressed in addition to lack of income by lack of essential human capabilities such as being literate, healthy and adequately nourished. Besides considerations of income, definition of poverty includes lack of access to basic education, health care, adequate nutrition, secure tenure, water and sanitation, as well as exclusion from relevant decision making processes.

Human poverty becomes a result of a whole set of intersecting inequalities -- social, political, and economic. The 1997 Human Development Report of the UNDP stresses this new concept of poverty which puts a great emphasis on assets, broadly defined: physical, financial, personal, social, political and environmental. From a human development perspective, poverty means, therefore, the denial of choices and opportunities for a tolerable life.

Based on this wide conceptualization of poverty, one of its dimensions we should stress is lack of access to adequate food and nutrition. It should be noted that many households in urban area suffer from perpetual food insecurity as shown by high prevalence of malnutrition which is especially devastating for children. In a chain reaction this will affect children’s physical stature and cognitive development which forces them to be trapped in a

poverty cycle for generations. This is a very important issue that needs to be addressed to tackle long-term, persistent chronic food poverty in the country.

Table 4. 5: Trends in real consumption expenditure and calorie-intake

Items	1995/96			1999/00			percent change over 1995/96		
	Rural	Urban	National	Rural	Urban	National	Rural	Urban	National
Real Food Expenditure Per Capita	577	790	607	609	631	612	5.55	-20.13	0.82
Real Food Expenditure Per Adult	697	947	732	774	767	773	11.05	-19.01	5.60
Kcal Consumed Per Day Per Adult	1938	2050	1954	2723	1861	2606	40.51	-9.22	33.37
Share of Food in total Expenditure	0.60	0.56	0.60	0.67	0.53	0.65	11.67	-5.36	8.33

Source: MoFED (2002) Poverty Profile of Ethiopia.

Indeed, poverty profile of Ethiopia prepared by the Government itself indicates how poverty situation in urban areas is deteriorating as captured in Table 4.5 above. Access to food has deteriorated in urban areas as measured by real food expenditure per capita and/ or adult, which also resulted into decline in Kcal consumption per day per adult[25].

Although empirical substantiation is required, there is observable evidence in urban areas of growing streetism, begging, and dietary change as more and more people have resorted to eating casual food such as 'kollo', banana and bread as their regular meal. It is also widely rumoured that an increasing number of people have simply began moonlighting lunch time, skipping any sort of meal.

[25] Note that in the same report, food poverty in urban areas has reportedly declined, which is in contrast with the decline in real food per capita expenditure. This indicates that we should be cautious in accepting the results of the study.

Worsening urban poverty is particularly captured in different qualitative assessments that were conducted by the Government and different civil society groups and researchers. Among these include the participatory poverty assessments that were conducted during the PRSP processes in 2001/02, women empowerment study by EEA/EEPRI in 2004 and the UNDP/DAG 2004 study of secondary cities.

Other capability dimensions of poverty relate to the performance of the social service sector. The social sector in Ethiopia has severely been constrained by poverty, underdevelopment and inappropriate policies. There have been serious limitations in the delivery and access to basic social services. While relatively urban areas have better access to these services, there are still, however, concerning and critical issues that need to be addressed. These are demonstrated below using the Addis Ababa case as an example.

Table 4. 6: Educational status in Addis Ababa

No.	Type of indicator	1994	1997	Remark
	Kindergarten			
1	Number	292	368	Coverage is still low
	Coverage	31.1%	31.8%	
	Primary School			
2	Number	310	367	The picture in slum areas is completely different from official statistics
	Enrolment (Gross)	105%	116%	
	Enrolment (Net)	87%	96%	
	Secondary School			
3	Number		78	The number of public schools is 22
	Technical & vocational	54	75	
	10+3 (college level)		70	

Source: Extracted from materials distributed at Addis Ababa SDPRP II consultation, Aug. 2005

The expansion of educational services in Addis Ababa, as is the case in most parts of the country, seems to be impressive. Increased involvement of the private sector in provision of educational services is the major driving factor. However, there are at least two concerning issues regarding this development. First, there is a widely held view that the quality of education is on the decline. Second, the indicators that emerge from slum areas of Addis Ababa depict quite a contrary picture.

Table 4. 7: Quality of education in Addis Ababa

No.	Type of indicator	1994	1997	Remark
1	Kindergarten			
	- Student/class ratio	34:1	32:1	
	- Qualified teachers	65%	83%	
2	Primary School			
	- Student/class ratio	63:1	58:1	The standard is 50:1
	- Qualified teachers (1-4)	94%	97%	
	- Qualified teachers (5-8)	72%	84%	
3	Secondary School			
	- Student/class ratio	82:1	70:1	The standard is 40:1
	- Qualified teachers	71%	82%	
	- Qualified teachers		36.7%	

Source: Extracted from materials distributed at Addis Ababa SDPRP II consultation, August 2005

Table 4.7 depicts some of the quality issues associated with educational expansion in Addis Ababa in recent period. While teachers below the standard qualification teach at all levels of education, the problem is grave in secondary education, where only 37 percent are qualified. Classrooms are also overcrowded at all levels of education. There is no doubt also that educational facilities are inadequate and teaching materials and text books are in great shortage as these are most common all over the country.

Although the city of Addis Ababa is growing rapidly, it still comprises of huge slum areas. There is severe homelessness problem as witnessed by tens of thousands of people living on the streets. Official statistics are likely, therefore, to overestimate basic services coverage as significant population is normally not captured through surveys and studies. For size of housing problem and associated deprivations, see Box 4 1.

Box 4. 1: Features * of a typical Slum Area in Addis - Housing

Housing

Houses totally unfit for human habitation	10%
Houses needing major and minor repairs…	79%
Houses rented from the government…….	75%
Houses with average rent below 20 birr….	72%
Houses with no potable water……..	60%
Houses with no latrines at all…….	26%
Houses with no kitchen at all…….	26%
Houses with latrines & kitchens built together….	38%

*Based on Dr. Jember Teferra (2004) paper in IHA-UDP area

The majority of houses in slum areas of the city are either unfit for human habitation and/ or require major or minor repairs. About three-quarters of the houses in these areas are also rented from the government at a very low price. Most houses also do not have potable water and more than a quarter do not have either a kitchen or a latrine.

While official statistics indicate that primary school enrolment rate in Addis Ababa is close to 100 percent, studies in slum areas of the city indicate, however, that a significant proportion of school age children are simply out of

school (see Box 4.2). Similarly, overall health service coverage and immunization coverage are estimated to be 73 percent and 95 percent respectively. However, it is quite striking that only less than 10 percent of the children are immunized and about 10 percent of children in these areas are repeatedly affected by acute health problems.

Table 4. 8: Health status in Addis Ababa

No.	Type of indicator	1997
1	Health service coverage	73%
2	Immunization coverage	95%
3	Assisted delivery	64%
4	Prenatal care	90%
5	Use of Family Planning	40%
6	Condoms distributed	16.5 million

Source: Extracted from materials distributed at Addis Ababa SDPRP II consultation, Aug. 2005

Box 4. 2: Features * of a typical Slum Area in Addis - Education & Health

Education & Health

- School age children with no schooling 25%
- School drop-out under 20 years old 18%
- Immunization coverage for under 5 <10%
- Repeated diarrhoea & vomiting infants 10%
- Repeated upper respiratory infections 9.6%

*Based on Dr. Jember Teferra (2004) paper in IHA-UDP area

4.3.4 Destitution

On income, services and infrastructure measure, urban centers may seem to be relatively well placed in the rank of all dwelling areas in the country. Yet, the worst form of poverty is likely to be found in these areas more than anywhere else. There is no gracefulness in poverty but the rural poor to some extent keep their dignity, self respect and peaceful consciences in contrast to the destitute in urban areas who are most likely forced to lose these values or state of mind.

The destitute commonly live in slum areas and comprise the most affected group from lack of basic services as indicated in boxes 1 and 2. They commonly face inadequate housing, infrastructure and severe sanitation problems. Apart from low levels of educational and health status for low income groups in urban areas, other distinct characteristics, according to Kedir and McKay (2004), include: high household dependency rates; lack of asset ownership; and insecure, low return or no employment. These in turn lead into homelessness, streetism and begging. The old aged and the disabled without regular own source of income are also categorized under this group.

Box 4. 3: Features * of a typical Slum Area in Addis - Economic

Economic

● Combined HH monthly income $20 or below	68%
● Women HHH with $6 monthly income	75%
● Adults with irregular employment	42%
● Old aged without income (begging)	10%
● The disabled with no organized support	10%

*Based on Dr. Jember Teferra (2004) paper in IHA-UDP area

The destitute comprise, therefore, the poorest of the poor who are severely deprived of not only basic services but also usually lack home, regular income and as such usually live on and from the streets in the rank of which are beggars, street children, orphans, old aged and the disabled. These groups are usually not captured through surveys and this explains why official statistics underestimate chronic poverty in urban areas.

The destitute also face the worst forms of poverty through human right abuse such as low payment and child labour, sexual exploitation, harassment, and psychological trauma which arises from lack of proper clothing, personal hygiene and sanitation facility. They are also tortured because they live amidst plenty in their surroundings.

4.4 Factors aggravating urban poverty

The causes of urban poverty should be made clear, so that most appropriate policies for reducing poverty can be determined. There are different causes of poverty that fall within the domains of social, political, natural, and economic spheres.

4.4.1 Shortage of income

A major capability problem afflicting the poor is poor purchasing capacity. This arises from shortage of income and lack of access to financial capital. Indeed there are various studies that have confirmed that the most important factors exacerbating urban poverty are unemployment and lack of income. This is manifested by high adult and youth unemployment, begging, homelessness, prostitution, streetism and high prevalence of HIV/AIDS.

In a Participatory Poverty Assessment conducted in Ethiopia (WMU, MoFED, 1997), communities in rural areas described wealth in terms of possession of livestock and land, while in urban areas, groups tended to define it primarily by occupation. So according to the communities, people in rural areas who have no land or cattle are poor people and people in urban areas who have no regular source of income are considered as poor people.

4.4.2 Capability problems

Poverty is expressed in addition to lack of income by lack of essential human capabilities such as being literate, healthy and adequately nourished. Hence, capability problems are manifested by more than just lack of income.

A remarkable correlation between poverty and level of education is, for example, observed in urban Ethiopia (Mekonnen, Bereket & Abebe 1998). The percentage of poor people significantly declines as the level of education of the household head increases. This is typically illustrated by the incidence of poverty among people who have never attended school which is 41.9 percent compared to people with college level or above education who have had no member to the poor population in the three survey periods.

Poor health, on the other hand, constitutes not only a consequence but also a cause of poverty. Poor people are usually faced with different sorts of health problems which affect their strength and vitality. Onset of sickness also erodes the financial capacity of the poor through additional expenditure they would incur to get treatment.

The poor in urban areas also face social exclusion, powerlessness, isolation and other dimensions of deprivation in the political, economic, social and cultural areas. Hence, they usually are less empowered and lack control over factors that determine their lives.

4.4.3 Lack of employment opportunities

Lack of employment opportunity is a major reason for low income situation of the majority of the population. Unemployment and underemployment are serious problems in Ethiopia. According to the March 1999 CSA national labour survey unemployment levels are 8.02 percent at the national level while it is 26.4 percent in urban and 5.14 percent in rural areas.

Level of unemployment including underemployment in urban areas is quite high and this definitely is associated with high level of urban poverty. Various factors can explain why unemployment level is generally high in urban areas. The primary reason is the fact that urban centers in Ethiopia have little economic dynamism and their economic base is largely services and trade. Hence, the absorptive capacity of these areas is limited, whereas they are characterized by high natural population growth and inflow of migrants from rural areas.

The problem with skilled labour unemployment to some extent relates to the fact that, since 1992, the Ethiopian government has stopped the automatic allocation of graduates of higher institutions of learning to employment. Hence, the unemployed in urban Ethiopia include a large section of well-educated persons. This is also due to the fact that most young adults who complete 12 years of schooling but fail to pursue their studies further become automatically unemployed. In any given year, there are around 190,000 of them – a figure rising over time (Kedir and McKey, 2004).

Underemployment, to some extent, has been also caused by increased casualisation of labour. When work is available, for many it is unstable, casual work paid on a daily basis. For instance, the proportion of urban households in certain communities in Addis Ababa engaged in casual work rose from below 5 percent in 1989/90 to 35 percent in 1995 (MEDAC, 1997 in Kedir and McKey, 2004). These are not necessarily under-employed at all

times in their working lives. The 5 percent for 1989/90 is surprisingly low but this figure pertains only to certain communities. However, the dramatic rise in the rate of casual work is indicative of the instability of income sources for majority of low income households which become vulnerable to further destitution as a result.

4.4.4 Rural to urban migration

The effects of poor performance of the agricultural sector indicate a growing rural-urban migration with concomitant urban problems associated with poor management, lack of infrastructure, inadequate service delivery and other typical dimensions of urban poverty. The effects of natural population growth and growing rural-urban migration have contributed, therefore, to the presence of poor level of urban infrastructure, inadequate social service delivery and weak urban management capacity.

4.4.5 Poor performance of town and city administrations

The general decline in the urban living condition has reportedly been caused by the poor performance of many municipalities in delivering urban social services and infrastructure to the residents. These include deplorable hygiene and sanitary conditions, acute problems of urban transport, inadequate public housing, limited access to clean water and electricity. Adequate urban management capacity and good urban governance are critical for efficient provision of services and facilities (Feleke, 2004). The problem to some extent is related to poor capacity and resource constraints faced by municipalities.

Wolday (2004) also mentions an important set of poverty correlates which often are responsible for poverty persistence. These include absence of the rule of law, lack of protection against violence, lack of civility and predictability in interaction with public officials. The last sets of determinants are key public sector failures to which the government should give special attention with some urgency.

4.4.6 Individual suppression and Isolation

Creative capacities of the people are suppressed due to social norms and values that undermine individual motivation and achievement. Communal similarity is upheld at the expense of individual advancement. Individuals who are highly motivated and make some advancement are normally ridiculed and discouraged.

Poverty is not just an absolute lack of the basic material needs. It is also exclusion from the goods, services, rights and activities, which constitute the basis of citizenship. So the eradication of poverty is inseparable from the promotion of social inclusion. As Sen emphasizes, freedom is a constitutive part of development as it is the instrument for development.

In Ethiopia, problems in this regard include:

- Poor political participation and failure to realize constitutional guarantees for a range of political freedoms;
- Poor political accountability and limited involvement by society in political decision making;
- Unhealthy political competition, with lack of free and fair elections; and
- Poor commitment to human rights and fundamental freedoms.

4.4.7 HIV/AIDS

The first evidence of HIV infection was found in 1984 and the first AIDS case was reported in 1986. HIV/AIDS prevalence was low in the 1980s, but increased quickly through the 1990s, and rose from an estimated 3.2 percent of the adult population in 1993 to 6.6 percent in 2002 (MoH, 2004).

According to Aklilu and Hailom (2003) the poor are at risk and are exposed to HIV infection more than any other group of people. They argue that poor people have less access to information and/or health services and their living conditions force them to practice risky behaviours to meet their daily needs. Similarly, they conclude that poor women engage in commercial sex while poor men leave their families in search of jobs and, in the process, get exposed to HIV/AIDS infection.

Hence, their findings suggest that the conditions that contribute to HIV/AIDS infection in Ethiopia revolve mostly, if not exclusively, around poverty. They conclude that poverty, indeed, is the major driving force behind the fast growth of HIV infection in the country. The Ethiopian people are at high risk of HIV/AIDS infection because the majority are poor, uneducated, and have little access to health services. There is no doubt, therefore, urban poverty is aggravated to some extent by the onset of this disease.

4.4.8 Macro-economic factors

Urban poverty is probably far more sensitive to macro-economic conditions than is rural poverty. This could be evidenced by a few cases of macro-economic changes. Growth is an essential ingredient of poverty reduction in the urban sector. Urban poverty elasticity, the percentage change in urban poverty per percent growth in per capita income, has been proved to be positive by various studies indicating that a positive change in income is very likely to bring about change in welfare. Hence, developing a sustainable strategy to produce rapid growth is a key component of a successful strategy to reduce urban poverty. Morley(1999) has found, for example, that based on a cross sectional studies of different countries in the world any country that manages to achieve per capita growth of 3 percent over a decade can expect to cut its urban poverty by half. Countries which succeed in making

that growth more labour intensive or more friendly to the poor could even make greater progress.

Recent experience in various parts of the world has also shown that inflation is a powerful regressive tax on the urban poor and that inflation control has an immediate positive impact on levels of poverty. Without undermining that possibility that low rates of inflation could have either positive or negative effects on the urban poor, there is an established positive relationship between the incidence of poverty and higher inflation rates.

The same could be said regarding the static and dynamic effects of inflationary trends. This could be illustrated by way of a case where a pro poor government intends to make huge spending beyond its disciplined ceiling and ultimately gets trapped into inflationary budget financing. This good intent of helping the poor could eventually harm them in several ways because in the first place usually the urban poor are heavily dependent on the minimum wage which means the real value of this minimum wage distressingly declines. Secondly, a natural response following such incidences is a contractionary inflation-control program which again potentially affects the poor negatively such as through the effects of a sudden fall in the rate of employment and a retrieve in the pro poor reform programs which were put in place with very good intent.

Another point to make here is the effect of rising minimum wages on urban poverty. Governments that attempted to reduce inflationary pressure tended to hold or delay adjustments in the minimum wage. Raising the minimum wage has three effects: it raises the income of those who keep their jobs and this should help the poor. But at the same time, raising the wage level may have a negative employment effect. Because of the higher labor cost, employment may shrink, or expand less than it might have otherwise, and that will hurt the poor. Some unskilled workers could be forced into the

informal sector which is the safest place for most of the urban poor but with declining income earning capacity. What finally happens to the income of the poor or to poverty level depends on which of these two effects dominates - employment or income. Raising the minimum wage can also have a positive effect on aggregate demand because it raises the income of those whose effective purchasing power has been limited by income shortage. Hence, the relationship between the minimum wage and urban poverty differs from case to case depending on the specific context. As a result, varying empirical findings have been obtained in different countries making it difficult to make an all inclusive generalization.

Another crucial macro-economic issue is the effect of changes in exchange rate régimes on the incidence of urban poverty. In a simple analysis the effect depends on the sector of production and the type of products and services that the poor consume. For instance if the poor are primarily producers of traded goods such as manufactured or agricultural commodities, they will be hurt by appreciations of the real exchange rate. In contrast, if the urban poor work primarily in non-tradables such as construction and services, they will gain from currency appreciation. That is because an appreciation of the real exchange rate implies a rise in the relative price of non-tradable, and with it, a rise in the real incomes of everyone who works in the non-tradable sectors.

The urban poor are also affected as consumers by the real exchange rate. If traded goods are an important component of their consumption, they are hurt by depreciations and helped by appreciations of the real exchange rate. It is likely that in most countries, the urban poor are primarily producers of non-traded goods and consumers of traded goods. If that is the case, they will tend to be hurt by real devaluations.

While the relationship between level of income and poverty is straightforward at household level, there are cases, however, which make this relationship not so

obvious at country level due to distributional factors. This is so because change in poverty can arise for two reasons: a change due to growth in mean consumption expenditure and a change in the distribution of income. These are captured in the literature of economics as the growth effect and the distribution effect of change in income level on poverty. While the importance of economic growth to poverty reduction is hardly questionable, the most important question is what pattern of economic growth is essential for poverty reduction.

To a large extent, increasing employment opportunities for the poor is the key to reducing poverty. That is why sustainable, rapid growth has to be a key element in any strategy to reduce poverty. But the issue doesn't stop there; rather the composition of aggregate demand matters too. Growth has to come much from the labour intensive options rather than capital intensive ones. If growth is led by a choice of labour intensive particularly allowing the participation of the unskilled labour force then the spillover on the reduction of urban poverty is of great importance. A good example in this regard is the construction sector. Construction works usually consume higher proportion of unskilled labour and help the generation of incomes. The impacts and outcomes of most construction works such as housing, roads, educational and health facilities on the urban poor even after their completion is definitely positive.

Governments could intensify such projects in a number of ways. One way is through the adoption of tight fiscal policy which will raise the private construction component of aggregate demand. It could also be achieved through raising government expenditure component which either serves as an inducement for the private ones to expedite their construction activities or which in itself could serve the objective. As stated above the potential danger of the latter option is that it could end up being inflationary ultimately hurting the poor.

4.5 A synopsis of current interventions to address the problem

Despite the prevalence of high urban poverty levels in Ethiopia, existing development policies and planning frameworks remain rural centred with limited opportunity for the potential of urbanization to materialize and thereby contribute to socio-economic development. Specifically, the focus on the Agricultural Development-Led Industrialization (ADLI) policy as the key to poverty reduction may be viewed as insufficient to address the growing impact of urbanization both in terms of risks/problems and opportunities. This approach has not been rectified in the SDPRP formulation, which makes only minimal reference to urbanization and urban poverty problems.

However, simply put, rural and urban development should go hand in hand to bring about positive economic transformation. In other words, currently the synergy between simultaneous urban and rural growth is not well recognized and maximized.

Although insufficient, there are signs that the government is slowly acknowledging the urgency of urban poverty problem if not outright acceptance of the potential of urbanization to bring about sustainable development. These are discernable in some initiatives such as Capacity Building for Decentralized Service Delivery (CBDSD) and the setting up of Municipal Development Fund (MDF) and the Community Action Fund (CAF). Notable progress in improving the legal framework of urban governance is also witnessed. The government has taken measures to strengthen the legal identity of cities and towns as well as capacity building and human resource development for decentralized administrations, improved revenue collection and resource allocation through policy manuals, guidelines and procedures.

4.5.1 Micro level interventions

One of the most crucial interventions to address urban poverty is the promotion of access to financial capital. Existing empirical evidence indicates that lack of access to credit is found to be one of the causes of poverty and its perpetuation. Wolday (2004) argues that microfinance services have increased income, social services of households and improved conditions of women clients. This reaffirmed the existing expectation in relation to MFIs (i.e. the institutions play a role in reaching vulnerable society members such as women and those who are more likely to be poor). Savings and credit cooperatives currently operating in Ethiopia are mainly urban-based and about 53 percent of them are based in Addis Ababa. These cooperatives have 156,938 members and mobilized 174.6 million ETB financial capital.

According to Wolday, challenges that need to be addressed to tackle poverty include: a) limited support to micro and small enterprise development; b) difficulties in addressing the financial needs of the poorest of the poor; c) lack of loanable funds; d) weak legal system *(although in the study it is also pointed out that the MFIs in Ethiopia are reaching the poor partly due to the presence of a favourable legal and policy environment)* e)poor infrastructure; f) HIV/AIDS; g) lack of capacity of the National Bank of Ethiopia. Microfinance alone cannot, however, solve the country's poverty problem. Other complimentary policies such as health, education and water supply expansion should be implemented to fight persistent poverty.

While the focus of the public investment program in expanding basic services in the past decade has been to rural areas, urban centers have also benefited from increased public expenditure on such services and particularly from the expansion of private sector investment in these areas. Quite a large number of private educational institutions and clinics including university colleges and hospitals have become operational in major urban centers.

While, no doubt, those that benefit from these institutions are primarily from the well-to-do segments of the society, they are likely to contribute to low income groups through provision of employment opportunities, relieving the burden on public institutions and fee exemption system that is adapted by some visionary private investors.

4.5.2 HIV/AIDS interventions

In the past few years, the government has tried to address some of the challenges posed by HIV/AIDS through instituting HIV/AIDS policies, strategies and programs. A National Task Force on HIV/AIDS was established by the government in 1985. Following that between 1987 and 1989, two medium-term prevention and control programs were designed and implemented focusing on IEC, condom promotion, surveillance, patient care and HIV screening laboratories at different health service delivery posts.

The National HIV/AIDS Policy was issued by the government in 1988. The policy focused on creating a favourable environment and a comprehensive approach to prevent and control HIV/AIDS.

In the year 2000, the National HIV/AIDS Council (which has since become HIV/AIDS Prevention and Control Office, HAPCO) was established with the objective of overseeing and evaluating the implementation of federal and regional HIV/AIDS policies and programs. The Council has also issued a five-year (2001-2005) strategic framework for the national response to HIV/AIDS in Ethiopia (NAC, 2001) as well as HIV/AIDS drug policy which aims at making retroviral drugs available in the country at affordable prices. HAPCO was initially organized under the Prime Minister's Office, which provided it with high profile and capacity to coordinate the involvement of various sectors in HIV/AIDS prevention and control activities. However, the office has recently been restructured and put under the Ministry of Health thereby

undermining the capacity to address the problem based on multi-sectoral approach and high level institutional support.

4.5.3 NGOs' programs

For a long period, a large number of NGOs have been implementing urban poverty reduction programmes targeting the poor, particularly women, children, the disabled and the old aged. Such programs usually focus on capacity building, rehabilitation and service delivery, including income generation, credit, skills training, education, health, sanitation and infrastructure development (housing and access road construction).

Accessing capital through credit and skills training is the most important NGO approach targeting the poor, particularly women and the unemployed youth as it allows them to initiate small income generating activities. A number of savings and credit cooperatives and micro-finance institutions owned by the poor have been established by NGOs. In urban settings, the income-raising programs of NGOs can be generalized as micro and small enterprise development, emphasizing skill development, appropriate technology, micro-finance, business management training and market development.

NGOs pursue strategies that reach and mobilize the poor at household level. However, their poverty reduction effort is a drop in the ocean when compared to the magnitude of urban poverty. Experience so far shows that NGOs' efforts should be complemented with strong government commitment and increased participation of the poor. It is also unacceptable that a large number of NGOs exist in urban areas while the problem of destitution is growing from time to time. NGOs should collaboratively address, at least, disturbing misery that is observable along the streets of urban centers in Ethiopia.

4.6 Outstanding policy and research issues

Many scholars accept that rapid urban growth in the less developed world is inevitable in the future, but do not accept the predictions of its dire consequences. This more optimistic perspective maintains that any urban area with good management capabilities can absorb large population increments without diminishing human welfare or the quality of the environment. The key to success is a commitment to adopt policies that, among other things, maintain infrastructure, increase productivity of the labour force, and alleviate poverty (Rabinovitch, 1997).

According to the 1997 HDR of the UNDP to eradicate poverty, capabilities of the poor should be strengthened so that they can better cope with adversity such as disease, economic shock, natural disaster, conflict, or discrimination. In the longer term they should help the poor build resistance and resilience, to seize opportunities for escape.

A multi-pronged policy approach is likely needed, therefore, to address the problems of poverty considering the numerous issues raised in this chapter. These include, among others, improving health outcomes, delivery of financial services, empowering the poor, addressing vulnerability/risk/insecurity, creating employment, transforming institutions, and improving economic infrastructure.

There is a need to clearly understand what helps individuals, households and settlements move out of chronic urban poverty. For some individuals their experience of poverty is one of persistent or chronic deprivation, while others may move in and out of poverty over time depending on changes in their circumstances or environment; in other words their poverty is transitory in nature. This distinction between chronic and transitory poverty is important because the policy responses are likely to be different.

Policy responses for chronic and transitory poverty are likely to be different. Therefore, distinguishing between the two types of poverty is crucial. However, studies of poverty dynamics in urban areas are relatively rare. Hence, research and studies on urban poverty need to be encouraged not only by government institutions but also by professional associations and NGOs.

The link between macro-policies and their micro-impacts is an important area of poverty research in recent years. The analysis of such link has been a challenge for researchers and it is a complex link to identify. For instance, the evidence about impact of trade liberalisation policies on poverty and employment patterns in developing countries is inconclusive as impacts on poverty vary from country to country and from sector to sector within countries. It is not clear either what channels are responsible to transmit the macro-policy changes to the household/individual level (Winters, in McKay and Kedir, 2004). Research on this link has to be one of the areas of future poverty research focus in Ethiopia because the country is not immune to globalisation issues such as trade liberalisation. For instance, without going into much detail Dessalegn and Aklilu (2003) linked growing insecurity in urban areas to globalisation which led to price volatility and market instability.

A further gap is the lack of information on the extent and nature of urban poverty in the smaller towns and cities in Ethiopia. The research work to date has been in Addis and the secondary cities such as Bahir Dar, Jimma, Mekelle and Awassa. Hence, studies need to be undertaken on the dynamics of small towns especially focusing on the linkage and interrelationship they have with the surrounding rural areas and agriculture.

It could be useful to look at the impact of participation in micro-finance institutions on poverty incidence or persistence. It could also be possible to investigate the saving/debt behaviour of households with different levels of

income and derive some policy relevant conclusions. For instance, providing quantitative evidence on the extent of credit constraints and volume of saving and its relationship to chronic poverty will be a substantial input to the existing debate on poverty persistence in the country (Wolday, 2004).

In terms of an overall intervention approach, the government should make poverty reduction a component of city development strategy, and urban development a component of the overall development strategy. As Jean Marie Cour (EEA/EEPRI, 2003) puts it high urbanization scenario is a positive process which generates division of labour, innovation and trade growth, opens up each local area to the market economy and increases the capacity of the country to diversify and expand its exports.

A broad range of actors needs to be involved to reduce poverty and bring about sustained urban development, with government focusing on creating an enabling environment to enhance popular participation and designing a comprehensive urban development policy and other policies that impact on poverty. An urban governance system should be instituted that includes local government, voluntary and community organizations, professional and trade associations, private sector and NGOs involved in providing services to urban communities.

NGOs, the business community and community-based organizations should be mobilized to help the destitute and curve the problem of begging, streetism, etc. and change the lives of the poorest of the poor including street children, orphans and the disabled. Mechanisms should be devised to change the lives of significant people that reside and earn their living on the streets of major urban centers.

Various centers around and/or within urban centers should be established, run and managed by NGOs, business community and CBOs to

accommodate the destitute and engage those that can work in productive activities and cater the children, disabled and the old aged. An office that administers such a program can be established and run by the mentioned development actors. The government should support such initiative by facilitating licensing, allocation of land and easy bureaucratic facilitation.

The development of the informal sector should be promoted by extending support for gradual integration with the formal economy, availing credit, marketing and social support services including protection, accreditation and licensing.

Labour market/ employment interventions are also necessary by supporting small and micro-enterprises through alleviating their constraints such as licensing, regulations, tax, and so on. They should also be supported through advisory services as well as infrastructure access and taxation that should be simple and creates small burden. Additional measures include facilitating access to job opportunities and training by providing better and affordable transport service to low income settlements, facilitating flow of information on jobs and markets for products; facilitating practical job training; and supporting sectors that have high employment generation capacities and implementation of public works programs.

Land and infrastructure development regulations should have strong poverty reduction component by considering and addressing the needs of the poor. In this respect, ensuring tenure security and property rights not only benefits the poor but also comprises a key ingredient for successful business activities.

Care and support for people living with HIV/AIDS and/or widows and orphans of HIV victims and their families is far from sufficient. Programs that target vulnerable populations including commercial sex workers, the unemployed

youth, displaced people, street children etc. are also inadequate. Hence, government action on HIV/AIDS prevention should be more aggressive and aimed at maximizing the benefits out of local and external resource made available for this purpose.

To conclude, Ethiopia should pursue a comprehensive approach to development that considers all sectors and areas of the country at the same time. The urban or the industrial sector cannot be left unattended until sustainable growth is achieved in rural or agriculture sector since the latter is also dependent on growth of the former. A comprehensive view about development leads to recognition of linkages among the different sectors of the economy and promotion of interdependent and complementary development processes. This approach also ensures that the needs of all categories of socio-economic groups and poor people are addressed regardless of where they are.

To provide context and framework, the government should consider developing an urban development policy that is multi-sectoral in nature and addresses all facets of urban problems and potentials. If urbanization is to contribute to the development of the rural economy, Berhanu (EEA/EEPRI, 2003) argues that the urbanization strategy ought to concentrate on the secondary cities and the smaller rural towns rather than on the primate city to serve as growth centers for the surrounding areas. The policy should be linked with the overall development strategy and geared to promoting rural development through enhanced rural-urban linkages and complementary development.

PART TWO

TRANSFORMATION OF THE ETHIOPIAN AGRICULTURE: POTENTIALS, CONSTRAINTS AND SUGGESTED INTERVENTION MEASURES

Introduction to Part Two

Part II of this report discusses about the need for transformation of the Ethiopian agriculture. The objective of this part is to provide bases for dialogue for policy and strategy direction towards transforming the agricultural. It begins with a brief highlight of the existing role of the agricultural sector in the national economy, the current performances of the production, marketing and trade activities in the different sub-sectors. An assessment of the resource bases, potentials and constraints, review of past and current development policies and strategies, the institutional environment and service delivery of the supportive systems in technology generation and dissemination, input and output marketing are discussed in the subsequent chapters – chapter five, six, seven, eight and nine, respectively. Chapter ten introduces the concept of agricultural transformation and provides the strategic options and packages of the elements of transformation, and what should be done towards this goal. Policy and strategy recommendations are forwarded.

Chapter 5

The Role and Performance of Ethiopian Agriculture

5.1 Agriculture and the Ethiopian economy

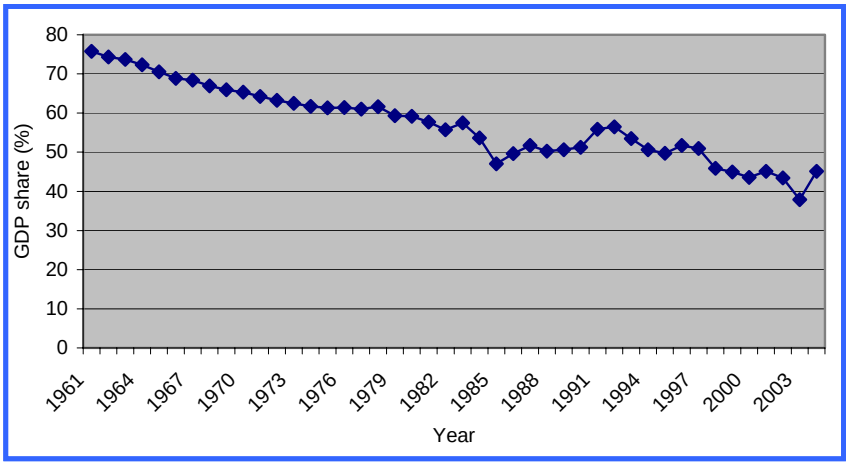
As in many less developed agrarian economies, the Ethiopian economy heavily depends on the agricultural sector. The sector contributes the largest share to the GDP, export trade and earnings, and employment. To some extent the sector also produces raw materials for the industrial sector. Despite such big socio-economic importance, due to many natural and man-made factors, the performance of the Ethiopian agriculture is very low by any standard. The low performance of the sector is reflected, among many other indicators, in the low level of land and labour productivity. A high level of food-self sufficiency gap at the national level and food insecurity at the household level has been the challenge the country has been facing for decades.

5.1.1 Contribution of agriculture to GDP and government revenue

Over the last four decades the share of agriculture and allies (forestry and fisheries) in the national GDP has been declining from time to time. The percentage share declined from 76 percent in the early 1960s to 45 percent in the year 2003/04, (Figure 5.1). Agricultural GDP increased only slowly in the past decade. Between 1992/93 and 2002/03, agricultural growth averaged about 1.5 percent per year, with sharp variations in between, increasing up to 15 percent in a particular good year and declining by as much as 12 percent in a drought year like

2002/03. Excluding the drought year of 2002/03, the average growth rate would have reached 2.3 percent per year, still less than the population growth rate.

Figure 5. 1: The share of agriculture and its allies in the total economy



Source: computed based on MoFED's database.

The annual growth rate of the agricultural GDP was also fluctuating from year to year. For instance, between 1999/2000 and 2003/2004, annual agricultural GDP growth rate has been negative in two years while it was positive during the other three years (Table 5.1) Consequently, agriculture has been the major source of the erratic performance of the Ethiopian economy. Major fluctuations in the national GDP follow from agriculture's poor performance often associated with frequent droughts[26]. Despite pressing needs for irrigation, Ethiopia irrigates only 3 percent of its farmland from the potential 3.7 million hectares of irrigable land.

[26] Excluding the purely pastoralist areas, more than 90 Woredas with over 2 million households in the country are drought prone and are regularly hit by severe water shortages (OCHA, 2003).

Table 5. 1: The performance of the agricultural sector and its contribution to GDP growth

Year	GDP at 1980/81 factor cost		Share of agriculture and allied activities in GDP		Agriculture's growth rate and its contribution to GDP	
1999/00	16,112.3	5.3	7024.9	43.6	2.2%	18.5%
2000/01	17,354.4	7.7	7826.8	45.1	11.4%	64.9%
2001/02	17,567.0	1.2	7588.9	43.2	-3.0%	-111.9%
2002/03	16,904.0	-3.8	6663.0	39.4	-12.2%	-139.7%
2003/04	18,900.9	11.6	8254.3	45.1	23.9%	79.7%

Source: Computed based on data obtained from NBE, 2001/2002 Annual Report and EEA's database.

In the year 2003/04, agricultural GDP per capita, per agricultural person and household was only Birr 138, 308 and 678 respectively (Table 5.2). During the five years period covering 1999/2000 to 2003/2004, total agricultural GDP increased by 15 percent. But, per capita agricultural GDP increased by 7 birr only. Earnings per agricultural person and farm household did not change much. The data clearly demonstrates that Ethiopian agriculture generates only a meagre amount of surplus and contributes much less than the expected contribution to the overall economy. Statistical data indicate that the sector is largely a non-monetized system and structurally in deep crises. Among the basic prerequisites for agricultural transformation is to have farmers produce sufficiently high above their subsistence requirement, and sustainably improve their income and living standard.

The performance of the Ethiopian agriculture has not been encouraging when one looks in terms of long-term performance indicators. For instance, analysis of the per capita income in agriculture over the last four decades (1953 – 1995) shows that per capita income declined by over 45 percent compared to its level in the early 1950s (Figure 5.2). The dwindling per capita

income of the population that is dependent on agriculture from time to time is one of the strong signals that justify the need for transforming the Ethiopian agriculture. Despite the growing and deepening problems of the sector, no fundamental change of a desired magnitude could be brought about after four to five decades of agricultural research and extension program activities in the country.

Table 5. 2: Agricultural GDP on per capita basis and agricultural households

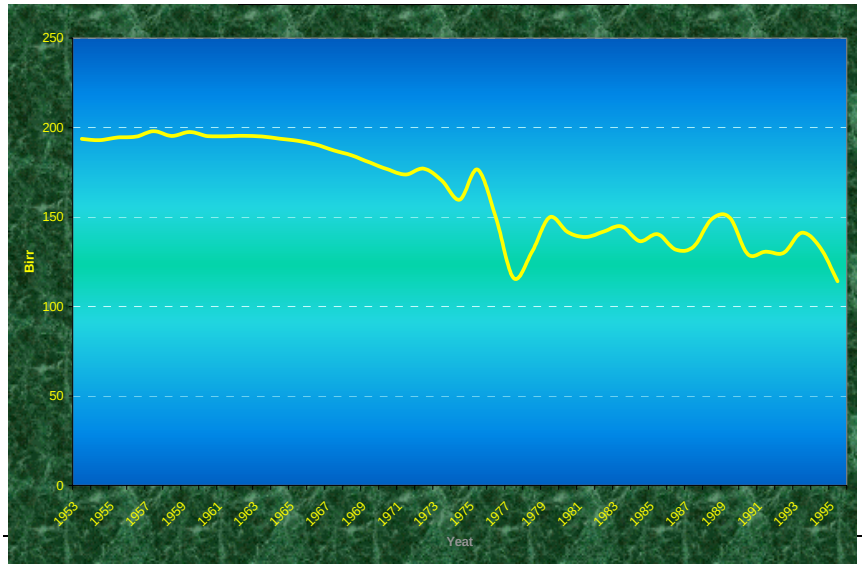
Year	Total GDP (million Birr)	Agricultural GDP (Birr)				Agricultural and rural population[27] (million)			
		Per Capita	working age population	Per agricultural person	Per household	Estimated	Working age	Engaged in agriculture	Agriculture households
1999/00	7024.9	130.00	250.88	294.18	654.09	54.04	28.00	23.88	10.74
2000/01	7826.8	141.28	271.74	318.68	701.33	55.40	28.80	24.56	11.16
2001/02	7588.9	133.33	254.66	298.66	659.33	56.92	29.80	25.41	11.51
2002/03	6663.0	114.13	218.17	255.88	562.75	58.38	30.54	26.04	11.84
2003/04	8254.3	137.82	262.88	308.23	678.25	59.89	31.40	26.78	12.17

Source: Computed based on data obtained from CSA and NBE.

Land and labour productivity growth in agriculture is necessary to enable agricultural income to rise faster than population growth. The current level of labour productivity is estimated to be less than one-fifth of the average for Sub-Saharan Africa. Given that the rural population in Ethiopia is still increasing at a rate of close to 3 percent per year, there is a need for sustained agricultural growth of at least 5-6 percent per year to significantly raise rural incomes.

[27] Total number of population engaged in agriculture is computed based on the 2001/02 CSA data which shows 85.28% of rural working age population was engaged in agriculture. Total number of households engaged in agriculture 2002/03 and 2003/04 was computed based on the trend between 1997/98 and 2001/02.

Figure 5. 2: Trends in per capita income of the agrarian society in Ethiopia during the last 40 years



Source: Berhanu (2003).

Empirical evidence elsewhere shows that industrial and general economic growth is preceded by agricultural growth or occurs simultaneously with agricultural growth, usually financed through resources extracted from the agricultural sector. This surplus extraction could occur directly through7 agricultural land tax, income or export tax, or indirectly through low agricultural terms of trade or quota delivery of basic farm products.

Government revenue from agricultural income tax varies in recent years, excluding the 2002/03 drought year, between 100 and 138 million Birr, which is only 10 to 13 Birr per agricultural household (Table 5.3). Agricultural export tax has been removed since 2002 to encourage export trade. Generally, agriculture's contribution to government direct revenue in the past four years

is on the average only 3 percent, which is too little and shows how Ethiopian agriculture is weak in terms of surplus generation. Indirect surplus extraction from agriculture in terms of the supply of cheap food is also low. The sector is dominated by subsistence farmers who produce largely for their own consumption, and contribute very little for the market and development of the economy.

Table 5. 3: Direct government revenue from agriculture

Year	Overall government direct income from agriculture		Government income from agriculture by source					
			Agricultural income tax		Rural land use fee		Agricultural export tax[28]	
	Total (million Birr)	Share of taxes (%)	Total (million Birr)	Per agri-cultural household (Birr)	Total (million Birr)	Per agri-cultural household (Birr)	Total (million Birr)	Per 1000 kg of exported products
1997/98	363.0	6.89	102.0	10.98	97.8	10.53	163.2	648.6
1998/99	361.0	6.46	113.1	12.15	108.4	11.64	139.8	616.1
1999/00	363.0	5.60	117.9	10.98	111.3	10.36	133.4	535.7
2000/01	320.0	4.30	119.9	10.74	116.2	10.41	84.0	299.8
2001/02	268.2	3.42	130.0	12.72	113.0	11.06	25.2	62.4
2002/03	160.9	1.95	72.0	NA	88.0	NA	0.9	0.0
2003/04	252.0	2.41	138.0	13.26	114.0	10.95	0.0	0.0

Source: CSA, Statistical Abstracts (2004 and 2002).

5.1.2 Contribution of agriculture to trade and export earnings

In 2003/04, the country has earned 5.17 billion Birr in foreign currency from its export trade. Agricultural export accounted for 82.2 percent of this income, while 37.3 and 2.7 percent of the income generated from the export of coffee

[28] From total export tax, 10% was deducted to account for the export of non-agricultural commodities.

and semi-processed agricultural commodities, respectively. Most of the export products are raw products, while few are semi-processed agricultural products. The major unprocessed agricultural export commodities include coffee, oilseeds, pulses, fruits and vegetables, *Chat* and live animals; while leather and leather products, meat, and sugar constitute the major semi-processed export commodities. With the exception of flower which has recently joined the list of export commodities, the structure of Ethiopia's export trade had remained unchanged for decades.

The share of processed agricultural products in export earnings is less than 3 percent, and shows how poor the performance of the country's export sector is in terms of processing and adding value to its primary commodities. Between 1992/93 and 2003/2004, the volume of export of coffee increased by more than double. Similarly, there has been a significant increase in the volume of oil crops, pulses and vegetables. On the other hand, the volume of export of live animals, and semi-processed products (leather and leather product meat, sugar and molasses) did not change much (Table 5.4). Compared to the 1993/94 level, coffee, pulses, Chat and meat export has increased by 226 percent, 745 percent, 491 percent and 8000 percent, respectively, in the year 2003/2004. The increase in volume of non-coffee export products might have been a reaction/adjustment to the unfavourable coffee market that occurred in recent years. However, there is no corresponding increase in the prices of these commodities.

Towards the mid 1990s world market coffee price was relatively attractive. Price has significantly declined after reaching its maximum in 1996/97 and 1997/98. Between 1997/98 and 2003/04, Ethiopian coffee has lost 49 percent of its value. Except for chat, fruits and vegetables which fetch a higher price, price for other unprocessed exported items, either fluctuates or declined slightly.

Table 5. 4: Volume of exported agricultural commodities by (millions of kg)

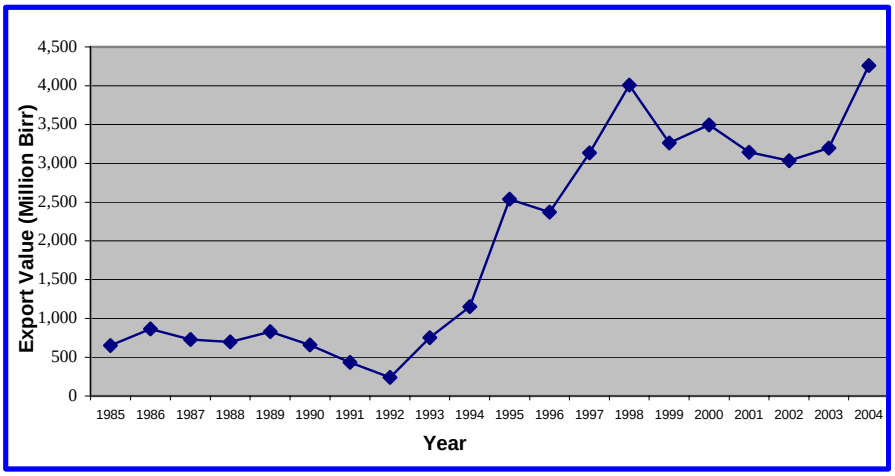
Year	Unprocessed commodities					Semi-processed commodities			
	Coffee	Oil Crops	Pulses	Fruits and Vegetables	Chat	Live animals	Leather and Leather products[29]	Meat, canned and frozen	Sugar and Molasses
1992/93	67.38	0.39	1.53	6.05	1.94	0.31	5.57	0.04	13.12
1993/94	69.16	10.19	9.84	15.89	2.81	2.41	7.81	0.05	15.21
1994/95	82.2	12.13	25.78	19.49	4.07	0.77	8.39	0.44	0.01
1995/96	97.6	7.83	28.97	19.00	3.71	0.18	7.55	0.95	0.00
1996/97	123.2	14.07	30.47	21.83	5.03	1.31	8.65	1.72	13.15
1997/98	120.1	66.50	30.91	17.00	6.00	1.3	7.9	1.90	0.00
1998/99	101.2	51.40	29.80	19.40	9.70	0.9	5.8	2.10	6.60
1999/00	116.6	43.10	23.50	20.70	15.70	1.8	8.6	2.00	17.00
2000/01	99.0	55.00	27.00	17.00	11.90	0.3	12.1	0.90	57.00
2001/02	110.1	76.70	109.20	30.00	9.00	0.165	10.3	0.60	58.00
2002/03	126.1	82.80	66.20	25.30	11.00	0.61	10.5	1.70	77.00
2003/04	156.4	105.90	73.30	36.6	13.80	3.1	9.4	4.00	16.00

Source: Computed from the NBE's various Annual Reports.

Export value of agricultural commodities significantly increased after 1994, partly reflecting the change in the exchange rate (or the devaluation of Ethiopian Birr). The value started declining after reaching a peak level in 1998. It has reached another high level in 2004 after successive declines from 1999 to 2003 (Figure 5.3).

[29] Data from the NBE don't differentiate between processed hides and skins (i.e. leather and leather products) and unprocessed hides and skins, which will have different implications in measuring the progress in diversifying and adding value to exported primary commodities.

Figure 5. 3: Export value of agricultural commodities (1985 –2004)

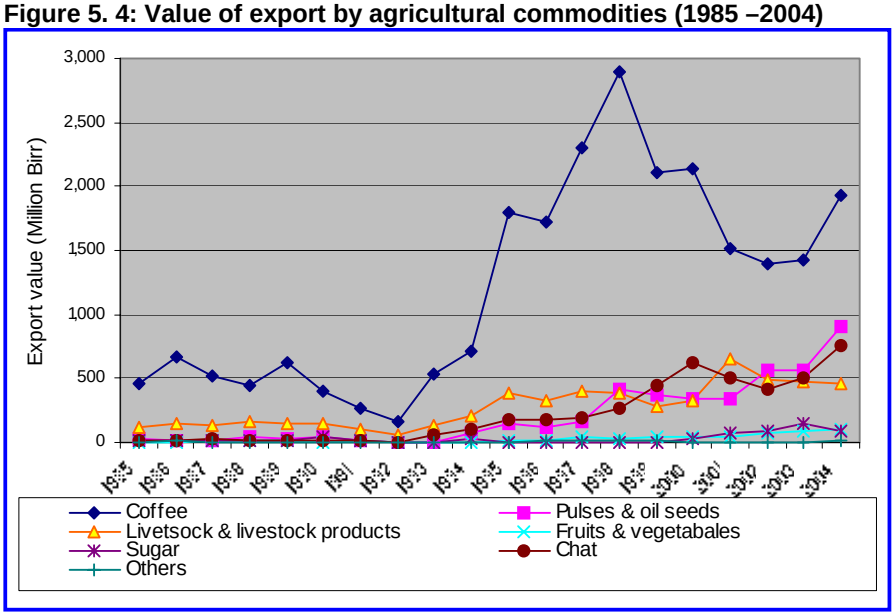


Source: Computed from the NBE's various Annual Reports.

Although the export value has been fluctuating from year to year for all commodities, hides and skins and chat, to a lesser extent pulses and oil seeds contributed to the rise in the value of export earnings after mid 1990s (Figure 5.4). Compared to other commodities, pulses and vegetables took the smallest share in the value of export earnings. The Export value from coffee has been increasing between 1994 and 1999. After 1999 it started declining due to the unfavorable world coffee market.

In general improvements in the volume of export commodities is the main factor that improved slightly the foreign exchange earnings from agricultural commodities. The positive trend in coffee earnings since the macro-economic reforms of the early 1990s is mainly due to an increase in the volume of exports rather than a gain in price.

Figure 5. 4: Value of export by agricultural commodities (1985 –2004)



Source: Computed from the NBE's various Annual Reports.

5.1.2.1 Export of cereals

Ethiopia has been an importer of food grains either commercially or as food aid. It has also exported some cereals intermittently[30] (see Annex Table 5.1). Compared to the volume of commercial grain import, the amount of export is insignificant. According to one recent study (McMillan et al, 2003), there exists a possibility for sustainable production and export of cereals in Ethiopia. The study has identified the following factors that stand out as unique to Ethiopia, relative to other maize and wheat exporting countries. The

[30] Ethiopia was an exporter of maize during the first half of the 1960s. Following a record level of exports of 2,400 metric tons of maize in 1965, however, the country began importing maize, and has generally continued on this path ever since (Macmillan, 2003).

first notable feature is the extremely small land area per worker. The only larger exporter with a similar small farm size is China. However, compared to China, Ethiopian farms get much less moisture; have poorer soil quality and less market access. The second difference between Ethiopia and other producers is the very low yields in Ethiopia.

At the moment, Ethiopia does not have a comparative advantage in cereals production and export due to low yields and a high transport cost. Thus, in order for Ethiopia to profitably export maize, a level of exportable surplus needs to be attained on a more consistent basis and costs of production and transport need to be decreased. One solution towards improving Ethiopia's comparative advantage in cereals production may be to get other – low-rainfall, non-irrigated – areas to specialize in less moisture-intensive crops such as oilseeds, cotton and livestock production.

Nevertheless, despite some problems like unfair competition from some major exporting countries and lack of competitiveness of domestic production and marketing of maize, export possibilities for maize to countries surrounding Ethiopia is quite attractive. Jordan, Saudi Arabia and Yemen import a great deal of maize each year, and pay prices that are approximately 35 percent higher (after accounting for marketing costs) than Ethiopian domestic prices. Further, Djibouti, Egypt, Kenya, Rwanda, Somalia and Uganda also offer promising markets for either direct import of Ethiopian maize or indirect receipt of maize through food aid transfers purchased in Ethiopia by international relief organizations. Though some of these countries are nearly self-sufficient in maize production during years of good weather, they can still import Ethiopian products during poor harvest seasons.

5.1.2.2 Export of horticultural crops and floriculture

The contribution of horticulture to Ethiopia's export earnings is negligible – the share of horticultural products in the total exports between 1994 and 2001

was 6 percent in quantity and less than 2 percent in value. Furthermore, horticulture is one of the most underdeveloped economic sub-sectors in Ethiopia. However, it remains a potential resource for the country, capable of acting as a backup for farmers who grow other crops. The potential for Ethiopian horticultural exports to supplement the European off-season market is very high. The country has many attributes favorable to horticultural crop production, including fertile areas in close proximity to Addis Ababa airport, a variety of altitudes and micro-climates, year-round production possibilities, low labor costs, and access to potentially irrigable land resources. All of these factors enable a wide range of fruit and vegetables to be grown at low cost.

Currently, the major producers of horticultural products are smallholders. Vegetables comprise the major share of production. There is a large price advantage attached to the export of organic products. Before this can happen, however, growers need knowledge of dealing with organic farming.[31] Such farming is generally more labor intensive and requires a high level of management attention in order to avoid contamination and pests.

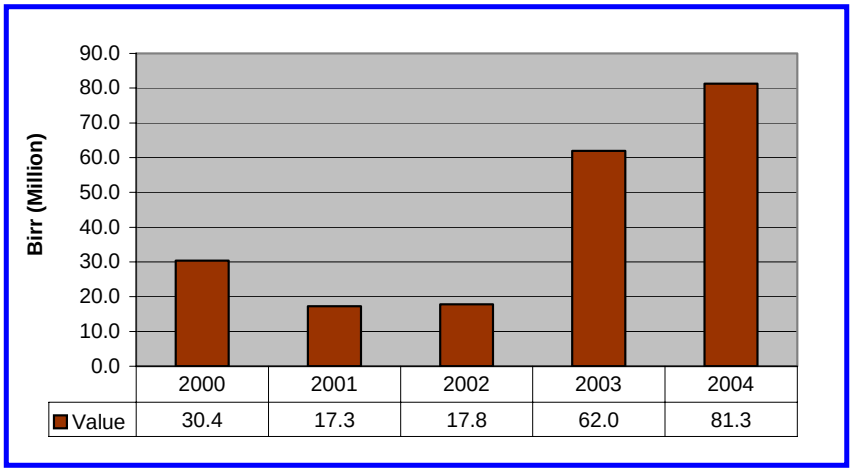
Among the major recognized constraints to expansion of horticultural crops is the lack of efficient media and communication that supports producers and marketers. There is no well-developed media to inform producers and consumers about current farm-gate and retail prices. Traders take advantage of this ignorance and offer lower farm-gate prices. Horticultural producers are powerless to negotiate prices because of perishability and poor infrastructure and poor financial condition – most farmers are dependent on wholesalers' advance payments, provision of packing materials and transport vehicles.

[31] Experience elsewhere has shown large losses during the first harvests arising from lower yields and insufficient knowledge and capability to protect the crops from pests and plagues.

5.1.2.3 Export of livestock and livestock products

Although the livestock sub-sector ranks second to coffee in foreign exchange earnings of the country, its highest contribution to the total GDP was only 16 percent, and that to the agricultural GDP is only 30 percent (MEDaC, 1999). With the expansion of export commodities more into grains and flowers, the slow growth in the export of livestock and livestock products would mean even less relative contribution of the sub-sector to the national export earnings.

Figure 5. 5: Value of total export (million Birr) of live animals and meat between 2000 and 2004



Source: Ethiopian Customs Authority (2005).

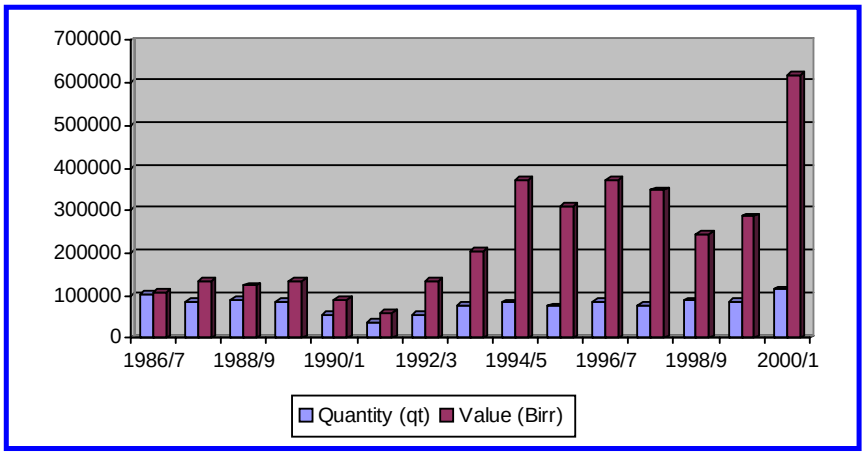
The current export figures from Ethiopian Customs Authority on the total value of exported live animals and chilled meat indicate that the sharp drop in earnings from 2000 to 2001 and 2002 was followed by sharp increases in 2003 and 2004, reaching Birr 81 million in 2004 (Figure 5.5), which is a 2.7 fold increase from that observed in 2000. This can be related to the liberalisation of the economy and

the subsequent intervention of the private sector into the export of livestock and livestock products. Almost all live animal exports were in the form of beef and sheep. Interestingly, however, records show exports of meat of equines, chicken and swine; there are also indications that the fast growing broiler industry by the private sector could catch up fast.

The largest export figures of live animals were recorded in the eighties with annual exports of 10 thousand cattle and 139 thousand sheep and goats (Belachew and Jemberu, 2003). These figures declined dramatically between 1999 and 2001, when on an average the country had exported about 56 thousand heads of live animals, mainly sheep and goats. Sintayehu (2003) found that earnings from the export of live animals, meat products and hides and skins increased in terms of monetary value (in Birr) due to policy interventions. The policy interventions were devaluation of the Birr and reduction of export taxes, which were intended to primarily stimulate the export market through increasing export earnings to exporters. Yet the earnings in US Dollars did not show much change (see Annex Figure 5.1 and Figure 5.6). Exporters may have benefited from the devaluation but the country has not as there was no meaningful increase either in the volume exported or in the unit price received in US Dollars. Ethiopia has not been able to meet the health and sanitary requirements of importing countries. The volumes by and large did not show changes. The quantity of live animal exports actually declined from the high amounts of the late eighties.

Sintayehu (2003) then concluded that the reduced quantities exported, coupled with the very negligible change in unit prices, point out the fact that it takes more than policy measure towards monetary incentives to enhance export of live animals and products. The necessary infrastructure and institutional arrangements are not in place to encourage reversal of livestock flow from the unofficial to the official route. It may be necessary to negotiate legal procedures with concerned neighbouring countries. Roads, telecommunications and financing (banking, credit, insurance) services are critical for the monetary transactions.

Figure 5. 6: Quantity (quintal) and value ('000 Birr) of exported hides and skins.



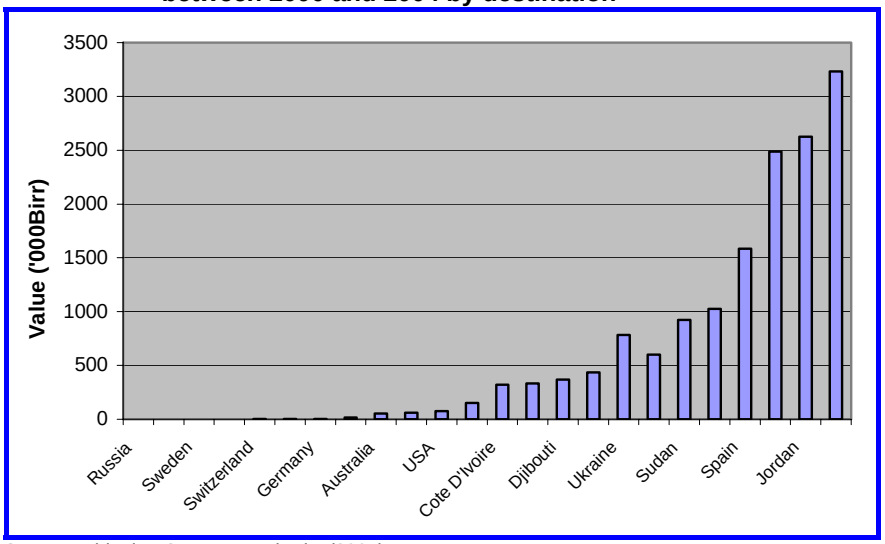
Source: Sintayehu (2003), as adapted from NBE (2001)

The destinations of these exports were mostly the United Arab Emirates, Jordan and Saudi Arabia, but also include new destinations like Spain, the Sudan, Italy, Ukraine and Indonesia (Figure 5.7). It is necessary to explore new potential markets for livestock and livestock products in the face of growing competition for the more lucrative Middle East market.

Belachew and Jemberu (2003) estimate that the domestic market consumes 56 percent of the cattle, 46 percent of the sheep, 22 percent of the goats and 70 percent of the camel off take. Judging by the size of the largest recorded annual official export of live animals, these figures indicate huge exportable surplus livestock from pastoral areas. There is a tremendous opportunity for the country given its proximity to a potential export market in the Middle East. Despite lack of empirical data, it is expected that the difference between the size of exportable off take and the official export figures (live animal and meat) end up in serving the unofficial cross-border livestock trade from these

pastoral areas. Yet, the size of the unofficial cross-border livestock trade is less than the difference between the calculated exportable off take surplus and the average official export.

Figure 5. 7: Value of total export (million Birr) of live animals and meat between 2000 and 2004 by destination



Source: Ethiopian Customs Authority (2005).

The potential demand for livestock and meat in the strategic Middle East countries is estimated at 226 thousand heads of cattle, 11.8 million sheep and goats, 64 thousand camels, and 207 thousand tones of meat a year. If Ethiopia exports its entire exportable livestock surplus, it could supply 46 percent of the demand for sheep and goats, and 36 percent of the demand for camels. On the other hand, the surplus exportable cattle number is higher than the demand in the Middle East countries by 44 percent, and hence even when these countries import Ethiopian cattle, additional market outlets in other countries need to be explored.

In recognition of this potential for much larger export of live animals and meat, the Ethiopian government has made some policy decisions to promote investment and trade in livestock exports. These include the establishment of a separate government body to facilitate livestock marketing, i.e. the Livestock Marketing Authority (which was subsequently merged with other institutions under a broader Ministry), introduction of tax holidays on production and processing investments, duty-free import of machinery and equipment required for new investments in this field, tax free privilege for exports, and credit guarantee schemes for products destined to exports.

5.1.3 Agriculture's contribution to employment

More than 80 percent of the Ethiopian population earn their livelihood from crop cultivation and livestock rearing activities. Agricultural marketing and export trade do also employ a significant portion of the population. CSA's data indicates that there were 10.58 million agricultural households with an average size of 5.16 members in 2001/2002. Among the 10.58 million households, about 82.4 percent were male-headed households while the remaining 17.6 percent were female-headed households. On the other hand, 3.39 percent of the agricultural households and 3.46 percent of the agricultural population live in urban areas (CSA, 2003). Evidences elsewhere show that in the long-term higher productivity in agriculture and economic growth will lead to the decline of the share of employment in agriculture.

There is a growing recognition that high population growth and low urbanization have increasingly caused a major challenge to subsistence agriculture that could not absorb the growing surplus labour force. According to Jean-Marie Cour (2003), many of the problems now facing the country with respect to rural poverty, regional disparities and underdevelopment of the domestic markets are a direct or indirect consequence of the de facto "rural bias" of the strategies and policies followed by successive governments of

Ethiopia. Neglect and less attention to urbanization and non-farm sector development have put the farm sector, particularly the peasant agriculture, under a growing pressure.

The implication of the issues discussed in the preceding sections is that, for transforming the agricultural sector and establish meaningful linkages with the national economic growth, the sector itself should be able to perform better. As it stands now, agriculture itself is increasingly facing difficulty of supporting the livelihood of those who depend on it, let alone generating surpluses for the growth of other economic sectors. In the face of the increasing scarcity of other resources particularly the agricultural land, measures should be taken to improve labour productivity in agriculture. Supporting strategic investments in the sector, improving the institutional and organizational performances of the agricultural services, better access to labour productivity enhancing technologies should help a lot in this respect.

5.2 Sub-sectoral performances

The economic policy and strategy reforms of the 1990s have positively influenced the performance of Ethiopian agriculture. Total production of food crops has increased. Similarly, the volume of agricultural commodities exported has been slightly improved while the new non-traditional commodities like flowers have joined the list of exported commodities. However, these relative improvements have not been sufficient to lift up the sector's role in the development process of the overall Ethiopian economy.

The performance of the Ethiopian agriculture can be evaluated, among other indicators, by its contribution to food security. Even though some notable improvements in total grain production have been observed since the mid 1990s, these improvements were inadequate to boost the level of food security to any meaningful level both at the national and household levels. Some four to five

million people (6 - 7 percent of the population) are chronically food insecure and require food aid from year to year. An additional six to seven million (8.5 – 10 percent of the population) are transitionally food insecure, and require food aid, when the rains fail. The drought of 2002/03 has clearly shown the weakening capacity of agriculture to provide food and play a buffer role in time of disaster. Even in some parts of the country where agriculture has been relatively performing better[32], drought has forced people to depend on food aid.

5.2.1 Crop production sub-sector

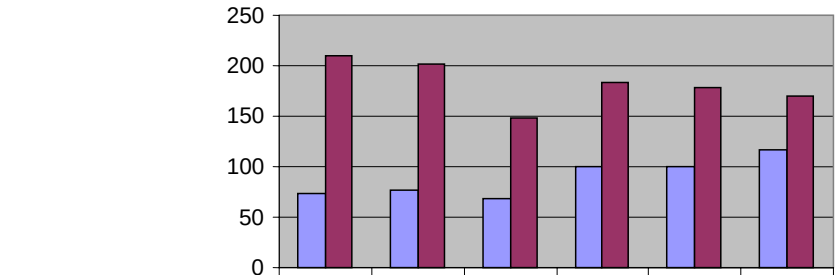
5.2.1.1 Grain production

Grain constitutes the major staple food item as well as the main source of income and consumption for the majority of the Ethiopian population. Grain crops production also takes the largest share of cultivated land, and the largest share of external inputs like chemical fertilizer. The adoption of the new extension program commonly known as PADETES in 1995, and the expanded use of fertilizer and improved seeds have contributed to the increase in production of grain crops. Compared to the level of the 1995/96, grain production increased by 17 million tones in 2003/2004 (Figure 5.8). In 2003/2004 cropping season total grain production almost doubled from its level of the late 1980s.

This increase in total production, however, has not been large enough to change the level of per capita production. Per capita production attained in 2003/04 is lower by 40 kilogram compared to the level of 20 years back, for instance that of 1979/80. This decline has been mainly attributed to the high rate of population growth. During the past two and a half decades, population has almost doubled (grew by 97.4 percent) while production has increased only by 59.4 percent, implying a negative growth in pre capita production.

[32] Some Woredas in western Hararghe and Arsi zones of Oromiya became vulnerable to drought in 2002/03.

Figure 5. 8: Total and per capita grain production for selected years of good production [33]



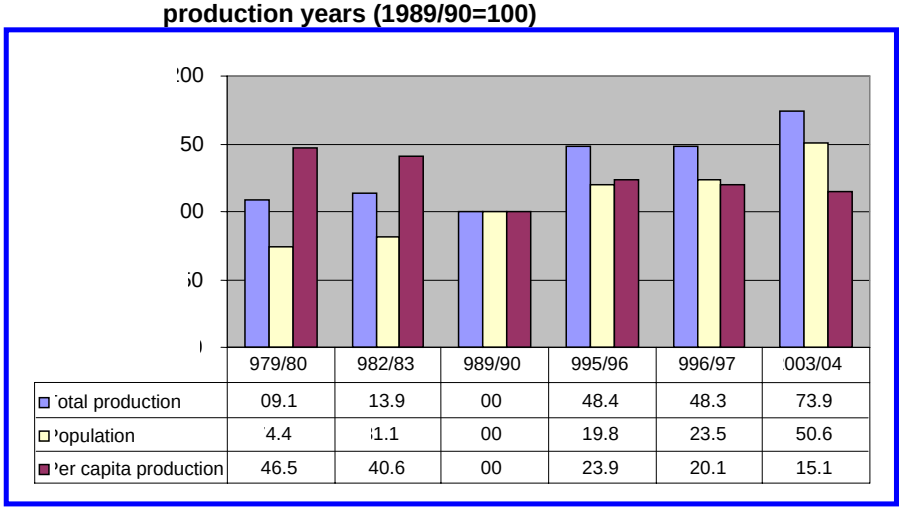
	1979/80	1982/83	1989/90	1995/96	1996/97	2003/04
Total production (Million qt.)	73.7	76.9	67.6	100.3	100.2	117.5
Per capita production (Kg/person)	210.5	201.8	148.2	183.5	177.7	170.1

Source: Computed based on the CSA data.

If we limit the analysis to the past one and a half decades and compare it to the situation of the 1980s, although the total volume of grain production has increased, the index of per capita grain production has been declining from its level of 124 in 1995/96 to 115 in 2003/2004 taking the year 1989/90 as a bench mark year (Figure 5.9). Production has increased between 1989/90 and 2003/04 by 74 percent while population has grown by 50.6 percent during the same period, implying a positive net balance to production growth. Per capita grain production in 2003/04, however, is still lower than the level of the 1960s[34] and the late 1970s by 70 and 30 kilograms, respectively. The staggering situation in food production has prevented the Ethiopian economy from a sustainable and rapid growth path.

[33] All production data indicate the harvest from Meher season which contributes more than 95% to total annual production.
[34] Per capita food production in 1960/61 and 1969/70 were 240 kg and 242 kg, respectively (Ezra, 1997 as quoted in the Annual Report of EEA, 1999/2000).

Figure 5. 9: Grain production and population index for selected good production years (1989/90=100)



	979/80	982/83	989/90	995/96	996/97	003/04
˙otal production	09.1	13.9	00	48.4	48.3	73.9
›opulation	‘4.4	‘1.1	00	19.8	23.5	50.6
›er capita production	46.5	40.6	00	23.9	20.1	15.1

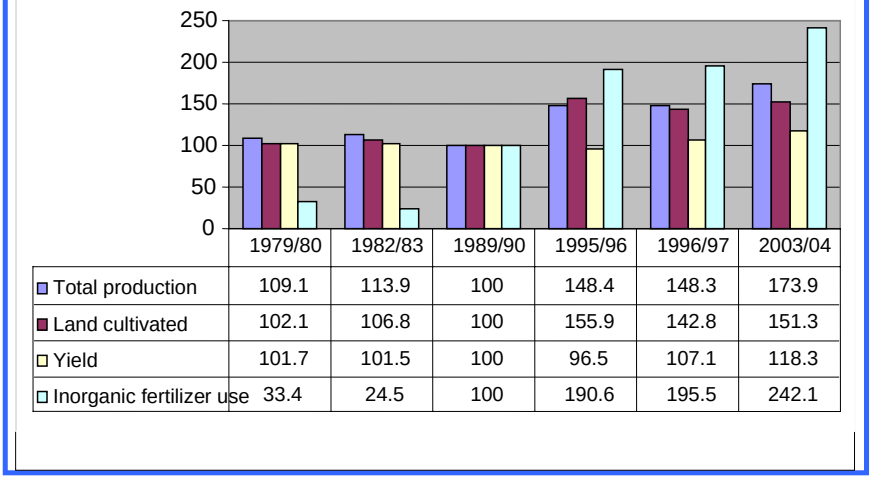
Source: Computed based on the CSA data

The major factor behind the relative improvement in total grain production in the 1990s is the expansion of cultivated area. Between 1989/90 and 2003/04 yield grew by 18.3 percent and area cultivated by 51.3 percent. It is the combined effect of these two and other factors that resulted in an increase of total grain production by 74 percent during the reference period. The fact that more land has been brought under cultivation implies that more extensive farming continued compared to intensification during the period. The amount of fertilizer imported and used has increased substantially[35]. Likewise, the availability of improved seeds has been better in mid 1990s. Despite the significant increase in the use of inorganic fertilizer and to some extent improved seeds, the level of yield has not shown a notable change (Figure 5.10)[36]. For instance, according to the World Bank Database (2002), average

[35] The use of inorganic fertilizers has increased by over 142% since 1989/90 and by over 33% since 1995.
[36] On the other hand, another study (Berhanu, 2003) based on regression model using a time series data has shown that the amount of fertilizer imported, rainfall and drought incidences explain the variability of domestic grain food supply.

cereal yield for the periods between 1993 and 2000 has remained at 11.5 quintals per hectare. In fact, this is not different from the average level of the 1970s.

Figure 5. 10: Cultivated land, yield and production for selected good production years (1989/90=100)



	1979/80	1982/83	1989/90	1995/96	1996/97	2003/04
Total production	109.1	113.9	100	148.4	148.3	173.9
Land cultivated	102.1	106.8	100	155.9	142.8	151.3
Yield	101.7	101.5	100	96.5	107.1	118.3
Inorganic fertilizer use	33.4	24.5	100	190.6	195.5	242.1

Source: Computed based on the CSA data

Data on improved farm management practices are indispensable to analyze the contribution of various farm input technologies and practices. Data obtained from the CSA[37] shows that the use of improved farm inputs in Ethiopia, particularly improved seed is still low. Considering the major cereal crops, cultivated land planted with improved seed has not yet exceeded 6 percent of the total area cultivated with cereals. For crops like sorghum it is even less than 0.5 percent of the cultivated land. Teff and wheat are relatively better in terms of application of

[37] The 2001/02 CSA's sample enumeration data indicates that out of the total 8.72 million hectares of land cultivated for different grain crops, only 2.9% was covered by improved seeds, while about 38.6% of the land was fertilized. The number of farmers that applied chemical fertilizer in 2001/02 was 34%. Only 8.04% of the land was treated with pesticides, while 1.75% of the land was irrigated (CSA, 2003). In general the use of improved inputs and management practices is very low.

chemical fertilizers where chemical fertilizers have been applied to, on average, 40 to 60 percent of the land, respectively (Table 5.5).

Table 5. 5: Share of cultivated land treated with inorganic fertilizer and improved seeds (%)

	Teff		Wheat		Barley		Maize		Sorghum	
	Fertilizer	Seed	Fertilizer	Seed	Fertilizer	Seed	Fertilizer	Seed	Fertilizer	Seed
1997/98	44.9	1.73	57.0	5.58	34.4	0.15	18.0	5.19	2.9	0.24
1998/99	48.8	1.07	62.6	6.01	32.6	*	19.2	10.11	3.0	0.19
1999/00	49.5	1.20	61.5	5.60	32.4	0.03	25.7	15.41	3.1	0.29
2000/01	50.2	0.67	61.7	4.73	29.3	0.10	29.6	20.04	2.4	0.10
2001/02	45.6	0.59	52.9	1.93	28.1	0.45	26.2	15.54	2.5	0.37
2003/04	47.8	0.61	53.6	4.13	26.7	0.39	30.5	20.15	3.3	0.47

* Shows that estimates have CV greater than 50 percent and not reliable to be used; and, hence, not indicated.

Source: Computed based on the CSA data.

One study showed that the existing improved technologies in Ethiopia could make a significant difference in terms of yield levels (Berhane et al, 2004). For instance, maize yield can be increased from the current farmers' yield of 15.9 qt/ha to 46.7 qt/ha, and that of wheat from 10.9 qt/ha to 28.3 qt/ha and teff from 6.8 qt/ha to 15.4 qt/ha if farmers use the technologies (improved seed varieties and fertilizers) at recommended rates.

A concerted and consistent effort should also be made to use the country's water resources for irrigation in order to raise land and labour productivity, and minimise weather-induced production risks. Irrigation is indispensable and cannot be deferred anymore as drought has become a frequent phenomenon that challenges the farming sector in Ethiopia. Similarly, unless appropriate incentive packages are in place, producers will not be motivated towards increased use of yield increasing inputs and technologies.

5.2.1.2 Root and tuber crops

Empirical evidence shows that different kinds of root crops are cultivated on about 466,984 hectares of land. It includes the 233,492 hectares of land covered by e*nset,* a root crop that is used as a staple food in many parts of southern, south-western and western parts of Ethiopia. The average land covered with other root crops and e*nset* was 0.09 and 0.08 hectare per holder, respectively. There were 2.90 and 3.06 million farmers cultivating root crops and e*nset*, respectively, in 200/02 (Table 5.6). Potatoes, sweet potatoes and onion constituted 60.4, 17.2 and 7.3 percent of the country's land under root crops, respectively. These crops made up 50.2, 20.8 and 13.6 percent of the volume of root crops production in that order. While only less than 0.5 percent of the area of root crops is put under improved seeds, 10 percent of the land is irrigated and 60 percent of the land is fertilized.

Table 5. 6: Number of farms and management practices of root and tuber crops

Root Crops	Number of holders	Area		Percent of land under improved crop management practices			
		Total (ha)	Per holder ha)	Improved seeds	Irrigation	Fertilizer	Pesticide
Beetroot	57,014	669	0.012	9.57	36.92	60.69	*
Carrot	35,052	827	0.024	12.94	33.74	67.11	0.97
Onion	485,573	19,787	0.041	3.06	35.89	55.08	10.19
Potatoes	820,487	162,854	0.198	0.18	10.63	67.84	3.15
Garlic	714,086	5,985	0.008	0.18	12.33	54.79	0.62
Taro/Godere	735,277	26,092	0.035	0.11	0.36	39.54	0.88
Sweet potato	742,496	46,343	0.062	0.43	4.21	49.86	1.98
Others	148,460	6,921	0.047	0.04	6.43	36.64	1.50
All root crops	2,904,130	269,478	0.093	0.49	10.45	59.96	3.14
Enset	3,057,656	233,492	0.076	0.11	0.46	63.77	0.22

* Shows that estimates have CV greater than 50 percent and not reliable to be used; and, hence, not indicated.
Source: CSA (2003). Ethiopian agricultural Sample Enumeration, 2001/02. Addis Ababa. All data are for the peasant sector. NA= not available.

Over 18 million quintals of different kinds of root crops were produced in 2001/02. Production per holder was 6.4 quintals. Average yield of all root crops excluding *enset* was 69 quintals per hectare (Table 5.7). Notably higher yielding root crops are garlic (132qt/ha,) and onion (128 qt/ha). Godere, carrot, and potato yield 75 qt, 88 qt, and 58 qt per hectare, respectively. About 37 percent of the produced root crops were consumed by the producers themselves. Compared to grain crops, production of root crops and tubers is at low level. Expanded production of root crops would help attain higher food and nutrition security. Adequate attention in research and extension is necessary to expand the production of root crops and tubers.

Table 5. 7: Yield levels and production of root and tuber crops

	Root Crop	Number of holders	Production and land productivity			Percent of production used for		
			Production					
			Total (qt)	Per holder (qt)	Productivity (qt/ha)	Home consumption	Sales	Other purposes (seed, feed, payment for labor etc)
Root crops	Beetroot	57,014	54,430	0.95	81.36	54.5	43.5	2.0
	Carrot	35,052	72,748	2.08	87.97	26.0	72.3	3.7
	Onion	485,573	2,549,640	5.25	128.85	41.1	46.5	12.4
	Potatoes	820,487	9,373, 505	11.40	57.56	66.0	15.1	18.9
	Garlic	714,086	791,786	1.11	132.30	64.6	22.5	12.9
	Taro/Godere	735,277	1,960,522	2.67	75.14	77.4	6.5	16.1
	Sweet potato	742,496	3,878,588	5.22	83.69	81.7	11.0	7.3
	Others	148,460	NA	NA	NA	NA	NA	NA
	All root crops	2,904,130	18,681,219	6.43	69.32	63.4	21.5	15.1
Enset		3,057,656	NA	NA	NA	NA	NA	NA

Source: CSA (2003). Ethiopian agricultural Sample Enumeration, 2001/02. Addis Ababa. All data indicate only for the peasant sector. NA= not available.

5.2.1.3 Major cash crops

In addition to the grain and root crops there are some cash crops of major economic importance. The three important cash crops in Ethiopia are coffee, chat and sugarcane which were cultivated by about 1.5 million, 0.5 million, and 2.1 million farmers, respectively, in 2001/02. The average holding was 0.062 hectares per holder for chat, 0.021 hectares for sugarcane, and 0.12 hectare for coffee (Table 5.8). The data show that chat producers apply more fertilizer, and 11 percent of the land is irrigated.

Table 5. 8: Land allocation and management practices of major cash crops in the peasant sector

Crops	Number of holders	Area		Percent of land under improved crop management practices			
		Total (Ha	Per holder (Ha.)	Improved seeds	Irrigation	fertilizer	pesticide
Chat	1,545,861	96,066	0.062	-	11.27	42.25	4.34
Sugar cane	563,310	11,775	0.021	0.25	27.10	28.75	0.63
Coffee	2120924	246033	0.12	4.4	2.17	16.46	0.72

Source: CSA (2003). Ethiopian Agricultural Sample Enumeration, 2001/02. Addis Ababa. Data are only for the peasant sector.

Similarly, 27 percent of land under sugar cane uses irrigation while 29 percent of the land is fertilized. Only 4.4 percent of the coffee land is planted with improved varieties, while 2.2 percent of the land is irrigated. Only 16 and 0.72 percent of the coffee planted land uses chemical fertilizer, and crop protection chemicals, respectively. In the year 2001/2002, 79.6 thousand tons of chat was produced out of which 63 percent was sold and the remaining consumed by the producers themselves (Table 5.9).

Table 5. 9: Production and yield levels of major cash crops in the peasant sector (2001/2002)

Crops	Number of holders	Production and land productivity			Percent of production used for		
		Production		Productivity (qt/ha)	Home consumption	Sales	Other purposes (seed, feed, payment for labor)
		Total (qt)	Per holder (qt)				
Chat	1,545,861	796,520	0.52	8.29	31.2	62.8	6.0
Sugar cane	563,310	783,803	1.39	66.57	38.4	48.9	12.7
coffee	2,120,924	1,629,110	0.80	6.63	35.64	60.68	3.69

Source: CSA (2003). Ethiopian agricultural Sample Enumeration, 2001/02. Addis Ababa. All data are for the peasant sector.

During the same period, over 78 thousand tones of sugarcane were produced. Yield per hectare is higher for sugarcane the average being 67 quintals. In the year 2001/2002 close to 163 thousand tones of coffee were produced. Out of these 60 percent was sold while close to 4 percent was used for other purposes including payment for labor. The remaining 36 percent is reported to have been consumed at home. Since coffee is the major cash crop in Ethiopia, home consumption of over a third of the production is very high. Average yield was 6.6 quintals per hectare

5.2.1.4 Fruits, vegetables and flowers

Ethiopia's agro-climatic conditions make it suitable for the production of a broad range of fruits and vegetables, including citrus, banana, mango, papaya, avocado, guava, grapes, pineapple, passion fruit, apples, potatoes, cabbages, cauliflower, okra, egg plant, tomato, celery, cucumbers, pepper, onion, asparagus, water melon, sweet melon, carrots, green beans and cut flowers. Cut flower and vegetable production are fast growing export businesses in recent times.

Data from the CSA's 2001/02 agricultural sample survey show that 2.1 million farmers were cultivating different kinds of fruits on about 40 thousand hectares of land. Similarly, 98.2 thousands of hectares of land were covered by different vegetables in 2001/02. Out of this 0.5, 6.5, 51.1 and 2.9 percent were planted with improved varieties, irrigated, fertilized with organic and inorganic fertilizers and treated with pesticides, respectively. On average 3.05 million farmers cultivate vegetables and about 0.032 hectare of land was cultivated by an average holder. Red peppers and Ethiopian cabbage occupy about 56.2 and 24.8 percent of the total area under vegetable crops, respectively. The same crops constitute 20.7 and 56.6 percent of the country's volume of vegetable production, in that order.

Table 5.11 shows that about 4 million quintals of vegetables were produced in 2001/02. About 38 percent of all vegetable produced were consumed by the producers themselves. The most productive vegetable is tomato, which yields 110 quintals on a hectare of land. Total production of fruits was 2.1 million quintals while production per holder was 0.9 quintal. Bananas, mangos and papayas shared 53.1, 9.1 and 6.8 percent of the land under fruit and 64.3, 10.4 and 9.6 percent of fruit production, in that order. The highest productive fruit crops are papaya with 67 quintals on a hectare of land, followed by banana and avocado at 57 quintals per hectare each. The most marketable fruits are lemons, avocados, bananas and in general, fruits production by the peasant sector is negligible, signaling the absence of adequate support in terms of research, extension and marketing services.

Vegetables are not only important for domestic consumption as a source of key nutrients, but they also generate some foreign exchange earnings. For instance, in 2001/02, Ethiopia exported about 61 thousand tons of vegetables that fetched 11.5 million Birr in foreign currency. The major country importing Ethiopia's fresh fruit and vegetables is Djibouti. In 2001/02-production year, over 29,000 tons of fruits and vegetables were exported. In 2003/04 over 40,000 tons of fruits, vegetables and flowers were exported.

Table 5. 10: Land holding and crop management in vegetables and fruits production (the peasant sector)

	Crops	Number of holders	Area		Percent of land under improved crop management practices			
			Total (Ha.)	Per holder (Ha.)	Improved seeds	Irrigation	Fertilizer	Pesticide
Vegetables	Lettuce	9,656	213	0.022	9.39	68.08	69.95	13.15
	Head cabbage	38,755	965	0.025	6.42	54.51	59.07	12.44
	Ethiopian cabbage (Kale)	1,439,965	24,398	0.017	0.23	1.87	56.70	1.48
	Tomatoes	45,647	3,035	0.067	6.99	65.57	61.58	27.55
	Green peppers	407,900	4,633	0.011	0.86	21.86	51.54	2.27
	Red peppers	1,116,270	55,198	0.049	0.20	3.87	48.81	2.48
	Swiss chard	21,260	158	0.007	12.66	28.48	46.84	*
	Others	558,106	9,662	0.017	0.12	0.91	44.86	0.38
	All vegetables	3,046,339	98,262	0.032	0.54	6.51	51.05	2.91
Fruits	Avocados	324,489	2,414	0.007	2.82	3.31	26.01	0.04
	Bananas	1,327,486	21,268	0.016	0.45	17.34	25.38	0.09
	Guavas	140,261	1,224	0.008	7.68	24.35	33.99	0.41
	Lemons	111,884	749	0.007	0.80	26.30	25.63	0.27
	Mangos	298,303	3,642	0.012	1.57	8.15	30.48	*
	Oranges	309,219	2,402	0.008	1.17	18.11	34.47	1.00
	Papayas	404,188	2,713	0.007	2.80	17.25	29.19	*
	Pineapples	10,974	171	0.016	*	*	4.68	-
	Others	255,007	5,494	0.022	0.51	7.35	22.59	*
	All fruits	2,110,342	40,076	0.019	1.13	14.63	26.49	0.41

* Shows that estimates have CV greater than 50 percent and not reliable to be used; and, hence, not indicated.

Source: CSA (2003). Ethiopian agricultural Sample Enumeration, 2001/02. Addis Ababa. All data are for the peasant sector. NA= not available.

Table 5. 11: Vegetables and fruits production in the peasant sector (2001/2002)

	Crops	Number of holders	Production and land productivity			Percent of production used for		
			Production					
			Total (qt)	Per holder (qt)	Productivity (qt/ha)	Home consumption	Sales	Other purposes (seed, feed, payment for labor)
Vegetables	Lettuce	9,656	13,371	1.38	62.77	48.6	45.4	6.0
	Head cabbage	38,755	71,115	1.83	73.69	48.4	48.5	3.1
	Ethiopian cabbage (Kale)	1,439,965	2,110,276	1.47	86.49	83.1	13.5	3.4
	Tomatoes	45,647	334,397	7.32	110.18	38.1	58.3	3.6
	Green peppers	407,900	413,991	1.02	89.36	77.6	19.3	3.1
	Red peppers	1,116,270	772,129	0.69	13.99	61.4	34.3	4.3
	Swiss chard	21,260	10,970	0.51	69.43	74.4	23.3	2.3
	Others	558,106	NA	NA	NA	NA	NA	NA
	All vegetables	3,046,339	3,726,249	1.22	37.92	73.4	22.9	3.7
Fruits	Avocados	324,489	138,884	0.43	57.53	46.6	50.0	3.4
	Bananas	1,327,486	1,223,720	0.92	57.54	48.1	49.0	2.9
	Guavas	140,261	16,582	0.19	13.55	56.9	34.8	8.3
	Lemons	111,884	11,716	0.10	15.64	31.4	62.5	6.1
	Mangos	298,303	198,033	0.66	54.37	54.4	40.5	5.5
	Oranges	309,219	132,504	0.43	55.16	46.4	49.0	4.6
	Papayas	404,188	182,959	0.45	67.44	71.9	24.0	4.1
	Pineapples	10,974	*	*	*	*	*	*
	Others	255,007	NA	NA	NA	NA	NA	NA
	All fruits	2,110,342	1,904,398	0.90	47.52	NA	NA	NA

Source: CSA (2003). Ethiopian agricultural Sample Enumeration, 2001/02. Addis Ababa. All data are for the peasant sector. NA= not available

Ethiopia has also been exporting horticultural and floricultural products (fresh produce and cut flowers) to European off-season market for over two

decades. In 2001/02 10 tons of flowers were exported. Recently, increasing attention is being given to the promotion of investment and export activities, particularly to the floriculture sub-sector. Following government's support in terms of providing suitable land, finance and other incentives both for domestic and foreign investors, export of flowers has been increasing both in volume and in terms of its contribution to the country's foreign exchange earnings. For instance, foreign exchange earnings from the export of cut flower have improved from 3.7 million Birr in 1994 to over 14 million Birr in 2004. The contribution of flower export to foreign exchange earning is expected to increase further in the coming years as there are many companies currently investing in flower production.

5.2.2 Livestock production

It is often reported that Ethiopia has the largest livestock population in Africa. Recent CSA (2004) data show that there are 41 million heads of cattle, 25 million sheep, 23 million goats, 41 million chicken, 5.7 million equines (donkeys, horses, mules) and 2.3 million camels, distributed in all the administrative regions. Altogether these make up 39.7 million Tropical Livestock Units (TLU), with an average distribution of 0.54 TLU per capita, which is equivalent to 5.4 heads of sheep or goat for every inhabitant. In terms of distribution across administrative Regions, the predominantly pastoral Regions of Afar and Somali have the highest densities per capita. Livestock keepers in the country typically maintain a mix of livestock species depending on the products and services they need from their livestock.

Since livestock in Ethiopia depend on the feed and water resources made available to them by their owners, the huge livestock populations can be both an asset as well as a liability for sustenance of livelihoods in poor farming families. They are assets when they are used to effectively convert otherwise low-economic-value forages into useful products and services. On the other hand, they are liabilities when they exacerbate environmental degradation

through overgrazing, and when they cause drains of meagre resources of their owners when they succumb to malnutrition, disease and drought.

5.2.2.1 Functions of livestock

Livestock have diverse functions and services for farmers in the highland mixed crop-livestock systems as well as in the lowland pastoral production systems. Jahnke (1982) makes a clear distinction between livestock products and functions. Product refers to the output of meat, milk, fibre (including hides and skins), manure and offspring (reproduction and growth). In the context of the subsistence highland as well as pastoral agriculture, the perspective of functions is more relevant than that of the products. The reasons for raising livestock, or the breeding objectives, go beyond the output functions (meat, milk, fibre, manure) and include benefits in resource use, socio-economic relevance and socio-cultural roles (Jahnke, 1982; Devendra, 1992; Bosman and Moll, 1995).

Livestock provide food in the form of meat, milk and eggs and non-food items such as draft power, manure and transport services as inputs into food crop production, and fuel for cooking. Livestock are also sources of cash income through the sale of the various livestock products: animals, milk, hides, skins, eggs and manure. Furthermore, they act as a store of wealth and determine social status within the community. Due to these important utility functions, livestock play an important role in improving food security and alleviating poverty in the country. Because they are central to the nutrient cycling, livestock are important to the efficiency, stability and sustainability of farming systems (Ehui et al., 1998; Delgado et al., 1999).

Live animals, meat, skins and hides are important export commodities for the national economy. These and milk also serve as raw materials for the emerging agro-industry sector, and in so doing generate important

employment opportunities. At the household level, skins, hides, hair (sheep, horse) and horns are used as raw materials for making a range of products, including utensils, tools and other marketable commodities. The success of Ethiopian agriculture depends, among others, on effective use of the available farm animals. Literally most traditional agricultural practices are related in one way or another to livestock. In some areas, farm animals are also used for weeding of especially maize and sorghum fields. Transportation of harvested and marketed agricultural produce is the burden of equines. In the agro-pastoral system, livestock have similar multiple functions, and contribute between 10 and 50 percent of the household revenue (Wilson, 1988). Camels are the main species for transportation of household supplies, mobile camps, and tradable commodities in most pastoral areas of the country. Foods of animal origin have high biological value in meeting nutritional requirements of humans, particularly poor livestock keepers with limited resources to secure their food needs. The relative contribution of milk, blood and meat in meeting the energy and protein requirements of pastoral communities is very high. Therefore, the benefits that accrue to subsistence livestock keepers (farmers as well as pastoralists) should be viewed from the perspective of the physical, socio-economic and socio-cultural products and services and functions.

Meat is an important livestock product for Ethiopian farmers. However, official estimates of national meat production from cattle, sheep, goats, camels, chicken and pigs measure only slaughters by farmers and consumers (FAO, 1999), and do not take into account the stock of disposable meat maintained in response to uncertainties in food supply and markets. Meat production is, therefore, more than the yield from slaughtered animals. Meat is produced through buying livestock and selling them later at a higher body weight. Meat is also produced as a net change in body weight of animals transferred between related households. The meat so produced can be sold, consumed, maintained or transferred. Meat in most of the traditional highland and

pastoral communities is, therefore, not only a product for home consumption and sale, but also a medium of frequent value transaction.

Milk off-take can either go to home consumption or sales. It is also converted to value-added products (butter, yoghurt, cottage cheese) and stored to better spread its utility over time and space. Apart from home use, manure is known to be a source of cash in some parts of the eastern and central highlands as organic fertiliser and as fuel. Its use as organic fertiliser constitutes a vital input function to the many subsistence households as the only major external source of nutrients used to maintain the nutrient level of soils. Grazing livestock speed up the recycling of crop residue, thereby adding value to them, and further integrating crop and livestock production for better use of the resources (Stangel, 1995). This is becoming increasingly important in Ethiopia in the face of declining farm size and declining soil fertility.

These socio-economic functions of livestock effectively increase the income and purchasing power of poor livestock keepers. In so doing, livestock help to adjust the consumption and savings of the household's income over time, by balancing the current cash needs against anticipated or unexpected cash needs of the future (Jahnke, 1982; Winrock, 1992; Sansoucy et al., 1995). Empirical data on the relative significance of the various production and service functions of livestock in Ethiopian are not available.

5.2.2.2 Livestock products

Data on national output from livestock are scarce, and available information is based on crude projections from population figures. For instance, the national meat production is estimated on an overall average meat yield of 108.4 kg for cattle, 10 kg for sheep, 8 kg for goats and 50kg for pigs per head of animal. Accordingly, cattle, sheep and goats contribute 63.1, 25.5 and 16.3 percent of the national meat output respectively (FAO, 2002). This does not

include the contribution of chicken and camels because of lack of indicative data. Similarly, 83.4 percent of the national milk production is contributed by cattle, and goats and sheep contribute 9.7 and 6.8 percent, respectively (FAO, 2002). Data is not available on the size of camel milk production in pastoral areas.

However, these figures are useful to compare such national productivity indicators with those of other countries and regions of the world. For instance, the current average beef yield per animal of 108.4 kg is by far less than similar figures of 121 kg for the Sudan, 130 kg for eastern Africa, 146 kg for Africa, 163 kg for Kenya, and 200 kg for the whole world (FAO STAT data, 2004). In the same way, national average cow milk yield per animal for Ethiopia estimated to be 198.6kg is very low compared to 320.7kg for eastern Africa, 480 kg for the Sudan, 703 kg for Kenya and 2199.1 kg for the world (FAO STAT data, 2004). Inadequate feed and nutrition, widespread diseases and poor health, poor breeding practice, inadequate livestock development policies with respect to extension, marketing, and credit, and poor infrastructure have been known to be the major constraints to performance of the livestock sector.

Table 5. 12: Estimated per capita livestock product production for Ethiopia and other countries (kg/capita/year) in 2002

Livestock product	Ethiopia	Kenya	Sudan	Africa	World
Beef	4.4	9.4	9.9	5.5	9.7
Milk	15.9	83.7	115.3	26.7	44.2
Mutton and goat meat	0.9	1.8	7.7	2.3	1.8
Chicken meat	0.7	1.7	0.9	4.4	11.7
Eggs	0.5	1.5	1.2	2.1	8.4
Fish and sea food	0.2	4.4	1.8	7.7	16.3
Honey	0.4	0.7	0.0	0.2	0.2

Source: FAO STATA data (2004).

In terms of supply of livestock products, the per capita production of beef, milk, mutton and goat meat, chicken meat, eggs and fish are very low, even when compared to those of Kenya and the Sudan. It is only in honey production that Ethiopia has better global standing (Table 5.12). Particularly milk and fish production levels are estimated to be less than once fifth and one twentieth of the levels in Kenya, despite the large resource base that can supply these food products. The average supply and consumption levels of these products are likely to decline given the human population annual growth rate of 2.9 percent. The type of the prevailing production environment partly explains these low production levels. For instance, although poultry in Ethiopia is produced under three distinct systems, namely traditional, small-scale intensive and commercial production, the backyard traditional production system maintains 99 percent of the total chicken population of the country. These birds produce 40 to 60 eggs per hen a year and growing on average to a weight of 1.5 and 2kg, respectively, for females and males at the age of one year, which can easily be doubled using feed supplementation, basic health care and improved rearing techniques (Tadelle, 1996). The traditional poultry production is constrained by easily manageable diseases, poor nutrition and feeding system and risky husbandry practices. However, traditional chicken production provides considerable opportunities as a low-cost, easily adaptable income as well as employment generating enterprise to the rural and urban poor. It particularly suits women and the youth with very limited resources to start viable sideline income and food generating activities.

While the human population is growing at about 2.9 percent per annum, the estimated total output of food of animal origin barely increased during the last two decades, with the result that per capita livestock production actually declined (FAO, 1996; FAO STAT data, 2004). This disturbing trend calls for rapid improvements in livestock production and productivity to increase the per capita consumption of animal products, and more importantly, to increase the contribution of livestock to household income. Given the right development

environment, the poor livestock keepers in Ethiopia could benefit from this market opportunity both in the domestic and international market. Commercial as well as market-oriented smallholder livestock production should be supported and promoted with the view to increase benefits to producers as well as to contribute to the national economy.

5.2.2.3 Livestock production in the mixed farming systems

Four major livestock production systems are known to exist in Ethiopia. These are the mixed crop-livestock production system in the high and mid altitude areas, the agro-pastoral system in the lowlands that receive encouraging rainfall for cropping, the pastoral system in the vast arid and semi-arid range-land, and the urban and peri-urban production system. Urban areas account for a very small proportion of the livestock population. However, urban agriculture currently absorbs a greater proportion of the crossbred and pure exotic dairy animals: In the mixed crop-livestock system, livestock and crops are maintained as complementary as well as competitive enterprises when land and labour resources are limited.

Almost all of the livestock population in Ethiopia belongs to indigenous breeds, crossbred and pure exotic animals accounting a small proportion only. Most of the livestock produce is meant for home consumption in both rural and urban areas. Only in case of skins, hides, honey, and wool are a larger proportion used for sale. Contrary to expectation, urban livestock keepers use even greater proportions of their milk, butter, cheese, meat, eggs and honey produce for home consumption. A very small percentage is used to pay wages (in-kind) of hired (contracted) agricultural labour mainly in urban areas.

Although the mix of livestock species kept serve multiple production and service functions the contribution of livestock to the total household revenue

is estimated to be less than 10 percent, in the mixed farming system (Wilson, 1988). Oxen have a critical role in the mixed farming system as the predominant source of traction for crop production. About two thirds of the crop farmers in the country keep 14 million working age cattle used for ploughing and threshing while the rest do not have oxen. Among those who own oxen, less than fifty percent keep only one ox. Apart from oxen, equines are more strongly represented in this production system, and have important traction and transport functions. Horses, mules, donkeys and indeed camels are used for land cultivation, threshing and farm transportation, but their relative numbers are very low.

Table 5. 13: Distribution and density of livestock resources in Ethiopia by region

Regions	Cattle	Sheep	Goat	Horse	Mule	Donkey*	Camel	Chicken	Human pop. ('000) (2005)	Area (sq.km) '000	Human Density (/sq.km)	TLU ('000)	TLU/ capita	TLU/ sq.km
Tigray	2546.8	652.5	2034.7	2.6	16.4	403.5	38.6	4049.5	4223	50078	84.3	2345.89	0.56	46.84
Afar	2376.7	2541.9	4398.6	0.9	0.3	11.5	884.3	50.6	1359	NA**	NA	3249.23	2.39	NA
Amhara	9592.2	6116.3	3969.1	250.7	105.5	1465	20.3	13140.0	18626	170752	117.0	8881.69	0.48	52.02
Oromia	16806.1	5969.5	4081.0	900.0	158.4	1626.2	113.5	14366.4	25817	353007	73.1	14670.46	0.57	41.56
Somali	1263.9	7121.0	6309.8	0.05	0.6	84.6	1269.9	125.2	4218	NA	NA	3541.72	0.84	NA
B. Gumuz	281.5	58.0	218.5	0	1.4	30.9	0	905.3	610	49289	12.38	250.18	0.41	5.08
SNNP	7881.7	3008.0	2317.6	292.8	70.4	305.1	0	7936.2	14490	112343	129.0	6565.18	0.45	58.44
Gabmella***	126.2	43.8	49.1	0.3	0	0.3	0	220.4	240	25802	9.3	100.22	0.42	3.88
Harari	32.4	3.8	26.4	0	0	6.2	0	28.9	190	311	610.4	29.09	0.15	93.53
A. Ababa	67.3	16.5	10.2	0.9	0.8	19.6	0	66.3	2887	530	5446.00	61.52	0.02	116.08
Dire Dawa	45.5	52.1	132.3	0	0.2	9.9	7.9	41.2	384	1213	316.5	63.69	0.17	52.51
Total	40894.4	25539.7	23498.3	1447.8	324.6	3962.8	2334.5	40929.6	73044			39660.54	0.54	NA

* Donkey population figures show only data from rural areas. ** NA=Data not available. *** Livestock data for Gambella Region was taken from CSA (2003).
Source: CSA. Statistical Abstract 2004. pp 395.

5.2.2.4 Livestock production system in pastoral areas

The pastoral areas in Ethiopia, known generally as rangelands, cover 650,000 square km in seven Regional States and 122 districts, and are inhabited by 9.8 million people, 56 percent of which are pastoral, 32 percent are agro-pastoral and the rest are urban (MoARD, 2004). The level of illiteracy in the pastoral communities is 97 percent. A total of 29 ethnic and linguistic groups are known to lead subsistence pastoral life in these areas (MoA and RD, 2004). In the pastoral production system, livestock are the mainstay of household subsistence economy and contribute more than 50 percent of the household revenue (Wilson, 1988). In these very sparsely populated rangelands, traditional crop production is not viable. Here the type and mix of the livestock species owned is influenced more by the type of grazing resource available. The dominant livestock species are goats, cattle, sheep and camels.

Table 5. 14: Distribution of pastoral areas in Ethiopia

Region	Total surface area ('000km^2)	Total pastoral area (km^2 sq.)	Pastoral districts	Human population ('000)	Livestock density (TLU/km^2)
Afar	98.4	90.4	29	1301	7
Benishangul-Gumuz	48.3	8.4	3	40.6	1
Dire Dawa	1.2	1.2	1	108.6	32
Gambella	25.8	17.3	5	133.6	17
Oromia	353.0	152.1	34	4007.9	33
SNNP	112.3	30.4	6	219.7	23
Somali	325.1	325.1	44	4002.2	8
Total	956.1	624.8	122	9813.6	16

TLU = Tropical livestock unit, equal to 250 kg of liveweight (Jahnke, 1982).
Source: MoA and RD (2004).

The total livestock biomass of cattle, goats, camels and equines in these areas is estimated at 9.2 million TLU, almost one TLU per capita. Cattle make up two thirds of animal resources, but are regressing against hardier yet less profitable camels, due to grassland degradation and bush encroachment. Browsing goats are also expanding at the expense of grazing sheep. Animal health service coverage, including vaccinations, is poor. Agro-pastoral communities cultivate 610 thousand ha depending totally on erratic rainfall, and their produce does not go beyond meeting their subsistence needs. There are, however, numerous irrigated state-owned and private commercial farms, with little functional economic linkages with the pastoral communities. Apart from extensive pastoral livestock production, the pastoral communities are also engaged in the gathering and sale of natural products (wood, resins, game and honey), off farm employment and handicrafts to generate additional cash (MoA and RD, 2004). Despite a strong subsistence orientation, pastoralists provide about 90 percent of the legal livestock exports in live animals, and 20 percent of the draught animals for the highlands (Coppock, 1994).

At the current levels of livestock productivity, it is estimated that the average pastoral household with 4.8 members needs to maintain about 10 TLU to secure their nutritional needs. At this rate, the rangelands could support only about 30 percent of the pastoral community, and the rest either live under impoverishment or meet their food needs from other sources, in many cases from the occasional drought relief aid. Even more unsettling is the exploitation of the once very productive rangelands beyond their regeneration capacity due to over-stocking and misuse of communal property. Poverty distribution is skewed, as 30 percent of the families own 60 percent of the total livestock, which can be a source of social tension when a growing proportion of the population lives under worsening poverty (MoA and RD, 2004).

5.2.3 Fisheries

Ethiopia has a large potential of fisheries resources in the country's water bodies – lakes, reservoirs, rivers, and small water bodies. The lakes and rivers support highly diverse aquatic life, including more than 100 fish species, of which about 40 are endemic to the country. Conservative estimates put Ethiopia's potential for fish production from the lakes, rivers, reservoirs and dams between 30 and 40 thousand tons per year, but the current production reaches only 30 to 40 percent of the potential (EARO, 2000a). This implies that harnessing the full potential of fish production could be tripled the current per capita supply of fish production. The FAO data (2003) on the other hand, show that the total production potential of all the water-bodies in the country is 51,481 tons per annum. The data from 2001 indicate that 15,389 tons of fish were harvested during the year. The average off-take rate amounts to 30 percent (Table 5.15). From the total production potential, 45.3, 42.3, 8.5, and 3.8 percent are found in major lakes, rivers, major reservoirs, and small water-bodies, respectively. Similarly, 45, 31, 16, and 14 percent of the total harvest is coming from the major lakes, major reservoirs, small water-bodies, and rivers respectively.

Table 5. 15: Ethiopia's water bodies and their fisheries

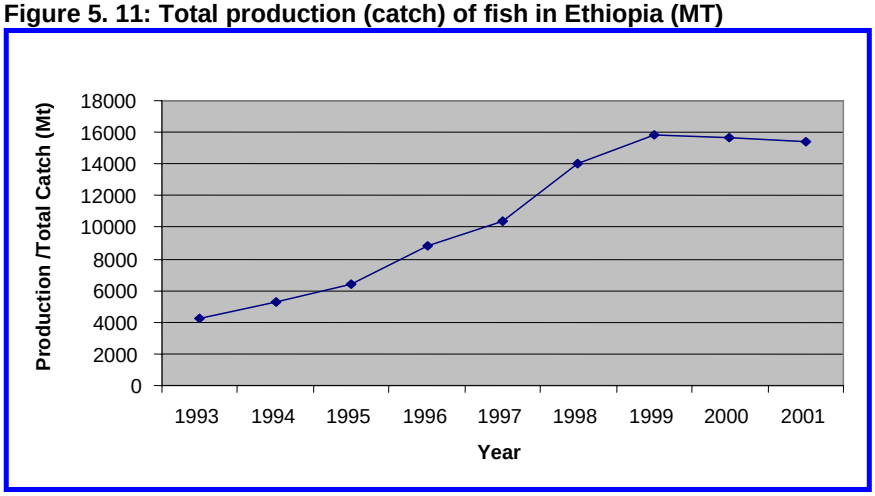
Water body type	Extent	Fishery potential (tone/year)	Catch (tone; 2001)	Off take
Major lakes	6 477 km^2	23 342	10 598	45%
Major reservoirs and dams	857 km^2	4 399	1 366	31%
Small water bodies	275 km^2	1 952	303	16%
Rivers	7 185 km^2	21 788	3 121	14%
Total		51 481	15 389	30%

Source: FAO, 2003.

The present haphazard production system leads to overexploitation of some fish sources while under-exploiting others. The country also has huge potential for smallholder integrated fish farming like those in Southeast Asia. The common constraints of fish production in Ethiopia are: inadequate knowledge of the resources, poorly developed linkages of producers with major markets, under-developed capacity for post-harvest handling of fish, lack of awareness on improved fish resource utilisation methods, and seasonality of the fish market. The current policy, which focuses on the development and promotion of small-scale irrigation, opens up considerable opportunities for the integration of fish farming into the mixed crop-livestock production system. Strong government support is needed for research and extension activities on this new but easily adaptable technology.

As shown in Figure 5.11, the total production (catch) of fish increased by four fold by the end of 1990s compared to its level of early 1990s when it was only 4 thousand metric tons. One of the indicators for the country's very poor performance in fisheries is the fact that during the last three and a half decades the contribution of the sector to the national GDP remained below 5 million Birr per annum.

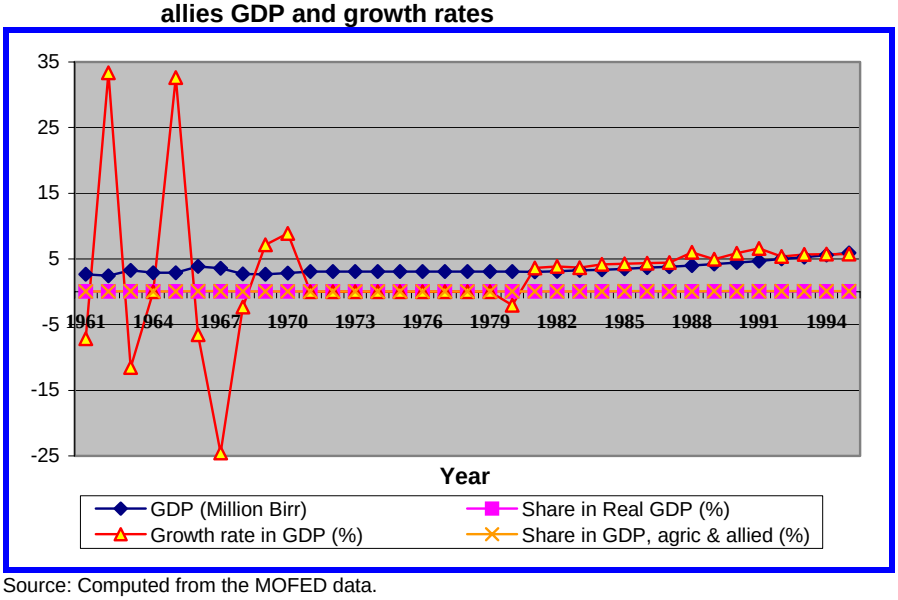
Figure 5. 11: Total production (catch) of fish in Ethiopia (MT)



Source: Computed from the FAOSTAT database.

Similarly, the share of value production from fisheries in the total national real GDP, and the GDP from agricultural and allied activities has been extremely insignificant and remained to be less than 0.1 percent (Figure 5.12). The growth in the GDP from this sector was fluctuating from year to year in the 1960s, had shown no change in the 1970s and slightly increased to close to 5 percent per year in the 1980s and early 1990s.

Figure 5. 12: Contributions of fisheries to GDP, share in agricultural and allies GDP and growth rates



Source: Computed from the MOFED data.

Despite a large economic potential of fisheries in the country, the sector is unfortunately underdeveloped. The major challenges of the fisheries sector are cited to be underutilization of fish production capacity in some sources and overexploitation of others for lack of effective resource management. Due to uncontrolled/lack of sustainable management and production, the genetic diversity in the fisheries resource is being threatened by overexploitation that may even lead to extinction of some species. As the fishery is an open access, localized over-fishing is reported to have taken place. Ethiopia does not have fisheries laws in force. Some commercially important species are already at risk of overexploitation, including Nile perch in Lake Chamo, and tilapia in Awassa and Ziway Lakes (FAO, 2003). The data shows that in some lakes the resources are overexploited. For instance, it was reported that the level of fishing is 140 percent in Awassa Lake, 97

percent in Chamo, 89 percent in Ziway and 83 percent in Koka Lakes. Low and seasonal demand for fish is another constraint to expand production and marketing. On the other hand, a weak involvement of the private sector in organised production, processing and marketing of fish is also cited among the challenges. Given the pressure on the limited land and other natural resources, fisheries could have helped the country not only by serving as an alternative employment means, and income generating activity, but also by contributing to improved food security and nutritional status if it were given sufficient attention and properly managed.

5.2.4 Forestry

Forests provide the basic needs for the poor including food, fibre, fodder, and fuel wood. Ethiopia's forest resources are primarily used for fuel-wood while the demand for various other uses are also growing but not being met (Table 5.16). Information on the economic value of forest resources such as export and employment generation is scanty. The total growth stock and annual incremental yield estimated from the forest resources had been 135-300 cubic meter/ha while the demand is 47.4 million cubic meter (EFAP, 1994). Ethiopia's production of sawn-wood is too small (45,000 cubic meters) because the forest resources are primarily used for fuel wood (FDRE, 2002). The demand and supply situation reveals that the country is facing a serious wood deficit, particularly for household fuel. As a result, cow dung and crop residues are being used for household fuel, which otherwise could have been used as inputs to the soil. Concerted effort, therefore, is needed to increase the supply of wood products by extensive tree planting and by seeking alternative sources of energy and efficient use of existing ones.

Table 5. 16: Demand and domestic supply of wood products for various uses in Ethiopia

Product type	Demand (m^3)	Supply (m^3)
Fuel wood	6,226,900	1,885,000
Industrial wood (timber, plywood, veneer)	745,000	329,000
Construction wood	367, 700	106,000
Total	7,339,600	2,320,000

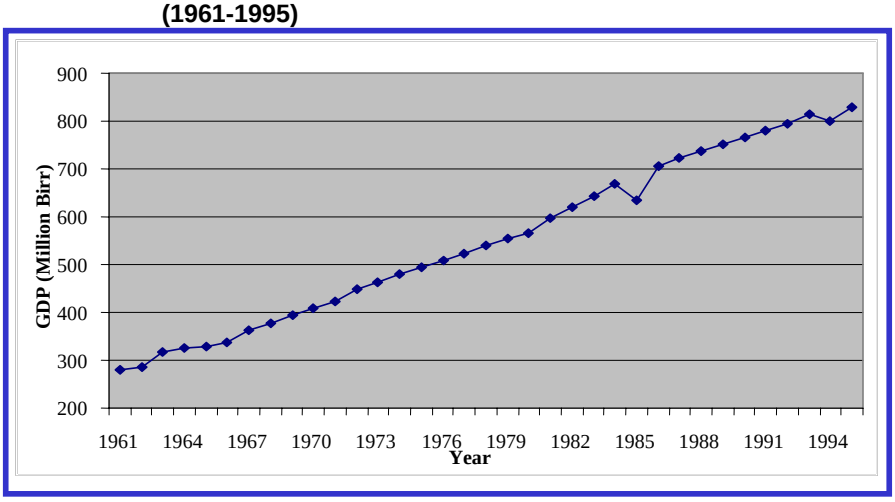
Source: FDRE (2002).

Information on the contribution of forestry to the national income in terms of employment generation and export earning has not been surveyed systematically. Available literature provides only a preliminary discussion on the economic contribution of the forest resources. During the period 1982-1992 forestry accounted for about 5.5 percent of the agricultural and allies sectors GDP and 2.5 percent of the total GDP (EFAP, 1994; EARO, 2000a). The data provided by MOFED shows that the contribution of the forestry sector to the GDP over the 30 years period has been increasing from over 250 million Birr in early 1960s to over 800 million Birr in mid 1990s (Figure 5.13). Recently, exports of forest products have been almost discontinued and limited only to gum and incense products. Forestry industry employment amounted to about 2.2 percent of the total work force in the country and contributed 2.8 percent to employment in the agricultural sector.

Plans for sustainable management and utilisation of state forests and plantations have not yet been in place. Utilisation of state forests and plantations is prohibited by proclamation (forest policy proclamation of 1994). In accordance with the existing protectionist policies of the government, commercial use of forest resources is only of secondary importance and they are primarily meant for watershed protection and conservation. Thus, logs which otherwise could have been used for commercial purposes, are decaying in the bush due to pests, disease and lack of management as well as fire hazards. If management plans were developed the nation's forest

resources could have been used for import substitution or exploited for export earning. On the contrary, the country is importing (from China, Europe, South Africa and Korea) industrial wood products such as logs, plywood, particleboard and paper. Data obtained from agricultural marketing department of the MoARD shows that the annual volume of industrial wood products imported into the country is in the order of 10,000 tons, worth over 100 million USD. Although the value of imports of forest products seems to be small compared with the total imports, it is significant for a poor country like Ethiopia.

Figure 5. 13: GDP from forestry sector production activities in Ethiopia (1961-1995)



Source: computed based on the MoFED data.

Apart from wood products, forests also provide non-timber forest products (NTFP) that are of growing importance to the national economy. These include gums and resins, frankincense, honey and forest coffee, which earn foreign exchange for the country. Data obtained from the national gum processing and marketing enterprise indicate that Ethiopia exported over

5,440 tons of gums and incense between 1999 and 2002. Gums and frankincense are collected from a variety of trees including Acacia commiphora and Bosweillia papriflora whose export market is growing. However, the trees that produce gum and incense are vanishing fast due to destruction of the natural vegetation and poor management. The industry could be expanded in terms of volume and value by controlling deforestation, domestication and planting new stands as well as improved harvesting techniques. The forest resource also provides an opportunity for the production of nun-timber forest products. One of such products is forest honey. The annual production of forest honey is about 24,000 tons (35 percent of the total production in Africa) out of which 20 percent is used for export market (FDRE, 2002).

5.2.5 Apiculture

Honey production in general is an environmentally friendly and productive agricultural activity for fragile and recovering environments in both urban and rural areas. Ethiopia currently produces about 24,000 tons of crude honey and about 3000 tons of beeswax per annum almost all of which is produced using traditional hives from one harvest. It is considered as one of the largest national production levels globally. About 10 million honeybee colonies are found distributed over all agro-ecological zones except the extreme cold and hot regions. But this is due to the extensive conducive agro-climatic zone and rich natural bee forages that exist in the country. The average levels of productivity of the existing beehives are only a third to one half of the known potentials. Using intermediate and modern beehives, farmers could harvest more honey. The traditional, transitional and improved beehives could yield 10, 40 and 60 kg per hive of honey, respectively, while current average performance levels do not exceed 5, 15 and 20 kg, respectively, for the three types of hives (EARO, 2000b). According to a recent assessment made by

the MOA[38], between 1996 and 2004 an average amount of 370 tons of honey were exported. This datum shows that only 10 percent of the production is exported. The low export performance could be attributed to low production and export quality.

Heavy reliance on traditional systems of production explains the low productivity. To the majority of farmers the improved beehives are either too expensive or simply unavailable. Moreover, there is indeed a very limited human resource capacity for research and extension on improved honey production. Among the challenges and constraints to exploiting the potentials of honey production in Ethiopia are said to be dominance of traditional beehive management practices and very low levels of production. Lack of standardisation and quality control to support honey marketing is another constraint that faces the sub-sector.

5.2.6 The peri-urban and urban agriculture

Peri-urban and urban agriculture emerges in response to the growing demands for food, income and raw material needs following urbanization, increasing urban population, and employment needs. Peri-urban and urban agricultural activities do play important socio-economic role by generating means of employment and subsistence for producers and also by supplying food and raw materials for the urban consumers. Peri-urban and urban agriculture system adjusts itself in a difficult environment where the competition for scare land and water is getting tougher and tougher from time to time. As a result, this type of farming is different from the rural one being a relatively land, capital and labour intensive.

[38] Honey and wax production and marketing plan. MOA, Addis Ababa (undated). Unpublished material.

As experience from other countries shows, peri-urban and urban agriculture played a significant role in generating employment, producing fresh food for urban markets and supporting the development of agro-industries. Jianming (undated) studied the historical emergence, development and the role of peri-urban agriculture in China. More priority was given to investment in the industrial economy and as a result, food shortages in China became so bad that many people died of hunger in the early 1960s, which led to the recognition that a balance between industry and agriculture was necessary. Consequently "walking on two legs" became a popular guideline for regional development of industry and agriculture in China in the 1960s, which also sparked the development of peri-urban agriculture in China. The "suburban agriculture" is fully oriented to the production of vegetables, fruit, milk, fish, livestock and poultry, as well as some high value-added grain products such as various beans for urban demand. Suburban agriculture is labor-, and relatively capital-intensive with a high level of productivity. It has absorbed many rural laborers and provided a stable and diversified food supply to the urban residents in terms of quantity.

The urban and peri-urban production system has in recent years seen a rapid expansion of commercial enterprises, which are engaged in dairy, chicken and feedlot beef production around major urban centres. The level of management adopted in these farms is highly intensive (Azage et al., 2000). Table 5.17 provides an insight into the nature, magnitude, diversity and some indicators of the resource performance of the urban agriculture. According to the information contained in the table, about 1.9 million of urban population is known to be agricultural. The total number of agricultural holders is 367,195. The largest number of holders is found in the urban areas of Oromia, followed by that of Amhara and SNNPR. There are 11,721 agricultural holders in Addis Ababa alone. The structure of the urban farms shows that predominantly (55 percent) they are engaged in livestock activities only. Mixed crops and livestock account for 34 percent while only crops farming are 11 percent. Over 75 percent of the agricultural households in Addis Ababa are engaged only in livestock rearing, while mixed livestock and crops is about 21 percent.

Table 5. 17: The structure, diversity, resources and selected production of urban agriculture in Ethiopia

Resources holdings, activities and production	Regions										National
	Tigray	Afar	Amhara	Oromia	Somalia	SNNPR	Benishangul Gumuz	Gambella	Dire Dawa	Addis Ababa	
Urban agricultural population	114,374	18,030	343,797	836,978	61,455	374,090	34,315	13,261	15,060	69,518	1,880,878
Urban holders	24,297	4,155	71,945	163,431	10,817	68,682	7,107	2,394	2,646	11,721	367,195
Type of holding:											
crop only	41.76 (17.2)	258 (6.2)	8449 (11.8)	21612 (13.2)	1160 (10.0)	11688 (17)	405 (5.7)	380 (15.9)	110 (4.2)	446 (3.8)	11%
Livestock only	10841 (44.6)	3560 (85.7)	39306 (54.6)	67478 (41.3)	7532 (69.6)	19316 (28.1)	3269 (46)	783 (32.7)	2018 (76.2)	8825 (75.31)	55%
crops and livestock	9279 (38.2)	337 (8.1)	24190 (33.6)	74340 (45.5)	2126 (19.7)	37678 (54.9)	3439 (48.3)	1231 (51.4)	518 (19.6)	2451 (20.9)	34%

Table 5.17 continued…

Land < 0.51 ha (%)	52	37	??	52	63	80	41	77	88	49	60
Land > = 0.51 ha (%)	48	63	??	48	40	20	60	23	12	50	40
Livestock holding											
• Cattle, total	48,533	9,633	152,207	451,908	16,917	140,146	22,891	3,115	3,443	31,123	879,916
• Cattle, hybrid	1,337	0	2,098	6,151	0	1,042	0	0	0	2,259	12,887
• Cattle exotic	1,472	31	9,461	18,827	0	6,102	8	0	88	6,400	42,389
• Cows	6,574	2,770	30,463	128,670	4,961	49,577	5,481	3,504	1,150	7,267	240,417
• Sheep	16,411	8,591	80,028	125,651	24,282	40,446	6,237	993	5,065	17,250	324,954
• Goats	10,830	16,443	15,057	73,281	33,458	31,536	3,292	2,341	6,490	2,759	195,487
• All Poultry	950,199	5,785	295,286	417,897	29,552	169,794	55,937	17,501	6,101	33,838	1,981,890
Milk production, ('000 liters)	4,122.6	2,696.3	16,105.7	49,433.4	467.855	27,207.2	1,977.5	1,559.1	419.447	7,806.4	111,795.5
% use improved feed	0.6	0.1	0.4	0.2	0.1	0.1	0.0	0.0	*	0.5	0.2
% use by-products	3.4	8.3	9.0	7.1	2.7	4.8	3.3	5.4	20.2	20.2	8.4
Vegetable produced (qt)	282	1,552	1,323	14,500	343	13,991	485	81	34	4,405	36,996

Source: Own computation based on the CSA Agricultural Sample Enumeration data of 2001/2002.

In terms of landholding the urban farms are obviously smaller in size. At the national level, 60 percent of the holdings are less than 0.5 ha in size while the remaining 40 percent are above 0.5 ha. In urban areas of the SNNPR and Dire Dawa, the holdings are predominantly smaller where 80 and 88 percent, respectively, are less than 0.5 ha. The data also shows that the urban and peri-urban agriculture has large cattle resources. At the national level about 800 thousand heads of cattle are owned by the urban dwellers. The largest number is over 450 thousand in Oromia towns while smallest number is in Gambella region. In Addis Ababa alone, over 31 thousands of heads of cattle are owned. At the national level dairy cows amount to 240 thousand while hybrid and exotic breeds of the cattle are close to 13 thousand and over 42 thousand respectively. This amounts to only 1.5 and 4.8 percent of the total cattle population, respectively. The total number of hybrid and exotic cattle breeds in Oromia, Amhara and SNNPR is 24,972, 11,559 and 7,144, respectively. In Addis Ababa there are 2,259 hybrids and 6,400 exotic breeds.

Similarly, over 500 thousand small ruminants (sheep and goat) are owned by the urban agricultural households. In the warmer and low land regions (Afar, Somalia, Gambella, Dire Dawa), goats predominate over sheep while the opposite is true in the other regions where highland agro-ecologies dominate. Close to 2 million poultry are owned by the urban agricultural households. The largest number (over 950 thousand) is found in urban areas of Tigray region followed by Oromia region (417 thousand). Agricultural households in Addis Ababa own 33,838 heads of chicken.

The data show that about 112 million litres of milk are produced by the urban agricultural households during the survey year. The large shares of volume of milk are from Oromia, SNNPR and Amhara urban areas with 49 million, 27 million and 16 million litres, respectively, annually. In Addis Ababa, 7.8 million litres of milk are produced annually. Milk per dairy cow per year is the highest in Addis Ababa at 1074 litres while the national average is less than 50

percent of that of Addis Ababa at 465 litres per cow per year. The milk productivity is higher than the national average in urban areas of Afar, Tigray, SNNPR, and Amhara with 973 litres, 627 litres, 549 litres and 529 litres, respectively.

The low performance of the dairy herd in urban households could be attributed to many factors including the genetic makeup of the cows, management, including availability of better productive feed resources. The data show that only a smaller proportion of the households did use improved feed and by-products as a feed. At the national level, only 8.4 and 0.2 percent of the households use by-products and improved feed, respectively. The use of by-products feed is relatively better practiced in Addis Ababa and Dire Dawa towns where the proportion of users is over 20 percent in both towns.

Vegetable production is also a dominant cropping activity of the urban agricultural households. If they get access to water for irrigation, multiple cropping of vegetables is convenient for urban agriculture, given the market demand and better access. During the survey year a total of about 3700 tons of vegetables were produced by the urban holders.

Despite an important and a growing role of the peri-urban and urban agriculture in Ethiopia, not enough attention has been given in terms of the necessary support to improve the organisation, performance and efficiency of the sub-sector. Like other production systems, urban and peri-urban agriculture has technical and institutional challenges such as management of animals, disease control and public health risks, waste management and disposal, and availability of formula feeds. The system is faced with difficulties including access to suitable and sufficient land and water resources, livestock feed, environmental hazards from urban household and industrial wastes, food safety risks and the like. Studies and documentation made about this system are not common, either. Support for this sub-sector is vital given the enormous social and economic role it is playing.

5.3 Food security in Ethiopia

One of the prime roles of agriculture is to produce sufficient amount of food and ensure food security of households and the population at large. Although sources of food supply could include commercial food imports depending on the foreign exchange availability, and the international market price of food, domestic food production should be the major supplier of food. Food security is a major challenge in Ethiopia. Despite ample resources and agro-climatic suitability for food production, Ethiopia couldn't achieve food self-sufficiency yet. A significant share of the population depends on food aid handouts. While the number of population vulnerable to famine and food insecurity increases during years of unfavourable weather and droughts[39], there are a significant number of chronically food insecure people who permanently need food aid even during normal rainfall years.

5.3.1 Food availability

5.3.1.1 Domestic food production, import, export and net supply

Grain (cereals, pulses and oil seeds) constitutes the major staple food for most Ethiopians; and, therefore, grain production indicates the level of food security in the country. In order to assess the situation of grain production and the level of food security, grain production and requirements are compared taking the relatively better five agricultural years. Comparing the situation of the production year for 2003/2004 with that of the 1978/79 production year, total grain food production in absolute terms increased by 59

[39] Government statistics show a worsening trend of the number of people affected by drought. For example, only about 1.5 million (5% of the total) population of the country suffered from drought-induced food insecurity problem during the imperial regime in the 1960s or early 1970s. By mid 1984, the figure increased to 7 million or 17.4% of the total population. In 2003, it increased to 14.5 million or 22% of the total population that was estimated at 69 million.

percent. Excluding the drought and famine year of 2002/2003 when the agricultural production has been reported to have declined by 26 percent compared to the pervious year, production reached 11.7 million tons in 2003/2004. In the drought year of 2002/03, food production declined by 26 percent to 73.47 million quintals, while in 2003/04, a record level of 117.47 million quintals of grains has been forecasted to be harvested**.** Even with the best estimate of 117 million quintals, there was food deficit of about 26 percent.

Assuming the standard grain food requirement of 210 kg/person per annum, and estimates of the population, food deficit increased fourfold from 1.2 million tons in 1978 to 4.8 million tons in the year 2003/2004. It must be noted that livestock products and non-grain food crops also contribute to the domestic food supply. The level of food security from domestic production declined from 82 percent in 1978 to only 66 percent in 2003/2004, which clearly shows the inadequacy of domestic production activities to meet the growing food demand in the country.

Although, domestic production is the prime source of food supply the national food availability/supply is determined by various factors. Account should be made for wastage and uses for other purposes including seed and feed, for instance. Post-harvest loss/wastage is significantly high in Ethiopia. The National Bank data for 2001/2002 shows that Ethiopia imported an average of over 263 thousand MT of food (food and live animals) during the first half of the 1980s. During the second half of the 1980s average amount was reduced to 255 thousand MT, grain accounting for over 86 percent of the volume of import. By the mid 1990s the average volume of food import increased to 377 thousand MT and the share of grains increased to 94 percent. The average volume for the periods from the second half of the 1990s to the early years after 2000 declined to 214 thousand MT with still higher share of grains at 92 percent.

Table 5. 18: Grain production and contribution to food security for selected years of better production

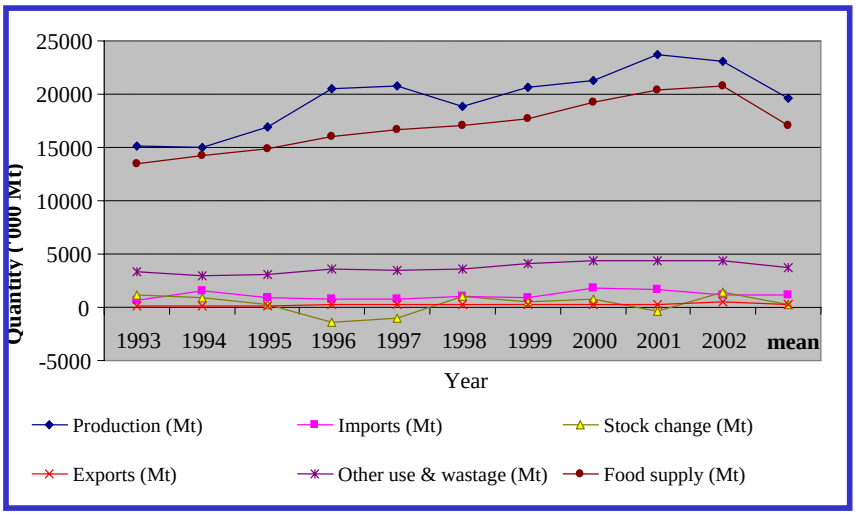
Grain production			Pre-EPRDF		EPRDF period			
			Peak production years		Peak production years			
			1979/80	1982/83	1995/96	1996/97	2003/04	1990/91 to 2003/04
Total estimated grain production (million quintals)			73.67	76.95	100.28	100.17	117.47	82.21
Grain requirement[40] (million qt)	For human consumption	Assuming 210kg/person/ year	72.91	77.74	114.83	118.38	145.17	103.74
	Seed use		3.60	3.76	4.89	4.89	5.73	4.01
	Post harvest loss		7.70	8.04	10.48	10.47	12.28	8.59
	Feed use		1.66	1.74	2.27	2.26	2.65	1.86
	Pulse and oil crops export		0.31	0.32	0.37	0.45	0.48	0.40
Total grain requirement			86.18	91.60	132.84	136.45	166.31	118.60
Estimated grain shortfall	Total shortfall/surplus (million qt)	@210kg/person/ annum	-12.51	-14.95	-32.56	-36.28	-48.84	-36.39
	Per capita shortfall/surplus (Kg./person)	@210kg/person/ annum	-36.03	-40.38	-59.55	-64.36	-70.64	-73.66
Food security index from own production	@210kg/person/annum=100	Food security index from own production	82.84	80.77	71.64	69.35	66.36	64.92

Source: Own computations.

[40] Grain requirement is computed based on a per capita grain consumption of 210kg/person/annum, which is most frequently used in literatures. The 210 kg per capita grain requirement is based on the assumption that all energy requirement comes from grain consumption. The minimum daily calorie requirement per person used to compute the food balance is 2100 kcal. FAO/WFP (2004) estimates that 4..8%, 10.5% and 2.3% of total annual grain production is used for seed, feed and lost in post harvest, respectively. These figures are used to compute grain requirement for nonhuman consumption. Volume of exported oil seeds and pulses was obtained from EEA Database and NBE. However, data for the 1979/80 and 1982/83 were estimated based on the average percent of export to total production for the period between 1889/90 to 2003/04.

Ethiopia exports little amount of food items. After accounting for export, import, stock change, wastage and uses for other purposes, the net food supply has been gradually increasing from less than 15 million MT in 1993 to over 20 million MT in 2002 (Figure 5.14).

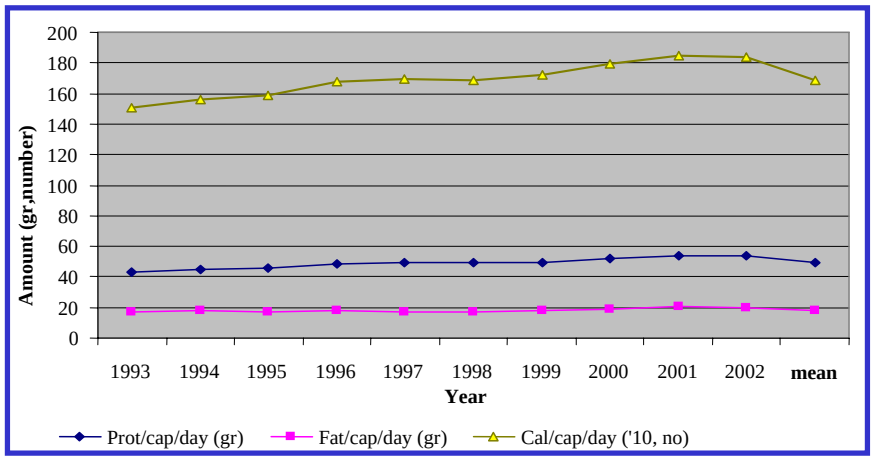
Figure 5. 14: Food production, import, export, various uses and net supply (1993-2002)



Source: Computed using the FAOSTAT database. Note: food includes both crop and livestock products.

Per capita food supply in terms of nutrients has also gradually increased between 1993 and 2002. Per capita calorie supply increased from a level of over 1500 kcal in 1993 to 1800 kcal in 2002 (Figure 5.15). The average for the period has been only about 1700 kcal. The data show that still the calorie supply has been significantly less than the minimum required 2100 kcal per person a day, clearly indicating the national food supply gap. Per capita protein supply increased from 40 grams to about 59 grams per day during the same period. Per capita supply of fat did not change much staying at 20 grams per day over the period.

Figure 5. 15: Per capita food supply per day in terms of nutrients (1993-2002)



Source: Computed using the FAOSTAT database. Note: food includes both crop and livestock products.

5.3.1.2 Food aid

Food aid has been a usual practice now for over three decades in Ethiopia. Although the major events that cause the food aid responses from donors and humanitarian agencies are severe famines triggered by frequent droughts, food aid remained a permanent response to the chronic food insecurity for a significant proportion of the population. Due to environmental problems and land degradation, asset depletion, poor productive capacity and poor agricultural performance, millions became vulnerable to food insecurity problems. As reported in the national food security program document[41], although the volume of food aid fluctuates depending on the weather, the average during the last fifteen years reached about 700,000 MT

[41] The New Coalition for Food Security in Ethiopia: Food Security Program, Volume I. November 2003. Addis Ababa.

per annum. Food aid usually takes two forms. The relief food which addresses the acute food shortages like famine periods and food-for-work programs where food is provided to the needy population as a resource to support some public works activities like soil and water conservation, road construction and maintenance, water resources development, reforestation, etc.

5.3.1.3 Food access and its factors

Access to food is the other important aspect of food security. In addition to food supply and availability, access is a major determinant of the level of food security. Many factors influence access to food. Purchasing power or ownership of resources required to access food, physical constraints, health, cultural or traditional factors regarding resource distribution, food eating habits, etc are some of the factors affecting access to food by households.

5.3.1.3.1 Economic access to food at national level

Economic access to food can be broadly viewed at two levels – at the national level and at the household level. As discussed earlier, one of the sources of food supply and availability is commercial import of food from the international market. Access to the international food market is determined by the availability of foreign exchange earnings required to import food, the price levels and other factors that affect trade. In Ethiopia, the value of food import significantly varied in relation to the value of export. Value of food import was on average 199.5 million USD between 1990 and 1995 and 172 million USD between 1990 and 2000. During these periods, accounting for debt repayment needs, the country's food import capacity was 370 million USD between 1990 and 1995 and 556 million USD between 1990 and 2000. According to the FAO database Ethiopia imported an amount of food valued at 251,191 and 564 million USD between the years 2001, 2002 and 2003, respectively.

Table 5. 19: Export revenues minus debt repayment and food import (cereals, dairy products, meat and oil)

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Avr. 1996-2000	Avr. 1990-2000
Revenues million US$	348	227	191	425	392	636	455	914	919	765	847	780	556
Food imports million US$	191	169	249	108	290	190	142	79.2	135	133	206	170	172
Import capacity index (%)	55	74	130	25	74	30	31	9	15	17	24	44	44

Note: Food import capacity index = (Food imports)/ (Export revenues minus debt repayment),
Source: Berhanu Adenew (2004) adapted from FAOSTAT.

The food import capacity index (value of import divided by import capacity) shows that on average 65 and 44 percent of the import capacity was allocated for import of food between 1990 and 1995 and 1990 and 2000, respectively (Table 5.19). This ratio is relatively high and indicates the country's vulnerability to high uncertainties of food import from the international market. One of the risk factors is the unreliability of the flow of export earnings. The county's major export earner, coffee, faced an unfavourable world market following a drastic fall in coffee price in recent years. According to the National Bank's Annual Report (2000/01), earnings from export of coffee fell from a high of 2.8 billion Birr in 1997/98 to 1.4 billion Birr in 2000/01, a decline by 50 percent (Berhanu, 2004).

5.3.1.3.2 The poverty incidence

Access to food particularly at household level is also significantly influenced by purchasing power. The widely prevalent rural and urban poverty in Ethiopia is one of the major constraints to household food security. Even if food is available on the market, households cannot buy food due to low

income and purchasing capacity. Lack of adequate purchasing power not only constrains food security, but also limits agricultural production and growth through lack of effective domestic demand for farm products manifested in lack of market and low prices to absorb expanded production. Lack of purchasing power is predominantly related to the absence of job and income earning opportunities, the prevailing socio-economic challenge particularly in urban areas.

The public data on poverty level in Ethiopia (MoFED, 2002) show that rural and urban poverty is 45.4 and 36.9 percent, respectively. Income distribution has also implications for the national as well as household food security. The widening income gap in the country is a big concern for food security and development as well. A report by Tessy and Ancy (2004) revealed that in Ethiopia the richest 20 percent of the population takes 50 percent of the national income while only 7 percent goes to the poorest 20 percent of the population.

5.3.1.4 Physical access

Food security can also be expressed in terms of physical access. Variation in agro-ecologies leads to variation in agricultural and food production capacity of the different areas of the country. Some areas have the capacity to produce surplus food while the others are deficit, given the existing farming systems, resource management, and technologies used. Physical barriers, topographic situations, lack of adequate marketing infrastructure (mainly roads, transport and storage facilities) effectively limit the mobility of food from areas of relatively surplus production to areas of food deficiency. In order to improve access to food for the low production areas, various programs of interventions have been undertaken by the government and NGOs. Such interventions include food-for-work and cash-for-work. Currently, the government's productive safety net program is being launched to improve access to food of the vulnerable population through various

integrated activities designed to rehabilitate their asset base and improve productive capacity, and income diversification measures.

Many other factors of physical access could be mentioned including political factors, socio-cultural factors (intra-household distribution), gender relation, etc. The role of political factors particularly power relations and participation in identifying vulnerability to food insecurity, and determination of food needs at the community and household levels are important. The role of culture and traditional factors, gender and access to resources and income are definitely important in determining access to food. However, empirical assessments of such facts are not common.

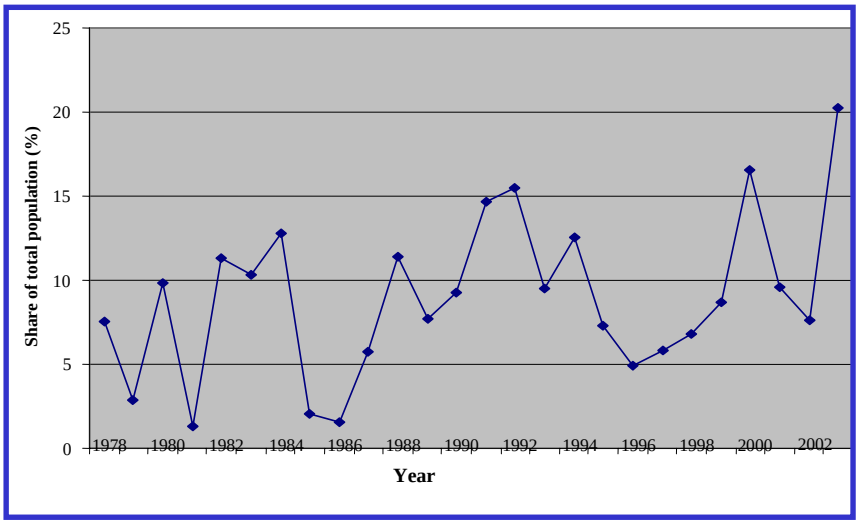
5.3.2 Trends of the number of food-aid dependent population

Food aid inflows in Ethiopia have been used to fill the gap of food demands left after domestic production and commercial imports. The rise in the volume of food aid arrivals in Ethiopia over time implies the fact that domestic food production and commercial imports continue failing to meet food demands of a growing population. At times foreign food resources are also used to support some development activities where monetization of donated food is used to support some development activities usually carried out by NGOs and donor organizations.

Over the last three decades there has never been a year when Ethiopia did not receive foreign food aid. In fact, evidence shows that the trend in the size of population affected by drought and which became vulnerable to famine has been increasing from time to time (Figure 5.16). Even during the years of normal rainfall distribution, millions of Ethiopians survive on food aid. In the recent drought that occurred in 2002/2003, the number of population that needed food aid surpassed over 20 percent. A forecast made using the historical data of the number of drought and famine affected population shows that the number has been increasing at a rate of 3.4 percent per

annum (EEA/EEPRI, 2003/04). While food aid helped a lot in terms of saving lives and supporting the vulnerable population, it is also undeniable fact that the presence of food aid over such a long period of time must have created a dependency syndrome at all levels – government, community and household.

Figure 5. 16: Ethiopian population affected by drought over the last two decades



Source: Computed from the DPPC data.

The continued inflow of food aid to the country can be largely explained by the failure of the country's development policies and strategies to generate and rely on own resources and means to increase food and agricultural production. In addition, despite the flow of food aid resources to Ethiopia for a long time, its contributions to sustainable development of the country is little, if any. The food aid and related measures have been short-term in nature without much consideration of the long-term needs. Due to this, there have been arguments whether food aid resources in particular and donors' supports in general could be directed towards supporting the long-term development needs of the country.

Chapter 6

Agricultural Resources Base: Potential and Constraints

6.1 Agro-climatic zones and their potential for agricultural development

Ethiopia is a country of great geographic diversity with high and rugged mountains, plateaus and deep gorges incised by river valleys and rolling plains. These physical conditions and variations in altitude have resulted in a great diversity of climate, soil and vegetation that are favourable for agriculture and tourism. The Great Rift Valley runs through the country from north to southwest separating the highlands into south-eastern massif and north-western massif. The altitude varies from as low as 120m below sea level at *Dallol* depression to as high as 4620 m above sea level at Ras Dashen peak. The highlands with altitude ranging from 1500 to3500 m accommodate 88 percent of the human population, 75 percent of the livestock population, and 95 percent of the total cultivated land (EFAP, 1994). The highlands are part of a vast mountain massif in the heart of the country, and account for about half of all the highlands in Africa (Hurni, 1988).

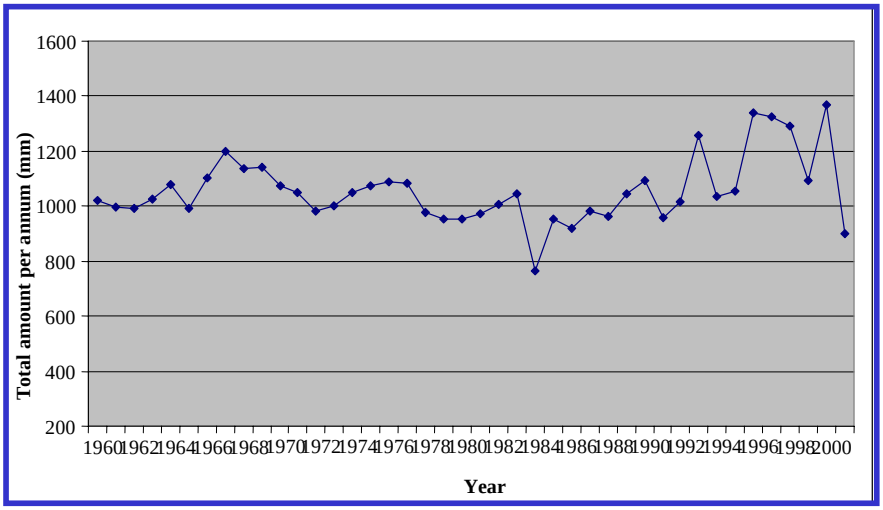
The diversity in altitude, climate, soils and other physical features have created a variety of agro-ecological zones based on rainfall, temperature regime, potential evapotranspiration, soils and land form (FAO, 1986). Farmers traditionally identify five agro-ecological zones based on temperature requirements (although with some overlaps)– *wurch, dega, woyinadega, kolla and bereha* and they macth their cropping and land use practices to the local agroclimatic conditions. The Land Use Planning and

Regulatory department of MoA with assistance from FAO delineated 18 major agro-climatic zones and 47 sub agro-ecologies based on the length of growing period and thermal conditions (MoA, 1998). Map 2.1 presents the major agro-climatic zones of Ethiopia.

Climate is the basic natural resource and together with soil, forest and water resources, determines the land use pattern and agricultural productivity. The length of growing period is largely dictated by altitude – the higher the altitude the longer the growing period. Five moisture zones are generally identified - hyper arid, arid, semi arid, dry sub humid and moist zones. The western and south-western part of the country is generally dominated by dry sub humid and moist zones while the semi arid and arid zones are found in the eastern half of the country. The hyper arid zone is located over north-eastern parts of Afar and south-eastern parts (EARO, 2000a; Engida, 2000). With few exceptions, most parts of the western, central, southern and eastern highlands of the country receive high and stable rainfall reliable for crop production. In places such as Kaffa, Illubabor, Sidamo, Arsi-Bale highlands, parts of East Gojjam and parts of Gamo highlands, receive mean annual rainfall of 2000 mm (EARO, 2000a). In the north-eastern highlands south-eastern lowlands, rainfall is generally low and variable.

The national data of rainfall documented over four decades show that on average the country receives high amount of rainfall, above 1000 mm per year. However, the amount fluctuates from year to year (Figure 6.1). This fluctuation has been very frequent in recent years, notably after the mid 1980s implying an increasingly serious challenge to agriculture which is predominantly dependent on rainfall. Drought has been frequent as a result of late onset, abnormal distribution and early stopping of rainfall. The trend has a serious implication for measures to combat risk induced through moisture shortages.

Figure 6. 1: Total annual rainfall amount in Ethiopia over the last four decades (1960-2001)



Source: computed from the national database.

A wide variety of crop and livestock production systems are practiced in different agro-ecological zones. The major land use categories are cultivated land, livestock rearing (grazing and browsing land) and forestland. Livestock rearing (grazing and browsing) is the largest use (over half of the agricultural land) while about 20 percent are put under crop sub-sector (annual and perennial crops). Cereals provide the most important part of food although a large population in the South-western part survives by growing enset, coffee and root crops. Westphal (1975) and FAO (1988) recognise four distinct farming systems in Ethiopia. These are the highland cereal system of the north-central and south-eastern highlands; the enset-coffee-livestock complex of the south and western highlands; the shifting cultivation confined to lowlands of the south-western part of the country; and the pastoral complex which involves complete dependence on livestock production for subsistence which is practiced in hotter and drier zones of Ethiopia.

In the plough-based cereal system teff, wheat, maize and sorghum are grown as staples mixed with livestock keeping. The system is extensive requiring about 2 ha of land/family. Population density is about 90 persons per sq km (FAO, 1986). In contrast, the hoe-based coffee-enset-livestock system is characterized by high population density (200-350 persons per sq km) with average holding of 0.5 ha for a family of 8 persons) where intensive mixed farming is practised (Eyasu, 2002).

Map 2.1 depicts that much of the Ethiopian highlands have temperate climate where the length of the growing period and amount of rainfall are adequate to grow the non-traditional high value crops (fruits and flowers). The agro-ecological and edaphic conditions are suitable to produce high value fruits (temperate and deciduous fruits) and for floriculture development. Parts of the Ethiopian highlands fulfil the chilling requirements for the production of temperate fruits such as apples and plum while much of the lowlands are suitable for mangoes, avocadoes and citrus fruits. The country is also located in the proximity of lucrative export markets in the Middle East and Europe. However, the vast majority of smallholder farmers depend on grain crops and the cultivation and consumption of fruit crops in the peasant sector is extremely low.

6.2 Agricultural land and soils

The Land Use Planning and Regulatory Department (LUPRD) of the MoA with assistance from FAO has compiled Ethiopia's soil resource base and mapped it at a scale of 1:2000 000 (FAO, 1986: Map 2.2). The available information indicates the existence of 18 major soil associations in Ethiopia. Map 2.2 presents the occurrence and distribution of the major soil types in different parts of the country. About eight soil associations together comprise about 75 percent of the agricultural soils of Ethiopia. These include Lithosols, Nitisols, Cambisols, Regosols, Vertisols, Fluvisols, Xerosols and Acrsiols.

The *UNDP/FAO* (1984) report presents the chemical properties and the soil profiles of the major Ethiopian highland soils. In most areas of the highlands the soils are relatively deep and inherently fertile. Even if the soil resources have been subject to degradation due to overuse and poor management, they can still be conserved and developed to support sustainable agricultural production. With the exception of Cambisols and Lithosols, all the main soils are derived from volcanic parent material and hence, inherently fertile. By international standards, Potassium, nitrogen (N), Cation Exchange Capacity (CEC) and organic matter contents of the Ethiopian soils are generally high as they belong to the more fertile tropical soils (FAO, 1986). All major soils have good workability, drainage and adequate depth except Vertisols and Lithosols that have some physical limitations. Vertisols are chemically fertile and rich in nutrients but they have physical limitations as they are prone to swelling and watrelogging when wet and cracking and self-mulching when dry. However, due to excessive use and poor management for centuries, the formerly fertile soils are being depleted and transformed into infertile ones.

Soil erosion has become the main manifestation of Ethiopia's landscape with formation of gullies in many areas. The Ethiopian Highlands Reclamation Study (EHRS) estimates annual average net soil loss of 130 t/ha, which would mean a loss of 1,900 million tones of soil. This results in annual soil depth loss of 8 mm (FAO, 1986). Chronically food deficit areas such as Tigray, Wollo, Gondar, North Shoa and parts of Haraghe, which have a long history of cereal cultivation, correspond well with severely degraded soils that partly explain chronic poverty and food insecurity. The soils in these areas heavily weathered and old, have high Potassium fixation properties, hence low potassium availability, loss of soil rooting depth due to severe erosion and low organic matter (due to dung burning and crop residue removal).

The immediate and future cost of land degradation for a nation has been an issue in the field of environmental economics with increased momentum in

recent times. The annual loss in grain production due to soil degradation was estimated at 40,000 tons in 1997, which reached 170,000 tons in 2000 (Shibru and Kifle, 1998). This translates into an annual income loss of US $150 million (Barbier, 1998), which is a loss of approximately 17 percent of the potential agricultural GDP (EPA, 1997). These estimates do not take into account the cumulative impact of soil degradation; they assume instead a constant productivity loss each year. Bojo (1996) provides estimates on discounted future loss of land productivity in the order of US$ 2.3 to 3 billion for Ethiopia.

Ethiopia once had an extensive forest area covering about 16 percent of the total land surface in the 1950s which declined to only 4 percent in the 1980s and to less than 2.7 percent at the end of the 1990s (Bojo and Cassels, 1995; Eyasu, 2002). The remaining woody vegetation resources are estimated to cover about 27.5 million ha of land in 1992 (EFAP, 1994). These resources comprise natural high forests, categorised as slightly and heavily disturbed high forests, woodlands, bush-lands, plantations and on-farm trees (Table 6.1). In addition to productive functions (wood, timber, pole and non-timber products), forest resources are valuable in watershed protection and maintaining biodiversity resources (flora and fauna).

Natural high forests are areas covered by a closed stand of trees with a more or less continuous canopy rising 7 to 30 m, and a sparse ground cover of few grasses. Ethiopia's remaining natural high forests include various types of montane forests concentrated in the less populated southern and western parts of the country. The central and northern parts are almost completely deforested (EARO, 2000a). The western zones of the southern region and Oromia are characterized by long rainy seasons and heavy natural forests, which are unique to Ethiopia. The forests represent the genetic pool of Arabica coffee. Lowland woodland, bush and shrub lands, and wooded grassland represent a variety of woody vegetation types. Woodlands can be

defined as land covered by an open stand of trees taller than 5 m and up to 20 m in height and a canopy cover of more than 20 percent (EFAP, 1994; EARO, 2000a; Demil, 2002).

Table 6. 1: Estimates of the area, growth stock and incremental yields of the various forests

Forest resource	Area (million ha)	Annual incremental yield	
		Per Unit Area (m^3 s / ha / y)	Total (million m^3)
Natural high forest	2.3		0.3
• Slightly disturbed	0.7	5-7	
• Highly disturbed	1.6	3-4	
Woodland	5.0	1.2	6.4
Bush land	20.0	0.2	4.0
Plantations	0.2	9.6-14.4	1.6
Farm forests	42,124	Not available	2.1

Source: EFAP (1994); Woody Biomass Project (2001).

Plantations include industrial and peri-urban plantations established and operated by the Government, as well as community woodlots and catchments protection plantations. We have about 200,000 ha of plantation forests across the country (Demil, 2002; EARO, 2000 (a)). These stands were established in the 1980s when the Derg government launched a nation-wide programme of conservation and reforestation. Eucalyptus and Cupressus are the main species in industrial plantations, followed by Juniperus procera and Pinus patula. Peri-urban plantations, created to supply urban centres with poles and fuel-wood, are located around Addis Abeba and other major towns. Community woodlots are plantations created and managed by groups of farmers or a community for both watershed protection as well as production of fuel-wood.

Farm forestry is a land use system and practice in which woody perennials are deliberately grown on land also used for crops and pasture. In parts of

Ethiopia, farmers have traditionally used farm forestry practices such as homestead tree planting, field tree planting and farm boundary planting. The Woody Biomass project of MoA estimated the area under farm forestry at 42,124 ha (Woody Biomass Project, 2001). There has been a massive increase in area of farm forests driven by increasing demand for poles that created a new source of revenue for rural households. Eucalyptus is the most popular tree planted for fuel, poles (construction) and as source of cash income (Woody Biomass, 2001; EFAP, 1994).

6.3 Water resources and irrigation

Throughout the history of mankind, from the era of ancient civilization of the Nile banks, Persia & the Far East to modern times, water resources development has been the prime factor influencing the development of agriculture & rural areas. More recently, technical progress & modernization of farming systems have allowed countries of the developed world to become net exporters of agricultural products, mainly due to sound policy on water resources that combine technological advancement with competent policies. These policies put together harmonious development that presupposes not only purely economic driving forces but also considers and embraces socio-economic aspects such as food self sufficiency & environmental protection. Despite their enormous potential, the water resources of Ethiopia did not contribute their share to the national economy. They have not been properly utilized to narrow the ever increasing gap of food demand & supply. There is, therefore, a need for a sound framework for planning & executing a water resources-centered agricultural development in which irrigation is one of the most decisive factors. The river basin/valley framework is the most convenient & powerful method particularly for developing the Ethiopian water resource potential.

6.3.1 River basin/valley planning framework

The agricultural production system, being the major component of the Ethiopian economy, influences almost all development activities to a large extent directly and in some instances indirectly. The crop livestock sectors of agriculture are the sources of domestic food requirements of the nation and constitute over 90 percent of the annual national exports (EEA, 2003/04). The rural economy is directly dependent on the agricultural production system which in turn dictates the direction of any development activity if fundamental results are to be achieved. Agriculture is highly influenced by the central and most critical element, moisture. Moisture required for agricultural production is derived from surface or ground water bodies. The development of these water resources requires a systematic and rational planning.

The drainage basin, river basin or valley, which will be treated as synonymous concepts, provides the natural geographic boundaries within which natural resources particularly water resources exploitation and regeneration can be naturally planned & systematically implemented. Agro-ecological & agro-climatic zones, which are essential to the understanding of future land use, can be integrated within the drainage basin (valley boundaries). The river basin in the context of Ethiopia is a uniquely appropriate unit on which to base both spatial and methodological approaches to water resources development analysis. This approach, by giving prominence to the natural relationship between the components of the environment has to be understood as an essential pre-condition for the elaboration of project proposals, which will increase food production & also bring about economic development through the development of agricultural lands & pastoral areas of Ethiopia.

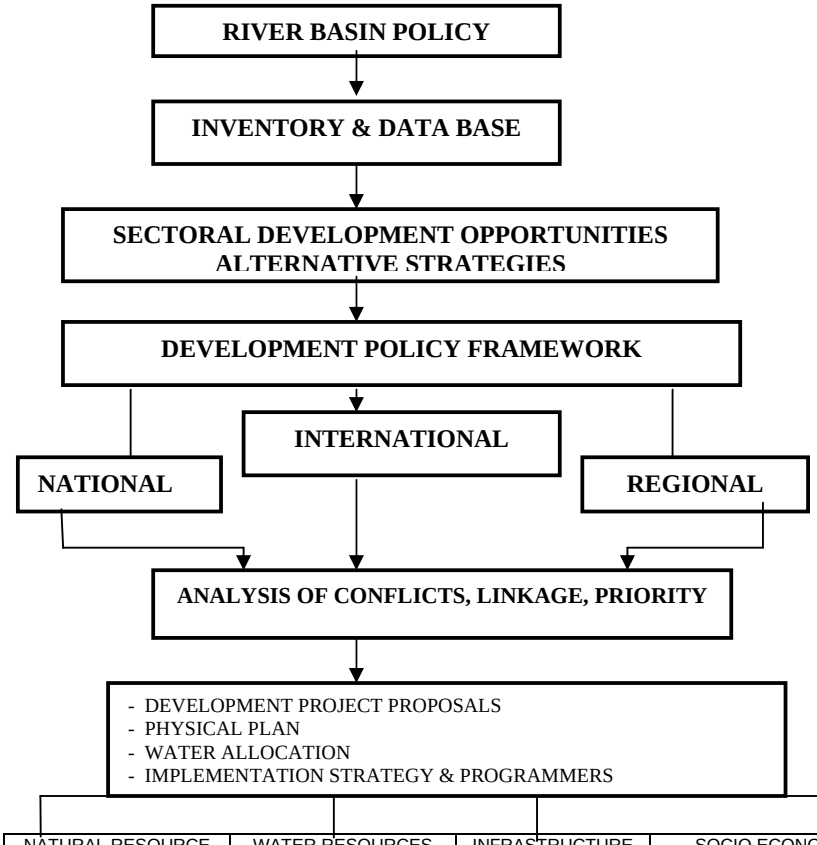
Comprehensive river basin development planning also requires consideration of other elements in any given valley, other than soil, water and vegetation.

There are natural phenomena, which are not necessarily confined within a valley boundary, such as wildlife, ground water, oil gas, etc. There are also a series of population-related issues such as settlement, transportation, industry, political and administrative boundaries, etc. which are spreading within & out of a given drainage basin. Such aspects based on natural economic and administrative units cannot, therefore, be ignored. A valley development study plays a unique role in proposing a rational allocation of water resources to different uses, based on their contribution to the development of the valley and the region as a whole (CIID, 2001). A comprehensive river basin development planning is different from other forms of planning such as regional planning because it considers both economic development as well as natural & enduring resources of the basin.

The flow chart (Figure 6.2) describes the most outstanding features of a river basin planning framework. It begins with a political decision for conducting water-centred agricultural transformation. The formation of a data base is the first & important step to be followed by models to simulate the natural existing balance/interrelationship. The most important aspects to be modelled will include population support capacity, water balance, energy balance, cattle feed balance, etc. The analysis will lead to the diagnosis of potentials, constraints and opportunities of the natural resources base. This will evolve into a sectoral development framework. Once the sectors of intervention are articulated, the development policy framework shall be established considering general and sectoral interventions at the national, international and regional levels. Here proper analysis on linkage, conflict & priority should be carried out. Subsequently the proposed interventions will be elaborated with development project proposals, physical plans, water allocation plans, programs/ projects with implementation strategies. The development projects/ programmes will be within a comprehensive river basin framework having the main components of the natural resource, water resource, infrastructure & socio-economic development.

The river basin approach for integrated water resources development is an international practice (Lohsmar et al., 2003). It has been proven to be a very effective mechanism, as witnessed by the experience of China, India, and France, etc. all of which are today net exporters of food crops. Under the river basin planning framework, the final selection of the alternatives must be based on the integral view of the whole basin as well as the economic implication of the alternatives. That means the economic benefits, the social benefits and the environmental benefits as a whole must be all considered in the selection of alternative projects.

Figure 6. 2: Conceptual flow chart for a river basin development framework



NATURAL RESOURCE	WATER RESOURCES	INFRASTRUCTURE	SOCIO ECONOMIC
- Agriculture - Forestry - Livestock - Fishery - Wild life - Minerals - Energy	- Surface water resource - Ground water resource - Water resource development for various uses.	- Settlement - Transport infrastructure - Transport service - Water supply & sewerage - Social service	- Industry - Commerce - Social service - Population & employment - Tourism, culture heritage - Economic development - Institutional development

6.3.2 The role of water resources for development and agricultural transformation

The contribution of water resources for rural development & agricultural transformation is a very central issue. The water sector has a lot to offer to the transformation process. If the water resources are properly developed and exploited it is possible to alter the existing situation significantly with respect to, food security, employment generation, poverty reduction and drought mitigation

Developing water resources for food security

Irrigation is a crucial activity to the country's food security and agricultural development efforts. There is a marked difference in yield response and water requirements between irrigated and non-irrigated agriculture. Irrigated crops produce better yield than rain-fed crops because of their higher water consumption even if those rain-fed crops get optimal inputs. The water consumption for-rain fed agriculture stops at 5,500 m^3/ha as it is impossible for 'typical' rain-fed crops to consume more water. The corresponding yield is estimated to be 5000kg/ha. Whereas the irrigation crops' water consumption could go up to 6500m^3 /ha with a corresponding yield of over 7500kg/ha.In irrigated agriculture, water taken up by crops is partly or totally provided through human intervention. Irrigation water is withdrawn from a water source (river, lake or aquifer) and led to the field through an appropriate conveyance infrastructure. To satisfy their water requirements, irrigated crops benefit both from more or less unreliable natural rainfall and from irrigation water. Irrigation provides a powerful management tool against the vagaries of rainfall, and makes it economically attractive to grow high-yielding seed varieties and to apply adequate plant nutrition as well as pest control and other inputs, thus giving room for a boost in yields (FAO, 1996).

Most of the expansion in irrigated land will be achieved by converting land used for rain-fed agriculture or land with rain-fed production potential but not yet in use into irrigated land. Experience shows that rain-fed agriculture has been unable to meet the food requirement of the Ethiopian population (see Table 6.2). The present annual per capita consumption of cereals and pulses in the country is 163 kg compared to the UNICEF standard of 240 kg and that of the average for developing countries of 230 kg (2100 Calories).

Table 6. 2: Requirement for food crop production and irrigation land – present and future forecasts

Year	1995	2000	2005	2010	2015	2020
Population ('000)	53,277	60,965	70,297	82,689	96,806	113,234
Annual per capita food consumption (kg)	150	160	170	180	190	200
Total cereal requirement (million MT)	7.99155	9.7544	11.95049	14.88402	18.39314	22.6468
Production from rain- fed agriculture (million MT)	7.491	7.99	8.49	8.99	9.99	10.99
Production from irrigated agriculture(million MT)	0.50055	1.7644	3.46049	5.89402	8.40314	11.6568
Yield of Irrigated agriculture (MT/Ha)	6.5	7	7.25	7.5	7.75	8
Area required for irrigated agriculture (million ha)	0.0770077	0.252057	0.477309	0.785869	1.084276	1.4571

Source: The 1984 Population and Housing Census of Ethiopia. Analytical Report Addis Ababa, 1991.

Even though considerable increase in production can be attained through intensification of the rain-fed agriculture, it is bound to fall short of the ever increasing population. Table 6.2 shows the required growth of irrigated agriculture in Ethiopia. It can be seen from the table that although the production from rain fed agriculture is expected to grow, additional production

is required to meet the demands, which should come from the irrigation sub-sector. In order to achieve this nearly 1.5 million hectares and all of the 3.5 million hectares must be developed by 2020 and 2040, respectively. Hence, it is high time now to be engaged in irrigation development if we want to ensure food security in the country.

Developing water resources for creating employment opportunities

Agriculture is the dominant source of employment in the rural economy. The means of production; mainly the land resource is not used with vital input such as irrigation on one hand & is also progressively fragmented in an effort to accommodate the ever increasing high unemployment level. Moreover, since the last three decades a rapid increase in population has led to accelerating rates of deforestation, soil erosion and soil fertility decline with increased use of marginal & often unsuitable land for cultivation. This makes the rural area more vulnerable to social & economic problems. Thus, this situation can be and has to be reversed through a long-term sustainable development framework.

Irrigation, supported through inputs such as high- yielding varieties, nutrients and pest management, together with a more extended agricultural season, higher cropping intensity and a more diverse assortment of crops, can generate more rural employment. The productivity boost provided by irrigated agriculture results in increased and sustained rural employment thereby reducing the hardship experienced by the rural and urban population. Growth in the incomes of farmers and farm laborers creates increased demand for basic non-farm products and services in rural areas. These goods and services are often difficult to trade over long distances. They tend to be produced and provided locally, usually with labor-intensive methods, and so have great potential to create employment and alleviate poverty. Studies in

many countries have shown multipliers effect ranging from two (in Malaysia, India and the United States) to six in (Australia) (UNDP, 2003).

Developing water resources for poverty reduction

In the absence of a strong rural economy, there is very little means of increasing income of farmers even if there is an apparent need. Most of the rural poor work directly in agriculture, as smallholders, farm laborers or herders. Poverty is rampant in rural Ethiopia. Poverty reduction is significantly related with water resource which is linked with agricultural activity. Income can be boosted by pro-poor measures, such as ensuring fair access to land, water and other assets and to services, including education and health. Relevant reforms of agricultural policy and practices can strengthen these measures. Developing water resource can be remarkably an effective measure in poverty reduction. Experience from India shows that in non-irrigated districts, 69 percent of people are poor, while in irrigated districts, only 26 percent are poor. The availability of water confers opportunities to individuals and communities to boost food production, both in quantity and diversity, to satisfy their own needs and also to generate income from surpluses. Irrigation has a land-augmenting effect and can therefore narrow the difference between extreme poverty and the satisfaction of the household's basic needs. Nevertheless, it is generally recognized that in order to have an impact on food self sufficiency, irrigation projects need to be integrated with an entire range of complementary measures, ranging from credit, marketing and agricultural extension advice to improvement of communications, health and education infrastructure.

Irrigation projects are as diverse as the local situation in which they are implemented. Generally, small-scale irrigation projects provide a manageable framework that can give control to the local poor and avoid leaking resource to the non-poor large -scale irrigation. At times high investment could be

needed to carry out large-scale engineering works to harness water and convey it to the fields. The same thing could also be made to work for the poor provided that the benefits can be shared equitably, and investment, operation and maintenance costs are efficiently covered. The recent study on irrigation possibilities in Ethiopia (World Bank, 2005) modeled the yield differential between irrigated and rain-fed crop production. According to the Agricultural Sample survey data of 1997 and 2000, the yield gap between irrigation and rain-fed grain production is 40 percent i.e., on average, irrigation can increase grain yield by up to 40 percent (World Bank, 2005). A simple calculation shows that if increased irrigation areas can help close this yield gap in the next 12 years, it would be equivalent to an additional 3 percent annual growth in gain production. The model projects that if all of Ethiopia's grain production could achieve this growth in productivity, the national poverty rate would fall to 33 percent by 2015 (World Bank, 2005).

Developing water resources for drought mitigation

Disasters due to drought and hence lack of food security have become increasingly the concerns of countries like Ethiopia where drought, is significantly exacerbated by backward or negligible natural and water resources development. The cumulative effect has been total loss of food production with severe social and economic implications. An integrated approach to the study and exploitation of water resources has to be intensively pursued if we are to break the vicious cycle of drought, partial or total crop production failure. Drought mitigation strategies may aim to reduce the vulnerability factor by, for example, altering land use and agricultural practices, or may modify the severity of the drought by providing irrigation from reservoirs, wells or water imports from areas unaffected by the drought.

There are a variety of long-term mitigation measures that can be taken in a basin planning framework. These include changing crop type, recognizing

lands that are indeed marginal and appropriately changing agricultural practices, and constructing water reservoirs. Populations will eventually have to build their security at a local and family level. An important requirement is, therefore, to identify and establish water centered strategies that enable the community to cope with droughts, including revival of traditional customs for cultivation and livestock. Relocation of populations considering resource bases in a basin planning frameworks is another possible long-term measure. However, the capacity to handle migration and resettlement are issues that warrant careful consideration.

6.3.3 The water resource potentials of Ethiopia

The country is endowed with ample natural resources especially of land and water whose potentials for development are enormous. Based on its river basins, Ethiopia is divided into twelve parts within longitudes 33^0_E to 48^0_E and latitudes $3^0_{N\ to}$ 14.5^0_N (see Map 6.2. and Annex Table 6.2). The top four big size basins are Wabi-Shebelle (200,214 $km^{2)}$ in South Eastern, Abbay (199,812 km^2) in West, Genale-Dawa (168,100 km^2) in South, and Awash (110,000 km^2) in Eastern part of the country. The size of the other five basins varies from 86,510 km^2 to 64,380km^2 while the least three namely Rift Valley Lakes, Mereb, and Ayisha have 52,000 Km^2, 5893 km2 and 2223km^2, respectively. Concerning the regions falling within a particular basin, three basins fall entirely within one region while other encompass by more than one region (MWR, 2001). The resource base is reasonably high to foster development and to bring about fundamental changes in the existing agricultural production system. The data show that (Table 6.3) the water resources provide potentially irrigable 3.5 million hectares of agricultural land.

Table 6. 3: Basins resource potential in Ethiopia

Basins	Resource	Potential		Forestry in (ha)
	Water resource (billion m^3)	Hydropower	Irrigation in ha	
Abbay	52.62	55,000 Gwh/Yr	1,700,000m	227,623
Tekeze	8.2	4,231 Gwh/Yr	69,061	1,052,617
Mereb	0.65		29,465	
Baro Akobo	23.24	4.146MW	600,000	2,200,000
Omo Give	17.6	2.583MW	90,394	1,070,000
Awash**	4.9	1.574 Gwh/Yr	205,400	
Rift Valley lakes	5.68		50,000	245,000
Genale-Dawa	6.1	670MW	423,000	1,061,800
Wabi Shebelle	3.16	5.400Gwh/Yr	204,000	na
Danakl	0.86	-	90,000	118,635
Ogaden	-	-	-	7,514,600
Ayisha	-	-	4,300	
Total	123.01		3,465,620	

Source: Profile of Basin Master plan studies (MWR), 2001; na = Data not available

Out of the potential resources for irrigation development 665,750 hectares of land in 40 different sites are identified for immediate implementation (see Annex Table 6.3).

6.3.4 Constraints to water resources development

The development of the national economy calls for an integrated planning & execution of the natural resources by putting water resources at the center of the agricultural development. Considering water resource as the basis for intensive & enhanced agricultural development requires a proper identification of the resources' availability and their distribution as well as the prevailing opportunities of development. Although the water policy of the Ethiopian government states that the hydrologic boundary or basin is the

fundamental planning unit, not much has been achieved with regard to proper utilization of this resource. The proper utilization of the water resource potentials is constrained by a host of factors.

i) Lack of appropriate policy and strategy

The government of the Federal Democratic Republic of Ethiopia has issued a National Water Resources Management Policy and National Water Sector Strategy in 2001. These documents could be taken as achievements by themselves since they indicate the level of importance given to the water sector by the government. However, there remains a lot in terms of improving the policy framework. The current policies assume a “normal condition of agricultural production system”. This implies that the food crop production (using irrigation or otherwise) and demand is in balance. However, the agricultural production situation in Ethiopia today is in crisis due to the poor overall crop production sector performance expressed in terms of food insecurity, unemployment, poverty, etc. Therefore, the Water Resources Management policy & Strategy should address the issue of the current agricultural sector crisis & should stipulate a short & medium-term exit strategy. It needs also a legal framework by which the central and important concept of using basin as fundamental planning unit could be converted into actions, i.e. programs, projects, and interventions. Without concerted and urgent actions, the prevailing policy & strategy will not meet the objective of water resources development and serve the purpose of the national socio-economic development.

ii) Lack of river basin institutional setup

Proper institutional arrangement plays a decisive role in promoting the development goals at minimum cost and time. Irrigation development also requires an effective planning and institutional arrangement. The best way of

tackling irrigation development would be by employing river basin/valley planning framework. This framework presupposes the establishment of river basin development institutions whose task will be ensuring that comprehensive planning & implementation is put in place.

Irrigation water use is one of the major consumptive uses of water resources and due to its social & economic dimensions needs a particular emphasis on how it should be planned & implemented. Under the Ethiopian context, irrigation development has to be set on the right track in order to exit from crop production crisis. This means that water resources development has to be given special focus & a specialized institutional arrangement, which to date does not exist. To date there is no holistic water resources development planning framework, which considers river basin as the basic planning & implementation unit. As a result of this, the efforts made so far with respect to small, medium & large scale irrigation schemes are not comprehensive, sustainable & with focused target. Hence accomplishment has been very low (only 15 percent of the potential). In addition, reformulation (revival measures) on past public investments has become difficult. For example, large scale irrigation projects implemented prior to 1991, such as Alwero (10,000 ha), Gode (30,000 ha) that needed reformulation for better economic & social benefit are left unattended due to lack of viable implementation arrangement.

iii) Inconsistent operational arrangements and strategic efforts

The planning and implementation of small, medium & large scale irrigation developments and implementation is currently the mandate of the Ministry of Water Resources, although regions and the Ministry of Agriculture are also involved in small scale irrigation & livestock development. To date there is no defined/ streamlined irrigation extension service that covers all existing small scale irrigation schemes. Thus, it is time to focus on setting targets of

agricultural output by giving due attention to the constraints, one of which is operational arrangement.

Inconsistencies in terms of strategic efforts of irrigation development have also been major constraints on the development of the sub sector. The pond “water harvesting programmes” have overlooked the basic principles of engineering & economics of scale by deploying a lot of resource in a manner which was biased against a holistic development that should link & integrate all scales of irrigation development in a given river basin/Valley framework.

Pond water harvesting is essentially a subsistence type of irrigation intervention within the small scale system which might have a “complimentary’’ effect than substituting the better sized small scale interventions. Considering the hydrological features of the basins of Ethiopia, other forms of water harvesting such as using micro-dams & diversion weirs, in fact have better production impact than pond water harvesting, which has a limited & small storage capacity. In addition, in most cases pond water harvesting requires the construction of an expensive structure that would not justify its implementation.

Nevertheless, if properly planned within a river basin or watershed framework, pond water harvesting, based on shallow wells, embankment and dug out or cut and fill ponds can be linked to other small scale irrigation systems that are based on diversions, micro-dams etc., so that they will have an impact on production due to the cross linkage (Alemayehu, 2002). Pond water harvesting is to be used only for supplementary irrigation due to capacity limitation (they do not have carryover storage), while the embankment type water harvesting & micro dams could be used for main irrigation, if planned and implemented within a watershed/basin system.

6.4 Biodiversity

6.4.1 Plant genetic resources

As a result of the diversity in climate, topography and soil types, Ethiopia possesses one of the largest plant genetic resources in the world. The higher plant flora of Ethiopia is estimated to be between 6500 and 7000 species out of which about 12 percent is considered endemic (EPA, 2002). The plant resources range from desert steppe vegetation to tropical rain forests, and with elevation and humidity, to alpine grasslands. Woody plants compose about 20 percent of the flora of the country and are found in areas of semi-arid, moist, wet intermediate altitude and semi-arid to moist low altitudes. Forest areas are diversity hotspots containing nearly 25 percent of wild relatives of crop plants. The areas above 1500 m.a.s.l, consist of evergreen and deciduous woodland and highland forests with upper canopy of tall trees and lower layer of shrubs. Ethiopia is the only country in the world where coffee grows in the wild as an under-storey shrub in the Afromontane rain forests in the south-western part of the country. The forest coffee is believed to contain a large genetic pool of Coffee arabica, which represents an invaluable source of genetic material for crop improvement breeding for the welfare of the present and future generations

The diversity within domesticated crops is also immense making Ethiopia the centre of origin for many crops. These include teff (*Eragrostis tef*), coffee (Coffee Arabica), and noug (Guzotia abssynica). It is also a centre of diversity for crops such as barley (*Hordium vulgarae)*, durum wheat (Triticum drum), sorghum (*Sorghum bicolour*), field peas, faba bean and lentils (Abebe, 2000; FDRE, 2002). Even crops that were originally domesticated elsewhere exhibit immense variation in a number of adaptive traits. These provide genetic stock for breeding programmes. Ethiopian farmers manage a range of crops that are little known as food crops outside Ethiopia including enset (*Enset*

ventricosum), tef (*Eragrostis tef*), anchote (*Coccinia abyssinica),* taro (*Colocasia esculenta)* and Ethiopian kale. Ethiopian farmers conserve biodiversity by growing different crops in their farms in different combinations and mixtures that encourages conservation of biodiversity resources.

The genetic diversity of the Ethiopian landraces has been found to be important worldwide in developing new crop varieties and for developing genetic resistance against disease/pests within crop cultivars through crop improvement breeding. National and international plant breeders use Ethiopian farmers' varieties as a source of desired genetic traits to incorporate into improved varieties. They use them to develop new products such as drugs, bio-pesticides and other goods and services. A case in point is the Ethiopian barley that has provided the genetic traits to develop resistance to barley yellow dwarf virus. The new resistant variety developed from genes taken from the Ethiopian barley has protected Californian barley from dwarf yellow virus, saving damages estimated at US$ 160 Million per year (Perrings, 2001). Trans-national seed companies have taken the larger share of the benefits of biological resources conserved by Ethiopian farmers. The Ethiopian farmers who maintained and nurtured this genetic diversity has not been recognised or compensated for their innovations

In particular, Ethiopia has served and continues to serve as a source of germplasm for coffee Arabica since the genetic pool of coffee is exclusively contained in Ethiopia. Ethiopia is the only country in the world with broad range of coffee genetic pool. It provides genetic material for resistance breeding against coffee berry disease (CBD) and coffee leaf rust (CLR), which threaten coffee production across the world. By using genetic material collected from Ethiopian coffee populations plant breeders have developed cultivars resistant to CBD and CLR in different parts of the world. This obviously saved possible catastrophic effects on coffee industries and consumers worldwide.

However, Ethiopia's biodiversity resources are declining mainly due to deforestation and loss of vegetation cover. It is estimated that about 48 percent of the plant species occur in or around forest areas; a large proportion of this is threatened for loss by forest destruction. Forest fire hazards in many places in 1999 alone, caused destruction of 1,226 ha coffee plantations, about 336 wild animals and about 8000 bee hives (Forum for Environment, 2001). A loss in biodiversity ultimately implies economic losses to Ethiopia and the world at large.

6.4.2 Livestock genetic resources diversity

The genetic diversity in livestock is manifested in the population numbers, varieties of sub-populations and variability within populations of livestock. The rising demand on natural and cultivated resources to feed and sustain human life has led to a serious depletion in the diversity of plant and animal life forms (agro-biodiversity) in both developed and developing countries. The future of sustainable agriculture depends on the availability of a sufficiently large gene pool from which useful genes can be selected. Since the demand in the future is largely unknown agro-biodiversity also provides the reservoir of genes to respond to changes in production circumstances, market needs or disease challenges. Genetic diversity is highly relevant in Ethiopia where specific adaptive attributes of indigenous animal genetic resources are vital, and where the production systems depend not on external inputs, but rather on the capacity of genetic resources to thrive under unfavourable environment, like the extremes of climate, disease challenge, and poor plane of nutrition. Many of the existing breeds are, however, declining in numbers due to indiscriminate crossbreeding and gradual replacement by a few exotic and supposedly more productive breeds. Moreover, it is not only these genetic resources and the production systems that they support that are under threat but also the accompanying local knowledge, skills and culture of the communities. Biodiversity is essential to food security not only in the

provision of the means to food production in time and space, but also in improving access to the food as well as its effective utilisation.

In the broader sense, for many farming communities diversity means security, be it social, cultural or economic. Farmers have managed and utilised genetic resources for as long as they have cultivated crops and raised livestock. Genetic diversity provides security for the farmers against pests, diseases and unexpected climatic conditions. It is particularly relevant to smallholder farmers for sustaining agricultural production in the highly variable environments. The low-input and risk-averse production strategies of poor farming communities means that higher yields are obtained from a mixture of species, breeds etc, each specifically adapted to the specific needs, rather than by using modern technology. The genetic wealth is an important reservoir of diversity for agriculture; it provides viable options to meet both predictable and unforeseen ecological and economic circumstances. Future improvements will have to depend on exploiting the specific adaptive abilities of indigenous animals, because modifying the production environment appears to continue to be more expensive and less feasible. Traditional rural communities have developed multiple strategies for their farming systems, almost all of which tend to maintain genetic diversity.

Ethiopia has the largest number of indigenous cattle breeds/strains, and a substantial diversity in its sheep, goat, donkey, dromedary, horse and chicken populations in Africa. The existence of the large livestock diversity in Ethiopia is due in large part to its geographical location near the historical entry and intermingling point of many livestock populations from Asia as well as North Africa, its diverse topographic and climatic conditions, the huge livestock population size and the wide range in production systems. Specifically the central highlands of Ethiopia are considered the ‘melting pot’ of farm animal genetic resources, especially cattle – of Africa – and the centre of diversity (Rege, 1999). For example, it is believed that a large

majority of cattle breeds in the Horn of Africa were derived from interbreeding between cattle domesticated in Africa (African *B. taurus* and *B. indicus)* brought into Africa from Asia about 700 A.D. This interbreeding occurred principally in present day Ethiopia. Although not much has been done to document the extent of diversity in these species, evidence emerging from comprehensive molecular genetic diversity studies of indigenous cattle (Hanotte et al., 2002) and goats (Tesfaye, 2004) in the country indicates that many indigenous breeds are under threat.

Livestock diversity in Ethiopia has suffered considerably due to the cyclical famines, numerous wars and civil strives. Growing transhumance and migrations in the lower altitude areas have resulted in massive interbreeding between traditionally isolated livestock populations. In the highlands, government sponsored crossbreeding programmes have severely compromised the sustenance of genetic diversity in indigenous livestock, especially cattle (Ababu, 2002), goats (Workneh et al., 2003a,b), sheep (Kassahun, 2001) and poultry (Tadelle, 2003). Yet not much has been done to document the existing indigenous livestock breeds and the impacts of agricultural development, increasing human populations and the booms and bursts in livestock population numbers associated with periodic good years and bad (drought) years mainly in the rangelands. The national effort in Ethiopia towards systematic characterisation and documentation of livestock biodiversity has been negligible, let alone planned interventions to curb the continuing threat of loss of genetic diversity. The little representation of animal genetic resources in the Institute of Biodiversity Conservation (IBC) of Ethiopia is disproportionate to the contribution of livestock biodiversity to the national economy.

Cattle genetic resources: Documented in the published and grey literature are a total of 23 recognised indigenous cattle breed types in Ethiopia, that fall into 5 distinct breed groups (DAGRIS, 2004) (Table 6.4). Nearly half of these

are in the group of Small East African Zebu, found widely distributed throughout the country, both in the high and lowland areas. Three other breeds (the Ethiopian Boran, Murle and Arsi) are classified in the group of Large East African Zebu. The Sanga group of cattle comprises the Danakil and Raya Azebo from northern and north-eastern Ethiopia and Anuak and Aliab Dinka in the far south-west lowlands of the country. Three other breeds (Horro, Fogera and Arado) from central highlands are classified under the group of Zenga (sanga-zebu interbreeds). There is only one representative of the Humpless Shorthorn group of cattle in Ethiopia – the Sheko - in the mid-altitude south-west of the country.

Only six of the 23 breed types have a fair description of their physical appearance, indications of their levels of production, reproduction and genetic attributes. These breeds have been the subject of recent research and development interventions from research, academic and extension institutions in the country. The rest either have very little information in any of these categories of characterisation information, or nothing is known about them. A well established fact is that the Sheko breed is known to be endangered of extinction due to neglect and interbreeding with neighbouring cattle breed types, although it is widely believed to have economically important trypanotolerant and good dairy attributes for use in the trypanosomosis-endemic southwest of the country (Takele, 2005). The Fogera is also declining and under heavy pressure (Zewdu, 2004).

Only seven of the recognised breed types have at least one estimate of their population sizes, and even these are either outdated or based on crude assessments. Close investigation of cattle genetic resources reveals that the indigenous breed populations are indeed on the decline under pressure from market-induced migration, restocking following heavy drought spells, well-intended but poorly managed crossbreeding programs and neglect (Ababu, 2002; Zewdu, 2003; Dereje, 2005; IBC, 2004; Takele , 2005).

Table 6. 4: Recognized indigenous cattle breed types in Ethiopia

Breed Group Name	Breed Name	Synonyms	Distribution	Population Estimate	Breed status
Small East African Zebu	Adwa	NA	Central zone of the Tigray Region, Adwa	NA	Unknown
	Ambo	NA	Western Shoa (Ambo, Addis Alem, Holetta)	NA	Unknown
	Bale	NA	Bale highlands	738000	Unknown
	Goffa	NA	South Omo (Goffa, Sawla)	NA	Unknown
	Guraghe	NA	Guraghe and Hadiya areas, close to the tsetse-infested valleys	NA	Unknown
	Hammer	NA	South Omo Zone	NA	Unknown
	Harari	NA	Highlands of Eastern and Western Hararghe	NA	Unknown
	Jem-Jem	Black Highland Cattle	Highlands of Jem-Jem, Sidamo and Bale	434000	Not at risk
	Jijiga	NA	Somali Region, Jijiga area	100000	Not at risk
	Mursi	NA	South Omo Zone	NA	Unknown
	Ogaden Zebu	Lowland Zebu	Somali Region, Ogaden area	NA	Unknown
	Smada		South Gondar zone (Gayint, Smada) and parts of North Wollo	NA	Unknown
Sanga	Aliab Dinka	NA	Gambella Region along the border with the Sudan	NA	Unknown
	Anuak	Abigar	Gambella Region and adjoining areas in south-western Ethiopia	548600	Not at risk
	Danakil	Adal, Afar, Kereyu, Keriyu	Northeastern Ethiopia (Tigray, Wollo), and parts of Djibouti and Eritrea.	NA	Not at risk
	Raya-Azebo	Galla-Azebo	Parts of Tigray and Wollo east of Lake Ashenge	NA	Not at risk
Large East African Zebu	Arsi	Arusi	Highlands of Arsi, Shoa, Bale, Sidamo and Hararghe	2012000	Not at risk
	Ethiopian Boran	Borana	In the southern rangelands with the Borana pastoralists	1896000	Not at risk
	Murle	NA	Western Gambella, on the border with the Sudan	NA	Unknown
Zenga	Arado	NA	Northern Tigray (Shire, Adwa, Agame) and the highlands of Eritrea	NA	Not at risk
	Fogera	NA	The Fogera plains around Lake Tana in South Gondar and adjoining areas of West Gojjam.	18000	Not at risk
	Horro	NA	Highlands of western Ethiopia (East Wollega, West Shoa, Illubabor)	NA	Not at risk
Humpless Shorthorns	Sheko	Shoa-Ghimira, Goda, Mitzan	Bench Zone in south-western Ethiopia, originally with the Sheko people.	4000	Endangered

Source: DAGRIS (2004).

Out of these, the Ethiopian Boran, Ogaden zebu, Jijiga zebu, the Hammer and Horro are known for good performance for beef production, and the first three are preferred for the export market. On the other hand, the Fogera and the Ethiopian Boran have proven ability as better milk producers. The latter plus the Arsi and Horro have been used in most of the crossbreeding programs for dairy improvement. In addition, the Sheko is known to have good trypanotolerance and milk production capacity in the warm and humid environments. The Anuak and to some extent the Horro are also believed to have some level of trypanotolerance. The Sheko and Anuak therefore are promising breeds to promote in the large trypanosomosis-endemic areas of south-western and western Ethiopia. Very little comparative production data are available on the other breeds.

Unfortunately, most of the cattle breeding ranches in operation today (Did Tuyera, Gobe, Abernosa, Metekel and Andassa) have been engaged, in the past in crossing the indigenous breeds with exotic breeds (Holstein-Friesian and Jersey), and it is only in the past years that Did Tuyera and Andassa shifted to pure-breeding of the Ethiopian Boran and Fogera, respectively. The large-scale crossbreeding at ranches did not result in sustainable outcomes (Ababu, 2002). Besides, more economical alternatives of crossbred production are available: contract production with highland farmers, use of targeted AI service delivery for this purpose and contract production with the private sector. Genetic improvement and conservation work on indigenous breeds should be the priority of government ranches as the outcomes of these activities are public goods and not necessarily commercial products.

Sheep genetic resources: There are six recognised indigenous sheep breed types in the country. These fall into three breed groups: the fat-tailed hair sheep (3 breeds), the fat-tailed coarse wool sheep (2 breeds) and the Fat-rumped hair sheep (1 breed) (Table 6.5) (DAGRIS, 2004). None of these recognised breed types have population estimates, and their status as

breeds is not known. A good deal of trait-level (physical, production, reproduction, genetic) characterisation information is available in the published literature on the Horro, Menz and Blackhead Somali sheep mainly because of the research interest on these sheep by the previous Institute of Agricultural Research (IAR), ILCA, ILRI and the previous Alemaya College of Agriculture. In addition to these, there are at least three important sheep populations that are not yet recognised as breeds at the national level. These are the Washera of West Gojjam (Adet, Quarit and Jiga area), the Bonga of south-western Ethiopia (Bonga area) and the Abergelle sheep of south-western Tigray, in the Tekeze valley. These appear to have good potential for mutton from their different natural habitats.

The indigenous sheep of Ethiopia are fat-tailed coarse hair type, with the exception of the fat-rumped hair type sheep that inhabit most of the eastern, south-eastern and southern rangelands of the country. Unlike others, the Afar sheep manifests a tail attribute somewhat intermediate between the true fat-tailed and fat-rumped types of sheep, which may be the result of interbreeding between the two populations. The increasing numbers of long-thin tailed sheep found in the north-west and west of the country on the border area with the Sudan are indigenous to the Sudan and have come from across the border. The export trade mostly used the Blackhead Ogaden and Afar sheep. But recently some highland sheep were exported from Wollo and Bonga. The Washera and Abergelle sheep are also promising.

There are a few sheep breeding ranches set up for research purposes at Bako, Sheno, Amed Guya and Melka Werer. None of these have functional linkages with traditional sheep flocks of at least the surrounding farmers. Policy decisions need to be taken to re-organise and re-orient these ranches to take lead responsibility for genetic improvement and conservation of the respective sheep breeds with clearly stated deliverable outcomes to serve the needs of dominant sheep production systems.

Table 6. 5: The recognized indigenous sheep breed types in Ethiopia

Breed Group Name	Breed Name	Synonyms	Distribution	Population Estimate	Breed status
Fat-tailed Hair Sheep	Afar	Danakil, Adal	Afar Region and parts of Dire Dawa and South Wollo with the Afar pastoralists	NA	Unknown
	Horro	Abyssinian, Ethiopian, Bonga, Wollega	Highlands of western Ethiopia (West Shoa, Wollega, Kaffa and Illubabor)	NA	Unknown
	Tukur	Lasta, Ethiopian Highland, Abyssinian	Highlands of northern Ethiopia (parts of Tigray, Gondar and Wollo)	NA	Unknown
Fat-tailed Coarse Wool (wavy wooled) Sheep	Arsi-Bale	Ethiopian Highland, Abyssinian	Highlands of eastern and south-central Ethiopia (Arsi, Bale, Hararghe, Sidamo and South Shoa)	NA	Unknown
	Menz	Ethiopian Highland, Abyssinian, Legagora	Highlands of northern and central Shoa and some parts of Wollo	NA	Unknown
Fat-rumped Hair Sheep	Black-head Somali	Blackhead Ogaden, Murle, Turkana, Gabbra, Boran	Rangelands of eastern, south-eastern, southern and south-western Ethiopia	NA	Unknown

NA=Not Available.
Source: DAGRIS (2004)

***Goat genetic resources*:** There are a total of 11 recognised indigenous goat breed types in Ethiopia under the group Short-eared Small-Horned and another one in the Lop-eared group (Table 6.6). Because of the unprecedented nation-wide comprehensive survey of indigenous goat breed types in Ethiopia (and Eritrea) implemented in collaboration between FARM-Africa (a UK based NGO), Alemaya University and ILRI, much more balanced phenotypic characterisation information has been documented on the 12 recognised breed types (FARM-Africa, 1996), than is the case for cattle or sheep. However, little is known of other categories of trait-level

information, particularly on genetic parameters. This survey has also come up with crude estimates of the breed populations, based on available breed distribution information and district-level goat population data. Despite the large population sizes, the breed status of all these breed types is critical mainly because of neglect and the extensive interbreeding between adjacent breed populations as human populations migrate for resettlement, move for marketing and struggle to restock their goat holdings after heavy drought-related goat losses (Workneh et al., 2004).

Almost all indigenous goat types in Ethiopia fall under the general group of Short-eared Small-horned goats found throughout eastern, central and southern Africa. They inhabit all agro-climatic zones and production systems in these areas. There is only one breed (the Barka) from another breed group, and it comes mainly from Eritrea.

Traditional suppliers of export goats have been the Short- and Long-eared Somali, the Afar and Hararghe highland. Recently, the Woyto-Guji and Central Highland were also included. As will be discussed in chapter 4 of this report, goats have become the focus of live animal and meat export in recent years, and new export-standard private abattoirs are purchasing these goats from their home areas. Particularly good for milk production are the Barka, Hararghe Highland, Long-eared Somali and Arsi-Bale.

Except the experimental goat flocks at Adami Tulu, Awassa and Alemaya, there is no breed improvement or conservation ranch in the country. Clearly, similar policy measures should be taken on goat genetic resources as indicated also for cattle and sheep above. Recent molecular genetic studies (Tesfaye, 2004) indicate that several of the indigenous goat breeds in the highlands may have worrisome inbreeding coefficients that need urgent interventions. The kinds of interventions needed are distribution of genetically selected breeding males and setting up systems for rotation of breeding males.

Table 6. 6: The recognized indigenous goat breed types in Ethiopia

Breed Group Name	Breed Name	Synonyms	Distribution	Population Estimate	Breed status
Lop-eared goats	Barka	Bellenay, Beni Amer, Begait	Northern and north-western Ethiopia near the border with Eritrea and the Sudan	600000	Critical
Short-eared Small-horned	Long-eared Somali	Digodi, Melebo, Boran Somali, Benadir, Gigwain	Rangelands of the southern Ogaden, Bale, Borana and southern Sidamo with the Somali and Borana pastoralists.	1500000	Critical
	Short-eared Somali	Ogaden, Mudugh, Dighier, Abgal, Issa-Somali, Bimal	Northern and eastern parts of Ogaden, and around Dire Dawa	1500000	Critical
	Western Highland	Agew	Highlands of western Ethiopia (Gondar, Gojjam, Wollega and Shoa)	3000000	Critical
	Western Lowland	Shankila, Gumuz	Lowlands of western Ethiopia (Metekel, Assosa and Gambella)	400000	Critical
	Woyto-Guji	Woyto, Guji, Konso	North Omo, South Omo, Sidamo, Borana	900000	Critical
	Abergelle	NA	Southern Tigray, North Wollo and South Gondar	300000	Critical
	Afar	Adal, Assaorta, Denakil,	Afar Region and parts of Eritrea and Djibouti with the Afar pastoralists	1000000	Critical
	Arsi-Bale	Arsi, Gishe, Sidama, Manta, Awarch	Arsi, Bale, Sidamo and Western Hararghe zones	600000	Critical
	Central Highland	Brown Goat, Kaye	Highlands of central Ethiopia from Tigray through Wollo, Gondar to Shoa	6000000	Critical
	Hararghe Highland	Kotu-Oromo	Highlands of Eastern and Western Hararghe	1000000	Critical
	Keffa	NA	Keffa and adjoining parts of Kembata and Hadiya	1000000	Critical

Source: DAGRIS (2004).

Other animal genetic resources: The major livestock species that merit similar treatment here are chicken, horses, donkeys and camels, none of which has ever been surveyed or documented at the national level. Some comprehensive characterisation information has recently been generated on indigenous chicken (Tadelle, 2003). This particular study surveyed the chicken resources by dividing the country into five major agro-ecological zones and ten market-sheds and identified five distinct indigenous chicken ecotypes: Tilili, Horro, Chefe, Jarso and Tepi. These ecotypes were then characterised in terms of physical, production, reproduction and molecular genetic attributes. More exploratory on-farm studies have been undertaken on camel than on the equines, and these mainly came from graduate studies and research programs of Alemaya University. The current level of research interest on equines is very low (Mengistu, 2004). Unpublished reports (IBC, 2004) mention four indigenous breed types of donkey: the Jimma, Abyssinian, Ogaden and Sinnar; the phenotypic and genetic identify of these is yet to be established. Two breed-types of horses are known in this country: the Oromo and the Dongola. There is no documented breed specific characterisation information on camels; however, unpublished reports (IBC, 2004) refer to four distinct breed-types of camels: the Afar, Borana, Anfi and Somali (Ogaden).

6.5 Labour force

Ethiopia is endowed with a large number of working age population. According to CSA's 2002 report, there are 35.8 million people of age 10 and above in 10.6 million agricultural households in Ethiopia. Among them 72.8 percent or about 26.1 million are engaged in productive employment, primarily in agriculture (97.4 percent). According to CSA, the remaining 9.7 million rural residents of working age were not engaged in productive employment because of education, health and interest to work at home. The CSA data that compares the 1984 and 1994 labour force also shows that the

unpaid family worker in rural areas increased by 46.4 percent within a decade. The dwindling average farm landholding is a clear indicator of the growing rural labour force, increased landlessness, disguised and open unemployment.

By promoting the use of improved inputs and technologies the government aims to transform the subsistence agriculture. The challenge is whether it is possible to utilize Ethiopia's abundant labour intensively without significant improvement in the country's capacity to utilize its abundant water resources for irrigation. Investment in irrigation technology that will increase the economic value of farm lands and create conducive conditions for labour intensive employment opportunities in rural Ethiopia should get a priority.

The problems that are facing the large agricultural labour force are many. The notable ones include a widely prevalent literacy, lack of skill training and diseases that affect productive employment. Malaria poses a great challenge in many areas of the country by not only affecting productive labour force, but also by undermining the development of human and other resources. The growing crisis due to HIV/Aids is a real threat to the rural labour force as well. Appropriate measures of awareness raising and prevention need to be given more attention as part of the agricultural and rural development programs.

6.6 Other farm resources

Other resources of high importance to the Ethiopian agriculture include farm tools and implements and traction power. Ethiopian farmers still predominantly use primitive and century-old farm tools and implements. Major activities of farming, including land preparation, heavily rely on ploughing where oxen draft power is used and hoe culture in areas where cash and garden crops are dominant. Despite attempts to improve farm tools and implements by research and extension programs since quite a long

time, to date not much has been achieved in terms of disseminating improved tools and implements that would help improve labour efficiency and productivity. Due to increasing population pressure and a growing demand for cultivable land resulting in shortage of feed and grazing land, the draft power from livestock is becoming more and more a scarce resource.

The traditional and unimproved farm implements used by peasants and the poor conditions of draught animals are considered to be among the main factors that hinder raising agricultural productivity. In addition to improving farmers' access to fertilizers and improved seeds, effort should made to improve parts of the traditional plough, and implements used for clearing land, cultivation, harvesting, and threshing. Depending on the suitability of topography, farm size, labour availability, in many places of the country there is a growing demand for modern farm machineries in land preparation and harvesting. Support for enhancing such services at reasonable cost can also be considered among the possible options. Improvement in storage facilities should be considered as one of the measures towards reducing post harvest losses and wastage which is currently known to be high in the Ethiopian conditions.

Chapter 7

Policy Framework, Strategies and Institutions

7.1 Macro-economic policies and strategies

Reviewing and understanding the past and present agricultural and rural development strategies should be one of the important issues when discussing ways and means of transforming the Ethiopian agriculture. It is useful to raise questions like “what worked?”, “What went wrong?” “How did the policies and strategies support the development of the sector in general and smallholder producers in particular?” Such queries help in understanding the strengths as well as the drawbacks of past and current policies and strategies and in drawing important lessons for future interventions. The different macro-economic policies and strategies formulated by the different regimes and their implications to agricultural and rural development will be reviewed in this chapter

7.1.1 The Imperial regime

The Ethiopian economy had always been dominated by the agricultural sector characterized by subsistence production. Throughout the Ethiopian history, traditional and primitive farming methods provided the population with a subsistence standard of living. During the late l940s for which written documents are available most Ethiopian farmers cultivated small plots of land or herded cattle. The industrial sector represented a small part of the total economy. By the early l950s, the Emperor had renewed calls for a transition

from a subsistence economy to an agro-industrial economy. A key element of the emperor's new economic policy was the adoption of centrally administered development plans prepared by foreign assistances (the United States, the Food and Agriculture Organization of the United Nations (FAO), and Yugoslavia.) However, these plans failed to achieve any meaningful results, largely because basic statistical data were scarce and the government's administrative and technical capabilities were minimal. In 1954/55 the government created the National Economic Council to coordinate the state's development plans. This agency devoted its attention to improving agricultural and industrial productivity, eradicating illiteracy and diseases, and improving living standards for all Ethiopians. The National Economic Council prepared the first and second five-year plans.

Various development strategies and economic policies were introduced in Ethiopia since formal planning was started in the country in 1957 (Zerihun, 2004). Institutionalization of the national economic and sectoral planning is known to have taken place in the framework of the Five-Years plans of the Imperial regime that were adopted starting during the second half of the 1950s. The strategies exerted their own influences on agriculture and non-agriculture. The development of human resources that is required to modernize the Ethiopian agriculture by introducing scientific research and extending better technologies, know-how and practices began during the late 1940s and early 1950s[42].During the 1960s and early 1970s, the focus of policy planners was to achieve industrialization by way of import substitution. The focus during that time was centred on transfer of resources from agriculture to development of the manufacturing sector within the framework of a free-market economic system. While different measures which encouraged investments in the manufacturing sector were introduced, the

[42] In 1939 the first agricultural training school came into being at Ambo. In June of 1952, an agreement was signed between the Imperial Ethiopian Government and the United States Department of State to develop and operate the Jimma Agricultural and Technical School (Feseha et al., 2004).

government, however, focused on agriculture as a result of food shortages that were encountered in the late 1960s.

The First Five-Year Plan (1957-61) sought to develop infrastructure and human resources, and aimed to accelerate agricultural development by promoting commercial agricultural ventures. The Second Five-Year Plan (1962-67) signalled the start of a twenty-year program to change Ethiopia's predominantly agricultural economy to an agro-industrial one. The plan's objectives included diversification of production, introduction of modern processing methods, and expansion of the economy's productive capacity to increase the country's growth rate. The World Bank's agricultural modernization strategy recommended and placed high importance on large-scale commercial farms for Ethiopia. Increasing agricultural export was also one of the major objectives of the agricultural sector at that time. The Third Five-Year Plan (1968-73) also sought to facilitate Ethiopia's economic well-being by raising manufacturing and agro-industrial performance. The third five-year plan expressed the government's willingness to expand educational opportunities and to improve peasant agriculture. Total investment for the First Five-Year Plan reached 839.6 million birr, about 25 percent above the planned 674 million birr figure; total expenditure for the Second Five-Year Plan was 13 percent higher than the planned 1,694 million birr figure. The allocation for the Third Five-Year Plan was 3,115 million birr.

As the agricultural development needed extension service, it was established with the help of USAID in 1954 as part of its Agricultural Training and Assistance program[43]. The technical supports and input delivery services in agriculture were centred around demonstration of the use of modern inputs.

[43] Original American IECAMA staff initiated agric. field experiments in Ethiopia in 1953. Founding experimental sites were at Jimma, Shashamene, and Addis Ababa. Other early sites were Debre Zeit, Alemaya, Andasa, Debre Birhan, Alamata. End of the 1950s was the beginning of Alemaya shouldering the national responsibility of research, extension, and teaching patterned after the Land Grant Model of the USA (Berhane et al., 2004).

The use and demonstration of fertilizer in the smallholder sector has been central to the various extension programs initiated in Ethiopia. Since 1967, agricultural extension has been organized under a series of package technology transfer programs within MoA with main objective of demonstrating the use of fertilizer recommendations to farmers allied with improved seeds (Eyasu Elias, 2002). The idea of integrated rural development came first from ILO which had been asked to advise the government on projects for rural employment (Dessalegn, 2004). A comprehensive package approach of large, multipurpose and integrated development operations were started in 1967 (CADU assisted by the Swedish aid) and in 1970 (WADU with the IDA/World Bank assistance). Other such capital and inputs intensive comprehensive Package Projects include Ada District Development Project (ADDP), Tache Adiabo and Hedekit Agricultural Development Unit (TAHADU), Southern Region Agricultural Development Project (SORADEP), and Humera Agricultural Development Project (HADP). Assessment reports show that because of their input-intensive nature and skilled staff requirement, it was difficult to replicate those intensive package projects across the whole country. Moreover, the prevailing agrarian relations, property right structure, poor infrastructure and market development during those periods hindered the benefits to the large mass of peasantry from such comprehensive packages. Institutional problems including land concentration and tenure insecurity of the mass of the peasantry were added to the limitations of the time.

The Imperial government designed a second type of rural development strategy called minimum package program (MPP) during the 1968-1974 periods. It was meant to reach a larger number of peasants, and was believed to bring about agricultural transformation (Dessalegn, 2004). The program was administered by the Extension Project Implementation Department (EPID) of the Ministry of Agriculture starting in 1971. The methods used for input dissemination were demonstration to farmers of new

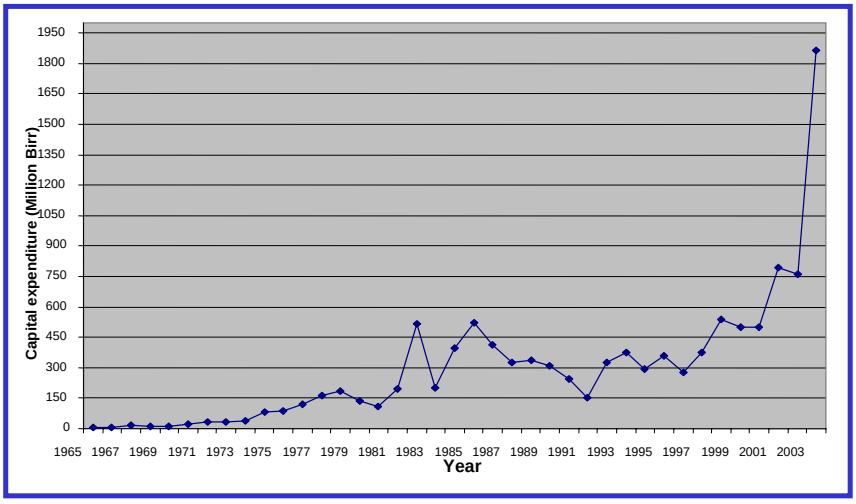
techniques and inputs, selection and use of model farmers, advices through extension agents. EPID's Minimum Package Project (MPP-I), promoted fertilizer application, improved seeds and crop management, crop protection technologies, grain storage, agricultural implements, soil and water management techniques, home economics, horticulture, and animal husbandry techniques (Berhane et al., 2004). The EPID and the MPP approaches did not bring significant success to the Ethiopian agriculture, except in some places like Arsi, Southern and southwestern Shoa where the program had been tried out longest. Reasons mentioned are that the program approach did not introduce a more dynamic farming system, and did not take into account the experience of the peasants and the prevailing property structure. It relied on supplying modern inputs, manly fertilizer (Dessalegn, 2004).

According to Dessalegn (2004), Ethiopia's agricultural policies during the Imperial Regime were outward oriented. Policy formulations and objectives were influenced by external donors, especially the World Bank and USAID. Hence as the development thinking was based on ideas developed in western countries at that time, as argued by Dessalegn, priority settings were frequently not relevant to the country's situation. The idea of modernization and prosperity and the need for investment in large scale enterprises for this purpose dominated the orientations and thoughts of the 1950s and 1960s. Not only did the regime borrow the idea of agricultural modernization from the western donors, but also did the technical assistance and financial resources come from outside sources. Dessalegn further noted in his research that agricultural policies during the Imperial regime were inconsistent and changed from one period to the other. Starting with large-scale mechanization and export promotion orientation, consideration of improvement in the well-being of the rural population came in the meantime, and further goals of social equity through increased employment and wealth redistribution were thought at the later period of the regime. Changing policies were observed in relation to the different Five-Year plans that ran from 1957 to 1974. Dessalegn describes them as a neglect of the peasant

sector, and active promotion of large-scale commercial farms, and swing in favour of small farms and peasant enterprise.

One of the indicators of insufficient attention given to the agricultural development, particularly to the peasant agriculture during the imperial regime is the low budgetary allocation to the sector. In each of the three Five-Year Plans, the agricultural sector received the least investment in comparison with other major sector. In the First Plan it received 8 percent, in the second, 17 percent and in the third 11 percent of the total investment allocations. Similarly, the data obtained from the national statistics indicate that in 1965, the total capital budget allocated to agriculture was only 6.7 million Birr. The average amount of capital budget for the second half of the 1960s was 10 million Birr and that of the first half of the 1970s before the fall of the regime reached 41 million (see Figure 7.1).

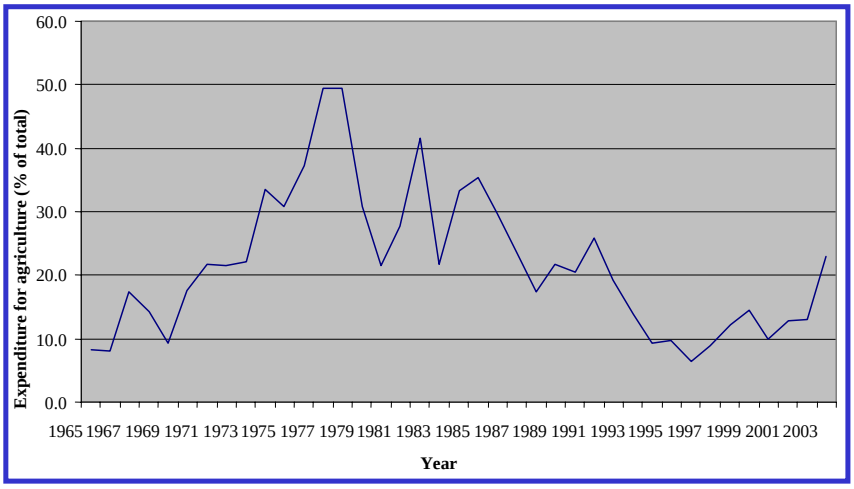
Figure 7. 1: Government capital expenditure on agriculture, natural resources and settlement (1965-2003)



Source: Computed from data obtained from Ministry of Finance and Economic Development.

The share of agriculture[44] in the total government capital expenditure has been fluctuating from time to time. As shown in Figure 7.2 there is a marked variation across different periods. The share was progressively rising between 1965 and 1978 reaching as high as 50 percent in 1978. Between 1978 and 1991 it has been fluctuating around 40 to 18 percent of the total capital expenditure. Between 1990 and1996 there was a sharp decline reaching a minimum at 6.4 percent. The later was the lowest in 40 years period and was even slightly lower than that of the 1965 which was 8 percent. The share has gradually increased starting in 1997 reaching close to 23 percent in the year 2003. The data shows that, the attention and support given to agriculture claimed by the EPRDF government is not reflected in capital budget allocation when seen in terms of the share of the sector in the overall budget allocation for the national economy.

Figure 7. 2: The share of agriculture in the government capital expenditure (%)



Source: Computed based on the data of Ministry of Finance and Economic Development.

[44] In the early periods, the budget allocation was titled as AGRICULTURE AND LAND SETTELEMENT.

7.1.2 The *Derg* regime (1975 -1991)

Following the 1974 revolution, the Derg made significant institutional changes including the land reform that made equitable distribution to the peasantry but at the same time transferred the ownership of land to the state. The backward economic system was carried over from the Imperial regime to the socialist government. The Derg regime adopted socialism and based its economic and political system on this doctrine. Hence, socialist production relations were created in the agricultural and non-agricultural sectors. The principles and practices of socialism shaped the economic polices that affected both the agricultural and non-agricultural sectors. As characterized by Brook (1990) quoted in Zerihun et al. (2004), the socialist production relations in agriculture had the aim of hastening the industrialization objectives of the socialist government since the use of markets as mechanism to help resource transfer from agriculture proved to be a failure in the pioneering countries. The economic policies of the Derg favoured mechanized state farms and collective farms while the policy marginalized the smallholder peasant farms. The system introduced administrative control of the market and undermined the incentive for private initiatives leading to further crises in the agriculture and other economic sectors.

Grassroots associations (*kebele* and peasant organizations) were formed to implement the government's development and political programs. Among the rural development program components of the Derg era are the Literacy Campaign notable for its efforts at improving the level of literacy of the rural masses, the expansion of service cooperatives that increased the access of communities to some basic consumer goods, and awareness raising about hygiene and public health (e.g. construction of latrine in villages and individual households). Massive soil and water conservation projects supported by donors based on the food-for-work projects were practiced. Assessments of the various interventions later on show that as they were not

community centred and were top-down mostly driven by the political motives of the Derg system, they did not yield much. Despite thousands of kilometre long physical soil conservation structures that were built by the local communities, there have not been significant effects on the ground and many of them were abandoned as they were not adequately internalized by the rural communities. Land degradation problem remained to be a major challenge to the country.

One of the difficulties of the policy environment that faced the agricultural sector, particularly the peasants sector was the administratively controlled product prices and delivery quota system. The peasants sector which accounts for the bulk of the agricultural production was neglected in favour of collective farms and state farms which took the lion's share of improved agricultural inputs, and technical services. In many places the producers' cooperatives and collective farms had a privileged access to fertile farmlands and irrigation facilities in line with the government’s priority for collectivization.

The socialist government also adopted an agricultural development and extension service program in the mid 1980s. Following the termination of EPID projects in 1985, the Ministry of Agriculture introduced what was called the Peasant Agriculture Development Extension Program (PADEP). The program focused on high potential surplus producing areas and used Training and Visit (T&V) extension approach. The program aimed at an increased application of improved agricultural inputs in limited agricultural zones to bring about efficiency and agricultural growth. However, this program had marginalized the peasant farmers outside the focus areas, and consequently had only little positive impact at the country level.

In terms of budgetary allocation, there was an improvement in resources allocation to the agricultural sector compared to the pervious periods. An average amount of capital expenditure for the sector reached 138 million birr

during the years 1975-1979. The average was more than double during mid 1980s. Maximum budget allotted for the sector during the *Derg* government was 519 million Birr in 1985. During the last 4 years before the change of government in 1991, the average share of expenditure for agriculture was only 8 percent of the total public expenditure. Of the total budget allocated for agriculture, on average, 70 percent was capital expenditure during the same period.

7.1.3 The EPRDF government: ADLI and rural development strategies

After the change of government in 1991, a socio-economic policy reform was introduced in order to guide the development of the agricultural sector, and the national economy at large. The government adopted a free-market economic policy and introduced a major liberalization in input and output markets. In terms of the management of the productive and service giving enterprises, the government privatized some of the state farms. The Transitional Government of Ethiopia (TGE) prepared a four pronged agricultural policy as part of the overall policy reforms introduced by the new Government (UNDP, 1997). The agricultural policy focused on crop sector development policy; livestock and fishery development policy; natural resources development and conservation policy; and rural infrastructure development policy. Except for the crop production sub-sector where a relatively better access of smallholder producers to improved inputs and extension technical supports has been attained and some increase in production has been achieved, there has been no notable progress in other sub-sectors. One of the major and primary objectives of the country's agricultural sector is to ensure food security of the rapidly growing population. In the framework of the macro-economic reforms, market reforms were implemented and affected input prices (e.g. fertilizer subsidy was removed) and grain marketing was liberalized.

As of mid 1990s the EPRDF adopted the Agricultural Development Led Industrialization (ADLI) Strategy which assumes agriculture's leading role in the transformation of the national economy towards industrialization. Agricultural Development Led Industrialization (ADLI) is a strategy in which agriculture and industry are brought into a single framework of development where the growth of agriculture is viewed as an important vehicle for industrialization by providing raw materials, a market base, surplus labour and capital accumulation (MoFED, 2002). The strategy assumes capacity building in human resources and extensive utilization of rural labour engaged in farming. The agricultural development strategy in the framework of ADLI has been geared towards removing constraints to the productivity of the agricultural sector, predominantly by expanded use of productivity raising inputs (seed, fertilizer and chemicals) served by the agricultural extension system. Significant effort has been made in improving smallholder production by supporting research and extension services. The agricultural extension package is hoped to serve as a channel for providing incentive, supplying inputs to the farmers (seed, fertilizer and chemicals), technical support (demonstration of input uses and agronomic practices) and training. Introduction of new technologies to farmers consists of two stages: generation of new technology through research or adaptation of existing technologies to the Ethiopian context and dissemination of this technology. Increased supply of improved farm technologies and their dissemination through credit-based activities with the help of the extension program is seen as an integral part of enhancing the productive capacity of smallholder farmers.

The Sasakawa Global 2000 in collaboration with the national research and extension systems and available stock of technologies initiated the extension program known as Participatory Demonstration and Training Extension System (PADETES) in 1993[45]. According to Quiñones *et al*. (997) quoted in

[45] PADETES aims at increasing the supply of food, industrial and export crops, improving productivity and income, ensuring rehabilitation and conservation of the natural resource base,

Habtemariam (2005) PADETES emphasized on better research-extension linkage, encouraged aggressive work in technology transfer to smallholders, and made efforts to strengthen the capacity of the extension system to disseminate research-proven pre-and post-harvest technologies mainly in food crops. Farmers' participation was promoted through planning and implementing on-farm trails and demonstrations, establishing rural development committees at various levels from the development center to regional level, and assisting farmers to organize themselves.

In 1995 the government in its rural-centred agricultural development program, using the experience of PADETES and SG-2000 approaches, devised the new extension intervention program. Hence as of mid 1990s the government decided to widely replicate the program and PADETES became the major extension management system in all Regional States. Features of PADETES include selecting technologies suitable to specific agro-ecological zones (AEZ), emphasis on participation through demonstration plots on farmers' fields, providing inputs to farmers through credit under local governments' collateral arrangement. The program used development agents (DAs) at the community level in training and organizing farmers, helping them to have access to and make use of technological innovations and inputs - chemical fertilizers and seeds of improved varieties, agronomic practices. One of the challenges of the extension program in expanding use of improved technologies has been the rising input prices, particularly imported chemicals and fertilizer following the elimination of subsidies in 1997. The program also experienced challenges when farmers faced crop failures and low product prices that lead to problems of loan repayment, and the subsequent incidences of liquidation of farm assets to meet the repayments.

---

and in empowering farmers. To this end, it emphasizes on the package approach to agricultural development (Habtemariam, 2005).

While the strategy focused on the supply side through promotion of input use to increase production the markets and demand side of the production and development were not properly addressed. The program has also been quite often blamed for the blanket recommendations of fewer crop varieties and chemical fertilizers across the broad ecological settings in the country. Frequent changes in institutional structures and policy signals have been among the difficulties of the extension program. The recent development is towards providing a more disaggregated and compatible development packages based on Agro-Ecological Zones. A new approach called 'menu-based' has been introduced during the last three to four years. The idea is to make available varieties of improved inputs out of which farmers will be able to choose depending on their needs and resources bases.

Food security is among the government's priority areas. Food security strategy was developed in 1996, and its updated version was provided in 2002. The adopted strategy relies on three aspects of increasing the availability of food through domestic production, ensuring access to food for food deficit households and strengthening emergency response capabilities of relevant institutions (FDRE, 2002). It was also indicated that particular attention will be given to the diversity of food production zones in Ethiopia (areas with adequate moisture, moisture deficit and pastoral areas) to tailor options and strategies depending on the situations. Expansion of investments and activities in health, education and road facilities to rural areas as supportive mechanisms are emphasized in the rural development strategy. Following the 2002/2003 drought, a strategy called a New Coalition for Food Security showing commitments of the government and donors was provided in November 2003. It envisages to ensure the food security of 10 million vulnerable and 5 million chronically food insecure Ethiopians within three to five years. The strategy consists of plans to increase food production, Safety Net programs and resettlement of 2.2 million people affected by the recurrent droughts and famine.

Despite efforts made at market liberalization[46] (as discussed above) and increased support for the smallholder farmers through the national agricultural extension program, the country's position of food security and agricultural development could not be markedly improved. In general terms, the strategy is confronted with structural problems and factors that limit its realization. Increasing population pressure, severe land degradation and underdeveloped market system are among the major challenges to ADLI. Deficiencies in markets and infrastructure and the negligence of development in non-farm sectors hindered growth in agriculture and food production. It must be in response to such shortcomings that some more policy directives are provided.

Recently a development strategy has been provided by the Ethiopian government aims at the transformation of the smallholder peasant farms into a "market-based smallholder agriculture" or 'commercialization of the smallholder farms'. The government's *'Rural Development Policies, Strategies and Measures'*[47] were provided in November 2002. This document further elaborates the Agricultural Development Led Industrialization (ADLI) policy provided in 1994/95 and serves as an operational policy. The Ministry of Agriculture has already started preparation of some strategies and guidelines for production of selected commodities for markets. These are pulses, oil crops, spices, tubers and root crops, meat, and dairy production. The Ministry did also delineate potential *woredas* for selected commodities, prepared farm management guidelines and trained selected farmers. After restructuring that

[46] In his research report entitled "macro-economic policy and Agriculture in Ethiopia" Alemayehu (2002) examined the link between macro-economic policy and agriculture in Ethiopia. From his study, he drew the following major conclusions (p.31): 1) the link between priority given to macro-economic stability and agricultural development is weak; 2) fiscal and monetary policies are weakly linked to the agricultural sector, 3) macro-policy towards agriculture needs to move from the creation of incentive-compatible environment, such as liberalization, towards policies aimed at tackling supply side issues (supply of fertilizer and related factors of production), stabilization of the market for agricultural produce and provision of regulatory and supporting services.

[47] The Amharic version of the document published by the Press and Operation Division of the Ministry of Information is available.

took place in 2003, the Ministry of Agriculture established a bureau responsible for the agricultural input and output marketing. The Ministry developed a National Agricultural Marketing Development Strategy in 2005.

During the EPRDF government, budget for the agricultural sector increased relative to previous times, and the average capital budget reached 290 million during the first half of the 1990s. During the second half of the 1990s the average capital expenditure reached close to half a Billion. In the year 2003/04 capital budget for agriculture was 1,862 million Birr. The average during the recent four years was 979 million Birr. It has to be noted that this amount includes budgets for agriculture, natural resources and settlement. The average share of capital budget slightly declined from 71 percent between 1987 and 1990 to 59 percent between 1991 and 1995. Recent data show that the share of capital budget further declined to an average of 47 percent for the period that covered 1996 to 1999. The share of budgetary resources for agriculture has never exceeded 10 percent of the total budget for the economy during the whole period and the average was even lower at only 7 percent for the periods 1996 to 1999.

It is now close to 10 years since the government adopted ADLI as a guiding national economic development policy and strategy. During the last ten years, efforts have been made to expand the use of chemical fertilizer, and improved crop varieties (mainly grain crops) by the smallholder farmers. These efforts have definitely resulted in increased yield and production in some locations, particular in ample moisture and potentially high productivity areas. The country's investment in road infrastructure, in terms of new feeder roads, and upgrading highways has been remarkable. Decentralization of government structures to *woreda* level and exercise on local level planning and budget utilization and capacity building have been recent experiences with potentially positive effects. Over two dozens of agricultural TVET

colleges were established and are currently training[48] thousands of middle level agricultural professionals who will later serve at the farmers' training centers (FTCs) to provide technical support and advice to farmers in crop and livestock production and natural resources management. The methodological difficulty and comprehensive data needed to empirically assess the extent to which ADLI policy has helped to generate a national wealth for industrialization and national economic development at large is understandable. There has not been a systematic evaluation of the achievements of ADLI in promoting agricultural growth, the national food security, poverty reduction, and further accumulating the capital resources needed for industrial development.

According to estimation made in 1999/2000 (MoFED, 2002) over 45 percent of the rural population live under poverty line. The national food production is not yet in a position to reduce the large amount of yearly inflow of foreign food aid into the country. A significant proportion of the population is chronically food insecure and vulnerable to famine caused by recurrent droughts. The structural problems that mainly underlie the country's poverty could not be overcome, and still persist. There has not been a notable achievement in investment and economic growth that lead to the creation of employment and income generation in non-farm sectors, and enable to absorb the growing surplus rural population. In the absence of or very much limited alterative livelihood opportunities out of farming the growing population pressure in rural areas results in the increasing number of the young and landless population. These are some of the issues that are frequently raised and remain to be points of debate as to whether ADLI has achieved its envisaged targets, in particular, and the national economic growth in general.

[48] At the end of the 2003/2004 academic year over 9000 were graduated in diploma from these Agricultural TVETs.

7.2 Sub-sectoral development strategies and measures

7.2.1 The natural resource sector development strategies

The problems of deforestation, soil erosion and accompanied problems of loss of soil fertility and productivity has been long recognized within Ethiopia, particularly since the drought and famine of 1972-74. In pursuit of agricultural modernization and environmental protection, successive governments of Ethiopia have employed agricultural strategies with financial and technical assistance from the international agencies. The various interventions employed can be broadly grouped as soil fertility and plant nutrition and physical soil conservation measures. Research and extension in Ethiopia were mainly directed towards the development of fertilizer requirements for highland crops and soil conservation. Other technologies, such as the use of legumes or agro forestry, have been given less attention.

Efforts made to improve soil fertility and plant nutrition

In pursuit of rapid agricultural growth and national food self-sufficiency, successive governments of Ethiopia have directed research and extension efforts towards fertilizer application for highland crops. Fertilizer use is seen by Ethiopian officials as the easiest way to increase agricultural productivity. This can be seen from the number of extension initiatives implemented, and the institutional structures that have been established to promote fertilizer use in Ethiopia since the 1950s. Several fertilizer trials and demonstrations have been conducted in the country by different institutions. In 1967, the Freedom from Hunger Campaign established 300 half-hectare fertilizer demonstration plots in different parts of the country with assistance from FAO. Since its establishment in 1966, the Institute of Agricultural Research (currently called the Ethiopian Agricultural research Organization, EARO) has launched a

series of on-farm and on-station experiments the on response of different crops to different levels of fertilizer application through its regional centers. The need for a modern soil testing, plant analysis programmes for the evaluation and improvement of soil fertility was recognized and 8 regional soil labs were established. The National Soil Service Project and several research centers have facilities and workforce to analyze a large number of soil, plant, fertilizer and water samples for agricultural purposes.

Between 1986 and 1996, the national fertiliser inputs unit of MoA with assistance from FAO has conducted about 2000 half-hectare fertiliser experiments in 98 trial and demonstration sites representing different agro-ecological zones across the country. Based on the research results, optimum fertiliser recommendations were issued for major cereal crops, soil types by colour and different regions of the country (Annex Table 7.4). The use and demonstration of fertiliser in the smallholder sector has been central to the various extension programmes initiated in Ethiopia. Since 1967, agricultural extension has been organised under a series of package technology transfer programmes within MoA with the main objective of demonstrating the use of fertiliser recommendations to farmers allied with improved seeds. Review of the extension programmes in terms of content, activities and achievements can be found elsewhere (see Fasil, 1993; Worku, 2000 and Eyasu, 2002).

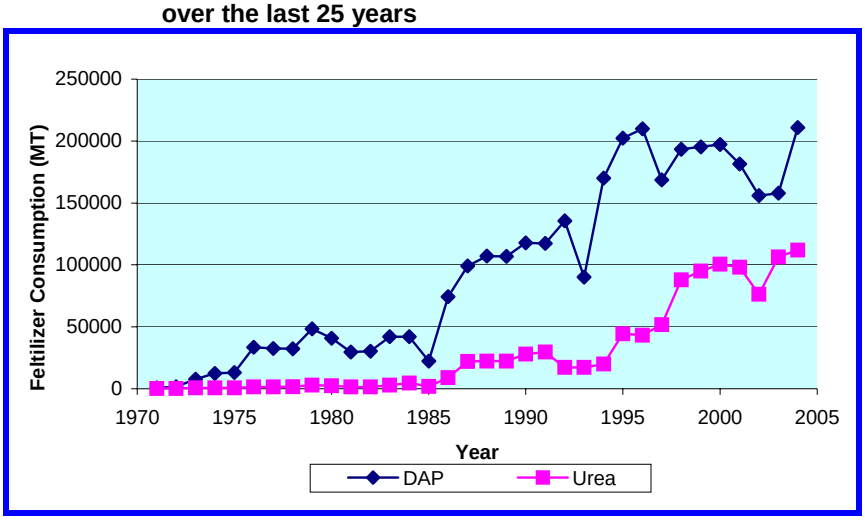
Following the termination of the EPID project in 1985, the MoA established the Peasant Agriculture Development Extension Program (PADEP). This operated in high potential surplus producing zones that had better soils and received higher rainfall. PADEP extension was based on the Training and Visit (T&V) procedure with intensive use of fertilizer. Concentration of fertilizer input and extension activities to geographically delineated areas was thought to allow efficient use of the limited resources and speed up agricultural growth in the nation. However, the great majority of farmers lay outside the PADEP zones and they were neglected by the extension service.

Consequently, achievements of PADEP projects were little better than the earlier extension initiatives and little positive impacts were made on soil improvement and the overall agricultural productivity of the country. Since the fall of the *Derg* regime and the take over by the EPRDF in 1991, modernization of the agricultural sector through supply of fertilizer and improved seed has been reinforced by a strong political commitment to achieve food self-sufficiency in the country. The SG 2000 approach of seed fertilizer credit package was taken as a new extension activity within the overall policy strategy of agricultural-development-led industrialization. Ethiopia has also spelled out a fertilizer policy that broadly aims to address farmer' effective demand, supply, distribution and marketing, pricing and subsidies, credit, research and extension, quality control, and environmental and organizational set-up. Similar to its predecessors, the current extension intervention concentrates on the use of fertilizer in conjunction with commercially improved seed targeted to richer farmers.

The programme achieved significantly higher yields in high rainfall areas and became profitable in areas that have better market connectivity but its applicability is limited in marginal areas that account for about 67 percent of the landmass. As a result, Ethiopia's agricultural production failed to develop. Despite all these extension efforts, the large majority of the Ethiopian farmers don't use any fertiliser at all, while the others use at levels significantly below the recommended rates. The national average of fertiliser application is estimated at 20 kg DAP/ha and represents about one-fifth of the level needed to replenish nutrient removals (Eyasu, 2002). Figure 7.3 shows that there was a steady growth in fertiliser consumption in the country but it remained at best low. Until towards the end of the 1980s, fertiliser consumption by the peasant sector remained low as a result of disincentives to smallholder farmers including fixed grain and fertiliser prices and quota systems. There has been a marked increase in fertiliser consumption since the 1990 economic reform. By 1998, average fertiliser nutrient use in Ethiopia rose to 7

kg/ha (nitrogen and phosphorus); this is still very low compared to the average consumption of 48 kg/ha in Kenya (Eyasu, 2002). Major constraints to increasing fertiliser use in Ethiopia are total dependence on imported fertiliser, high foreign exchange requirement, delays in procurement, inefficient marketing and distribution systems and pricing policies that negatively affect the relative prices of inputs and products.

Figure 7. 3: Fertilizer consumption in smallholder sector in Ethiopia over the last 25 years



Source: Raw data from Agricultural Inputs Marketing Department of MoARD.

Soil and water conservation measures

The problem of soil erosion leading to low crop production has been a policy concern in Ethiopia for a long time now. Soil erosion issues became prominent in the policy debate following droughts and major famine in 1984. The alarming reports of the Ethiopian Highlands reclamation Study (EHRS) and the results of the Soil Conservation Research Project (SCRP) have generated data on the magnitude of soil erosion and its impacts on the

agricultural production with projections of what might happen if nothing was done (FAO, 1986). This has attracted the attention of both the government and the donors resulting in major nation-wide programmes of conservation and reforestation supported by food-for-work payments. A package of conservation measures has been developed usually employing hillside terraces, soil and stone bunds on cultivated fields, tree planting on communal areas (woodlots) and hillside closures (Table 7.1).

Table 7. 1: Soil and water conservation measures implemented between 1976 and 1988

Conservation measure	Area covered	Remark
Soil and stone bunds on cultivated fields	800,000 km	Level earth works and stone lines on 350,000 ha crop land
Hill-side terraces and afforestation	600,000 km	
Check dams on gullied lands	15,400 km	
Area closures on communal areas (hill-sides)	410,000 ha	Area closures were meant for regeneration of natural vegetation
Tree planting on communal areas (woodlots)	465,000 ha of tree planting	500 million seedlings planted on Community woodlots for conservation of communal lands

Source: Wood (1990); Tamire Hawando (1996).

However, despite decades of soil conservation campaigns, there is a steadily increasing rate of soil degradation. Various factors contributed towards poor performance of the conservation measures (Wood, 1990; Eyasu and Scoones, 1999; Campbell, 1991). First, emphasis on physical structures, that did not include vegetative and cultural measures, was the major weakness of the soil conservation measures that were implemented. Physical structures, which are not stabilised by vegetative measures, are not efficient in erosion control. In general the control of soil erosion was treated in isolation of other

land improvement practices, and conservation-oriented farming has been lacking in Ethiopia.

Secondly, conservation structures were poorly designed, which have decreased productivity due to reduction of cultivated area. Bunds were constructed at 1meter vertical intervals along the contour, which were inconvenient for ploughing using oxen drawn implements and caused 10-20 percent reduction in production area, which results in decreased productivity in the short run. Poorly designed terraces aggravated erosion as they quickly fill-up with sediments and break during large storms. Breakage of terraces on upper slopes would mean that runoff water gets concentrated into down slope farms causing great damage to agricultural land. Reports indicate that 40 percent terraces constructed in Ethiopia were broken the year after construction (SIDA, 1984 cited by Pretty, 1995).

Thirdly, soil and water conservation programmes have tended to be top-down and non-participatory lacking_community participation that affected the acceptability and sustainability of the measures. . The local people were not involved in the planning and implementation of schemes, which resulted in poor execution and lack of sense of ownership. In many instances farmers were interested in the FFW grains or oil than the actual work. Thus, they tended to destroy the bunds and terraces in the hope of obtaining further opportunities for food-for-work. Following the fall of the *Derg* regime in 1991, farmers who have resented coercive measures destroyed many of these structures (Campbell, 1991).

Fourthly, isolated tree planting was not effective. The quality of community forests was widely considered to be poor, with low seedling survival rates and poor maintenance. Due to a lack of regeneration of vegetative ground cover, soil erosion cannot be controlled by tree planting alone. This is particularly so under the most common species, *Eucalyptus globulus*. Also, it has been

difficult to retain grass or herbaceous vegetation on the soil surface due to lack of control of livestock grazing on the community forestlands.

Since the takeover of the EPRDF, the government has designed a national conservation strategy that was approved in 1997 for implementation by the federal Environment Protection Authority (EPA) and the regional environmental co-ordination committees. The strategy is a comprehensive guideline as to how soil, forest, water and biodiversity resources should be managed and utilised for the well-being of the present and future generation of Ethiopians. However, the implementation of the strategy in practice has been rather poor due to various factors including technical, institutional and resource constraints. Lack of co-ordination mechanisms to harmonies and integrate multi-sectoral environmental issues involving agriculture, water, mines, health, education, transport, etc) into a broader framework of implementation has been a major problem to materialize the environmental legislation leading to fragmentation of activities. To this can be added limited awareness of environmental issues on the part of the communities and lack of their participation in the environment management.

7.2.2 Water resources and irrigation development

7.2.2.1 Institutional arrangements

Acknowledgment of the importance of river basin planning and development goes back several decades in Ethiopia. A Water Resources Department had been established under the Ministry of Public Works in 1956 to handle a multi-purpose investigation of the Blue Nile basin. The first valley to receive continuous attention as a coordinated unit, both from developers and from government bureaucracy, was that of the River Awash. This has the distinction of being one of Ethiopia's few internal river basins, terminating in Lake Abe on the border with Djibouti. There were early pressures for irrigated agriculture, and also for hydropower. To take responsibility for the allocation

and use of water for agricultural development in the Awash valley the government created a special authority, the Awash Valley Authority (AVA) in1962. However, there was a growing recognition of the potential importance of the country's water resources and the National water Resources Commission (NWRC) was established in 1971 empowered with the responsibility for all aspects of water use and development.

The AVA continued to operate as a separate authority, for the time being independent of WRC. By 1977 the importance of planning water resources along the natural boundaries of river basins was recognized by the creation of the Valley Development Authority (VADA) and AVA was incorporated in this new body and renamed the Awash valley Development Agency (AVDA). The new Authority assumed responsibility for all water resources development throughout the country although, at the same time, the Ministry of Agriculture (MOA) was empowered to undertake certain water development functions, specifically in the irrigation sector. In 1981, a further re-organization took place within the NWRC and VADA became incorporated within the larger body. The NWRC was now composed of four component authorities; Water Resources Development Authority (WRDA), National Meteorological Service (NMSA), Ethiopian Water Works Construction (EWWCA) and Water Supply and Sewerage Authority (WSSA). This institutional arrangement effectively brought the responsibility of water resources development under the umbrella of one agency the NWRC.

In 1987 EVDSA (Ethiopian Valleys Development Authority) came into existence in parallel with NWRC, given the task of mainly urgent study & research to secure integrated resource utilization and of final water allocation. In the most recent (late 1992 & 1993) reorganization, the Ministry of Natural Resources Development and Environmental Protection (MNRDEP) has been formed incorporating EVDSA, WRDA & some departments of the Ministry of Agriculture. Later on it was converted into the Ministry of water Resources

(MWR). The Ministry is currently the apex body in the country with matters related to policies, strategies & regulatory aspects of water.

Under the Prevailing Federal arrangement, Regional governments handle the task of planning & implementing their water development efforts. In line with this the Amhara, Tigray & Southern Regions launched irrigation development commissions that have brought considerable development of irrigation (1995-2001). The other regions followed similar approach with due emphasis on irrigation. To date, the focus has diminished due to institutional reshuffles resulting in the abolition of irrigation institutions & expertise that have been dissolved into disarrayed & unfocused institutional setups.

7.2.2.2 Irrigation development

A brief account of the various efforts made in the irrigation sub sector of the country is presented in a form of SWOP (strength, weakness, opportunity/ potential) analysis (see Annex Table 7.5). The presentation highlights the challenges faced, efforts undertaken, impediments encountered & lessons learnt. The eighteen years before the 1974 revolution saw the identification of water resources potentials in the Blue Nile, Rift valley, Wabi Shebele, and the Awash Valley. Some projects in the Awash Valley even reached the implementation level. The developments were carried out through concessions with foreign companies. Quite a number of national investors also took part in the development. This enthusiasm was overtaken by the 1974 revolution.

After 1974 and until 1991 the development of irrigation schemes was purely the responsibility of the government. The primary objectives of the development endeavors were for import substitution, export, and resettlement of farmers from drought affected areas. The expansion could not continue as planned for many reasons, the major ones being lack of comprehensive planning frame work, lack of high level trained man power, lack of foreign currency from international

financial institutions, and poor economic viability. But quite a number of projects were studied at feasibility level, although they were relegated to the shelves.

The pre – 1991 approaches were dominated by a centralized process of project identification, funding, implementation and operation. The government centrally established development priorities and budgets, which, in turn, formed the basis for annual allocations of capital and operating expenditures from the Ministry of Finance. Development was, therefore, driven by state allocations of finance and land to public sector projects. Other factors which normally contributed to the development process were accorded low priority. These include local participation of affected communities, environmental impact assessment, development of markets for products, labor availability, development of infrastructure (settlements, transportation, and utilities), diversification of the rural economy and private sector investment.

Since 1991 great emphasis was given to small scale developments with the farmers as the primary target beneficiaries. In fact the development of small scale irrigations schemes proliferated throughout the country, although the majority of the schemes were implemented in Tigray, Amhara, Oromia, and Southern Region. The development of the schemes did not deliver the expected results. Some schemes were found to be losing water to seepage; some storages were filled with sediment; some irrigation schemes could not manage the irrigation water properly and as result water logging become a serious problem. Similar problems in some countries were observed during the formative years. Since the level of management is the result of long years of experience, the efficiency of the Ethiopian schemes will improve with time if due consideration is given. Large scale irrigation development was suspended for over a decade. But since the last two years the situation seems to favor the development of large-scale irrigation schemes. The development of 6000 ha in Koga and 90000 ha in the Awash Valley are examples of this tendency.

7.2.2.3 Current practices of small scale irrigation and water harvesting program

The government of Ethiopia is promoting the development of small scale irrigation schemes and water harvesting programs in the framework of strategies to combat drought and food insecurity induced by moisture shortages. Water-centred development is taken to be the key strategy where efforts are being made through rainwater harvesting (Soil storage and structural) practices as well as small scale development irrigation schemes. Small scale irrigation takes different forms including traditional, communal and modern types. There are also different types of technologies applied for water harvesting. For instance, ponds, storage tanks, check dams (Adugna, 2003). Evidence shows that small scale irrigation schemes are practiced all over the country in both traditional and modern ways. As of 2003, there were traditional small scale irrigations that used to irrigate 140 thousand hectares of agricultural land. Similarly, over 47 thousand hectares of land use modern small scale irrigation schemes. More small scale irrigation schemes were proposed to be developed in order to put another 33 thousand heaters of land under irrigation (Table 7.2.).

Table 7. 2: Existing and proposed SSI schemes

No	Region	Existing SSI schemes (ha)		Proposed SSI schemes (ha)	Remark
		Traditional	Modern		
1	Amhara	72000	11450	20975	In Tigray and
2	Tigray	2637	2084	3337	Amhara
3	Oromia	48000	18100	3345	Regions, Small
4	SNNP	5200	13000	2126	Scale Irrigation
5	Somali	8200	1800	405	development is
6	Gambella	46	70	850	implemented
7	Benishangul	387	200	280	through Dams,
8	Afar	2440		300	Diversions,
9	Harari	812	125	125	spring hand-dug
10	Dire Dawa	640	860	2039	wells, spate &
11	Addis Ababa	352			Treadle pumps.
	Total	140714	47689	33782	

Source: Adugna Jabessa (2003). Paper presented at the Development Debates Organized by EDRI.

In recent years big emphasis was also given to the expansion of various water harvesting practices. The data for the four major regions (Adugna 2003) show that as of the year 2003, over 325 thousand structures of rain water harvesting were planned, 163 thousand were under construction and about 96 thousand were completed (Table 7.3). Given the diverse agro-ecology, topography and soil structures, the main arguments around the application, use and efficiency of water harvesting technologies is the capacity to hold and conserve water that will be sufficient to provide supplementary irrigation possibilities under situations of water stress. The need for flexibility in design and choice of technologies is imperative to make the practice adaptable to various circumstances. A report by the Ministry of Agriculture and Rural Development (Lakew, 2004)[49] indicates that in 2004, over 640 thousand different water harvesting structures were built to irrigate 93 thousand hectares of land that be fitted 732 thousand households.

Table 7. 3: Current water harvesting practices

No.	Region	Rain water harvesting			Remark
		Planned	On-going	Completed	
1	Amhara	85000	18600	25900	In Amhara Region in 2004 more than 100,000 water harvesting structures were planned to be constructed. In Tigray and Oromia Regions about 500,000 and 608,000 water harvesting structures, respectively, were to be constructed by the end of 2004/2005.
2	Tigray	41800	10000	22000	
3	Oromia	83400	19542	24803	
4	SNNP	115000	115000	-	
	Total	325200	163142	95803	

Source: Adugna Jabessa (2003). Paper presented at the Development Debates Organized by EDRI.

[49] A workshop paper presented at the forum prepared by the Ministry of Water Resources Development.

7.2.3 The livestock sub-sector development strategies

The Ethiopian livestock sub-sector has a huge potential in terms of resources and contribution to the livelihood of the farming and pastoralist communities and the national economy at large. In the past various intervention measures have been taken to develop the sub-sector albeit without much effect to date.

7.2.3.1 Approaches to livestock development

Intensification versus diversification approaches

As is common with other developing countries with predominantly subsistence agriculture the low-input and subsistence agricultural practices of Ethiopian highland (mixed crop-livestock farmers) as well as lowland (pastoral, agro-pastoral livestock keepers) areas are characterised by their heavy dependence on exploitation of the natural resources (soil, vegetation, water) (Hayami, 1997). This unhealthy tendency has been further exacerbated by the pressure from fast growing human population and unstable policy and institutional environments. Particularly in the mountainous highlands, land of decreasing nutrient quality and high slopes is increasingly put under crop and livestock production (Tilahun, 2003). The pastoral rangelands are also deteriorating under pressure from population growth, over-exploitation of rangeland resources and breakdown of the hitherto effective indigenous institutions for judicious use of communal rangeland resources (pasture and water) (Gemedo, 2004).

In Ethiopia farmers do not own the land, and hence livestock are the most important asset with the capacity of self-renewal. Poor farmers view their smallholdings of mixed livestock species as uniquely productive asset that subsist on resources outside the control of the household. The majority of the

farmers typically practice a low-input livestock management. They work in short time horizons and tend to minimise risk to the little capital holdings, and hence accept low production per animal (Jahnke, 1982). Even in the highland communities, biological survival and multiple production functions (biological, social) are more relevant than high productivity for specific products (Ørskov and Viglizzo, 1994). This led to the traditional production systems dependent on livestock breed types that can withstand environmental stress (von Kaufmann and Peters, 1990). Such livestock provide more avenues to generate income from feed resources of low opportunity costs and from common properties like poor grazing pastures and wastelands.

There is a consensus that increased production and productivity are imperative in the smallholder sector, but the relevant strategies to achieve these are open to debate. While the survival strategies of smallholder farmers have been towards diversified use of the available livestock, land, and labour resources with the view to minimise food security risks, official development interventions have been promoting further intensification of livestock production targeting supposedly marketable products. For instance, the major thrust of livestock development in the high-potential agricultural highlands in recent decades has been, and indeed still is, genetic improvement of indigenous cattle, sheep, goats and chicken through crossbreeding with selected improved exotic breeds (Workneh, 2000; Kassahun, 2000; Tadelle, 2003). Crossbreeding entails intensification of livestock production by investing more resources, particularly capital, on the crossbreeds, i.e. specialisation. But the risk-averse poor farmers tend to increase production by way of diversifying and integrating farming activities to maximise use of particularly land and labour (Devendra, 1992). As a recent comprehensive on-farm study in the eastern Hararghe highlands demonstrated (Habtemariam, 1999), poor livestock keepers of the highlands and development professionals (researchers, extension staff) differ widely in their views concerning problems limiting livestock production and the avenues for

livestock development. Such interventions in the direction of intensification not only fail to generate net benefits to target beneficiaries, but also disturb the genetic resource base and increase the risk of loss of indigenous livestock biodiversity (Workneh et al., 2003b; Ababu, 2004).

Livestock development interventions of the recent past in Ethiopia have, therefore, been constrained by poorly justified strategies, and have largely been unsuccessful. A World Bank evaluation report concluded that livestock development projects carried out in Ethiopia and financed by the World Bank were largely failures, due to civil unrest and poor project design (World Bank, 1985). Lack of adequate information on production systems and farmers' production objectives are the major causes of poor project design in livestock development programmes (Gryseels, 1988; Coppock, 1994).

The approach to development: poor targeting

With the exception of the First Livestock Development Project of the 1960s that targeted commercial dairy producers, livestock development interventions of the recent past in Ethiopia, of both government and non-government organisations, generally targeted poor livestock keepers, and in fact the poorest of the poor in many cases. They also make direct contacts with a very small proportion of the farming community, although the issues addressed may be relevant to a wider population domain. These households tend to have less resources and disposable income than the average farmers; they tend to have less access to information and hence poor bargaining positions; they are less connected to markets. These factors also influence the success of development interventions that promote adoption of new technologies, particularly those that call for more intensification of the livestock production process. While giving priority to the poorest farmers may be more appealing in terms of equity and political thinking, it tends to compromise opportunities for longer-term development and continuity of

promoted technologies as it disregards farmers' motivation for development and their capacity for innovation. More resourceful and innovative farmers improve chances of technology adoption; they are more likely to invest from their own resources on new technologies, and hence create more dynamism for continued local development. As will be discussed further in the following sections of this report, most of the development interventions did not continue after their promotion phase. Part of the explanation for their failure should be sought from their design, particularly their targeting strategies.

7.2.3.2 Livestock development in the highlands

The smallholder highland farmers have not been benefiting from the mainstream agricultural research and extension services. Systematic development intervention in the livestock sub-sector of the past several decades focused more on the benefits to consumers rather than on the development needs of the farmers themselves. For instance, the first four major livestock development programmes of the country, which were financed by long-term credit, promoted interventions in public animal health services, livestock marketing, pastoral development and dairy development with major objectives of boosting export earnings and increasing supply of animal products to the urban consumer. The First Livestock Development Project (LDP) of the 1960s was targeted at supporting development of commercial dairy farming around the capital, Addis Ababa. The Second LDP focused on the establishment of slaughter facilities for major cities, and for the development of stock routes and markets in pastoral areas. The Third LDP in the 1970s focused on improvement of rangeland management and veterinary services in pastoral areas to support the expanding livestock export market. The Fourth LDP of the late 1980s was designed specifically for the highlands to improve fodder production of particularly smallholder and co-operative dairy farms (Teferra and Abaye, 1995). It is only in the Fourth LDP, in a few area-specific pilot projects

and in veterinary services that the highland mixed farming system received serious development assistance.

The second and third LDPs did not achieve their targets because of limitations in project design (poor participation of national stakeholders, inappropriate technologies) and political instability (the change of government and the Somali war in the 1970s). In the wake of the drought and famine of 1984, it was considered appropriate to particularly support highland peasant livestock development, where livestock and crop production are intimately interdependent. In this respect the Fourth Livestock Development Project (FLDP) was prepared and implemented from 1987 to 1994. The primary objectives of the FLDP were to increase livestock and agricultural production by improving animal health and nutrition. Project components comprised of animal health, animal nutrition, rangeland management, credit for livestock development and capacity building.

At project implementation the project has generally achieved its broad objectives of widely demonstrating increased animal production (milk, meat) through better feeding, health care and building the capacity of extension services, and some important lessons were drawn (Alemayehu, 2002). Allowing sufficient flexibility in project design improves chances for success in field programs. Investment in training of local staff and production of training resources, extension manuals and visual aids brings about lasting impacts. Total dependence of promoted technologies on imported inputs using public resources will make the technologies unsustainable. And retention of experienced and senior staff in programme formulation and implementation is associated with successful results.

The livestock component of PADEP included improvement of cattle, sheep, goat, and poultry production and development of apiculture. Yet the focus was mainly on cattle, especially on promoting dairy farming through the use of F1

crosses of exotic dairy breeds, whereby Artificial Insemination (AI) was used as a major vehicle and five crossbreeding stations were also built to produce crossbreed heifers for distribution to farmers (Tefera and Abaye, 1995).

The latest serious attempt for livestock development came though the National Livestock Development Project (NLDP), which unlike the previous major projects was initiated and developed with direct involvement of the Ethiopian Ministry of Agriculture. This five-year project was launched in 1999 with a total project cost of Birr 308 million. Unpublished documents show that the project has three rather broad objectives: to achieve sustainable increases in livestock household incomes, improve the nutritional status of the smallholders, and satisfy consumers demand for livestock and livestock products. The components of this project are livestock production, animal health, and forage production. The major activities implemented in almost all administrative Regions include livestock production, animal health and forage production.

The implementation and impact of this project is yet to be evaluated. However, given that the strategy and focus of this project was similar with its predecessors, and that the policy and institutional environments did not change during implementation, the success rate of this project is not expected to be very different from similar projects in the past. For instance, crossbreeding of indigenous cattle has been promoted in much the same way as with previous projects; AI technicians were allocated to districts irrespective of the actual demand for AI services, leaving major urban centres heavily understaffed while some AI technicians work under their capacity.

7.2.3.3 Livestock development extension strategies

The emphasis of these major development projects in the highlands on crossbreeding has been by far disproportionate to the number of crossbred and pure exotic stock in the country; crossbred and pure exotic animals

account only to 0.6 percent of the cattle, 0.17 percent of sheep and 0.01 percent of the goat populations (CSA, 2003). The fragmented and largely unsuccessful crossbreeding programmes supported so far by the extension services in the highlands (on cattle, sheep, goats, poultry) were based on the conviction that the indigenous livestock do not adequately respond to the improvements in the level of management, which is open to debate (Workneh et al., 2003a). As elsewhere in the tropics (McDowell, 1972; 1988), a major reason for the failures of previous experiments on promoting crossbreeding in the tropical subsistence production system has been inadequate provision of the requirements for introducing and maintaining the crossbreds. Another reason appears to be lack of focus on the actual production objectives of the farmers for whom the technologies are promoted (Rischkowsky, 1996; Workneh, 2000). Some such measures even had unanticipated negative impacts, for instance the crossbreeding programme for increasing wool production had reduced market acceptability of sheepskins (Jahnke, 1982). Under smallholder settings of eastern Ethiopian highlands, crossbreeding of goats could not be sustained after the promotion phase because of the small flock sizes, rapid turnover of breeding animals, dependence on external sources for genetically selected breeding stock and the multiple purposes of keeping breeding animals (Workneh et al., 2002).

Livestock development efforts that focused on intensification of animal production through specialisation into dairy or beef farms to produce more milk or meat per animal and to reduce the number of 'less productive' animals that can only 'degrade' the environment, have not been very successful either. Cognisant of existing risks and emerging market opportunities, farmers diversify their production systems through further integration of crop and livestock systems, and are making a marked shift towards cash crop production increasing household income (Eshetu and Habtemariam, 2001).

Habtemariam (2003) argues that the thinking that livestock are less important to sustainability of highland agricultural system seems to have dominated the policy making, the research and the extension systems of the country, based on the assumption that with declining availability of grazing lands, farming systems will be forced to progressively lose their livestock components, and livestock will be concentrated on a smaller land area and will graze on marginal lands. This meant that relatively little attention has been devoted to livestock development in the dominant crop-livestock systems of Ethiopian highlands. Uncontrolled use of grazing and water resources in the densely populated highlands can exacerbate the competition for fertile land, further affecting the longer term sustainability of the agricultural systems as a whole, and hence livestock development policies should duly recognise such drawbacks (Winrock, 1992; de Wit *et al.,* 1995; Benin *et al*., 2002). Livestock are integral and critical elements of smallholder mixed farming systems because of their integrative input and output functions. These play crucial roles in household food security (Sansoucy *et al.*, 1995), and also benefit the environment (de Haan *et al*., 1997; Ehui *et al.,* 1998). The roles of livestock, therefore, deserve due attention while planning the development of smallholder, resource-limited, risk-averse and subsistence-oriented mixed farming systems of the Ethiopian Highlands (Habtemariam, 2002).

The current policy on agricultural extension services, particularly those in the agricultural high and mid-altitude areas, is guided by a new strategy adopted in 1995: the Agricultural Development Led Industrialisation (ADLI). The strategy sets out to improve productivity of the agricultural sector. With respect to the livestock sub-sector, the development strategy seeks to enhance the quality and quantity of feed by allocating sites for grazing, providing improved animal feed and improving extension services to farmers, increase livestock health service coverage including vaccination services; and improve dairy productivity through crossbreeding while also conserving indigenous breeds.

Benin *et al.,* (2002) conducted an extensive survey of the livestock sub-sector in the Amhara Region between 1999 and 2000 to examine changes that have taken place since 1991, and found out that there have been significant changes in the utilization of feed resources, expansion of animal health and other extension services, and ownership of various types of livestock. They reported that while use of communal grazing lands, private pastures, woodlots and forest areas as feed sources has declined, use of crop residues and purchased feed has increased. Use of improved livestock, AI, stall feeding and fattening has increased. Increased proportion of area irrigated was found to be associated with reduced ownership of livestock, particularly goats, donkeys and oxen, as crops become more dominant livestock strategies in irrigated areas. Increase in household density was associated with reductions in ownership of multiple oxen, heifers and bulls, which reflect the increasing pressure on already degraded resources to adequately support large herds of cattle. The study found out that improvement in access to markets (roads, etc.), access to own land and particularly to land of high agricultural potential, and increased participation in credit and extension programs targeting livestock have had significant positive impacts on ownership of livestock and adoption of improved livestock technologies. Population pressure, on the other hand, has had negative impacts on ownership of livestock and grazing resources. The study also revealed that agricultural credit delivered by NGOs in more remote areas has had a positive impact on ownership of livestock, unlike those delivered by the government extension services as well as regional credit and savings institutions, and recommended that the government credit and extension programs could adopt the management and delivery strategies of those NGOs to improve their positive impact at a larger scale. It was then concluded that reducing population growth and improving access to markets and credit and extension services targeting livestock can enhance the role of livestock in the mixed crop-livestock farming systems of the Ethiopian highlands.

7.2.3.4 Livestock development in pastoral areas

The first major development intervention for pastoral areas came in the form of the Second Livestock Development Project (SLDP) (1973-81), which was financed by the World Bank. The main objectives of this project were (Sintayehu, 2003) to siphon surplus livestock out of the major pastoral areas to consumption centres of the country and for the export market, improve the quantity and quality of hides produced in the country, and indirectly curb the unofficial cross-border trade of livestock and livestock products to neighbouring countries.

The project had a strong component for constructing necessary infrastructure: livestock markets, stock routes and slaughterhouses. By its closure in 1981 SLDP managed to construct 470 km of stock route consisting of 10 staging points and 10 grazing areas, which was about 19 percent of its target. A total of 11 primary (23 percent of plan) and 3 terminal (50 percent) markets were built. Altogether 159 slaughterhouses and hide sheds were also constructed. It also purchased livestock transport trucks. However, these interventions did not lead to increased livestock marketing for several reasons (Sintayehu, 2003).

Subsequently, the Third Livestock Development Project (TLDP) and the Southeast Rangelands Project (SERP) were initiated with focus on improvement of rangeland management and veterinary services in pastoral areas to support the expanding livestock export market. These projects covered the Borana, Afar and Ogaden rangelands. These projects were also affected by insecurity problems in parts of their mandate areas. They did not achieve their targets because of limitations in project design (poor participation of national stakeholders, inappropriate technologies) and political instability (the change of government and the Somali war in the 1970s).

Although not specifically for pastoral areas, there was a project for supporting livestock marketing by establishing a formal Livestock Market Information System (LMIS) in the 1980s in selected towns in the country with technical assistance from FAO under the Animal Resources Marketing Department of the Ministry of Agriculture (Sintayehu, 2003). LMIS was designed to improve transparency of operations of livestock markets by providing information on the types of animals entering the markets, approximate/exact weights, conditions and prices of the animals transacted. The selected markets were fenced and were equipped with chutes, weighing scales/tapes and notice boards. The information gathered from the markets was channelled to the Department weekly for processing and dispatch to the Regions. Communication proved to be very difficult. Because of its limited period of existence it is difficult to determine whether stakeholders might have benefited from the information. LMIS was also foreign-financed and its activities stopped with termination of the assistance. However, the project was highly relevant for pastoral areas as well as for livestock marketing in general. The fact that LIMS was totally dependent on foreign aid and that it was not designed to be integrated with the regular livestock extension services indicates a design limitation in the project, a characteristic also common to other livestock development projects.

Many studies have shown that the major pastoral development projects that were implemented in the country attempted to modify the traditional system of communal extensive livestock production through the development of watering points and introduction of modern administration into communal resource use, for instance the group ranches (Coppock, 1994; Taffesse, 2001). With no improvements in the animal off take rates, the increased livestock population indeed led to overgrazing and severe degradation (Coppock, 1993). Recurrent droughts aggravated the problem by causing loss of livestock and grazing resources as well as unsustainable exploitation of the rangeland resources. Coupled with these, the break up of indigenous

institutions responsible for generations for efficient use of communal resources led to uncontrolled misuse of the valuable pastures and destruction of important social structures (Kamara, 2001). It seems that pastoralism which once was capable for efficient production can no longer be continued in the traditional way, and the capacity for extensive range management is very limited (Kamara, 2001; Homann, 2004; Gemedo, 2004).

An in-depth study of pastoral indigenous institutions in the Borana rangelands (Homann, 2004) reported that interference of the formal administration into the operations of indigenous practices in the management of communal property (particularly pasture and dry-season water), changes in land use policy, and political upheavals disturbed the harmonious system of resource use in the pastoral communities, and resulted in socio-economic instability and ecological degradation. Indigenous institutions used to practice systematic herd mobility linked with flexible stocking densities and herd diversification, as key strategies to exploit the heterogeneous rangeland resources on a large scale. Common property regimes were designed for extended user groups to co-ordinate and enforce decisions over access to shared grazing resources. The local decision making structures were flexible enough to allow multiple users to negotiate over the use of key resources during times of scarcity. However, since the 1970s various development interventions (well meant but poorly designed) ignoring the importance of indigenous knowledge systems have undermined pastoral production. In response to deteriorating rangelands, the Borana pastoralists adjust their breeding strategies by selecting for cattle types with lower demands for forage, and by increasingly keeping camels; they further gave up the satellite herds of castrated males, formerly a precious reserve to overcome droughts. The progeny histories confirmed a reduced overall performance of livestock between highly degraded and more stable rangelands. This study showed that ignoring the indigenous institutions and knowledge systems of the

Borana pastoralists contributed to progressive erosion of important social structures, degradation of rangelands and worsening poverty.

There is one major comprehensive pastoral development project under implementation– the Pastoral Communities Development Project (PCDP). The PCDP has total investment funds of US$60 million over five years period, and focuses on reduction of poverty in pastoral areas, through the creation of infrastructure, services, new income generation opportunities and a favourable institutional environment and good governance. Basically this project is designed to build capacity of major pastoral areas in terms of trained manpower, socio-economic infrastructure and governance. There is another large (covering all seven regions with pastoral communities in them) pastoral development project prepared for funding – the Pastoral Areas Development Plan (PADS). This project is intended to support economically and environmentally viable livestock production in pastoral areas to support pastoral livelihoods as well as the national economy. Potentially there is overlapping of activities between these projects, and there is need to check for duplication of effort and ensure complementarities.

7.2.3.5 Animal health service delivery

Another major area of intervention into livestock production in Ethiopia is animal health. Livestock diseases cause aggregate annual economic losses of about US$150 million through direct mortality and reduced productive and reproductive performance (Berhanu, 2002). Until recently the only channel for animal health service delivery in the country was through the Ministry of Agriculture and Rural Development, which operates on cost-recovery basis. While a wide range of diseases may potentially affect smallholder livestock, the overwhelming majority of morbidity and mortality is caused by a finite set of common and predictably occurring disease problems. However, these apparently manageable problems often appear to be beyond the capacity of

governments' veterinary services, which are often entrusted with the delivery as well as regulation of veterinary services (Sherman, 2000). In Ethiopia, the veterinary services are generally constrained by limited infrastructure, limited geographical service coverage, too low veterinary staff allocation, and more importantly poor cost recovery (Solomon, 2002). For instance, a close investigation of the latter case in the Somali Regional State in 1997 revealed that the allocated operational budget for delivery of animal health services was only 8.5 percent of the estimated cost of the veterinary drug requirements for the Region, and only about 20 percent of the annual veterinary costs could be recovered during the budgetary year (Catley et al., 1997). Another study also revealed that only 30 percent of the country's surface area is served by the current system of fixed-point veterinary clinics (Moorehouse and Ayalew, 1997). Although at present Regional States are building more veterinary clinics with massive investment in fixed-point public clinics, the extent of coverage would not be adequate. It is also unclear how the expanding fixed-point clinic system would be supported in terms of operating budget.

The coverage of veterinary services in the pastoral areas of the country is even worse, although more than 90 percent of the livestock export originates from the pastoral areas. The provision of animal health services in pastoral areas requires a radical change from the conventional approach prescribed for the highland mixed farming system of the country. The challenge is even greater, considering unique conditions in pastoral areas such as low cash economy, insecurity, and high cost of service delivery and poor infrastructure.

An alternative to public veterinary services could be to set up basic animal health services to be delivered as community-based programs to provide more accessible, cost-effective and sustainable animal health services to rural communities. Such services, generally known as Community-based Animal Health Services (CAHS), are established by training local people to

serve the basic animal health needs of their own communities by providing easy and affordable access to basic animal health services primarily to reduce morbidity (illness) and mortality (death) from the commonly occurring livestock diseases.

The potential contribution of CAHS to a more effective animal health delivery in both pastoral and highland agricultural areas has been increasingly recognised by the government veterinary departments as demonstrated by the growing number of such programs operating in the country (Kassaye, 2002; Workneh and Risckowsky, 2004). CAHS are complementary to both public and private veterinary services. However, the operationalization of CAHS has been constrained by the vague policy environment on the operation of CAHS and weak integration of the service into the network of public veterinary services (Workneh and Risckowsky, 2004).

Despite the growing assertion that the private sector should play a leading role in the delivery of veterinary services, this has not been achieved to date in Ethiopia due to technical, financial, legislative and in some cases institutional constraints over modalities (Yacob, 2003). The tendency to retain much of the veterinary services within the public sector has not been helpful for the development of the private sector. In strategic terms, decision on whether a veterinary service should be delivered by the public or private sectors is guided by: 1) economic feasibility of marketable services, and 2) the nature and significance of service as a public or private good. Services mainly under the responsibility of the private sector are clinical diagnosis and treatment and production and distribution of remedies and vaccines. Functions under shared responsibilities are disease diagnosis and reporting; compulsory testing; tick and tsetse control; food hygiene and inspection; disease emergency response and zoonosis control. Recently, the role of the private sector appears to be rapidly growing at least in urban areas, both in drug supply and service delivery (Thewodros, 2002).

7.2.4 Land tenure systems under different regimes

Property rights and the land tenure system has been an important aspect of the economic, social, political and ideological history of Ethiopia. Complex land ownership and tenure systems are known to have existed in the country. The policy and politics of rural and agricultural tenure mark important events in the Ethiopian socio-economic and political history. Ownership, access to land and tenure security have been important elements of not only the agricultural and rural life but also of the social, economic and political relations in the country. The social, economic and political crises during the period of Emperor Haile Selassie involved, among other things, the question of land. Concentration of land in the hands of the few (the nobility, the church and high-ranking military personnel), and tenure insecurity in the tenant-landlord relations were the major criticism levelled against the then land administration system. Before 1974 common tenure types were *rist*/kinship, private, church, and state holding systems.

The military government (Derg) which took power in 1974 introduced a major land and rural institutional reform, by nationalizing the lands of imperial and feudal landlords as well as all privately owned land; it then redistributed the land to peasants through peasants' associations (grassroots administrative organs). While the land was made a property of the state, the peasants were entitled to user rights. The Derg system ruled out renting of land and other transactions (sales, mortgages, sharecropping). Peasants' Associations were mandated to handle land related matters (redistribution, tax collections, and arbitration of disputes). Despite the equity effects of rural land redistribution, the system involved a lot of tenure insecurities and uncertainty due to frequent land redistributions effected to accommodate growing demands. In addition, the socialist economic policy largely favoured large-scale mechanized state farms and collective farms at the expense of the

smallholder farms, which, however, contributed the largest share to agricultural production and economy in the country.

The EPRDF government followed a free market economic system and introduced important economic and social reforms. Regarding the land tenure policy, the Constitution states that land continues to be a public property. A new land law was also provided in 2002 that allowed legislative and implementation powers to the Regional governments. The Regional governments have been exercising their own land policies. For instance, the Tigray Regional State implemented land registration and title certification since 1998. The other regions, the Amhara, Oromia and SNNPR have also started the same program since 2003. Regional States have also made some adjustments regarding provisions on land transactions (renting and leasing) by farmers.

The major challenges that currently confront the country's land policy include: the growing population pressure and the rising number of landless people on one hand, and the need to create an enabling environment for investment in agricultural development, on the other hand. The country's agricultural development led industrialization (ADLI) policy relies on rural development and agriculture. While re-distribution of land has not happened in recent years (except the one that took place in Amhara region in 1997), there is no guarantee that this would not happen again. A study by the Ethiopian Economic Association and the World Bank (Deininger, et al. 2003) showed that past history of land redistribution creates a subjective feeling of tenure insecurity, and involvement in off-farm work is constrained by such a policy that doesn't allow leaving one's village and going for other jobs for a long period of time.

The question of land and debates around it continue and will continue to be one of the major elements of the socio-economic discourse for a long time to come. Studies have been conducted to describe the tenure systems and that consequences in the past. The problems of access to land, tenure security,

land and gender relations, and ownership were raised in various forms by different institutions, and individual researchers, both domestic and external.

As a result of the dialogue at various fora on the land question, the Ethiopian government has now recognized the existing land tenure insecurity problem and its effects. In recognition of the importance of tenure security, the federal and regional governments have now started to set up rural land administration institutions, and implement land measurement and land title certification programs. The recent initiatives of land use and land administration proclamations are measures designed to improve land tenure security. This is a positive development the impact of which on tenure security, the behaviour of land users, resource allocation and agricultural performances has yet to be systematically studied. While it is recognized that the issue of land is highly complex and sensitive, conclusive recommendations on the appropriate tenure systems that suit the diverse cultural, historical, ecological and farming systems of the country are matters of further empirical research and policy dialogue.

7.2.5 Farmers organizations and participation

The participation of the rural population in planning and implementing agricultural policies in Ethiopia has been minimal. This was due to either the lack of organizations representing peasant farmers or due to the assumption that agricultural development would be achieved mainly through the efforts of government and development agencies. Under Haile Selassie's government, peasant farmers did not have any organization (either at local or national levels) that could represent their interests. They neither had political power to administer their affairs at the local level nor to influence government policies that directly affected their lives at a national level. Peasant farmers, for example, did not have any collective mechanism to challenge the exploitative land tenure system, to influence pricing to their advantage, to have better

access to social services, or to make taxation levels affordable. The members of the Chamber of Deputies, who were elected to the parliament by local people, were rich landlords and businessmen who could not represent the interests of peasant farmers. This lack of representation had been a hindrance to farmer's meaningful participation in agricultural development policies that directly affected their lives.

Under the Military regime, it was hoped that Peasants' Associations (PAs) might develop into genuine autonomous grass-roots level organizations that could actively represent the interests of their members. Indeed, in the early stages of the revolution, Peasants' Associations were genuine participatory organizations with considerable autonomy especially in regards to local land affairs, local government, the administration of justice, and the right to farm the land individually or in cooperation (Pausewang, 1990). Such developments were later shattered when the hard-liners within the government took over and started to establish a Stalinist form of rule, which the political cadres misleadingly described it as democratic centralism" (Kirsch, Goricke, and Worz, 1989:161). Thereafter, the peasants' organizations ceased to be forums of participation in agricultural development ventures. Instead they became local-level instruments of the central government dominated and manipulated by political cadres. PAs lost their function as pressure group covering for the interests of the rural population. For instance, there were no open opposition by the peasants' organizations when the interests of their members were threatened by unpopular government policies such as villagization, Agricultural Marketing Corporation (AMC), resettlement, militia recruitment and others. There is no national organization that represents the interests of peasant farmers under the current administration.

In Ethiopia, government officials and even professionals unconsciously believe that agricultural development ventures will be achieved through the

efforts of government and development agencies. They do not recognize on the possibility that sustainable agricultural development can only be achieved through the efforts of the rural people themselves working for their own benefits. Because of this, programs and policies aimed at agricultural development tended to be initiated, designed and implemented from the “top-down” by government agencies and institutions without a systematic consultation and involvement of the intended beneficiaries. In the top-down approach, officials plan and organize everything themselves and the participants only participate in carrying out the instructions. It hardly encourages grass-roots participation. Besides, the top-down approach usually encourages dependency on government and development agencies by undermining peasant farmers' sense of self-reliance and confidence.

Development or the improvement in the well-being of a society includes autonomy and participation of the people. Development projects directed from above by elites are often insensitive to local community needs and concerns. Thus, self-reliant participatory development initiatives by peasant farmers should be encouraged and supported. Moreover, locally drawn-up development strategies not only directly address local problems, but also enjoy the support of the local population.

Chapter 8

Technology Development and Dissemination

8.1 Agricultural research

There is no doubt about the need for effective and efficient agricultural research for sustainable agricultural growth. Agricultural research and technology generation have been an important aspect of the Ethiopian agriculture for a long period of time. It is now over five decades since agricultural research activities were institutionalized[50] in Ethiopia. The end of the 1950s was the beginning of Alemaya College of Agriculture shouldering the national responsibility of research, extension, and teaching patterned after the Land Grant Model of the USA. A report by ISNAR (Nienke and Menelik, 2003) which summarized the history of the public agricultural research system in Ethiopia indicates that agricultural research started during the late 1940s. According to this report, limited research was initiated when the Ambo and Jimma Junior Colleges of Agriculture were established in 1947.

In 1953, the Debre Zeit Agricultural Research Center was established under the then Imperial College of Agriculture and Mechanical Arts (now Alemaya University) and remained the primary Ethiopian agricultural research entity until 1966. Then the Institute of Agricultural Research (IAR) was established as a semi-autonomous institute with financial support from the United Nations Development Programme (UNDP) and the Food and Agriculture Organization

[50] The Oklahoma College of Agriculture and Mechanical Arts in collaboration with the Alemaya College initiated agricultural field experiments in Ethiopia in 1953 (Berhane et al, 2004). Founding experimental sites were at Jimma, Shashamene, and Addis Ababa. Other early sites were Debre Zeit, Alemaya, Andasa, Debre Birhan, Alamata.

of the United Nations (FAO). Since then, IAR subsumed the limited and scattered research activities of the Ministry of Agriculture and became responsible for formulating national agricultural research policy and conducting research on crops, livestock, and natural resources.

In 1977, IAR's research programs were restructured as departments according to subject areas, and multidisciplinary commodity teams were assembled to make more effective use of IAR's small number of research specialists. In the mid 1980s, IAR was again restructured to emphasize regional research, whereby a center was identified in each regional zone to take responsibility for coordinating IAR's research activities. In addition, some of these research centers developed into national centers with national mandate as commodity research centers (e.g. coffee research at Jimma research center). During the 1970s, a number of other national research centers were established including the Plant Protection Research Center (1972), the Plant Genetic Resources Center (1974), the Forestry Research Center (1975), and the Wood Utilization Research Center (1979). Two more centers were established some time later—the National Soils Laboratory (1989) and the Institute of Animal Health Research (1992).

Agricultural research underwent significant reform in the early 1990s when the government adopted a decentralized system of administration. As a result, a number of IAR centers were transferred to the respective regional governments and became independent research centers in 1993. In June 1997, the Ethiopian Agricultural Research Organization (EARO) was newly created. EARO is now the main agricultural research entity in Ethiopia and is mandated to coordinate the agricultural research activities of the federal and regional research centers and the higher-learning institutions. Its mandate encompasses agricultural researches in crops, livestock, fisheries, forestry, and other natural resources. EARO falls under the administrative responsibility of the Ministry of Agriculture and Rural Development and, as of 2000, organized its

research through 5 research directorates, 3 research coordination offices, 40 programs, and 106 projects (Nienke and Menelik, 2003).

As part of the reorganization of the national agricultural research system, research activities were decentralized and a number of former IAR research stations were transferred to the regional states. The Regional Agricultural Research Institutions (RARIs) were established to undertake researches in respective regions. In addition to the formerly established research centers, they have also opened new centers and expanded their areas of operations. While the four major regions (Tigray, Amhara, Oromia and SNNPRS) have relatively well organized research systems the other emerging regions are on the way to establish research organizations.

Colleges of Agriculture and Universities also undertake agricultural research activities. The Ethiopian Science and Technology Commission also supports agricultural research by providing small research grants for individual researchers. Other institutions which are currently engaged in agricultural research include professional associations like the Ethiopian Economics Association, the Agricultural Economic Society of Ethiopia, the Ethiopian Soils Sciences Society, the Animal Sciences Association, etc. The Agricultural Science and Technology Indicators (ASTI) of ISNAR (Beinteman and Menelik, 2003) identified 41 agencies engaged in agricultural research in Ethiopia in the late 1990s.

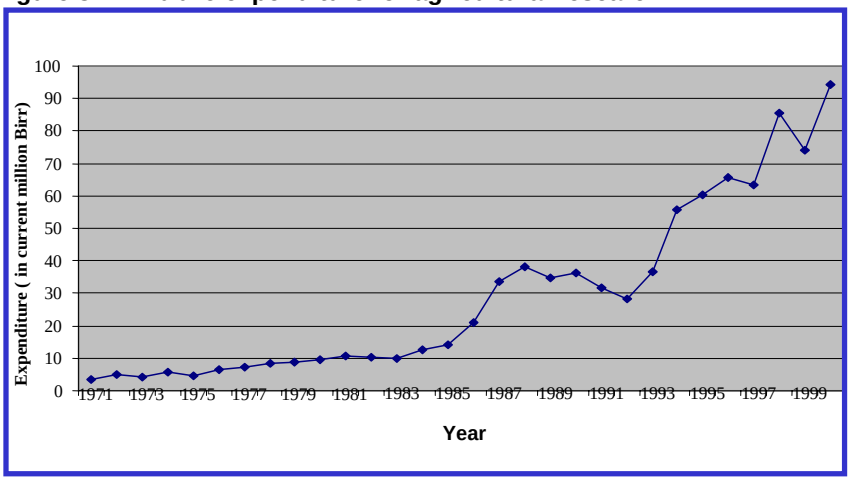
Financing Agricultural Research

Agricultural research in Ethiopia is largely funded by the government, loans from the World Bank, and contributions from other donors. During 1993–2000, on average, government contributions accounted for about 80 percent of funding for research at the federal level (meaning EARO and the higher education institutions). Similarly, the regional research centers get the largest share of their research funds from government. During 1993–2000, bilateral

and multilateral donor contributions accounted, on average, for 6 and 11 percent of total funding, respectively. Among the notable recent external supports for research is the Agricultural Research and Training Project (ARTP) of the World Bank for EARO and the regional research centers which were planned to run until 2005. Two thirds of the $90 million budget were coming from the World Bank and the International Fund for Agricultural Development (IFAD) loans while the remaining one-third was coming from the Government of Ethiopia. The project supports investments in infrastructure, equipment, and research staff training. The agricultural universities also benefited from the fund.

Before the 1980s, public expenditure on Agricultural research did not exceed 10 million Birr. However, starting in the mid 1980's public expenditure on agricultural research has significantly increased reaching close to 40 million birr towards the second half of the 1980s. It had reached 94.3 million Birr in the year 2000 (Figure 8.1).

Figure 8. 1: Public expenditure for agricultural research



Source: Computed from the Agricultural Sciences and Technology Indicators (ASTI) Database.

Total public spending as a percent of agricultural output is used as a common indicator of investment in research. Public expenditure on research as a percent of agricultural GDP in Ethiopia is very small. Research took a share of 0.19, 0.44, 0.31 and 0.35 percent, respectively, during the first and second half of the 1980s, and the first and second half of the 1990s.

According to a report made for ISNAR (Nienke and Menelik, 2003), Ethiopia invested US$0.43 in research for every US$100 of agricultural output in the year 2000, which was higher than the level in 1981. The report also shows that the 1995 ratio was similar to the 2000 level and was appreciably lower than both the average ratio for Africa (0.85 percent) and the average for the developing world (0.62 percent). This lack of growth in the intensity of expenditure for agricultural research, despite the relative increase in total agricultural R and D spending in recent years can be partly explained by the parallel increase in total agricultural GDP after adjusting for inflation.

As the ASTI data shown in Table 8.1 indicate, the Federal Agricultural Research Organization (EARO) took two-thirds of the research spending and 58 percent of the researchers engaged. The regional governments' research institutions altogether commended less than 25 percent of the total spending and close to one-third of full time equivalent research staff. Based on a study of 30 sample research agencies, the study shows that a total of 742 full-time equivalent (fte) researchers were employed and a combined amount of 93 million birr was spent on agricultural research and development in the year 1999.

In terms of human resources, the quality of agricultural staff in Ethiopia, as measured by the number of PhD- and MSc-qualified researchers, was relatively low compared to other African countries (Nienke and Menelik, 2003). In 2000, slightly more than half of the 728 full time equivalent researchers had postgraduate-level training, while less than 10 percent held

doctorate degrees. Only 5 of the 232 full time equivalent researchers employed at the regional research centers have PhD level training.

Table 8. 1: Composition of agricultural research expenditures and total researchers, 2000

	Spending		Researchers	Share	
Type of agency	**1999 birr (million)**	**1999 international dollars (million)**	**Full time equivalent (fte)**	**Spending (%)**	***Researchers (%)***
Public agencies					
EARO	61.3	53.5	428	65.9	*57.7*
Regional governments	21.4	18.7	232	23	*31.3*
Higher education	10	8.8	80.2	10.8	*10.8*
Subtotal	92.7	80.9	740.2	99.8	*99.7*
Business enterprise	0.2	0.2	0.2	0.2	*0.3*
Total	92.9	81.1	724.2	100	*100*

Source: Nienke Beintema and Menelik Solomon (2003). ISNAR Agricultural Science & Technology Indicators (ASTI) for Ethiopia.

Agricultural research orientation and impacts

Resource allocation between different areas of research is an important policy decision in research management. ASTI's report for the 2003 based on detailed information of the number of researchers working in specific commodity and thematic areas show that, more than half of the 691 full time-equivalent researchers are engaged in crop research. Livestock accounted for only 18 percent, while forestry and post harvest research each accounted for 7 percent. The report also shows that of the total researchers at the 13 EARO research centres included in the study sample, crop genetic improvement was the focus of 33 percent, and pest and disease control was

the focus of 14 percent of the researchers in 2000. The corresponding researcher shares at the other institutions were slightly lower, at 24 and 11 percent, respectively. The remaining researchers at EARO and the other research institutions focused on livestock, post-harvest, natural resources research with a small proportion working on other thematic areas. The evidence shows that enough attention needs to be given to other areas which could be equally important depending on the situation.

Studies on the impacts of agricultural research in Ethiopia are rare. The existing studies quite often focus on examining adoptions technologies of specific type. Documentations on the impacts on agricultural production and changes in the livelihood of farming communities are very rare. A recent assessment of research outputs (see Table 8.2) indicates that a large number of improved crop varieties have been released. Similarly, technologies in farm implements, soil and water conservation, livestock breeds, and forage species have been developed and released.

Table 8. 2: Agricultural research outputs in Ethiopia

Type of research technology developed, tested and released	Number
Crop varieties	390
Farm implements	25
Soil and water conservation techniques	16
Livestock breeds	10
Forage species	17

Source: Tesfaye and Senait (2003). Earlier reports by Legesse (2001), Tesfaye (2001), the Ethiopian Science and Technology Commission (1994) were quoted.

However, the same assessment report shows that 50 percent of the crops are currently under production; many have been replaced by HYVs, others are out of production because of disease susceptibility and other factors; and others may have never been widely adopted due to seed unavailability, input market opportunities or other system constrains. There has not been much

work done on the assessment of the cost effectiveness and efficiency of the Ethiopian agricultural research system. One of the challenges of assessing the cost effectiveness of research is the methodological difficulty in evaluating research programs in terms of costs incurred and their social benefits. Although some yield improvements are achieved albeit relatively lower at farm level compared to experimental stations, improvement in production is the result of many other factors including research impacts. It needs a systematic study to isolate the role of research and technology improvement programs in this respect.

Data on the cost of crop improvement programs are scanty in Ethiopia. An attempt made by ECORYS-NEI and Ethiopian Economic Association (Krit, et al., 2003)[51] gave some rough indication of unit costing of some research activities. The study based on the case of the Regional Agricultural Research Institute of the SNNPR State[52] shows that the development of a new crop variety is a lengthy process that involves screening of a large sample (sometimes as large as 500 species) in a nursery ending after 5 to 8 years after a test by the National Seed Releasing Authority (NSRA). According to conversation with the research staff, a large difference exists between crops which require stakes and those which do not.

The minimum cost to develop an improved crop (without stakes) is Birr 56 thousand for non-segregating seeds so that the second nursery can be skipped, and only two years of National or Regional Trials are done. The maximum cost for improved cereals and oil crops (without stakes) is estimated at Birr 72 thousand (Table 8.3). Under the assumption that only one out of three tested crops is finally approved, average cost of improving cereals, oil crops or other crops without stakes is Birr 179 thousand, and of

[51] A study conducted for the Ministry of Finance and Economic Development of Ethiopia, with financial support of the Delegation of the European Commission in Ethiopia.
[52] Although the research has covered other major regional states such data were only found in SNNPR at that time.

crops needing stakes (e.g. beans) may reach Birr 254 thousand. Many factors affect the level of cost of crop improvement program including the number of cycles of the selection process, and the location of testing or experiment stations. This simple illustration using the example from the Southern Region shows that generation of yield increasing technology is an expensive venture and justifies why extension and adoption of technologies by farmers need to be done effectively to bring about sustainable benefits to the farmers themselves and the country at large.

Table 8. 3: Unit costing of agricultural research: Crop improvement (the case of the data from ARI of SNNPRS)

Stage	Description	without stakes (cereals, oil crops)	with stakes (beans)	Comment
Total cost of proposed variety	minimum	56,375	79,631	Non-segregating seeds, skipping of 2nd nursery
	maximum	72,436	101,812	segregating seeds, 2 nursery stages
Percentage of proposed seeds selected		33%	33%	Estimate of Ethiopian Agricultural Research Institute, Awassa
Increase	Multiplication of the seed in plots of 0.5 ha	12,797	20,447	
Total cost of selected and multiplied variety	Average	178,924	254,339	

Source: Krit et al., (2003). Unit costing study of sectoral programs in Ethiopia.

The challenges to agricultural research and technology generation

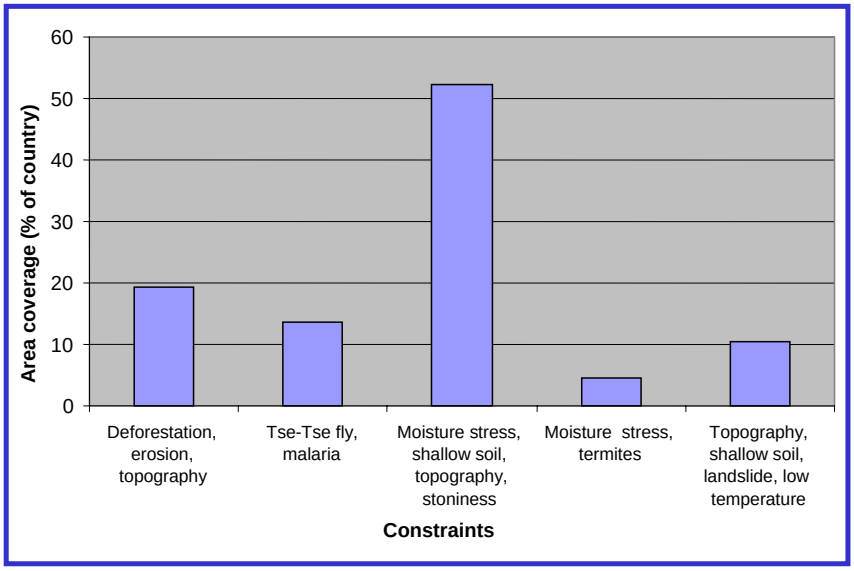
As with other agricultural sub-sectors and activities in Ethiopia, research is also faced with a number of long-standing constraints. Although recent interventions (for instance the ARTP) may help to overcome some of the shortages in qualified research staff, physical and financial resources, there

have been significant capacity limitations in the past. Research has not yet been able to provide adequate coverage of the agro-ecological zones of the country. The fact that research could not sufficiently address the problems of Ethiopian agriculture is due partly to the complexity of the problems and partly to the vast diversity of the agricultural environments and their farming systems, even within micro-agro-climates.

There are some new initiatives mainly by the regional research institutions to open up new research stations. Because of the research orientation in limited areas, like heavy focus on crop research, other important areas are largely neglected. The diverse agro-ecology in the country basically implies that agricultural and rural livelihood problems and challenges are also diverse implying diverse intervention strategies (see Figure 8.2). For instance, analysis of the agro-ecological data provided by the MoARD shows that over 50 percent of the land mass of the country suffers from problems of moisture stress, shallowness of soils, topographic and soil quality problems which are the basic constraints to agricultural production. Research should be able to understand the potentials and basic limitations. Lack of collaboration among research organizations, between research and extension[53] and farmers are often cited as major reasons for lack of effectiveness in research, technology generation and sustainable dissemination. It is a well recognized fact that inefficiency in the agricultural extension also undermined the potential effects of the research and technology generation efforts.

[53] Berhane et al. (2004) based on their assessment of the activities and achievements of agricultural education, agricultural research and extension over decades, wrote the following conclusions: "Ever since the three pillars of Ethiopia's agriculture (agricultural education, research and extension) became the independent and separate mandates of the three autonomous entities, they have drifted farther and farther apart with no strong magnet to pull them together. Research and Extension have not worked closely enough to influence the stagnant and dismally low productivity of Ethiopia's agriculture".

Figure 8. 2: Ago-ecological based analysis of production constraints (a rough assessment)



Source: Own summary from the agro-ecological data of MOARD reported in 2000.

While many factors determine production and productivity of agriculture, less research attention has been given to the potentially important areas and resources. There has not been a real and significant breakthrough in research in farm tools and implements, farm power, rural energy, fisheries, post-harvest technologies, food processing, food and nutrition and others. Although it has been indicated that the only future in improving the Ethiopian agriculture is said to be lying in harnessing the use of water potentials for irrigated agriculture, not much is seen in terms of appropriate water resource use and technology research, as much as it should have been.

Land resources degradation and declining soil fertility have been major threats and will continue to affect the sustainability of Ethiopian agriculture. Despite increasing chemical fertilizer prices from time to time and a foreign exchange burden to import, research efforts to develop effective and affordable organic soil fertilization technologies seem not to have been aggressively carried out. The national agricultural research systems also suffer from brain drain as is the case with the other sectors of the economy. It has been difficult to maintain senior and experienced research staff. Although government budgetary support from domestic resources is on an increasing trend, research also highly relied on external funding.

Above all, it can be clearly stated that Ethiopian agricultural research lacks a long-term research plan and strategy. Such a strategy needs to be put in place by identifying priority needs, goals and appropriate research approaches. It should be able to integrate and coordinate public- and private-sector research institutions to plan and implement research with large scale impacts. Research should be demand driven and reorient its scope by also engaging and serving the growing private sector in agri-business. Appreciating farmers' innovation and devising a mechanism to exploit its potential in improving the problem solving capacity of research and technology generation is vital. While the idea of farmers' innovation has been around since quite recent past, it does not seem that it has been well internalized and integrated with the research system

If appropriate measures are taken to improve the capacity and effectiveness of research, agricultural research can be expected to address the overwhelming problems of increasing food insecurity, increasing trend of land and soil degradation, worsening rainfall uncertainty and farming risk, rising rural population pressure, and declining productivity. Research should serve as an instrument to change the trend of a low performing Ethiopian agriculture.

8.2 Seed and breed multiplication

Improved crop varieties and livestock breeds are vital inputs needed to raise farm productivity. Hence, multiplication and distribution of improved seeds and livestock breeds is crucial. Not only is the availability of seeds and breeds, but also affordability by smallholder producers and farm enterprises is critical for sustainable adoption and utilization. Some recent studies have well elaborated on the problems and challenges of the seed industry in Sub-Saharan African Countries including Ethiopia (UN-EUE, 2002; Bay, 1997; Kebede, 1997).

The formal seed sector in Ethiopia comprises of the Ethiopian Seed Enterprise (ESE), which is the main certified improved seed producer and supplier in the country. Pioneer Hy-breds Seeds Ethiopia (PHSE) as well as certified Farmer Based Seed Production and Marketing Schemes (FBSPMS) ensure the increase of improved seed production and availability on the national market[54] (UN-EUE, 2002). According to EEA (2003/04) only 73.4, 43.1 and 14.5 percent of seeds produced by the Ethiopian Seeds Enterprise in 1999/00, 2000/01 and 2001/02, respectively, were sold. The formal seed sector is supposed to comprise of all seed program components, namely plant breeding, seed production, processing, marketing, extension, quality control and certification, that interact among themselves and are usually regulated by laws and regulations. A study by Bay (1997) finds that the formal seed sector in Sub-Saharan African countries generally lacks the presence of small- to medium-size enterprises producing and distributing

[54] ESE grows seeds on 4 farms totaling 4,300 hectares (1 in Awassa, 1 in Gojjam and 2 in Arsi). Also, intermittently, ESE and PHSE have sub-contracted part of their seed production to private farmers that were then assisted through the necessary certification process. Furthermore, private farmers can produce seeds independently and seek certification of their product by accessing the laboratory services of the ESE or the National Agriculture Input Authority (UN-EUE, 2002).

seeds of improved varieties. This is crucial to guarantee supply of all types of seeds of all crops to the different types of farmers.

Direct sales of commercial seeds to the smallholders by Ethiopia Seed Enterprise are very minimal. The two major seed types handled and marketed by the ESE are maize and wheat. Of the total sales volume maize accounts for one-third while wheat takes two-thirds of the share (Table 8.4). One of the constraints to expanded use of improved seeds is the relatively high prices to the smallholder farmers. Adequate mass production should be able to lower the cost of production and reduce the prices to farmers in order to make seed purchase and use attractive and profitable. As the development of an efficient and well-articulated seed marketing system that is capable of reaching out to the smallholders is a critical building block for an effective seed system, the Ethiopian Seed Enterprise is doing its best to attract private dealers and farmer service cooperatives to become involved in seed marketing (Kebede, 1997).

Table 8. 4: ESE and PHSE certified improved seed sales (1996 – 2002)

Year	ESE Seed sales			PHSE seed sale (MT)
	Total (MT)	Percentage share maize versus total annual sale	Percentage share wheat versus total annual sale	
1996	12,172.2	15.5%	77.0%	742.0
1997	10,578.6	15.8%	77.3%	740.0
1998	15,565.1	27.1%	71.2%	472.0
1999	13,348.3	34.1%	63.3%	1,450.0
2000	20,154.3	35.3%	62.2%	1,194.0
2001	11,278.4	48.6%	49.3%	1,276.0
2002	3,611.1	71.1%	22.0%	250.9

Source: UN-EUE, 2002.

Many reports indicate that the quality of seeds used in Ethiopia is low due to many reasons. One of the major problems is loss of genetic quality due to

long period of repeated use (Mulat, 2000). There have been weaknesses on the part of the research system to replace the old varieties. There is also a limitation of service providing agencies in the seed industry. Another constraint to seed production in Ethiopia is lack of access to land for multiplication. The pioneer Hybrid, is the major enterprise that is engaged in seed production; it produces hybrid maize only. The company imports parent seed from aboard. The operation of such multinational company in seed production and supply is constrained by lack of credit for seed buyers for those outside the extension system, high price of seed, and low awareness about high quality hybrid seeds. Only few private and state farms are involved in seed production in contract with the Ethiopian Seed Enterprise.

Seed marketing is the weakest link in the seed production /marketing chain in Ethiopia. While the use of good quality seeds of adapted and improved varieties is widely recognized as fundamental to ensure increased crop production and productivity, for centuries, the Ethiopian farmers have used land races for agricultural production. Even today, some 85 percent of the Ethiopian farmers are believed to be depending upon these seeds (Kebede, 1997). According to FAO/WFP (2005), 97 percent of the seeds used for grain production in 2004 were local seeds carried over from previous harvests. In general, the use of improved seeds is far behind the use of fertilizer while it is proved that to be more effective in raising crop yields both improved seeds and fertilizers must be used together.

With regard to the improved livestock breeds, it is obvious that supply is highly constrained, except may be poultry breeds. Although there are livestock breeding ranches operating in the country since many years ago, they seem to be weak in terms of producing the improved breeds in sufficient quantity. Likewise, they had also orientation problems as to how to produce better animal breeds needed for improved production. Most of the cattle breeding ranches in operation today (Did Tuyera, Gobe, Abernosa, Metekel

and Andassa) have been engaged, in the past, in crossing the indigenous breeds with exotic breeds (Holstein-Friesian and Jersey). It is only in the past years that Did Tuyera and Andassa shifted to pure-breeding of the Ethiopian Boran and Fogera, respectively. The large-scale crossbreeding at ranches are reported to have not resulted in sustainable outcomes (Ababu, 2002). There are more economical alternatives of crossbred production: contract production with highland farmers, use of targeted AI service delivery for this purpose and contract production with the private sector. They recommend that genetic improvement and conservation work on indigenous breeds should be the priority of government ranches as the outcomes of these activities are public goods and not necessarily commercial products.

8.3 Agricultural extension

Agricultural extension service is the logical step after research and technology generation activities in the chain of promoting the use of modern agricultural technologies by farmers. The objective of agricultural extension system is to introduce modern technologies to the farmers; these could be improved seed, fertilizer and/or chemicals, different techniques and cultural practices in crop production, introduction of fodder crops, improved livestock breeds, and animal health service, natural resources management and other practices.

The agricultural extension program in Ethiopia has a long history. A detailed review of the history of agricultural extension and its current challenges in Ethiopia by the Ethiopian Economic Association (Habtemariam, 2005) clearly indicates that the Ethiopian agricultural extension system has been much influenced by the different political systems and prevailing policies and development strategies. Extension system during the Imperial Era was limited in its coverage. That time national economic development policies more favoured industrial development, while the agricultural sector was relatively neglected. It is known that the then designed agricultural

development plans marginalized the smallholder farmers but supported better-off and commercial farmers. The potential contributions of the national extension programs to the smallholder agriculture were constrained by the inappropriate development policies, the system of land tenure and restrictive credit policy at that time. Reports show that the earlier rural development projects initiated by the donors' support (e.g. CADU and WADU) could not result in significant impacts because of the unfavourable land tenure systems and weak infrastructure, among other factors. It is understandable that the supporting agricultural services (research, input supply, credit, and marketing) were all underdeveloped.

After the radical political reforms of the 1974 and subsequent development policy and strategy changes, agricultural extension got a relatively wider coverage and attention. During the *Derg* period (1975-1991), the extension system mainly focused on grain production and community forestry while horticulture and livestock extension did not receive adequate attention (Habtemariam, 2005). It is to be recalled that, the political and economic policy of the Derg favoured cooperative/collective farms, and large scale commercial state farms at the expense of peasant agriculture. Collective farms and state farms had favourable access to improved agricultural input technologies, extension support, and credit resources. With regards to the extension management, the Development Agents who were working at the community level were involved much in non-extension activities; also extension planning was known to be much centralized.

After 1991, the public agricultural extension system has shown a marked expansion in its area coverage. The previously neglected regions like the lowland areas received more attention and the number and academic level of community level extension workers (DAs) increased. Since increasing productivity of the smallholder agriculture is an important policy direction of the Agricultural Development Led Industrialization (ADLI) strategy of the government, extension activities are recognized as important instruments to provide increased support to the smallholder farmers. Among the changes

that took place is the decentralization of the extension system including staff and budget reallocations from the Federal to Regional, and from Regional to *Woreda* levels. The Regional States were given autonomy in the planning, execution, monitoring and evaluation of extension programs.

A donor supported project, the Sasakawa Global 2000 (known as SG-2000) has initiated an extension strategy in 1993, which was later known as Participatory Demonstration and Training Extension System (PADETES). PADETES aimed at increasing the supply of food, industrial and export crops, improving productivity and income, ensuring rehabilitation and conservation of the natural resource base, and empowering farmers. To this end, it gave more emphasize to the package approach to agricultural development (MoA, 1994c). Expanded use of chemical fertilizer, improved seeds particularly of grain crops, demonstrations of agronomical practices like row planting, and other technical advises were promoted as a package. On-farm demonstrations were practiced on a half hectare-sized farm plots (Extension Management Training Plots) to show the farmers the advantages of using high yielding varieties (HYVs) in combination with recommended fertilizer levels and management practices.

Starting 1995 the PADETES and modified SG-2000 approaches were further promoted. Hence, as of 1995/96 cropping season the government decided to widely replicate the PADETES program as the major extension management system in all Regional States. The core features of PADETES include clear objectives and implementation strategies, selecting technologies suitable to the specific AEZ, use of a wide range of communication methods and media, emphasis on participation through a large number of demonstration plots on farmers' fields, providing inputs through credit under local government, collateral arrangement, and systematic inclusion of women and the youth (Habtemariam, 2005).

There has been a remarkable expansion of the extension coverage to millions of farm households. However, the extension program did not yield up to the expectation, although greater yield increases have been possible in certain localities particularly in potentially productive cereal growing areas with good weather and soil fertility. The problem with repayment of input loans as a result of low product prices (following increased grain supply), lack of diversity in technology packages extended to the farmers in different places and agro-ecological zones, lack of competence on the part of the development agents who serve the farmers, lack of adaptation trials for some site-specific technologies (*e.g.* lack of location specific fertilizer recommendation), and DAs inadequate physical capacity to effectively and timely monitor up to 300 farmers under their mandate are cited as some of the major reasons for limitations in the acceptance of technologies by farmers. A frequent restructuring of extension institutions and changing policy signals in terms of focus and priorities are said to have created difficulties in local level planning and implementation of consistent development plans.

While greater attention has been given to increased food production throughout the 1990s, a recent development in the extension orientation includes the promotion of cash crops for export markets. Also there is an emergence of what is called *menu-based* approach. The idea is to make available the packages of alternative technology options out of which a farmer is expected to select a technology and practice of his choice depending on his resources and other decision parameters. It is not, however, well-known how far the menu-based approach has been put in to practice and provided a better service to the farmers and also overcome the drawbacks of earlier approaches. Due to the major focus on crop production, extension activities in livestock production, natural resources conservation and development, pastoral development, marketing and agri-business have been minimal if not totally neglected. Following the famine and severe food insecurity due to the drought of 2002/2003, the government's extension activities widely focused on small-scale water harvesting programs to provide some supplementary moisture mainly for garden crops production.

Since the past few years, the Federal as well as Regional Governments have embarked on establishing and running agricultural TVETs. The Agricultural TVET colleges have a tremendous potential of producing the desperately needed mass of middle level agricultural professionals who are equipped with the necessary practical skills needed to improve the performance of the smallholder agriculture. The idea of agricultural TEVTs is to enable the trainees to have access to not only a theoretical background but practical skills in agricultural business management. It is understandable, hence, that investment on practical training and field level demonstrations are crucial if the trainees are to be equipped with the skill that would bring about significant differences as professional and practical advisors to the farming communities.

The training colleges need strong demonstrations and focus on skill training to generate the real cadres of agricultural development. In addition to the current areas of specialization, other areas of training are critically needed. Cooperative management, marketing and agri-business, post harvest and processing technologies and practices, veterinary, home-economics and food and nutrition are important areas that need to be considered. The envisaged Farmers Training Centers (FTCs) should not only aim at introducing the new techniques and knowledge, but also be able to give the rural communities a chance to demonstrate their own will, indigenous knowledge and skill towards overcoming the problems of low productivity and improving their well-being.

Although extension program is a crucial element of the country's strategy of agricultural development, there is no organized data/information on the cost of the extension system and service delivery that would enable us to assess its cost effectiveness. There is no systematic study of the cost effectiveness of the extension services provided, either. A recent study by the ECORYS-NEI and Ethiopian Economic Association (Krit, et al., 2003) gave a rough assessment and estimate of the cost of extension service delivery to the farmers based on a case study from the SNNPR State. The study shows that the budget for the extension service absorbs 33 percent of the recurrent

budget of the Bureau of Agriculture and Natural Resource. Furthermore, 75 percent of this budget is spent on salary expenditure, and the remaining 25 percent on operational expenditure (Table 8.5). The report further estimated that the cost of the extension system per farmer reached by the service amounts to Birr 32.3 Birr (Table 8.6).

Table 8. 5: Agricultural extension program costs of SNNPR bureau of agriculture and natural resources

	Birr	percent	percent
Recurrent budget BoANR	89,029,130	100	-
Budget for extension service	28,965,989	33	100
Out of which salary	21,646,512	24	75
Out of which operational expenditure	7,319,477	8	25

Source: Krit et al., (2003). Unit costing study of Sectoral programs in Ethiopia.

While it would be interesting and also useful to know the cost per farmer who has adopted and used a certain extension technology in order to give an indication of the effectiveness of the extension service for planning purposes, such data are not, however, available. The impact of the decentralization of planning and budgeting to the *woreda* level on extension service delivery and cost effectiveness is yet to be studied.

Table 8. 6: Unit cost of the extension services (based on SNNPR data)

	Unit	Amount
Average salary of Development Agent per year	Birr	5,536.5
Budget per Development Agent	Birr	6,595.8
Average coverage of farmer households per Development Agent	Nr.	204.5
Cost per household covered	Birr	32.3
Out of which salary	Birr	27.1
Out of which non salary	Birr	5.2

Source: Krit et al., (2003). Unit costing study of Sectoral programs in Ethiopia.

8.4 Farmers' education and training

Beyond the limited awareness raising and some demonstration activities, framers' training is little practiced in Ethiopia. There were few but popular training centres established during the 1970s and 1980s by the Derg government[55]. They were engaged in training of selected farmers in addition to training programs for the middle level agricultural experts. Those training centres are currently upgraded to the TVET college levels.

The TVET program aims at training middle level career of agricultural practitioners at a diploma level. This has been a major education and training program by both the Federal government and Regional governments recently. The trainees are high school completes and former development agents who are to be given theoretical and practical training in crop production, animal production, and natural resources management for a three years period at the training colleges.

The governments' original motto of creating educated farmers seems to be replaced by the objective of availing graduates who will be assigned to assist the farmers at the Farmers Training Centres (FTCs)[56] established in rural areas. Currently there are 25 Agricultural TVET colleges operating all over the country. During the 2004/2005 academic year a total of 29,619 students are enrolled (17,889 in first year and 11,730 in their second year courses). Over 600 million birr has been allotted for infrastructural and facility development at the colleges. By the end of 2003/2004 academic year the colleges have graduated a total of over 9000 trainees. The graduates are expected to be assigned in rural kebeles and serve as trainers at the FTCs being established all over the country. There is no data yet as to how many FTCs are currently operating in the country.

[55] Some of these training centers are found at Agarfa, Alage, Ardayta, etc.
[56] Since 2002/2003 hundreds and thousands of FTCs are being established in rural kebeles to serve as training and demonstration centres whereby three diploma graduates (in animal production, crop production, and natural resources) will be assigned to train and work with the farmers. The government is said to have a plan of establishing 15000 such centres.

Chapter 9

Markets, Infrastructure and Finance

9.1 The role of agricultural marketing system

Both the theoretical and empirical literature sufficiently documents that efficiently operating agricultural markets contribute to the modernization of agriculture. Based on a case study in four Africa countries Thomas et al. (1997) has made three conclusions on the role of efficient markets: 1) well functioning input and output markets help farmers acquire and use productivity-increasing inputs; 2) vertical integration and coordination functions (input supply, credit, output marketing) were assured effectively and helped promote adoption of improved seed and use of fertilizer by different forms of market institutions (e.g. parastatals, government marketing depots, etc); and 3) where farm conditions are poor, however, proximity to markets can diminish incentives to increase agricultural productivity because the markets provide alternative employment opportunities.

Underdeveloped agricultural market is one of the major problems contributing to the poor linkage between the agricultural and non-agriculture sectors of the Ethiopian economy. The low level of agricultural performance in Ethiopia is partly attributed to the weak agricultural input and output marketing system that has prevailed in the country. Inefficient input marketing system hinders the purchase and use of better productive technologies because of unavailability as well as high cost of such input technologies. Similarly, underdeveloped and weakly performing agricultural product market system does not offer sufficient incentive that is commensurate with the farmers' inputted efforts in production. Inability of the market to offer such

opportunities to the agricultural procedures partly stem from the low development of infrastructure and communication required for proper market functions. Underdevelopment of product market also relates to the low purchasing power of consumers as a result of the highly prevalent income poverty in the country. Low level development and limited capacity of the agro-processing and industrial sectors in Ethiopia contribute to the existing limitations in the agricultural product markets. Because of the low industrial capacity and demand for raw materials, agricultural markets could not serve as proactive mechanisms in the forward and backward linkages between the Ethiopian agriculture and the non-agricultural sectors, especially the industrial sector.

The Ethiopian agricultural sector is largely a non-monetized sector as can be seen from the low input-output matrix (see Table 9.1). Of the total demand of manufactured inputs required by agriculture–modern technology inputs such as fertilizer, insecticides, pesticides, improved seeds, etc - domestic manufacturing supplies only 1.8 percent. On the other hand, of the total inputs demanded by manufacturing, agriculture supplies 29.2 percent. The evidence implies that the structural weakness of the agricultural sector inhibits its economy-wide roles (i.e. forward and backward linkages) and own transformation. Agriculture's absorptive capacity of industrial good is very low.

Table 9. 1: Sectoral inputs flow in the Ethiopian economy (%)

Economic sector	Agriculture	Manufacturing	ROW (export)
Agriculture	68.1	29.2	80.2
Manufacturing	1.8	23.4	19.8
Mining	0	2.8	--
ROW (import)	30.1	44.6	--
Total inputs demand	100	100	100

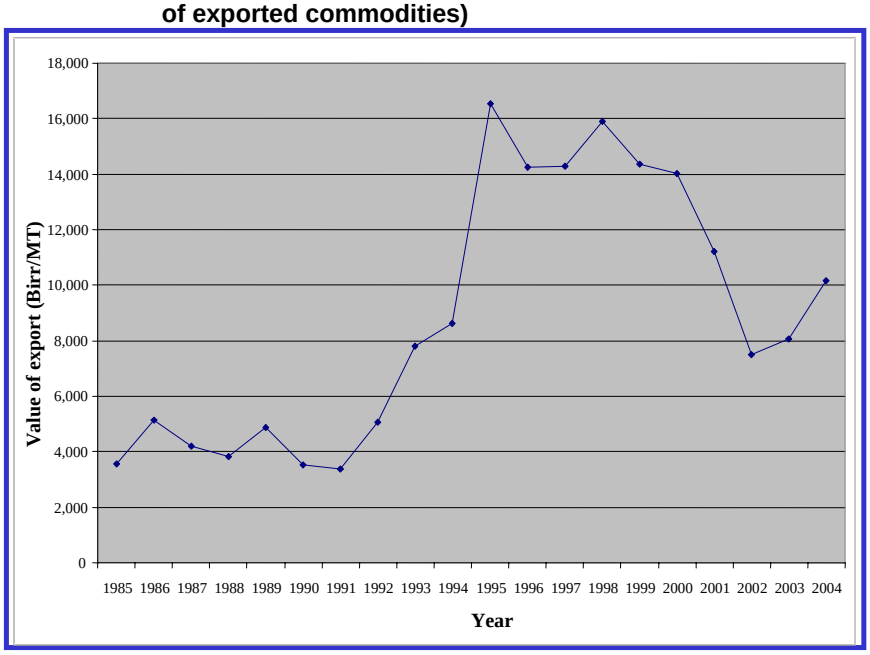
Source: EEA 2003/04.

9.2 Agricultural trade and market access

9.2.1 Terms of trade

As much as globalization could provide an opportunity in technology and know-how transfer, it also brings significant challenge for agrarian economies like Ethiopia where a predominant production and marketing system involves the smallholder producers. It is becoming difficult from time to time to compete for and access the world agricultural trade markets. Excessive reliance on export of unprocessed primary commodities has a huge cost to the economy mainly due to some basic reasons. First, primary commodities in general and food products in particular have low income elasticity. Per capita demand for these commodities in importing countries is almost saturated and grows scarcely more than the growth of population. On the other hand, the growing competition among many primary products exporting countries makes supply to exceed demand resulting in low and declining prices and further competition. There are evidences to support this situation. For example, Ethiopia's earning from coffee export has been badly hit in the recent past mainly due to increased competition that resulted from the emergence of other producers like Vietnam and the inability of the International Coffee Organization to regulate world coffee supply. In Ethiopia, the value earned from a unit has been progressively falling as shown in Figure 9.1.

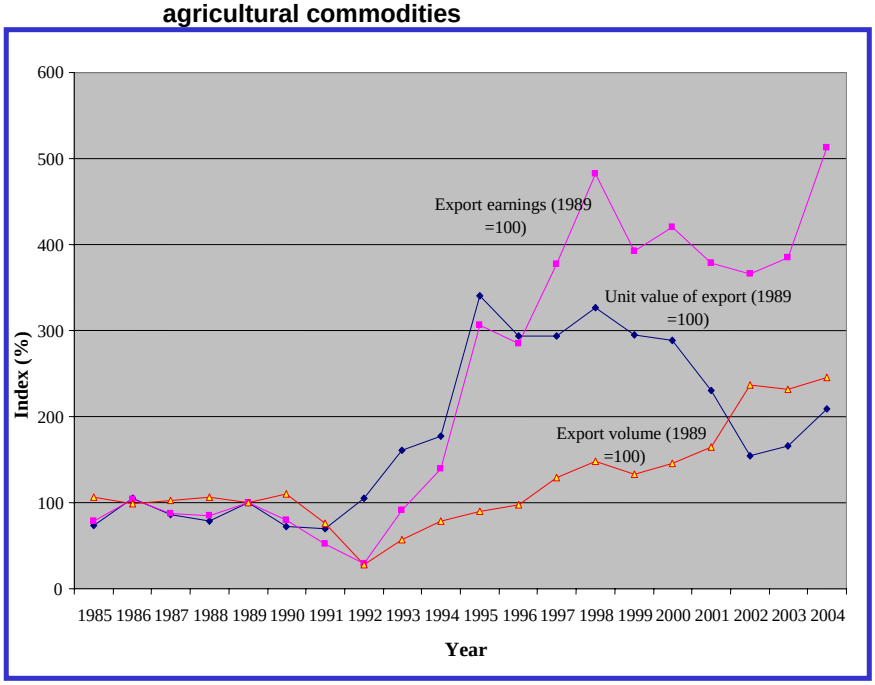
Figure 9. 1: Trend in agricultural export earnings (value in Birr per MT of exported commodities)



Source: Computed from the data of Customs Authority (EEA Database)

Ethiopia's performance in agricultural export has shown a significant improvement from early years through mid 1990s. Compared to the level of 1991 value of export earning per unit volume of export commodities (for all commodities) increased fourfold. The devaluation of Ethiopian birr might have also contributed to such a large increase. While the unit value of export has been declining, volume of export has been increasing, resulting still in an increasing trend of export earnings (Figure 9.2). It shows that the world trade for primary agricultural commodities has not been favourable.

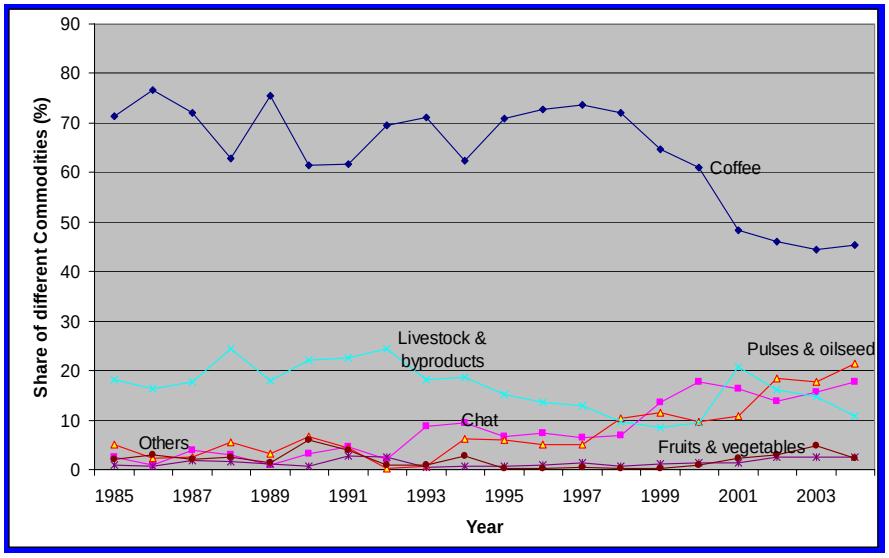
Figure 9. 2: The trend in export volume, value and unit price of agricultural commodities



Source: Computed from the data of Customs Authority (EEA Database)

The unfavourable situation of agricultural trade for primary commodities is also manifested in terms of unstable export earnings. Not only did the export earnings from coffee dwindle after 1997, but has been also fluctuating from year to year (Figure 9.3). The same is true with earnings from livestock and livestock products trade. There has been a gradual but increasing trend in the share of earnings from chat, pulses and oil seeds export.

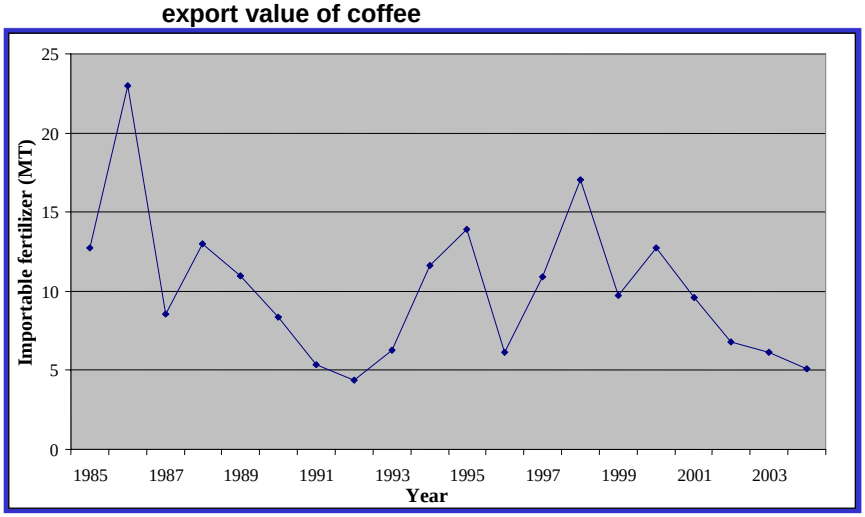
Figure 9. 3: The share of export earnings from different agricultural commodities



Source: Computed from the data of Customs Authority (EEA Database)

One of the indicators used to show the difficulties faced in agricultural trade, particularly of primary commodities, is the terms of trade. The latter shows the relationship between prices of export commodities and prices of imported commodities. If we take Ethiopia's major agricultural export commodity (coffee) and major agricultural import commodity (fertilizer), the prices relationships shows that the terms of trade has been deteriorating from time to time against the primary export commodity. While it was possible to import between 10 to 20 MT of fertilizer using the value of 1 MT of coffee some 20 years ago, earning from 1 MT of coffee could import only 5 Mt of fertilizer in 2004 (Figure 9.4). Such unfavourable terms of trade show the country's inability to finance the import of goods needed for higher agricultural production.

Figure 9. 4: The amount of Fertilizer that could be bought by the export value of coffee



Source: computed from the Customs Authority data.

9.2.2 Diversification of agricultural exports

There is no argument that one of the difficulties in accessing and benefiting from export trade of agricultural commodities is reliance on primary export commodities. Looking at the structure of Ethiopia's agricultural export commodities, few products have been dominating the export trade. According to the latest data obtained from the National Bank, in 2004 the share of coffee in export earnings was 45 percent. Its earlier share has been 70 percent towards the end of the 1980s, 68 percent in 1990s and reduced to 46 percent during the first 4 years after 2000.

On the other hand the share of chat, pulses and oil crops, livestock, fruits and vegetables and other export commodities were 18, 21, 11, 3 and 2 percent, respectively, in 2004. The danger of excessive reliance on few primary

commodities is obvious. Any shock in the world price regime like that which happened to coffee during the past few years will put the national export trade in crisis and in the disruption of the domestic production and marketing activities.

The two most often recommended strategies to reduce such effects and improve trade performance and foreign exchange earnings are diversification of export commodities and value-adding. Ethiopia has ample potential to diversify its agricultural export trade commodity bases. Recently emerging examples are the production and export of floriculture, honey and wax production, spices, fruits and vegetables, exploitation of opportunities of organically produced coffee, etc.

If adequate control of livestock diseases is achieved export potential for the livestock sub-sector is also known to be ample. Some processing and packaging will also add value to the export commodities and fetch higher value than the case with unrecorded primary commodities. Improved quality and grading of commodities like coffee would also help better market price and earnings.

9.3 Structure and conduct of the output market

9.3.1 Marketable surplus

Getting actual data on marketable surplus of agricultural products in Ethiopia is obviously a very difficult task. One of the challenges relates to the nature of the farm structure particularly that of the smallholder agriculture sub-sector. Currently, the production is taking place by millions of producers whose farm holdings in crop production are scattered and allocated to different crops. Not only does such farm structure and organization pose difficulties for collection and assembly of products for markets (difficulty of access, lack of transport), but more is a challenge to assess the volume of marketable surplus so as to plan and operate product marketing.

Although, taking the country as a whole, it is arguable whether Ethiopian agriculture is in a position to produce surplus, given the agro-ecological diversity and production potentials, it is quite true that some agricultural areas do produce surplus while others are deficit in production. Producers market their products for various reasons including the need to meet their cash demands, to repay debts, and for investments in farm. Due to pressing needs to be met at a time, products may be taken to markets even when a given household does not produce a surplus beyond its own consumption. Such are reasons why households become food deficit at the end of the harvest seasons while they have been selling after harvest. Sales can also take place due to preferences in consumption and habit. A household can sale more valued product and buy cheap food as it is done quite often.

The extent of marketable surplus in Ethiopia is also much dependent on the weather situation which is greatly affecting the level of production during a specific year. An empirical investigation of the nature and extent of marketable surplus and forecasting ability is crucial for planning and organizing marketing system.

9.3.2 Performance of the agricultural output market

The problems and constraints of agricultural marketing system in Ethiopia have been extensively studied. Many of the research undertakings, however, focused on the problems of grain marketing, while fertilizer input attracted relatively more attention from the input side. Mulat and Tadelle (2005) gave an extensive review of several studies that have dealt with agricultural marketing system in Ethiopia. According to their assessment the studies (by Amha, 1999a; Lirenso, 1993; Amha, 1994; Sinke and Demeke, 1995; Negassa and Jayne 1997) as quoted in Mulat and Tadelle (2005) have addressed various issues of the agricultural input and output marketing performances, challenges and constraints. These studies have analyzed the performance of Ethiopia's grain marketing system after the market

liberalization, the marketing system in southern Ethiopia using the industrial organization model, market integration after 1990 reform using data of rural markets, price spreads of cereal crops, the consequences of transaction costs of searching for a trading partner on the emergence of the institutions of brokerage in the Ethiopian grain market; and the impact of market reform on the efficiency and flow of maize into markets

Mulat and Tadelle (2005) concluded from their analysis of the problems of the central grain markets that the major problems are reported to be expensive rent for stalls, lack of access to operating premises, high tax rate, congestion at the marketplace, and poor tax administration. The need for government interventions to overcome these constraints is implied. Similarly, the study has shown that grain retail traders are dissatisfied with the level of the government regulatory framework and policies and public services. A large share of respondents felt that transport facilities have not been improved, security and legal services are low, and support for traders' associations are very much low, and have not been improved over time.

The Grain Market Research Project (GMRP) study conducted by the Ministry of Economic Development and Cooperation (MEDaC) and the Michigan State University (MSU) is the most comprehensive study recently done on the Ethiopian grain market system[57]. Gebremeskel et al. (1998) reported that the wholesale market for grain is nationally dominated by few merchants. The largest 10 percent of the traders command 43 percent of the volume of trade at wholesale level. Degree of inequality in market share at local level varies from market to market and from crop to crop. More than 79 percent of annual grain sales occur immediately after the harvest. Generally, farmers and merchants do not have access to high-quality market information. The report also identified the absence of market extension service. Because of shortage of financial credit and lack of transport service, smaller merchants are

[57]The project has produced a lot of research outputs including 11 Working papers, 4 Conference papers, and 6 market Analyses Notes. http://www.aec.msu.edu/agecon/fs2/fact/idwp54c.htm.

subjected to low capital turnover. This has a negative impact on the competitiveness of the market. Showing that the marketing costs account for about 40 to 60 percent of the total price spread between producer and retail prices in Ethiopia, the study suggests that reduction of these costs represents a major opportunity to improve farm production incentives and simultaneously make more food affordable to low-income consumers.

Resal (1999) found that grain market integration is more than ever one of the most crucial issues of any food security strategy in Ethiopia; even if the market liberalization has allowed the trading sector to develop, many sources of inefficiency remain. It further states that effective demand is so weak as to limit the market's capacity to absorb large amounts of grain while the connection with the international market is poor. Insufficient trading capacities are other aspects where the trading sector, especially at the level of the small and medium traders, remains underdeveloped. Very high transfer costs from one market to another explain the large spread observed between producer prices in surplus producing areas and consumer prices on deficit markets. The report shows that the marketing margins are due most of the time to the very high level of transport costs and not really to market defects.

A study by Xinshen Diao et al. (2004) reveals that poor marketing conditions and high transportation costs are believed to significantly increase the gap of price received by farmers and paid by consumers, and hence, reduce the benefit to farmers from increased production. The study estimates the average grain price gap at about 30 to 70 percent. A similar study by ADE (1999) indicates that grain transfer costs are very high and contribute to the wide gap between producer and consumer prices on the one hand, and low farm gate prices on the other. According to the study, existing markets don't encourage farmers to use new techniques and improved inputs to increase their production.

One of the fundamental and persistent problems in the agricultural marketing system in Ethiopia is lack of regulatory frameworks to protect the rights of producers. It is more so especially for the smallholder peasants and livestock producers. Smallholders have always been on the weak and loser side of the market system. The lion's share of the margin of product prices goes to traders and service producers. This is largely attributed to the lack of information, low bargaining power, lack of adequate storage facilities to keep products till prices improve, and the pressing needs of cash to pay their debts and meet other cash needs. For instance, a recent study by Mulat et al (2004) has revealed a monopolistic act and effects of the Addis Ababa vegetable market agents. The major market outlet for vegetables, the Addis Ababa central vegetable market, is dominated and controlled by a limited number of traders who are organized in association and prevent any new entrant into the market making it extremely difficult and risky for the smallholders or the cooperatives to trade at the central market place. In the Addis Ababa market all traders maximize their benefits by colluding rather than competing[58].

[58] The study characterizes the nature of the vegetable market in Addis Ababa. The volatility of prices between 6:00and 10:00 AM is such that fluctuations reaching as high as 100-150 % for the same produce are not uncommon. The mechanisms used by the colluded traders to prohibit new entrants take many forms, both subtle and aggressive. For instance, trucks carrying the vegetable of hitherto unknown producers, regional traders or new traders will find it impossible to get the identifying tags needed to enter the compound. Those that do manage to get the tags will get marked identities and will find it very difficult to negotiate better prices, even for good quality produce, as the traders will pass on the word among themselves that the produce on the truck with the marked tag should be bought at the least possible price (usually, this price is a loss-incurring price). New entrants who do manage to get stalls in the compound will be forced to exit the market as they cannot compete with the colluded traders. The Meki Batu Horticulture Growers' Cooperatives' Union has had this experience when it tried to market the produce of members directly in the Addis Ababa central market. Threats to personal injury and even beating are reported to be common mechanisms of discouraging new prospective entrants. The central vegetable market is extremely chaotic where a few may have manipulated and regulated the many such that they maximize their benefit at the expense of the majority. Note that in this awkward market structure, the end losers are the poor smallholders who are located in rural areas.

Lack of suitable storage facilities and post harvest grain loss is one of the major hindrances to the supply of farm products to market. A study by Abebe and Bekele (2005) has shown that post harvest loss is one of the major challenges of the grain marketing for the smallholder farmers in Ethiopia. The study found that the average actual loss per household was about 500 kg of total grain output which is equivalent to 12 percent of the average total grain production of the sample households studied.

9.3.3 Food demand and urbanization

One of the fundamental goals of agricultural growth is to enable agriculture supply reasonably priced food for urban consumers. Currently over 15 percent of the Ethiopian population are estimated to be urban dwellers. Although Ethiopia is known to be among the least urbanized countries in the world the rapid rural-urban migration recently being witnessed and urban population explosion pose both a challenge and an opportunity for agricultural marketing. High unemployment and low income of the majority of the urban dwellers is a major constraint that hinders rapid agricultural product market growth. Due to a slow pace in adjustment to the urban demands by the Ethiopian agricultural and food marketing and processing systems, relatively high valued, processed and semi-processed food products are being imported. The rapid growth in supermarkets that are handling imported foods is a clear evidence that shows the nature of the demand of a segment of the urban population. The data obtained from the National bank of Ethiopia (NBE, 2001/2002) show that Ethiopia commercially imported food grain amounting to an average volume of 326 thousand MT in the 1980s; and 269 thousand MT in the 1990s. The data for the two years (2000/2001 and 2001/2002) show that food import has doubled reaching 527 thousand Mt. Some of the imported grain may be for food processing plants.

Future rate of urbanization and growing demand for food is an obvious challenge for Ethiopia. According to a projection made by Jean-Marie Cour (2003) if current urbanization and population trends continue, the Ethiopian population will increase to about 110 million in 2025 of which the rural population will account for 88 million, and the urban 22 million. There will be about 30 million more mouths to feed many of them urban dwellers. The need for more agriculture and food production and organization of efficient food marketing system will be a crucial task to be accomplished, sooner than later.

9.3.4 Livestock and livestock products marketing

There is a general consensus that the marketing of livestock and livestock products in Ethiopia is underdeveloped. This is critical to the livestock sub-sector in general because viable markets ideally serve as engines for development of livestock production, processing, consumption, and for attracting investment. Ultimately these positive developments are reflected in greater overall benefits generated from the livestock resources. It is argued, therefore, that limitations at all levels of the production and marketing chain influence all the stakeholders involved, including producers, processors, traders and consumers of the products. Unfortunately, the changing official national policy guidelines on livestock marketing in the past several decades have not been very helpful to maintain sustained policy and investment support for the sector.

Even the major urban markets for meat and dairy products lack a system of grading on quality and standards. Culture and tradition alone do not fully explain why the majority of consumers still prefer to have home slaughter of meat animals rather than get the services of organised and safe facilities. Both small and large livestock are marketed in every corner of cities when there are designated market places. Consequently livestock producers are deprived of the incentive of producing quality products for a demanding market.

9.3.4.1 Potential and actual off take

Belachew and Jemberu (2003) estimated that the annual off take rate of livestock, particularly from pastoral areas, is 10 percent for cattle, 35 percent for sheep, 38 percent for goats and 6.5 percent for camels. Based on these rates and using the latest national livestock population figures from CSA (2004), the total potential national off take becomes 4.1 million cattle, 8.9 million sheep, 8.9 million goats and 151 thousand camels. The figures for pastoral areas only (i.e. sources for 90 percent of the export livestock) amounts to 709 thousand cattle, 2.2 million sheep, 5.3 million goats and 76 thousand camels. The study used a much lower estimate of national population of cattle, goats and camels and assumed that the pastoral areas maintain 20 percent of the cattle, 25 percent of the sheep, 73 percent of the goats and all the camel population in the country. They also used annual livestock population growth rates of 1.2 percent for cattle, 1 percent for sheep, 0.5 percent for goats and 1.14 percent for camels. Based on this assumption, the pastoral areas of the country could generate average livestock off take of 734 thousand heads of cattle, 5.4 million goats, 2.3 million sheep and 78 thousand camels between the years 2003 and 2007 (Table 9.2). Although it may be difficult to substantiate this due to lack of accurate livestock data, it is useful for planning and analytical purposes.

Table 9. 2: Annual livestock off take from pastoral areas between 2003 and 2007 ('000 heads)

Description	Annual Supply						
	Off take (%)	2003	2004	2005	2006	2007	Annual average
Cattle	10	718	721	735	744	753	734
Sheep	35	2,252	2,275	2,297	2,319	2,343	2,297
Goats	38	5,316	5,364	5,412	5,461	5,510	5,413
Camels	6.5	77	77	78	79	79	78

Source: Belachew and Jemberu (2003)

For pastoralist communities, livestock market systems are unsecured and mostly out of their control. Market places are at long distance while cross border livestock markets are more risky where their rights to their product values are not assured due to their weak bargaining power. A recent market assessment in the pastoral areas identified that poorly developed market infrastructures, inadequate and inappropriate road transport facilities, few and unevenly distributed export abattoirs, absence of market information and promotional activities, the problem of trans-boundary animal diseases, lack of formal trade among the neighbouring countries, disasters (drought, famine, wars) are among the major obstacles to promote livestock marketing in the pastoral systems (Belachew, 2003).

9.3.4.2 Milk marketing

Sintayehu (2003) and Zegeye (2003) reviewed the recent but rather turbulent history of the development of modern dairy production and processing in Ethiopia. Direct government intervention to promote dairy marketing in Ethiopia is only 50 years old, when a 300-cow dairy farm and a small milk processing plant were established under the UN Relief and Rehabilitation Program in 1947 in Addis Ababa in the premises of the Dairy Development Enterprise (DDE). In 1959 UNICEF helped establish a milk processing plant with a capacity of 10,000 litres a day with milk collection and purchasing centres around Addis Ababa. The radius of milk collection was later expanded to 70 km around the capital, and the capacity of the processing plant was increased to 30,000 litres in 1969. Subsequently, using a World Bank loan, the Addis Ababa milk shed was further developed through: 1) establishment of 40 medium (40 milking cows) and 200 small (10 milking cows) size private dairy farms; 2) setting up a ranch to produce cross-bred heifers; 3) promoting the collection, processing and sale of milk, and 4) provision of technical assistance to milk producers.

The radical change of government policy in 1974 resulted in the abandonment of many of the private farms and the nationalisation of the big ones which were incorporated into the DDE. In 1979 the processing capacity of DDE was increased to 60,000 litres/day and the radius of collection expanded to 150 km with donor assistance. The UNCDF/FINNIDA Dairy Development Project (1983-1986) came to the assistance of the DDE by providing milk processing machinery and equipment to increase its processing capacity and to enable it to also extend into the production of new products such as yoghurt and ice cream. The assistance also extended to equipping milk collection centres with cooling facilities, milk handling and transport equipment, refrigerated town milk sales depots and laboratory facilities and equipment alongside training of the staff. The Enterprise then expanded its size to about 27 raw milk collection and about 4 chilling centres along the main highways that lead into Addis Ababa. Later DDE reached near collapse, but just managed to stay in operation because, as Sintayehu (2003) indicated, it has been involved in the whole process of collection, processing and sale of milk and milk products, it has own source of raw milk to fall back to, has an increasing number of raw milk suppliers, and received substantial critical financial assistance from bilateral and multilateral projects.

Other milk production, collection and processing schemes were set up by the Chilalo Agricultural Development Unit (CADU) around Assela, and by the Wolayita Agricultural Development Unit (WADU) around Wolayita. More recently, larger-scale and more comprehensive national dairy development projects have been implemented to meet the expanding demand for milk in urban and rural areas. The Selalle Peasant Dairy Development Pilot Project (SPDDPP, 1987-91) and the Smallholder Dairy Development Project (SDDP, 1995-98), both financed by the Government of Finland promoted the establishment of smallholder farmer-owned and farmer-operated milk marketing and processing units. By the end of 1998 the latter had set up 9 milk marketing and processing units on a strong and

reliable footing. These, however, needed critical support in milk marketing and in availing essential external inputs (forage planting materials, AI services, replacement breeding animals, animal health services) for sustaining improved dairy production from crossbred cows (Ababu, 2002). In fact, the 20 years (to the year 2000) of AI service from the Kaliti National Artificial Insemination Centre did not result in the expected increase in average milk production (305-day lactation yield) per cow in selected commercial dairy herds, and that genetic progress was not made (Mohammed, 2004). This indicates that crossbred and exotic dairy herds in Ethiopia do not as yet provide a strong support for milk production increases as observed in Kenya (Ahmed et al., 2003). Ababu's (2002) observation of smallholder dairy herds in the Selalle area indicated that the smallholder dairy farmers indeed have difficulties to sale milk and buy essential inputs, thus discouraging the participation of smallholder dairy farmers in the milk market.

Despite long-years of promotion of improved smallholder dairy production around major urban centres, most of the milk production in Ethiopia is still produced by the smallholder dairy farmers living in the villages and exercising, in most instances, traditional dairying (Tsehay, 1998). Large-scale marketing and processing of milk is limited to the area around Addis Ababa, generally known as the Addis Ababa milk shed. Butter dominates dairy marketing, and the transaction in the form of raw milk is limited around major urban centres. Largely village-level small market networks manage marketing of milk and milk products. Therefore, lack of market can mean wastage of the milk, and the resources that went into its production (labour, land, time). As Tsehay (1998) put it, provision of improved and sustainable milk marketing arrangements in smallholder villages is, therefore, indispensable for advancement of the national dairy industry.

The short shelf-life of raw milk, lack of pasteurisation facilities, poor market infra-structure, and above all, the low and seasonal demand for dairy products can explain the weak marketing of dairy products in the country (Zegeye, 2003). Experiences with dairy industry in Kenya suggest that, given the currently low level of average consumption of milk and milk products in Ethiopia, there is need in Ethiopia to strongly promote and support domestic consumption of milk and milk products (Ahmed et al., 2003).

Berhane and Workneh (2003) observed that some form of organised marketing of milk is already practised in some parts of the country, for instance in eastern Hararghe highlands and some pastoral communities; on the other hand, major milk producing areas of the country, such as the Selalle plateau have serious problems in accessing the Addis Ababa market. India has demonstrated an exemplary group marketing of milk by producers themselves initiated from Kaira district, popularly known as Anand Milk Union Limited (AMUL). This pattern of dairy development can be emulated in Ethiopia, at least around the major milk sheds. The Adaa Liben Woreda Dairy and Dairy Products Marketing Association operating between Debre Zeit and Addis Ababa has become the latest success story in Ethiopia in organised dairy marketing driven by the producers themselves. The same can be attempted in other major milk sheds of the country, for instance around Nazareth, Dire Dawa, Bahir Dar, Gondar, Awassa, Jimma and Asella (Berhane and Workneh, 2003). The conducive policy environment on the establishment and operation of farmers´ co-operatives also facilitates the initiation of organised milk marketing by the small producers themselves. A concerted effort to organise these farmers into marketing groups, provide finance for the setting up of essential milk collection, handling and processing facilities, and link them up with consumers in systematic market networks could revolutionise the smallholder dairy industry. But milk groups are only a necessary first step in the process of developing a more sophisticated co-operative organisations and well functioning dairy markets. Success of the milk groups will depend on their continued ability to capture value-adding

processing of dairy products and return that value-added to their members (Ahmed et al., 2003).

Given these technical and institutional constraints in the performance of the milk market in Ethiopia in recent years, Zegeye (2003) argues for the establishment of an autonomous government department to direct dairy development which would include regulatory work in production, processing and marketing in the country at large. This department will be responsible for developing regional and or agro-ecological strategies for dairy development, and supervising its implementation. Such an institution could also handle the promotion of domestic consumption of dairy products, for instance in school feeding schemes. Due to poor infrastructure, the concentration of milk producers in rural areas, seasonal fluctuation of demand for fresh milk, and its perishability, the development and promotion of small-scale processing technologies is critical to increase the participation of smallholder producers in the dairy market (Ahmed et al., 2004). This is particularly important for Ethiopia where the demand for dairy products is dominated by butter rather than fluid milk (Ahmed et al., 2004).

9.3.4.3 Marketing of hides and skins

Ethiopia has been exporting hides & skins in the past 100 years, and these have been a major source of foreign exchange earnings for the country accounting to 14-16 percent of the total export revenue (MEDaC, 1999). During the 2000/01 fiscal year, leather & leather products were the second category of foreign currency generators with an export value of US$ 74.1 million. The country has a potential for total annual output of 2.4 million cattle hides, 10.1 million sheep skins and 7.4 million goat skins based on the average off-take (Girma, 2003). Hides & skins from the highland areas of the country are preferred to those of the lowlands in the foreign market, because these are known to have unique characteristics of compactness and

suitability for different end products such as sports wear, garments, gloves, shoes and hand bags.

Girma (2003) has reviewed the status of marketing of hides and skins in Ethiopia. Following liberalisation of the economy in 1991, private companies have established substantial numbers of tanneries. These companies export mainly semi-processed products. Export of finished or processed products is negligible. Traditional tanners also absorb substantial quantities of hides and skins for processing and manufacture of traditional household articles including farm implements, furniture, saddles and traditional musical instruments. There are about six major actors in the hides and skins markets in Ethiopia: primary producers, collectors, big suppliers, slaughterhouses and abattoirs, traditional tanners and tanning industries.

According to Girma (2003), large-scale collection and processing of hides and skins in Ethiopia is hampered by: 1) poor infrastructure in rural and peripheral areas of the country and lack of efficient transport services; 2) inadequate capacity to properly handle seasonal surges in supplies of hides and skins; 3) lack of knowledge and skills on proper handling as well as preservation of hides and skins; and 4) very limited number of standard slaughterhouses and poor work efficiency in the existing ones.

The purchase records of the functional tanning industries during the 1994/95 fiscal year show that only 45 percent of hides, 88 percent of sheep skins and 72 percent of goat skins are collected for processing in the tanning industries and the rest is handled by traditional tanners and other users (Table 9.3.). In view of the fact that the tanning industries operate only at 41 and 49 percent of their soaking capacity for hides and skins, respectively, because of their limited supplies, there is considerable idle processing capacity especially for hides. According to Girma (2003) the hides and skins industry faces two major challenges to take active part in the export market: (1) limited supplies

and low quality of raw materials, and (2) because they operate below their capacity, their production marketing costs are inflated, making them less competitive in the export market. Unknown quantity of hides and skins produced in this country is considered wasted because of poor handling and poor access to markets. An unknown quantity of hides and skins finds its way to neighbouring countries through unofficial cross-border trade. These resources constitute lost opportunity to the tanning industry in this country.

Table 9. 3: Quantity of hides and skins supplied to tanneries in 1994/95

Product	To tanning industries (million pieces)	To traditional tanners and other users (million pieces)	Percent supplied to tanning industries
Cattle hides	1.07	1.31	45
Sheep skin	8.9	1.17	88
Goat skin	5.3	2.08	72

Source: Girma (2003) and the reference therein.

Because raw or semi-processed hides and skins pass through a series of actors in the market (primary producers, collectors, suppliers and tanning industries) many handling problems affect quality of the final end product (leather). This introduces a factor of uncertainty in the marketing process, and hence the benefits may not necessarily be equitably distributed to all actors, which have become point of contention between collectors and suppliers. In many cases, payment is not made to suppliers on delivery of the raw hides and skins as the tanning industries insist to grade the quality of the raw hides and skins after processing. This is said to avoid payment of higher prices for inconspicuous defects while the product is in raw form (Girma, 2003). This is also further complicated by lack of quality standards for raw products to serve as the basis during transactions.

Girma (2003) further notes that domestic leather industries in Ethiopia do not decide prices of their raw materials since their share of the market is too

small to influence prices. Instead these are decided at the final stage of transaction where end product consumers and retailers of leather products meet. Here, the demand for leather products can be judged and based on this, the prices are set. The price established at this stage goes down the supply channel, after the buyer at each echelon decides his own margin of profit, until the price for the primary product is set. This indicates that the product flows from primary producers to final producers while decision on prices flow the opposite direction. The Livestock Marketing Authority (LMA) took a step to fill the price information gap by establishing a suitable market information system whereby current prices are collected from seventeen selected towns in five regions of the country, analysed and disseminated to relevant stakeholders.

9.3.4.4 Problems and constraints of livestock marketing

Livestock marketing in Ethiopia is constrained by several factors. Some of the factors are internal while some are externally imposed. Information which is needed for planning and service delivery is scarce in Ethiopia. There is little or no information on accurate livestock number, annual off take rates and consumption level. In addition to lack of market information the sector is faced with acute shortage of market infrastructure mainly in the peripheral and marginal lowland areas. Organised markets, stock routes, resting places, and quarantine stations are all in short supply. Efficient transportation services are needed to allow adequate flow of livestock and meat from these areas to the export route. The private sector has little interest in investing in the livestock sector because of these and many other problems.

The export market is also constrained by the threat of livestock export bans on animal health grounds and the limited capacity for developing animal health certification. In addition, the size of the unofficial cross-border livestock export trade, its effect on official export trade and the way it is being handled

by official government policy is not well known. The strong competition on the major export market from Somalia, the Sudan, South America, Australia, New Zealand, Eastern Europe and the European Union has limited the potential benefit from the sector, although Ethiopia enjoys preferred animal types (taste), location (proximity) and stable supply to exploit these markets. Inadequate port facilities at Djibouti port for handling large number of livestock and poor market support services including lack of market information system (such as market intelligence in major export markets), poor promotional activities, and lack of a system for grading and standardising product quality are additional constraints.

Large lost opportunities for industrial processing of skins and hides due to weak organization of collection and preservation activities, traditional tanning, inadequate capacity to handle seasonal surges in supplies of raw material, very limited standard slaughterhouses and abattoirs, very long channels of skins and hides markets to move the raw product from the point of primary production to the tanning industries, which inflate the transaction costs and increase the risk of mishandling of the product, as well as low consumption of livestock products are major problems.

9.3.5 Agro-processing and economy wide linkages

9.3.5.1 Urbanization and rural-urban linkages

Efforts made to transform Ethiopian agriculture will not have a significant and lasting effect without equal attention accorded to the interventions required to improve the demand side of the agricultural and non-agricultural sectors. Giving due emphasis to the vital role of urbanization, the development of non-farm economic sectors, and strong linkages among farm and non-farm sectors is crucial. Urbanization and growth in the non-farm sectors serve as an input for agricultural growth by providing market outlets for agriculture, and

providing cheap inputs and services needed by the farm sector. The positive aspects of mobility and rural-urban migration must also be appreciated. The fact that urbanization in Ethiopia has been very slow is part of the challenge that faces the development of product market system in the country[59]. The low level of urbanization and limited purchasing power of urban dwellers is one of the constraints to agricultural growth and economic development at large. Urbanization should be an important policy goal that could support agricultural development for two reasons. It will create employment opportunities for people in rural areas who suffer from shortage of farm land on the one hand and lack of market for their products, on the other hand. Urbanization should be looked as a development strategy that complements ADLI by bringing development factors from the demand side of the agricultural development equation into the function.

The central issue while discussing the strong rural-urban linkage is the need for economy-wide improvement in employment and income. A major determinant to agricultural transformation in Ethiopia is through improving the extent of effective domestic demand for farm products. Low income of both the urban and rural population can potentially limit the possibility of higher production. A study by Xinshen Diao et al. (2004) observes that in Ethiopia higher livestock productivity is constrained by domestic demand, and may require a strong export orientation. If there is no intervention to promote alternative market strategy, producers might suffer from significantly lower prices. Consistent efforts should be made to create labour-intensive employments in the non-farm sector (in both rural and urban areas) to enhance the demand and purchasing power of consumers. This will also contribute to reducing the existing population pressure on agricultural resources in rural areas. Searching for markets of the non-farm activity products is another challenge if the sector has to sustain itself and survive. The expansion

[59] According to Yeraswerk (2003), a study has revealed that in the year 2000 Ethiopia became 2.5 times less urbanized compared to the less developed regions of the world and 3 times less compared to the world average share of urban population. The average rate of migration in Ethiopia measured as a proportion of rural population during 1980 to 2001 was found to be about 0.25%.

of cottage and small and micro-enterprises which are mostly engaged in producing farm tools and implements is a beginning in the right direction.

It is high time to revisit the agricultural development strategy which heavily emphasizes on the supply side intervention with minimal attention to the demand side problems. It is only when the farmers get access to the low cost improved farm inputs that come from the manufacturing and service sectors that they will be more motivated to produce more products of higher quality. On the other hand, farmers will sustainably invest in better productive technologies when there are buyers with sustainable and adequate purchasing power and demand for farm products, both at industry and household levels. Such relationships signify the need for economy wide investment, employment creation and improved purchasing power.

A recent study that discussed the interrelationship between urbanization and rural development seriously questioned the validity of heavily relying on agriculture as the engine of growth for the whole Ethiopian economy. In his article Jean-Marie Cour (2003) argued that given the current level of urbanization where the urban/rural ratio is only 0.14 (roughly seven farmers supplying for one urban consumer), the only result is a decline in prices owing to shortage of demand leaving the farmer possibly worse off. This situation has been repeatedly observed when prices of important grain crops fell following good harvests. In the recent past, two continuous bumper harvests (largely caused by good weather) led to a precipitous collapse in grain prices. So, there is a need for an urgent intervention to increase urbanization and mobility of farmers to urban areas.

9.3.5.2 Agro-processing and value-adding

Developed agro-processing and value-adding system is one of the main future options for transformation of the Ethiopian agriculture. A common and traditional definition of agro-processing industry refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector. Agro-processing industry thus means transforming products originating from agriculture, forestry and fisheries (FAO, 1997). Agro-industry does not, however, comprise industries supplying agriculture with industrial machinery, inputs and tools.

Agro-processing industries play valuable role by creating market outlets for agricultural products and adding value to the raw materials obtained from the sector. It can be said that agro-processing and value adding system creates an incentive mechanism for the producers to improve the quality and diversity of the agricultural products. If the raw farm products have the chance to be processed for further supply to the market and consumers, the smallholder subsistence farm economy will be more and more integrated into the market and might gradually be able to commercialize. Processing and value-adding activities do also provide economic advantages through elongating shelf life of products, and reducing the risk of perishability, a problem of many raw farm products.

9.3.5.2.1 Medium and large-scale manufacturing agro- industries

The establishment of manufacturing industries in Ethiopian dates back to the 1930s and 1940s. Despite a long history of the sector, there has not been a significant breakthrough in terms of expanding numbers, size and volume of operations. A survey based study report by EEA/EEPRI (2005) concludes that industrialization in Ethiopia is still in incipient stage the manufacturing sector being too small and undeveloped. Its structural linkages with the other economic sectors and within itself are distorted and unbalanced. Most of all, the technological status of the sector is backward and its labour force is least

educated and unskilled putting manufacturing in Ethiopia as one of the least efficient, even by the Sub-Saharan African standards.

The manufacturing industries' census undertaken by the Central Statistical Authority (CSA, 2004) shows that there are 965 medium and large–scale manufacturing industries in Ethiopia. Out of these 818 (85 percent) are private establishments while the remaining are public enterprises. The data show that 390 of these manufacturing establishments are agro-industries that are engaged in processing of different agricultural products. Close to 75 percent of the agro-industries are engaged in manufacturing of food products and beverages (Table 9.4). The agro-industries altogether have generated a gross value production of over 5 billion Birr, out of which 64 percent comes from the public enterprise while the private firms contribute the remaining 36 percent in 2002/2003. Industries in food and beverages account for the largest share (65 percent) of the total value of production. Textiles, tanning and dressing of leather follow with 15 and 12 percent contributions, respectively.

The total value-added of the agro-industries during the year 2002/2003 was over 1.5 billion Birr. Food and beverages industries produced 79 percent of this value-added. In terms of performance, the data show that the public agro-industries have been using less than two thirds of their potential production capacity while the case of the private companies is even worse with only 37 percent of the production capacities utilized during the survey year. In the case of the public companies, capacity utilization is lowest in textiles (35 percent) while in the private sector lowest capacity used is reported in the tanning and dressing of leather products. Such very low level of capacity utilization in the private agro-industries could be partially attributed to the nature of data reporting which could be different from the public enterprises. The private companies might have underreported their volume of production and earnings because of tax related issues. The large and medium scale agro-industries would have utilized a raw material valued

at over 4 billion Birr, if they could work at full capacity. The major reasons for not operating at full capacity include absence of market demand for their products, shortage of supply of raw materials, absence of credit facilities etc. Appropriate measures need to be taken to improve the demand for the products of the agro-industries, and facilitate the working environment including better access to credit facilities.

Table 9. 4: The structure and performances of agro-processing industries (CSA 2002/2003)

Type of manufacturing	Public					Private				
	Number	Initial capital ('000 birr)	Gross Value Product	Value added*	Percentage capacity used	Number	Initial capital ('000 birr)	Gross Value Product	Value added*	percent capacity used
Food and beverages	43	1,377,238	2,142,799	991,264	78	245	876, 972	1,164,631	216,105	45
Tobacco products	1	49,400	256,768	90,056	72		--	--	--	--
Textiles	20	581,729	542,255	96,064	35	18	88, 860	209,644	10,709	35
Wearing apparel,	4	8,960	19,764	4,128	45	28	24,854	53,357	19,015	47
Tanning and dressing leather	3	14,424	236,726	40,337	78	11	215,822	365,725	25,396	19
Wood and wood products	7	13,030	59,578	25,872	72	10	3,162	1,639	539	39
Total/average	78	667,543	3,257,890	1,247,721	63	312	243,838	1,794,996	271,764	37

* Value-added at factor price.

Source: Extracted from the CSA Report on Large and Medium Scale Manufacturing Survey, November 2004.

9.3.5.2.2 Small-scale manufacturing agro-industries

The development of small-scale manufacturing particularly those in the agri-business sector is important for agricultural transformation and rural development at large. Experiences in countries that register remarkable agricultural growth and rural development confirm this fact. The development of agro-processing rural industries in China is a good example in this respect. The Chinese rural industrial sector accounts for half of the national economy and its growth rate has been three times that of the national GDP (Peng et al, 1997). In fact, China is becoming market-oriented through rapid growth of the non-planned rural industrial sector, initially township and village enterprises and cooperatives and private firms rather than through transformation of the planned sector. The rural industry in China is described as the most dynamic sector. While the average GDP growth rate during 1984 to 1993 was 9.5 percent, the rural industrial output grew at an average rate of 27 percent during the same period. The diversion of rural labour force from farming to rural industries and sideline production during the reform era reversed a long period growth of agricultural output without labour productivity and peasant income, and brought about a genuine possibility for transformative development for the first time. A study by Roger and Xiaoping (undated) shows that higher value added in rural industries occurs in places where a higher proportion of the rural labour force is involved in industrial activities. The more industrialized regions have rural industries that are characterized by high value added products.

The manufacturing industries' census made by the Central Statistical Authority (CSA, 2004) shows that there are 31,863 small–scale manufacturing industries in Ethiopia. The share of rural-based small-scale industries is very small as shown by the spatial distribution in urban and rural areas all over the country. The evidence shows that only 3.7 percent of the small-scale industries are located in rural areas. (Tigray (2.93%), Afar (0.05%), Amhara (12.57%), Oromia (16.67%), Somali (0.17%), Benishangul

Gumuz (0.45%), SNNPR (4.26%), Gambella (.09%), Dire Dawa (0.02%), and Addis Ababa (0.05%). This indicates that the role of small-scale manufacturing in the rural economies is insignificant.

Table 9. 5: Small-scale agro processing industries in Ethiopia

Type of manufacturing	Number	percent	Value of fixed assets	Investment in fixed assets	Gross Value Production	Value-added
Food products and beverages	693	2.38	29,682,636	4,307,592	73,499,167	21,399,856
Grain mill	27223	93.6	662,173,924	123,435,346	691,370,901	367,407,957
Textiles	23	0.08	1,215,321	40,645	2,272,818	1,079,232
Wearing apparel, dressing, dying	962	3.31	3,497,908	915,780	16,619,759	8,791,551
Manufacture of luggage, handbags, footwear	15	0.05	311,344	53,218	363,362	140,389
Wood and wood products	167	0.57	5,350,937	1,750,930	4,952,672	2,203,271
Total	29083	100	702,232,070	130,503,511	789,078,679	401,022,256

Source: CSA small scale manufacturing survey of 2001/2002.

Table 9.5 shows that 29083 or 91 percent of the small-scale manufacturing industries are agro-processing industries out of which more than 93 percent are grain mills. The share of industries engaged in food products and beverages, and wearing apparel, dressing and dying is only, 2.4 and 3.3 percent, respectively. The total value of fixed assets owned by the small-scale agro-processing industries amounts to over 720 million Birr. The small-scale industries have produced products valued at 789 million Birr. Out of this total amount, 87.5 percent is accounted for by the Grain mills. And the small-scale industries have added a value amounting to over 400 million Birr, out of which 91.5 percent again comes from the grain mills during the same period. If we take the share of vale-added in gross value production as a rough indicator of the productivity/efficiency level, the small-scale manufacturing industries seem to be more productive than the large and medium scale

ones. Fifty one percent of the gross value product of the small-scale industries is value-added while it is only 38 percent in the large and medium-scale industries.

One of the major problems of the small-scale industries is lack of sufficient initial capital. Similarly, absence of market demand is cited as one of the major reasons for not being able to operate at full capacity. Other reasons include shortage of spare parts and shortage of raw materials. The extremely low level of small-scale manufacturing industries in the country in general and rural areas in particular shows the need for greater policy attention to be given to the sector if its role in value-addition and alternative income generation has to be promoted.

9.4 Agricultural input market (fertilizer, seeds and chemicals)

Like the output market, agricultural input marketing is also a major issue that needs sufficient attention in order to transform the Ethiopian agriculture. Up to 1991, the agricultural input and output markets were largely controlled by the parastatal government organizations. The supply of important agricultural inputs (fertilizer, seed, and chemicals) was controlled by the Agricultural Input Supply Cooperation (AISCO) while the grain product marketing was in the hands of the then Agricultural Marketing Corporation (AMC). Farmers were obliged to supply part of their produce as a quota to the AMC. Moreover, grain prices were administratively controlled. Following the change in government and economic policy after 1991, the adoption of free market economic policy and market liberalization affected the agricultural input and output market systems. Restrictions on movements of farm products, particularly food grains were lifted; and product prices were left to market operations. As of mid 1990s subsidies on important inputs like fertilizer were abolished. In addition to the government organization (Agricultural Input

Supply Agency, the former AISCO), other agencies (including the "party" trading enterprises, and private companies) started to engage in the importation and distribution of agricultural inputs.

9.4.1 Agricultural inputs prices trends

The fact that the major input used in promoting agricultural production in Ethiopia (chemical fertilizer) has to be imported from aboard has put a significant pressure on the capital resources required, due to an ever increasing price of fertilizer. Increasing price of input while not much improvement is seen in the product markets is also one of the hindrances to the adoption of yield increasing input technologies by the smallholder producers. For instance, over the last 25 years, the price of chemical fertilizer has been increasing at level of threefold in 2004 compared to the price of 1980. As shown in Table 9.6, despite significant increases in prices of DAP (diammonium phosphate) and Urea[60], however, the volume of fertilizer imported and used has been increasing.

Table 9. 6: Fertilizer import, distribution and use in recent years (MT)

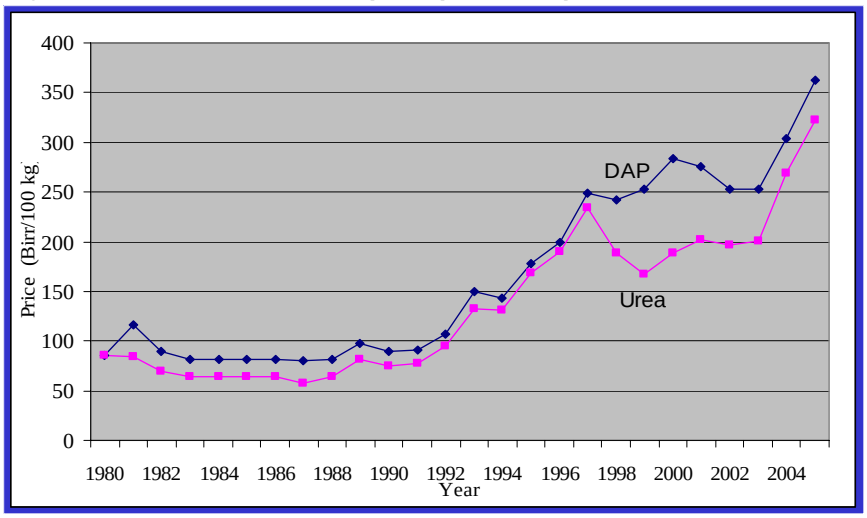
Year	Imported	Distributed	Used
1997/98	381,908	325,641	281,371
1998/99	262,712	337,698	290,264
1999/00	209000	332,525	297,907
2000/01	269,500	314,269	279,602
2001/02	368,424	301,345	232,270
2002/03	46,041	270,548	264,349
2003/04	374,748	324,298	313,387

Source: Agricultural Input Marketing department, MOARD.

[60] Reports given by Input Department of the MOARD to media (ETV Report of July 13,2005) show that this year the price of urea increased by 30% while that of DAP by 15% from the level of 2003/2004. For the 2004/2005 cropping season 480,000 tons of fertilizer are estimated to be demanded.

The FAO/WFP (2005) data report that in the year 2004 about 323,000 tons of fertilizer were used while the MOARD data show a slightly lower amount at only 313, 387 tons. Compared to the level of 1997/98, there was an increase in use by 14 and 11 percent, respectively, in 2004 according to the two data sources. The CSA's estimate indicates that about 40 percent of the land under crops was treated with chemical fertilizers in 2003/04 (FAO/WFP, 2005).

Figure 9. 5: Trends in fertilizer price (1980-2005)



Note: The price data of 1980-1996 are fixed pan territorial retail prices, whereas retail prices of 1997-2005 are the average of free market prices at some selected sales centres.
Source: Computed from data of the National Fertilizer Industry Agency (or MOARD)

According to Dimithe et al (2000), supply side constraints to increased use of fertilizer include: poor rural road networks (high transportation costs) in high potential areas; shortage of foreign exchange or lengthy bureaucratic procedures in the allocation of available foreign exchange; high cost of capital and/or limited access to credit; inexperience of importers and dealers and weakness in the domestic procurement and distribution network that

often lead to physical non-availability of fertilizers in the right quantities and at the right time, and inappropriate donor aid in-kind.

The price of improved seeds has also been increasing from time to time. Comparison of the average prices for two periods – first half of the 1990s (1992 -1995) and second half of the 1990s through 2002 (1996 to 2002), shows that there has been a significant increase in the price of improved seeds. During the reference periods, prices of wheat, barley, composite maize, hybrid maize, sorghum and *teff* increased by 21, 31, 61, 39, and 23 percent respectively. On the contrary the price of composite maize has declined by 20 percent (Table 9.7). The increase in the price of improved seeds of pulses ranged from 45 to 74 percent during the reference periods.

Table 9. 7: Ethiopian seed enterprise cleaned seed selling price (Birr/quintal)

Crop	1981-1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Wheat	65.25	140	196	203.95	216.03	214	211	245	245	245	245	197
Barley	65.10	140	196	207.24	209.30	229	230	246	267	271.65	271	209
Maize												
Composite	47.70	115	178	201.84	203.10	202	172	222	222	222	222	180
Hybrid		160	248	450.00	500.00	500	497	547	578	578	578	560
Katumani	96.00	-	-		-	-	-	240	-	-	240	196
Sorghum	57.90	128	192	203.19	- 219.52	225	223	196		268	268	316
Teff	73.25	153	352	277.24	352.92	360.33	327	324	324	324	324	385
Haricot bean	104.10	201	308	202.97	352.80	353	322	322	-	385	385	385
Soybean	68	145	353	279.92	-	-	-	-	-	385	385	385
Fiel Pea	63	134	351	241.49	-	-	-	322	-	385	385	385
Faba bean	78	174	211	218.45	-	-	-	269.62	-	385	385	385
Chick pea	117	188	308	208.68	229.37	-	-	-	-	350	350	350
Lentil	70	145	352	255.98	-	-	-	-	-	-	450	-
Lin seed	69	143	308	299.34	308.25	371	350	350	-	397	397	397
Rape seed	71.35	148	308	247.24	-	378	349	349	-	360	360	360
Niger seed	-	-	-	-	-	-	343	343	-	-	-	-
Sunflower	90.00	177	-	-	-	-	-	-	-	-	-	-

Source: Ethiopian Seed Enterprise

Plant protection chemicals are the other useful inputs. Commercial farms are the major users of pesticides in Ethiopia. Pesticide use in state farms is estimated at 7.76kg/ha/year while in smallholder farms, it is less than 0.1kg/ha/year (Gordon et al, 1995). The biggest share of imported pesticides is used for cotton in commercial farms where 38 percent of the total pesticides imports and 90 percent of the insecticides imported are applied. The use of pesticide in smallholder agriculture is usually limited to herbicide. The other pesticides that are widely used in smallholder farms are migratory pest control pesticides, which are provided for free by the government. The import of pesticides in the 1980s averaging 4,100MT annually was much higher than in the 1990s when the annual average dropped to 1,452 MT. During the 2002 crop season, a total of 1,357 MT of pesticides were imported (see Table 9.8). The increase in herbicide imports stems in part from continued demand at state farms for the treatment of cereals. An apparent increase in smallholder demand for use of herbicide on wheat and teff has been recorded. By contrast, insecticide volumes did not increase due to drastic reduction in the surface of cotton cultivation (Woldeamanuel, 2002, quoted by UN-EUE, 2002).

Table 9. 8: Volume of chemical imports in MT in recent past

Year	Insecticide	Herbicide	Fungicide	Others	Total
1998	767.90	417.58	5.50	35.9	1,226.88
1999	302.39	602.86	63.26	2.02	970.53
2000	300.33	517.43	73.71	3.44	894.91
2001	244.56	1,078.27	47.42	3.02	1,373.27
2002	426.22	840.84	70.64	19.67	1,357.37
Total	2,041.4	3,456.98	260.53	64.05	5,822.59
Average	408.28	691.39	52.10	12.81	100%
Percentage Share	35%	59.4%	4.5%	1.1%	100%
Forecast 2003	449.59	1,135.59	60.85	24.94	1,670.97

Source: Ministry of Agriculture as quoted by UN-EUE, 2002.

9.4.2 Profitability of agricultural inputs

Profitability of improved farm inputs is one of the major determinants of technology adoption and sustainable use. Many factors influence the profitability of inputs including the yield response, cost of inputs and price of outputs. Yield response, in turn is influenced by the rate of application of inputs, the quality of farm management, and combination of other complementary inputs. Weather conditions, quality of agronomic practices like land preparation in crop production, soil quality, etc, are the major factors the limit the yield response. The nature of the input market and output market systems is crucial for the inputs to be profitable or not.

Mulat et al. (1997) have made an extensive study of the economics of improved farm inputs and impacts of agricultural market on farm productivity and input use. The findings indicate that profitability of fertilizer use can be increased by improving the functioning of grain marketing system signifying the imperative role of markets for agricultural development. Reduction in marketing cost will benefit both producers and consumers.

Knowledge of optimum combination of improved inputs is important to realize the increased potentials in yield (both crops and livestock). Studies show that the use of fertilizer, an important yield increasing input, in Ethiopia is low (i.e. as low as 30 kg/ha of cultivated land) and is unfavourable compared to countries which had carried out green revolution. Fertilizer use per hectare of cultivable land was 68 kilogram in Latin America, 92 kilogram in South Asia and 205 in East Asia in 1997/98 (Dimithe et al, 2000). Given the mounting pressure on scarce agricultural land increasing crop yield is the only viable and sustainable option for increasing food availability and enabling agriculture to generate surplus in Ethiopia.

The study made by the Grain Marketing Research Project of the former MEDaC has indicated the following findings regarding the profitability of fertilizer use in Ethiopia. i) The major factor determining fertilizer use and, hence, profitability is the agronomic response of crop yield to fertilizer application. The average response rate varies greatly by crop and region; ii) Crop value is important rather than just crop prices in determining fertilizer use: The value cost ratio (VCR) highlights that the profitability of fertilizer use depends on the additional value of crop output generated from its application, not just the price of the crop. Crop value is related not only to the output price, but also the additional amount produced from fertilizer application. The study also concluded that payoff to increased fertilizer use is high. It was indicated that about 10 million quintals (12 percent of total cereal output)[61] in 1995/96 was attributable to the use of fertilizers. This was roughly 46 percent of the total cereal marketed in 1995/96. This volume of cereal output, valued at average 1996 producer prices, was about 1.18 billion birr. It was further implied that improving the performance of grain market system in Ethiopia strongly influences the profitability of fertilizer use by farmers. Furthermore the study underscores the importance of viewing productivity growth from a "systems perspective," in which the profitability of investments made at one level of the system (e.g., farm production) is liable to depend on the kinds of investments (or lack thereof) made at other stages of the agricultural system. Therefore, improvements in marketing, rural finance and infrastructure have paramount importance.

9.4.3 Farmers' cooperatives and unions

Farmers' own organizations are known to have played an important role in the modernization of agriculture as witnessed in other parts of the world. It is the farmers' cooperatives who mostly helped in enhancing the bargaining

[61] According to the study, the incremental yield by using 100kg of DAP was 3.87 qt./ha for Teff, 4.86 qt./ha for wheat, 7.03 qt/ha for maize, 5.10 qt/ha for barely, 3.68 qt/ha for millet, and 3.40 qt/ha for sorghum (GMRP, 1997).

power of producers, facilitated the link between production, marketing and processing sectors in other countries. Farmers' cooperatives, especially in agricultural marketing, also existed in Ethiopia as early as the 1960s. For instance, marketing cooperatives in vegetables, poultry and other market-oriented production systems existed in rural kebeles in the vicinity of Alemaya College. The College's extension and outreach program helped to expand improved technologies and assisted the smallholder farmers to organize themselves in to cooperatives to facilitate marketing of their products. It was known that some of them were even exporting agricultural products to Djibouti.

In the framework of the socialist economic management of the Derg period cooperative farms, collectivization of productive resources and production system were promoted. Service cooperatives were established to help the rural communities to get access to consumer goods and also dispose of their marketable products, usually through obligatory quota delivery system. The cooperative farms were favoured by the government policy whereby they had better access to improved technologies like fertilizer, agricultural credit, and irrigated farm lands. Some of the cooperatives could grow up to the union levels, and mobilized large production resources. Notable among them were farmers' cooperatives in East Gojjam (Ytnora *kebele*), in East Hararghe (Finklee and Tininkee kebeles) and others. The cooperatives during the Derg period had basic management problems as the socialist system itself. There were excessive political interventions from the government cadres, to the extent of the cooperatives serving as a mechanism of promoting the political goal in rural areas. They were challenged by the difficulty of internalizing the benefits by the member farmers, the increasing tendency of lost private initiatives and privacy, resource mismanagement and inefficiency.

When the Derg regime fell in 1991, the farmers' producers and service cooperatives were all dismantled. Many of them lost their properties and also got them distributed among the members and rural communities. The process of

cooperative organization and management, and the resulting consequence is considered as a bad experience in the history of agricultural cooperatives in Ethiopia.

The EPRDF government has made some interventions to revitalize farmers' cooperative organizations recently. One of the notable interventions is institutionalization of cooperative promotion whereby the Federal Cooperative Commission as well as the regional Cooperative Promotion Bureaus are actively engaged in facilitating formation and operation of cooperatives. Capacity building in terms of human resources development has been another aspect of the cooperative promotion. In this respect the Ambo College of Agriculture has started to train professionals in agricultural cooperatives at B.Sc. level. Some of the agricultural TVETs are also offering courses in cooperative management.

Recent data obtained from the Federal Cooperative Commission show that currently there are 91 secondary level cooperatives (Unions) established and operating in the major Regional states. The unions are composed of 1677 member primary cooperatives (see Table 9.9). The most common types of unions and cooperatives are the multipurpose ones followed by those engaged in cereal marketing. There are unions established for coffee marketing, livestock marketing, milk marketing, sugarcane and for the purpose of saving and credit. The data show that the cooperative formation process is active mainly in the four major regions when one looks at the number of organizations established.

The unions and cooperatives are currently serving over one million members (985, 283 male and 102065 female). Altogether they have assets amounting to over 310 million Birr. The largest share of their assets (96.3 percent) is in terms of the current assets, while a smaller share of less than 4 percent is fixed assets. The low investment in fixed assets might mean that the cooperatives and unions are still young and have not yet started long-term

investments in facilities and infrastructure. It is probably due to the high value commodity that they handle that the coffee marketing unions and cooperatives take the largest share of total current assets i.e. 220.7 million Birr or 74 percent of the total. Currently, all the unions and cooperatives together own a capital amounting to 246 million birr. Their outstanding debt is over 50 million Birr, which is about one–fifth of their total capital.

A new aspect of the emerging cooperative union is the saving and credit union. Currently there are 2 in SNNPR, 1 each in Oromia and Addis Ababa. They are serving close to four thousand members. They own over 2 million Birr in total assets and over 1 million birr in Capital. The data also show that despite the country's huge livestock resource potential, so far, activities in organizing cooperatives and unions that engage in livestock sub-sector are low. There are only 2 unions working in livestock marketing and milk marketing, having 7 and 12 primary cooperative members, respectively. Of course, the multi-purpose unions and cooperatives might also include livestock marketing activities along with others.

Although it certainly takes a long time to create a conducive and sustainable working environment for agricultural cooperatives to emerge and successfully operate in many parts of the country, there are already notable but few examples of active farmers' cooperatives in areas of agricultural input and output marketing. The Mojo Farmers Cooperative Union in Ada *woreda* of East Shoa zone in Oromia region; the Kaffa Coffee Farmers Union; the Oromia Coffee Farmers Union, and others are examples. The former is engaged in promoting marketing of agricultural products of the union member cooperatives and farmers. It is also purchasing agricultural inputs (fertilizer)[62] and distributing them to members at a relatively reasonable price. The latter two are also involved in collection and export of coffee

[62] In the 2004/2005 cropping season, few farmers' cooperative unions are known to have imported chemical fertilizers from abroad for further distribution in the country. According to ETV News of August 11, 2005, cooperatives have imported 1 million quintals of chemical fertilizers for distribution for the current cropping seasons.

to the world market. Farmers' cooperatives and unions provide an opportunity to enhance the bargaining power of agricultural producers in both the purchase of necessary inputs and sales of farm products.

Table 9. 9: Type, number and resources of primary cooperatives and unions in Ethiopia

Area of specialization / activity	Number of cooperative unions by region						Coops	Members			Assets ('000 Birr)				
	Tigray	Amhara	Oromia	SNNPR	Benishangul_ Gumuz	Addis Ababa	Total	Primary members	Male	Female	Total	Fixed	Current	Total	Debt	Capital
Cereal marketing	1	12	16	8			37	510	459960	44049	504009	6144.4	48171	54315.6	20515.6	21799
Coffee marketing			1	3			4	152	158405	8326	166731	1506.8	220709	222216	20147	202069
Livestock Mkt			1				1	7	778	319	1097	0	115	115	0	115
Milk Marketing			1				1	12	635	87	722	67.5	474.2	541.7	363.7	178
Multipurpose	16	12	13		1		42	882	362917	47031	409656	2807.8	24115	26922.5	6927.4	17995
Saving & credit			1	2		1	4	93	1101	1873	3964	0	2332.4	2332.4	0	2332.4
Sugarcane			1				1	7	1026	314	1340	708.5	1399.3	2107.7	1069.9	1037.9
Vegetable Mkt			1				1	14	461	66	527	347.7	1523.3	1871	1138.6	732.4
Total	*17*	*24*	*35*	*13*	*1*	*1*	*91*	*1677*	*985283*	*102065*	*1088046*	*11582.7*	*298839*	*310421.9*	*50162*	*246258.8*

Source: computed based on the data obtained from the Cooperative Commission- "Nationally Organized Secondary Level Cooperatives/Unions/ Detail Information as of May 2005.

There is a long way to go in order to expand the positive role of farmers' cooperative organizations in agricultural development in Ethiopia. The task of capacity building and technical assistance to improve their management is enormous. In addition to support by the government, NGOs (donors) like VOCA Ethiopia are currently providing valuable support to establish and strengthen cooperatives.

In summary, not much can be expected from the much told technology promotion activities through agricultural extension services unless proper and adequate attention is given to the marketing side of the overall development efforts. Proper functioning of market forces while protecting the rights of producers, traders and consumers must be at the centre of any agricultural development endeavour. The long-term approach to solve the problems in agricultural products marketing, and especially food grains market should be to narrow the gap between the actual and effective demand by raising the average income and income-earning opportunities. Programs aiming at increasing income-generating capacity such as safety-net programs must be pursued. In this regard, one of the most important measures especially during normal year could be to transform food aid distribution into cash in order to improve effective demand on markets.

9.5 Rural infrastructure

The development of the agricultural and food marketing sub-sector is below expectation. Areas with relatively good potential for food and agricultural production are remote; in a sense they are not easily accessible to markets and consumers due to many barriers including high transport cost. Inaccessibility and low marketing network can be considered as one of the reasons for the subsistence nature of production. If there is no effective marketing system there is no incentive for farmers to produce more. Lack of sufficient market for produce limits the purchase and use of yield increasing

inputs. If we consider road density as one of the indicators of market network and access, Ethiopia has the lowest road accessibility even compared to some African countries. The World Bank Data (2002) shows that in Ethiopia, over a period of two decades (1970 to 1990) the road availability per million inhabitants grew from 250 km to only 550 km. During the same period, the road availability changed from 3610 km to 2620 km per million inhabitants in Kenya, from 2830 km to 1760 km in Uganda, and from 14920 km to 12010 km in Zimbabwe. In the latter three countries, although the road length increased in absolute terms the rise in population pressure has caused a fall in the ratio.

Despite lots of efforts made by investing in roads development[63], the effects in terms of reduced transportation costs in rural areas are not yet significantly achieved, although significant achievements have been made particularly in upgrading the quality of some highways. More work is required on the lack of regulatory framework, inability of users to defend their rights and limited entry of new transport service providers to enter in the market and increase the level of competition. In addition, lack of monitoring and check by the transport authorities at various levels and locations appear to be a major constraint towards improved transportation services in rural areas. It is easy to observe how rural people respond to the incentives that arise due to access to road facilities. Farmers usually move their houses or building new ones nearby the newly built or recently maintained roads. Small rural kiosks or shops are also opened. These facts testify to the need for creating road and communication infrastructure for rural and agricultural transformation.

[63] The road sector development programme aims at increasing the road network from 0.43 to 0.54 km per one thousand population within ten years (1997-2007). Over 15000 km of new regional roads are to be constructed and more than 8000 km roads rehabilitated. The programme expected to cost US$3.9 billion will require substantial financial assistance from foreign sources. A number of donors including the World Bank and EU have pledged support to the programme. Some of the pledges have also started to materialize. The challenge of tackling the transport bottleneck, one of the critical constraints to the development of Ethiopia, is not expected to be an easy one (Mulat, 1998).

9.6 Private sector development and agriculture

Following the economic reform programs that were pursued after 1991, private sector investment in agriculture has been encouraged. The creation of the Federal Investment Authority as well as Regional Investment Bureaus, and incentives in terms of duty free importation of investment capital like farm machinery, tax holiday and other measures have been notable interventions to promote investments by domestic capital owners and to attract foreign investments into the country. According to data obtained from the Investment Authority (EEA Database, 2005), investments have been taking place in the primary and secondary sectors. Between the years 1992/1993 and 2000/2001, a total of 1426 investment projects have been approved (new and expansions) in the primary agricultural sector (Table 9.10). Other 50 projects were approved in the primary sector other than agriculture. In terms of the source of capital, domestic investment capital took a share of 98 percent while the remaining 2 percent was owned by foreigners. Starting 1992/93 the number of approved projects was increasing and reached its peak in 1995/1996; and declined there after gradually, probably as the investment climate was disturbed by the Ethio-Eritrean war.

Table 9. 10: Number of approved investment projects in agricultural production

Sector/sub-sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Primary agriculture	49	136	267	374	179	140	98	102	81	1426
Food crops	7	43	48	75	21	22	15	29	22	282
Cash crops	1	10	11	14	18	19	33	13	31	150
Mixed food &cash crops	2	24	109	120	33	14	4	8	6	320
Livestock	31	39	56	84	58	48	20	28	9	373
Integrated crops & livestock	4	11	14	24	19	7	2	6	-	87
Agricultural services	3	8	26	55	26	28	22	17	12	197
Forestry	1	1	-	1	3	1	1	1	1	10
Fishing	-	-	3	1	1	1	1			7

Source: Computed from EEA database.

In terms of the distribution of the approved investments over different sub-sectors, slightly over 25 percent of the investments have been in the livestock sector followed by mixed food and cash crops (22.4 percent). Investment in food crops only was 19.8 percent while in cash crops only were 13.8 percent. Despite a huge water resources and potential for fisheries production, investment in this sub-sector has been largely neglected as shown by only 0.5 percent share of the approved investments.

The information contained in Table 9.11 shows that, investment projects with a total capital of 7.9 billion Birr were approved in primary sector out of which 92 percent of the investment capital (about 7.3 billion Birr) was directed to primary agricultural production sector. In terms of ownership, the foreign investment takes a share of 37 percent of the capital while the domestic owners take the remaining 63 percent. The data show that foreign investments are relatively more capital intensive than the domestic ones. Of the total capital investments in agricultural production, 29.5 percent were approved for mixed food and cash crops production. Food crops production follows at 27.6 percent while cash crops production only took 19.2 percent of the total. Despite one in four projects being in livestock production, in terms of share of capital, the sub-sector took less than 10 percent suggesting that approved investments in livestock were not capital intensive.

Between 1992/1993 and 2000/2001, the total number of approved projects in all secondary sectors (processing sectors) was 2758. Starting in 1992/93 the number of approved projects was increasing reaching peak in 1997/1998 and gradually declining there after. In terms of distribution of the approved investments over different sub-sectors, a relatively larger share of 41 percent went to coffee hulling, followed by food products processing (38.1 percent). The smallest number of investment projects (0.8 percent) has been made in wood products except furniture.

Table 9. 11: Investment capital approved agricultural projects (1992/93 -2000/2001) (million Birr)

Sector/ sub-sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total	percent
All Primary Sector	272	925	806	1058	2387	622	562	652	627	7912	
Primary sector agriculture	101	924	646	1017	2373	551	486	568	617	7283	100.0
Food crops	14	167	153	115	1241	51	47	112	107	2008	27.6
Cash crops	4	74	60	112	288	188	272	184	211	1393	19.2
Mixed food & cash crops	20	539	222	452	570	83	19	127	112	2143	29.5
Livestock	38	49	107	106	63	84	21	58	147	673	9.3
Integrated crops & livestock	19	51	40	65	101	53	3	16	0	348	4.8
Agricultural services	6	42	61	160	104	87	120	58	41	677	9.3
Forestry	1	1	0	5	6	1	3	0	1	18	0.2
Fishing	0	0	3	2	1	3	0	0	0	9	0.1
% of all primary sector	37	100	80	96	99	89	86	85	98	92	

Source: Computed from EEA database.

Table 9. 12: Number of approved investment projects in agricultural processing

Sector/sub-sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total	percent
All secondary Sector	258	209	251	323	376	471	372	240	258	2758	
All agricultural processing	141	81	118	208	239	324	262	145	123	1641	59
Food products	58	41	67	115	97	65	63	62	58	626	38.1
Coffee hulling	0	6	26	56	113	214	174	52	27	668	40.7
Beverages	6	2	2	4	5	11	7	7	7	51	3.1
Textiles except garment	6	1	2	2	1	2	2	5	5	26	1.6
Garment and related articles	20	9	5	6	7	14	1	2	3	67	4.1
Tanneries	16	5	4	10	4	6	4	1	2	52	3.2
Footwear	35	17	9	13	10	12	10	13	19	138	8.4
Wood products except furniture	-	-	3	2	2	-	1	3	2	13	0.8

Source: Computed from EEA database.

Investment projects in secondary sector (processing) with a total capital of 22 billion Birr were approved during the reference period. Out of this, 45.9 percent of the investment capital (10.1 billion Birr) was directed to agricultural processing (Table 9.13). The foreign and joint venture investment capital had a share of 27 percent, while the domestic capital took the remaining 73 percent suggesting that the foreign investments are relatively more capital intensive than the domestic ones. The number of foreign and joint venture investments in the total processing projects was only 4 and 3 percent, respectively, in all secondary sectors. Of the total capital investments in agricultural processing, 36.3 percent were approved for food products processing while beverages, coffee hauling and textile take 23.7, 11.3 and 10.7 percent, respectively.

Table 9. 13: Investment capital of approved projects in agricultural processing

Sector/sub-sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total	percent
All Secondary Sector	2050	1266	1757	2320	1935	4194	2307	2611	3627	22067	
Total agric-processing	1296	459	674	1400	843	2333	1312	1074	739	10130	45.9
Food products	351	150	379	713	320	741	248	317	462	3682	36.3
Coffee hulling	0	10	39	72	145	340	324	172	42	1145	11.3
Beverages	52	107	36	405	149	835	456	296	62	2398	23.7
Textiles except garment	584	73	2	20	121	81	39	153	16	1088	10.7
Garment and related articles	73	20	13	32	13	44	3	8	9	215	2.1
Tanneries	154	42	45	109	29	218	33	7	19	656	6.5
Footwear	83	58	63	44	62	74	54	103	116	658	6.5
Wood products except furniture	0	0	96	4	3	0	153	18	14	288	2.8
Percentage of agric. in all secondary sector	63.2	36.3	38.3	60.3	43.5	55.6	56.8	41.1	20.4	45.9	

Source: Computed from EEA database.

9.7 Agricultural credit and finance

Shortage of capital to finance agricultural production and marketing activities is one of the major problems the Ethiopian smallholder farmers face. Farmers need credit to meet short-term requirements of working capital and long-term investment in agriculture and other income-bearing activities. They need financial resource to buy improved agricultural inputs that can increase yield and production. Moreover, rural households need credit for different types of consumption items including expenditure on food purchase, medication and education, and other services.

As agricultural and non-agricultural activities in rural areas are seasonal in nature, households need credit to smoothen out seasonal fluctuations in earnings and expenditure. In many areas, rural households are vulnerable to risks of various shocks that threat their income and consumptions. It is known that smallholder farmers and the rural communities have developed their own informal mechanism of credit systems. Some studies (e.g. Bezabih et al., 2005) have shown that despite some problems, informal credit markets in rural areas are providing valuable services in availing small capital resources to rural dwellers. The formal banking system has not been able to provide credits to the largely subsistence oriented smallholder agriculture in Ethiopia.

Many studies gave attention to the problems of agricultural credit and finance in Ethiopia. Assefa (2004) has recently made a detailed and very comprehensive assessment of the agricultural credit and rural finance services in Ethiopia. His study covered the historical perspective of the evolution of the formal financial sector, the institutions and their operations with emphasis on the agricultural credit and rural finance through the different regimes that existed in the country (the Imperial, the Derg and EPRDF governments). The study shows that in terms of financial institutions that

cater for agricultural finance, the establishment of the Agricultural Bank of Ethiopia in 1945 was a pioneer. The study concluded that, efforts to support agriculture and small farmers through credit during the pre-Five Year Development Plan (1945-1951) were not a success for a number of reasons including the collateral requirement involved, the landlord-tenant relationship which made it difficult to produce certificate of ownership, diversion of loans to non-agricultural uses, etc. It further noted that neither did the efforts under the Five Year Development Plans succeed. High collateral (as high as 200 percent of the loan), mainly in the form of real property and machinery, and guarantor requirements, in the face of widespread tenancy, land title problems (e.g. communal land, *rist* system), etc., proved to be prohibitive hindrances.

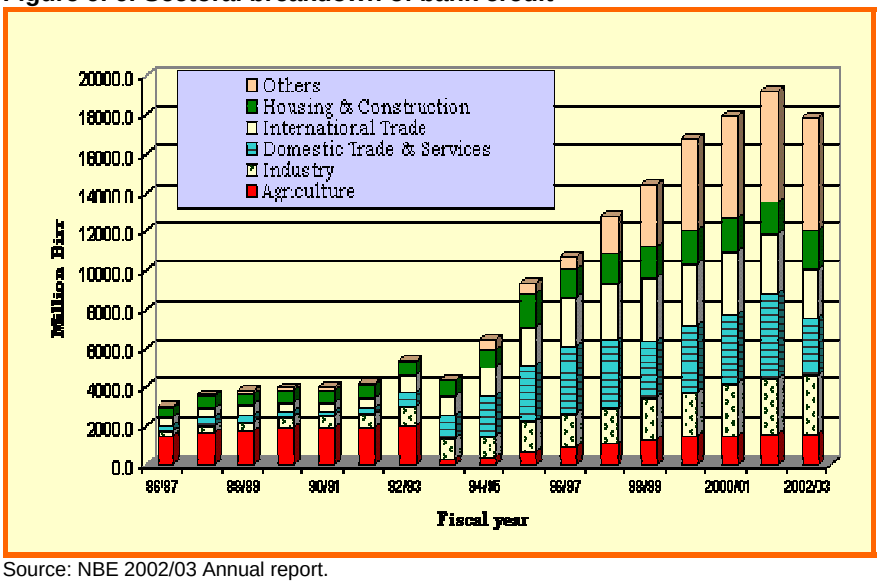
The Derg regime has nationalized and restructured the financial system in Ethiopia. Among the public institutions, Agricultural and Industrial Development Bank (AID Bank) had activities that focused on agriculture and other economic sectors. Its activities, however, concentrated on seasonal production credit, medium and long-term credit for agriculture, industry and other sectors. It is to be recalled that public enterprises, state farms and farmers' cooperatives were given favourable terms and priority of access to credit resources at the expense of the peasant agriculture sector.

Following the change in government in 1991, subsequent reforms were introduced in economic policies, and institutions. The financial reforms include elimination of priority access to credit, interest rate liberalization, restructuring and introduction of profitability criteria, reduced direct government control on financial intermediaries and limits of bank loans to the government. Private financial intermediaries emerged through new entry of domestic private intermediaries, and other measures. One of the practices of credit adopted is the involvement of government bodies serving as intermediaries between farmers and the bank institutions. For instance in the case of fertilizer credit for smallholders, regional governments act as

intermediaries between banks and farmers. The governments allocate/use their own budgets as collateral to borrow from banks and further lend the borrowed funds to farmers for the purchase of agricultural inputs.

As the data obtained from the National Bank of Ethiopia indicate (see Figure 9.6), the relative share of agricultural credits in the total amount of bank credits has been the lowest when compared to that of industry, domestic and international trade activities, housing and construction. The share of loan for domestic and international trading and services has been larger than all other sectors. The data interestingly show that the relative share of agriculture in the total bank loans was larger for the years 1986/87 to 1992/1993. The share drastically fell from 1993/94 to 1999/98 before it increases there after. Even then the share did not yet reach the level of pervious periods before 1992/93.

Figure 9. 6: Sectoral breakdown of bank credit



Source: NBE 2002/03 Annual report.

There was an increasing tendency by the DBE to stop giving credit to small farmers. According to the information presented Table 9.14, the trend of the agricultural loan by the DBE has been declining during the recent 7 years from its high level of over 420 million birr in 1997/98. In 2002/2003 the amount was dramatically reduced to only 10 percent of the 1997/1998 level. Such a decline could be attributed to the performances of loans dispersed to the sector in previous years. The unfavorable circumstances that faced the coffee production and marketing could be some of the reasons that underlie the decline in the amount of loan to agriculture.

Table 9. 14: Agricultural credit extended by development bank of Ethiopia

Year	Total credit disbursed	Amount disbursed to Agriculture ('000 Birr)	Agriculture's share (%)
1997/98	705,253	420,253	59.6
1998/99	553,714	313,169	56.6
1999/00	456,959	232,497	50.9
2000/01	227,683	108,004	47.4
2001/02	111,292	58,860	52.9
2002/03	67,177	40,368	60.1
2003/04	294,896	110,851	37.6

Source: computed based on data provided by Development Bank of Ethiopia.

On the other hand, according to FAO/WFP (2005) data, the amount of loans approved for the agricultural sector by the Commercial Bank of Ethiopia during the last five years has been on a rising trend. The amount disbursed, however, has been declining from 82 percent in 2000/01 to 51 percent in 2004/05 (Table 9.15).

Table 9. 15: Total agricultural input credit approved, disbursed and overdue by CBE

Year	Amount approved (Birr '000)	Amount disbursed (Birr '000)	Amount disbursed (percent)	Amount overdue (Birr '000)	Amount overdue (percent)
2000/01	593 963	484 698	82	0	0
2001/02	641 924	459 050	72	32 038	7
2002/03	545 783	453 999	83	41 299	9
2003/04	780 690	376 410	48	59 496	16
2004/05	978 932	495 720	51	not yet due	na
Total	3 541 292	2 269 877	64	132 833	6

Source: FAO/WFP, 2005. Note that the data are available as of September 2004.

In the current cropping year (2004/05), CBE approved a total of 979 million Birr of agricultural input loans based on credit requests submitted by the regional governments - Oromia, Amhara, SNNP, Tigray, and Addis Ababa. In general, Ethiopian agriculture which, on average, currently gets only about 15 percent of credit disbursed by all formal financial sectors requires major government support in terms of the right incentives to attract capital in general and long-term capital in particular to promote investment in the sector. Efforts should also be made to analyze agriculture's absorption capacity of available credit and the existing hinderers. It is only through increased use of improved productive technologies and capital injection into the agricultural sector that the vicious cycle of low productivity, low income and high poverty can be broken-up.

In this respect, efforts made to expand micro-finance services in rural areas are commendable interventions. The micro-finance institutions and cooperative banks are modestly expanding in rural areas. It is being reported that despite the scarcity of the loanable capital disposable at such institutions, they are contributing remarkably to the financing capacity of the rural poor. Public reports show that particularly women are benefiting a lot from the small credits by investing in petty trading, production of poultry,

small ruminants, dairy cows, fattening, etc. Continuous and expanded efforts in this respect would help overcome capital deficiency, promote income diversification, and commercialisation of rural activities in the long-term.

Saving and credit associations are gradually emerging to support capital needs of rural and agricultural communities. Organizing and supporting farmers' own institutions for saving and credit is an alternative and complementary development strategy in the promotion of financial services. In this respect the Oromia Farmers' Cooperative Bank is established as pioneer in 2005. Such innovative institutions and organizations would not only help to improve farmers' access to capital resources, but also enhance the saving behaviour of farmers and their own organizations including producer and marketing/ service cooperatives.

Chapter 10

Transforming Agriculture: The Way Forward

Despite being considered as the backbone of the Ethiopian economy, the agricultural sector is still unable to generate any meaningful surplus that could bring sustained growth in the Ethiopian economy. Several studies have repeatedly indicated that the performance of the national economy has been greatly affected by what happens in the agricultural sector. The Ethiopian economy remains an agrarian economy that is extremely vulnerable to climatic and environmental shocks. According to recent estimates, not less than 40 percent of the population still lives under miserable poverty and over 13 million people are still vulnerable to recurrent risks of drought and famine. The farming sector is under constant pressure and competition for resource - cultivable land, water and rural energy supply. Evidence shows that extreme dependence on natural resources-based development – land, rainfall, forest, and livestock draft power leads further to resource degradation and declining productive capacity.

Efforts have been made to improve the productive capacity of Ethiopian agriculture through research and technology generation, provision of extension services and increased import and use of improved technologies (mainly fertilizer and seed). Nevertheless, large-scale improvements in the living conditions of farmers and the rural population have been far from being achieved, although localized improvements in crop yields were observed. The low land and labour productivity levels are constraining the capacity of the sector from meeting the expectations of generating food, raw materials and capital resources for national economic development. The agricultural

sector has been unable to meet the growing needs of the rural population, let alone to generate surplus for national economic growth.

Although there could be diversified opinion as to the prerequisites for inducing agricultural transformation (take-off), three facts are often recognized as essential pre-requisites for agricultural growth (Schultz, 1964) quoted in Arnon (undated). First, it should be recognized that agriculture has a crucial role to play in the take-off process in agriculture. Second, this role cannot be achieved without transforming the traditional agriculture. And third, traditional agriculture cannot itself supply the capital required to make its own transformation. The Ethiopian agriculture is currently confronted with the herculean national task of narrowing the increasing food deficit both at the national and household levels. Currently, the food supply gap is being met by a large inflow of external aid[64].

In summary, rural poverty in Ethiopia is still widely prevalent and rampant. The Ethiopian agricultural system is characterized by dwindling farm size, extensive land degradation, declining soil fertility and falling productivity. Environmental and natural resources degradation is also a threat in the rangelands of the pastoral areas. The agricultural marketing system (of input and output) could not adequately serve the increasing need for inputs and service of product markets. There is also a weak linkage between agriculture and the rest of the economy. A growing number of young and potentially productive people in rural areas are becoming landless because of declining cultivable land particularly in the highlands. Lacks of alternative employment opportunities seriously aggravate the problem. Despite frequent incidences of weather-induced risks and uncertainties that affect the agricultural sector, development of water resources and irrigation systems as alternative and

[64] The average volume of food aid inflow during the last fifteen years reached about 700,000 MT per annum. This was recently acknowledged by the program document: The New Coalition for Food Security in Ethiopia. Food Security Program, Volume I. November 2003. Addis Ababa.

viable means of availing moisture needed for crop and livestock production is insignificant. These facts underscore the urgency for the need to transform the Ethiopian agricultural sector.

10.1 Agricultural transformation: Concept and historical experiences

The essential developmental role of agriculture is to generate a surplus, although the form that this takes differs from situation to situation. A basic imperative is to produce a real surplus of food (especially for industrial workers and their urban dependants), raw materials for light industry, and for exports in order to earn foreign exchange (Robert, 2000).

The theoretical and empirical literature provides concepts, prerequisites and the process of agricultural transformation. In his famous writing on agriculture and rural development, Todaro (1989) describes agricultural modernization in mixed-market developing economies as a gradual but sustained transition from subsistence to diversified and specialized production. Such a transition involves much more than reorganizing the structure of the farm economy or applying new farm technologies. He also suggests that as agriculture is not only economic activity but a way of life in traditional societies, any government attempting to transform its traditional agriculture must recognize that in addition to adapting the farm structure to meet the demand for increased production, profound changes in the entire social, political, and institutional structure of rural societies will often be necessary.

Transformation of agriculture also links with rural development, which is defined as a process of socio-economic change involving the transformation of agrarian society in order to reach a common set of development goals based on the capacities and needs of people. These goals include a nationally determined growth process that gives priority to poverty reduction,

solving the problems of unemployment and inequality, satisfaction of minimum human needs, self reliance, and participation of all people, particularly those with the lowest standards of living (UNDP, 1997). Rural development is an integrated process of fundamental social and economic transformation in rural areas that covers all sectors. It depends on many factors including industrialisation, health, education, agricultural development, nutrition, ownership of means of production and access to productive inputs.

One aspect of structural change in the development process is a decline in the relative weight of the agricultural sector *vis-à-vis* the non-agricultural sector as per capita income increases. In other words, structural changes in the economy involve a fall in the share of agriculture in value added, employment, trade and per capita consumption. These observations gave rise to a popular prescription that development necessarily involves a transfer of resources out of agriculture and that this is largely coterminous with industrial development. Johnston and Mellor (1995) describe such a process of a secular decline in the share of agriculture in the national economy as an important aspect of the process of structural transformation. They note that such a transformation is a necessary condition for a cumulative and self sustained growth; the process and the capital requirement for expansion of other sectors place a great burden on agriculture. It has also implications for the changing role of labour and capital and the choice of methods for developing agriculture. Two basic factors are recognized to be responsive for the structural transformation: i) an income elasticity of demand for food that is less than 1 and declining, and; 2) the possibility of a substantial expansion of agricultural production with a constant or declining farm labour force.

Johnston and Mellor (1995) recommend that the most practical approach to achieving sizeable increase in agricultural productivity and output lies in enhancing the efficiency of the existing agricultural economy through the introduction of modern technology on a broad front. Of particular importance

are expenditures for developmental services or unconventional inputs – agricultural research, education, and extension. It is widely agreed that increased agricultural output and productivity play a decisive role in economic growth. They do contribute to this effect in the following important ways (Johnston and Mellor, 1995): 1) economic development is characterized by a substantial increase in the demand for agricultural products. Failure to expand food supplies in pace with the growth of demand can seriously impede economic growth; 2) expansion of export of agricultural products may be one of the promising means of increasing income and foreign earnings, particularly in the earlier stages of development; 3) the labor force for the other expanding non-agricultural sectors must be drawn mainly from agriculture; 4) agriculture, as the dominant sector of an underdeveloped economy, can and should make a net contribution to the capital required for investment in other sectors like industry; 5) raising net cash income of the farm population may be an important stimulus for industrial expansion.

As noted by Timmer (1993) cited by (Mulat, 1999) transforming agriculture and expanding its productive capacity is the prerequisite for sustained economic growth in Sub-Saharan Africa. It is impossible to stabilize the macro-economy without stabilizing the food economy. Food prices are so important in the overall welfare of consumers and producers that some reasonable degree of stability is essential. The main beneficiaries of lower prices are poor households who spend 40 to 60 percent of their income on food items.

The price of food is also a key factor that determines the economics of diversifying into non-food cash crop production and non-farm activities and encourages the overall process of structural transformation. Productivity growth in food crop production will be critical to lower the price of food and raise rural disposal income; and hence to promote demand for products and services in non-food sectors of the economy (Govereh et al, 1999).

There is considerable historical evidence that agricultural revolution and transformation had preceded general economic growth in industrialized economics. A broadly-accepted conceptual framework for agricultural and economic transformation identifies four stages (Economic Committee, 1999). In the first stage, agriculture is adequately nurtured and starts growing and creating wealth at a rate that allows direct and indirect taxation. This enables investment in other major public assets including infrastructure. In the second stage, agricultural growth becomes a direct contributor to the overall economic growth through greater links with industry, improving efficiency of product and factor markets, and sustained mobilization of rural resources. In the third stage, agriculture is fully integrated into the market economy. In the fourth stage, agriculture is part of an industrial economy. Productivity and efficiency of agriculture become major issues, and environmental and other concerns assume greater significance

As broadly discussed by Badiane (1999), the need for increased agricultural production and supply of food, as a wage good to sustain the industrialization process, became apparent as early as the 1950s. This notion was reflected in the findings that “industrialization depends upon agricultural improvements;” “industrial and agrarian revolutions always go together;” and “economies in which agriculture is stagnant do not show industrial development”. Agriculture-oriented development strategies have also received substantial support from the development debates of the 1980s. The process of growth induces a gradual transfer of labour from the rural (agricultural sector) to the urban (industrial sector).

According to Badiane (1999) the analysis of long-term industrialization in 100 countries has shown that the growth rate of value added and input use in agriculture is about 40 to 50 percent less than that in manufacturing. In this connection, it is argued that the ultimate goal of the best agriculture-oriented development strategy must be to foster non-agricultural growth, as well. The

reason forwarded is that agriculture will not provide the rates of growth necessary to absorb the growing labour force even if the most labour-intensive production techniques are employed.

The long-term strategic issues in Ethiopia may be broadly summarized into three key questions that largely depend on what happens in the agricultural and rural sectors: i) how to reduce the absolute number of poor and undernourished people, ii) how to reduce/ eliminate chronic food insecurity and child malnutrition, and (iii) how to transform the subsistence agriculture so that it progressively plays its full role as the supporter of growth of the other economic sectors by generating surplus food, labor and capital. To make agriculture a progressive sector that can eradicate current chronic food insecurity and vulnerability to famine and ensure food security for 120 million plus Ethiopians in 20 years time the rural economy must undergo a structural transformation.

10.1.1 What needs to be changed to bring the transformation?

The goal of agricultural transformation dictates the direction and strategy that should be followed towards the transformation. Following Todaro (1989), one needs to ask the following main questions about the agricultural sector and rural development in relation to the overall national development and modernisation process:

1) How can total agricultural output and per capita productivity be substantially increased in a manner that will directly benefit the average small farmer and the landless rural dweller while providing surplus food to support a growing urban, industrial sector?
2) What is the process by which traditional low-productive peasant farms may be transformed into high-productivity commercial enterprises?

3) Are economic and price incentives sufficient to elicit output increase among peasant agriculturalists or are institutional and structural changes in rural farming systems also required?
4) Is raising agricultural productivity sufficient to improve rural life or must there be concomitant off-farm employment creation along with improvements in educational, medical, and other social services? i.e. how can rural development be achieved?

Agricultural and rural transformation requires enabling policy, institutional and technical environment in the production and marketing systems. Abdulai and Delgado (1995) summarized the prerequisites for sustainable agricultural development. These are appropriate policies, appropriate technologies, rural infrastructure, and management of the environment. This implies that it needs more than improved farm technologies to bring about agricultural transformation.

Three important sources of growth for the agricultural sector are identified (Sadoulet and Janvry, 1995). These sources of growth which are traditionally a focus of policymakers are: 1) factor deepening in response to price incentives, to non-price factors such as public investment which affects the profitability of private investment, and to the relaxation of constraints on, for instance, access to credit; 2) efficiency gains through greater technical and allocative efficiency by producers in response to better information and education and; 3) productivity gains through technical changes as a result of research or the transfer of new technologies. In addition, the existence of transaction costs which make many markets imperfect gained importance as area which needs policy intervention.

The limitation of subsistence agriculture to lead to a sufficient surplus required for further investment in transforming the Ethiopian agriculture and enhancing its linkage with the rest of the national economy needs profound public and private sector interventions. The interventions can be grouped into

two broad areas. The first group is interventions which affect the agricultural supply side while the second group is demand enhancing interventions. In addition, creating supportive and enabling environment is vital for the transformation.

10.2 Addressing the supply side constraints

The transformation of the agricultural sector involves a broad range of interventions that affect the supply side. Possible measures in this respect are elaborated in the following sections.

10.2.1 Strengthening institutional and human capacity

Human resource is a prime factor for designing and implementing an effective agricultural and rural development. The capacity to formulate policies and strategies and to implement and monitor them is necessary. To achieve this objective, appropriate measures of skill building and improving incentive structural for workers of the agriculture and rural development organizations are vital. Ensuring institutional stability and effective utilization of the available human resources and expertise for agricultural development is crucial in Ethiopia.

10.2.2 Enhancing skill and entrepreneurship training for farmers and pastoralists

Integrated knowledge and skill building for farmers and pastoralists should be given due emphasis to bring meaningful change in the agricultural production system. The current program of training community level extension workers who are to serve in rural Kebeles needs to be strengthened and expanded. However, such an effort and intervention should go beyond training farmers

about production and natural resource management. Training in marketing, product quality improvement, processing and value-adding, reduction of post harvest losses need to be an integral part of the newly established training centres. Training and advice for entrepreneurship and job creation in non-traditional/new areas of enterprises (agriculture, fisheries, floriculture, and forestry) are vital for the young people in rural areas.

10.2.3 Promoting sustainable intensification and diversification

Intensification and diversification strategies are crucial in the system for two major reasons. The natural resources upon which the smallholder agriculture depends are getting scarcer from time to time as a result of the growing population pressure. Secondly, given the ever-increasing rural and agricultural population and difficulty of the traditional production system to support the livelihood needs, diversification is becoming extremely critical. Strategies to transform agriculture should involve appropriate measures of enhancing sustainable intensification and diversification. Such measures should aim at addressing the problems of the poor and need to be gender sensitive. Conservation of land and natural resources should result in developing sustainable farming and livelihood system in ecologically fragile areas. Sustainable production and conservation of underutilized resources like fisheries, apiculture and modification of non-timber forest products need to be given adequate attention.

10.2.4 Effective and efficient agricultural research and technology generation

Agricultural research should be able to identify potential resources and comparative advantages in technology generation and recommendation for specific production system and agro-ecological settings. Modernization of

traditional agriculture needs changes in factors of productions and their relative importance. Arnon (undated) classifies the facilities and services required for bringing agricultural transformation/modernization into two – the *essentials* which must be present to enable a farmer to adopt an innovation, and the *accelerators*[65] which may be important to get an innovation adopted but are not indispensable. Some of the essential factors include constantly improving availability of markets for farm products, technology, local availability of supplies and equipment, incentives and transportation. Absence of accelerator institutions is among the characteristics of subsistence agriculture. The accelerators are needed to facilitate adoption of improved technologies/innovations and increase their profitability.

The following specific areas of emphasis for agricultural research and technology development need to be considered:

i) More effort is needed to promote soil fertility maintenance. In addition to the need for area specific recommendations of chemical fertilizers, research should give emphasis to the promotion of organic fertilizer use by the smallholder farmers in Ethiopia. Given the ever increasing cost of accessing imported chemical fertilizers, sustainable and alternative /complementary means of soil fertilization must be important agenda of research.

ii) Research should be able to identify strategic and high value cash crops (including importable and adaptable to Ethiopian agro-ecologies) which can be promoted for commercialization for domestic and export markets.

iii) Research should focus on ways and means of improving labour productivity in the Ethiopian agriculture. So far adequate attention has not been given to overcoming the problems and constraints that lead to the low labour productivity of the Ethiopian smallholder producers.

[65] What can be considered as accelerators include, – education for development, credit, group actions by farmers/farmers' organizations, improving agricultural land, and national planning.

Research should seek solutions and measures in both technology generation and working methods (management practices) in order to improve labour productivity.

iv) Enhanced research efficiency to reduce cost of technology to farmers and pastoralists should be in place. One of the reasons for the low adoption of improved technologies and inputs in Ethiopian agriculture is the expensiveness and unaffordability of the technologies that are disseminated. Efficiency in reducing time and cost of research undertakings would help increase adoption by reducing the cost of technology to producers.

v) In order to improve the performance of the dairy production activities, improving the Ethiopian local dairy breed through cross-breeding is essential to increase their milk productivity[66]. This can be achieved at a faster rate through Artificial Insemination (AI). In addition to research interventions, it is, therefore, recommended that the AI service be strengthened and aggressively promoted in the country

vi) More research in storage and processing technologies and ways of reducing post-harvest losses should be given more attention. Storage and post harvest losses are significant in Ethiopia. Improved practices would contribute to support increased supply of agricultural produce and the development of the marketing system.

vii) Research in farm tools and implements, and farm power needs special attention. Low quality and untimely land preparation has undeniably contributed to the low land productivity in Ethiopian agriculture. Hence, better technology in farm tools and implements are needed for quality and timely land preparation, harvesting and handling. The use of improved farm tools and implements would help to raise labour productivity and improve production.

[66] Data from a recent study of the agricultural extension program (EEA, 2005) show that the milk production of local cow is limited to an average of 1.23 liter/day with a short lactation period.

viii) Improved problem identification and problem solving approach to research is essential. A strong research-extension-farmers linkage and feedback should be a way to identify and address the real problems of the Ethiopian agriculture.

ix) In addition to research in the generation of technology, enough attention should be given to the institutional arrangements involved in research and policy constraints to technology adoption.

10.2.5 Improving the agricultural extension system

The national agricultural extension program that has been implemented for many years has made significant efforts to promote the adoption of improved technologies and better practices that would lead to higher production. Notable achievements have been witnessed in increasing yields for selected crops at least in potential areas of favourable weather and good soil conditions. However, the program has been defective in many ways. Extension staffs have unnecessarily been engaged in administrative matters like handling input loans, enforcing loan repayments, etc. which at times have put them in conflict with communities. Despite the existence of diverse agro-ecologies in the country, the extension system has been trying to promote uniform recommendations of technologies for all areas (e.g. fertilizer types and application rates).

The extension program has not given adequate and uniform attention to the different agricultural sub-sectors. A study by EEA/EEPRI[67] based on a large sample survey found that interventions in the livestock production have been minimal. The study has reported, for instance, that the animal resource development extension package has not yet addressed the technical constraints like breed, feeds and feeding, housing and marketing of animals

[67] Publication of research report forthcoming.

and their products. Indicators like training frequencies of farmers, frequency of visit by the Extension Agents, availability of inputs (breed, bee-hive, improved pasture and forage seed), availability and accessibility of AI and credit services, and marketing outlet do not indicate that effective and aggressive extension work has been promoted in most of the Regions. Regions like Afar, Somalia and Benishangul Gumuz are not sometimes addressed by the animal resource extension programme at all.

In order to enhance effective technology and know-how dissemination and adoption by producers, extension needs to revisit its approaches and strategies. Extension should focus its efforts on promoting technologies and advising farmers leaving the activities of handling inputs to the private sector, for instance. Extension programs should be able to build their interventions on the felt-needs of farmers and pastoralists, their aspirations and capacities rather than serving to transmit top-down orders. Institutional and organisational stability of extension and allowance of adequate time is essential to enable extension programme activities to bear fruits.

Some important lessons could be drawn from the experiences to improve the Ethiopian agricultural extension system. For instance, the experience of the agricultural extension system in Uganda (Habtemariam, 2005) shows that the adoption of a new constitution in 1995 and the Local Governments Act of 1997 forced major changes in the way extension services are delivered. Many government functions and powers were devolved to districts and the extension personnel became under the local administration. In 2001, the Government of Uganda launched the establishment, as a semi-autonomous body under the Ministry of Agriculture, Animal Industries and Fishery (MAAIF), of the National Agricultural Advisory Services (NAADS). These services were to be approached by representative farmers' groups and were to be managed under the sub-counties. In accordance with these developments and demands of the government, the Uganda Land

Management Project (ULAMP) proposed a new extension strategy, called ULAMP's extension strategy. The principle of ULAMP's extension strategy is that farmers are owners of the extension program, and they should be empowered to organize themselves to demand and access a wide range of services. It is also believed that the implementation guidelines should be improvised and adjusted to suit the local social and biophysical environment and to respond to changing situations.

10.2.6 Improved agricultural credit and finance

The emergence of sustainable and viable rural financial institutions is also crucial if agricultural transformation and rural development is to be achieved. Long-term finance and support to the agricultural sector is crucial to attain development goals. For this purpose, various possible measures could be undertaken. Expansion of membership-based financial organizations, rural banks and micro-finance activities should be encouraged and supported. These institutions would help better access of the farmers and pastoralists to capital resources needed for agricultural and livestock development. Ways should be sought to help farmers and pastoralists to be able to use rural assets as collateral for loans. To improve access to credit and overcome capital shortage promotion of contract-farming and out-grower scheme can be considered. Support for the establishment of agricultural insurance schemes should be thought of. Given the risks involved in agricultural production, credit guarantee fund scheme for rural credit is necessary. This measure would support the adoption of more productive but risky technologies by farmers and pastoralists.

Increased budgetary allocation and investment in the development and dissemination of appropriate farm input technologies and practices is crucial. In this respect appropriate subsidy scheme or support should also be provided for products of comparative advantage to make them competitive in

export markets. It will be difficult to achieve a substantive surplus from peasant agriculture to finance industrialization without a significant support (subsidy) for the sector.

10.2.7 Assuring sustainable input supply

Access to improved farm technologies and inputs is an essential condition to raise farm productivity. The major constraints to a wider adoption of such technological inputs by the smallholder farmers and pastoralists are the cost of inputs, availability and timely delivery of the services. For an average producer, improved inputs (seed, fertilizer and chemicals) are still expensive and unaffordable. Even then, at times the required inputs have not been readily available. Hence, sustainable supply of the necessary inputs and technologies at a reasonable cost and at appropriate time is an indispensable task to be accomplished in order to improve agricultural productivity and production.

10.2.8 Specific sub-sectoral development interventions

10.2.8.1 Transformation of the livestock sub-sector

In general terms the country has untapped potential for substantial growth in the livestock industry, mainly for meat, dairy, fish, and honey. The major market for these products continues to be the domestic market, and the increasingly competitive export market will need strong support to continue to serve its important role of generating export revenue. There are huge exploitable development opportunities that could make significant contributions to the national economy. For instance;

- There exists a large and diverse livestock resource base distributed in all agro-ecological zones of the country;

- There exists a large human population with potentially large domestic market for livestock products, particularly with-growing urbanization and rise of incomes;
- The strategic location of the country close to a lucrative export market in the Middle East creates huge export opportunities;
- There is a huge potential for synergies of developments with other sectors: crop production in the mixed crop-livestock systems and natural resource management in degraded and fragile environments. For instance, mention should be made about the honey and fish production in fragile environments; the commercial chicken and dairy production in peri-urban areas;
- A market -led development of smallholder dairy production through promotion of milk groups and milk marketing co-operatives around major urban centers; commercialization of subsistence dairy production has a potential to drive enhanced participation of smallholder producers and sustain economic growth. Similarly marketing co-operatives can reduce transaction costs and enhance participation in markets;
- The increasing participation of the private sector in veterinary service delivery is an important step;
- Survival (though declining) of indigenous institutions and knowledge systems for management of common property, animal health care, particularly in pastoral and agro-pastoral areas and encouraging institutional frameworks for enhanced pastoral development will bring significant benefits.
- The presence of a standing committee for pastoral affairs in the federal parliament; representation of pastoral communities in district administrative councils; efficient early warning system in place to minimise risks associated with recurrent droughts; and growing donor sympathy for long-term pastoral development are all important.

Exploiting the potential for dairy development

Although at low level of development at present, the highland and peri-urban dairy sector in Ethiopia has a huge potential for economic growth and support of farmer livelihoods. Encouraged by the fast growing demand for dairy products[68] around urban centres, growing private sector investment (especially agro-industry), and promotion of smallholder dairy production, the dairy sector appears to be moving towards a rapid transformation. This indicates the relative significance of indigenous stock of cows for dairy production in the country. Despite the general assessment that local cows have low level of production and a limited potential for improvement, they still contribute most of the national dairy production. Furthermore a growing body of evidence shows that there is indeed a large variation in milk production of indigenous cows (Hegde, 2002; Ababu Dekeba, 2002; Zewdu Wuletaw, 2004; Dereje Tadesse, 2005), and that the scope for improvement is tremendous provided concerted effort is exerted to improve access to market, input (feed, health care) supply and level of management. As observed in Kenya over several years, and in Ethiopia in recent years, milk collection and selling groups in the form of milk groups and milk marketing co-operatives increase the participation of poor smallholder farmers in fluid milk markets (Holloway et al, 2000; Azage Tegegne et al., 2003).

Crossbred and pure exotic dairy herds are also needed to boost milk production in the growing private commercial farming communities as well as in the expanding peri-urban market-oriented smallholder dairy farms with conducive linkages to dairy markets. Therefore, proper integration of these grade dairy herds to the dairy sector is imperative for dairy development in the country. This can be achieved through:

[68] According to Ahmed et al. (2003), milk production during the 1990s expanded at an annual rate of 3% compared to about 1.63% during the preceding three decades. Most (60%) of the growth in milk production was, however, due to the increase in herd size, and only one-quarter was due to increase in productivity per animal resulting from technological change.

- promoting market-oriented smallholder dairy development around major urban centres, also to serve as incentive/ encouragement for the surrounding smallholder farmers, through developing essential infrastructure and delivery of technical advice;
- adequate and timely delivery of the AI service and animal health services to the smallholder farmers possibly also through the involvement of the private sector;
- strong (government) support to the small but growing feed processing industry;
- encouraging private investment into dairy processing and marketing around major urban centres, and
- encouraging the consumption of milk and milk products in the domestic market, for instance in the form of school milk feeding schemes.

Because of the complexity and interdependence of technical and socio-economic factors in dairy development, there is a need to focus interventions coherently and ensure that the interventions address both the technological gaps and marketing problems. As observed in Kenya, dairy production responds positively if producer price incentives are in place and input markets are allowed to operate freely (Ahmed et al., 2003).

Exploring and utilizing market opportunities for livestock products

Owing to the low income of the majority of the population, the livestock contribute a smaller portion of the daily calorie need. Increase in purchasing power of the population is one of the prerequisites for the development of the livestock sector. At the same time, efforts need to be made to facilitate export markets for livestock products to help the producers and the national economy by compensating the low domestic demand in the short to medium-term. The difficulty that pastoralist communities face in selling their livestock (instability and risk in cross

border trades, lack of market infrastructure and facilities, etc) deserves special attention.

10.2.8.2 Diversification and investment in non-traditional export commodities

Ethiopia is dependent on limited export commodities like coffee, hides and skin, pulses and oil crops. While it is vital to strengthen the performance of the existing export commodities, it is also necessary that opportunities for new products be explored. A study by Xinshen Diao et al. (2004) on the growth options for Ethiopian agriculture indicates that a combination of investments in cereals, non-traditional export crops, and agricultural marketing would be most effective in bringing about higher agricultural growth (4.7 percent annually) and reducing national poverty rates to 23.2 percent by 2015, almost half of its current level**.** Another study by Margaret et al. (2003) concludes that a growing demand for niche markets such as organic coffee beans gives Ethiopia an opportunity to increase export. It is known that Ethiopia's climatic diversity provides an ideal environment for the cultivation of various exportable horticultural crops. In order to promote export it also needs to meet higher quality standards in production, packaging and handling.

In Ethiopia industrial crops like sugarcane are known to have the highest productivity per hectare of land. Mechanisms should be developed to engage small producers in out growers' schemes to improve their management, productivity and income.

10.2.8.3 Peri-urban and urban agriculture can have a great potential role

Given the important economic role of food supply to the market and the producing households themselves, significant employment and income generation, peri-urban and urban agriculture in Ethiopia deserves adequate policy attention. This sub-sector is facing challenges including access to suitable and sufficient land and water resources, livestock feed, environmental hazards from urban household and industrial wastes, food safety risks and the like. Due to lack of proper urban land us plans that accounts for the growing demand of peri-urban urban agriculture, the system is increasingly facing competition for the scare land and water resources. Lack of proper household and industrial waste disposal mechanisms in urban areas causes environmental pollution and food safety problems.

Some of the measures to promote the potential role of peri-urban and urban agriculture could include giving adequate thought while developing urban master plans. Finding a solution to the problems of urban waste disposal positively contributes to urban agriculture and food hygiene. Development and delineation of green areas in urban zones will not only support the different types of intensive urban agriculture but also promote parks and gardens for recreation. Currently, in almost all urban and peri-urban areas water for irrigated vegetable production comes from the heavily polluted rivers and springs due to the uncontrolled waste disposals. Access to clean water would promote vegetable farming and public health in urban areas. The development of agro-processing and recognition of the role of peri-urban and urban agriculture by such enterprises would be an incentive for the intensification and greater role of peri-urban and urban agriculture in serving the growing food and raw material need in urban economies.

10.2.8.4 Development of water resource for agricultural transformation

To overcome the persistent and longstanding crisis of Ethiopian agriculture, it will require efforts of generations the foundation of which has to be laid probably by the present generation. Developing and exploiting the massive water resources is one of the main ingredients for agricultural transformation. The efforts made so far to develop and utilize the water resources are far from being satisfactory. The use of irrigation facilities to intensify agricultural production is insignificant. There is an urgent need for a sound planning and implementation framework to develop and exploit the water resources of the country. The river basin planning and implementation framework is the most suitable approach to bring about agricultural transformation. Some of the important activities that could be considered to fully exploit the water resource potential include:

a) Formulation of appropriate policies and strategies

There is an overall neglect of the importance of water resources in the comprehensive development framework of the country. The existing National Water Resources Management Policy and National Water Sector Strategy are not satisfactory in guiding interventions in the water sector. The role of irrigation could be promoted if appropriate irrigation sub-sector policies and strategies are put in place. Some of the policy interventions required in this sector include:

a) The water sector policy and strategy need to incorporate short and medium-term approaches to institutionalize river basin organizations for each of the river basins of the country urgently.
b) The actual implementation of the Water Resources Management Policy and Water Sector Strategy needs appropriate institutional and legal framework so as to implement programs, projects and interventions of all scales of irrigation development.

c) The policy and strategy with regard to irrigation development need to address the proper handling of trans-borders river issues.

b) Developing intensive agriculture within a river basin framework

Agricultural development should be based on reliable resource base, or on a resource base whose associated risk on production is fairly known and quantified. The rural areas with fertile soil and most of all reasonably assured rainfall can be developed as a rain-fed system with properly designed extension service. However, the most reliable mode of production would be that of irrigation, which necessitates capital investment and proper management to get the maximum yield per unit of water and land. One of the approaches to transform Ethiopian agriculture is, therefore, to intensively use land and water resources. The specific activities to be undertaken to intensify agricultural production should include: a) delineating the area under rained and irrigation system within the river basin/ valley framework; b) adopting, improving and implementing irrigation technology that would have a high return on investment; c) preparing a comprehensive rain-fed and irrigated extension packages with definite objectives and targets. The already prepared master plans of the different river basins could constitute an important starting point to undertake such interventions.

The most important tool in this exercise is the planning process, which should consider the inventory of natural resource base, and diagnosis of constraints of rain-fed and irrigated intensive production in a diversified manner. This can be conveniently framed within a valley/basin system, which is the most logical and appropriate method for natural resource analysis. Thus, the river basin/valley study concept should not be limited to identifying possible intervention areas in agriculture only but should also be able to serve as a tool to understand and direct integrated economic and social activities.

c) Diversified and integrated rural economy

The agricultural production system in the highlands of Ethiopia is not diversified beyond the mix of crops and livestock. To foster the diversification and integration of activities the resource base needs to be identified, diagnosed and articulated within a river basin framework so as to be able to maximize resource utilization. The complete diversification of the rural economy, as has been witnessed from the experience of South Asian countries, requires a relentless effort of many years supported by policy and strategy (Alemayehu, 1999). Such diversification and integration of the rural economy need to be initially started at household level. The water resources centered agricultural activities are the core activities of the diversification exercise.

The diversification and integration of the rural economy demands a very well thought-out arrangement of infrastructures that support irrigated agriculture. These include electricity, telecommunication, road network, education, health and water supply. All these infrastructures need to be studied and planned within a basin framework. In cases where there are already defined regional/national sector development programs in energy, road, educational, health and water supply etc, the valley/basin development framework needs to asses, sort out and analyze these in order to direct the sector programs so as to support the valley development interventions.

d) Appropriate institutions for irrigation development

The effective implementation of programs and projects emanating from sound policies and strategies requires proper institutional and operational arrangements. Currently irrigation has not received due attention. The existing water resource and agricultural institution lack the requisite planning, management and operational arrangement as far as water resources

development is concerned. One important intervention is establishing an irrigation institutions with the duty of mainly project formulation, implementation (own or contract out using partnership with the private sector), operation, and extension service. Under the present federal arrangement in Ethiopia, as far as the irrigation sub sector is concerned, it will have two level operations. The tasks at federal level are mainly related with policy, inter-region and inter-basin projects planning and regulation while at regional level it is mainly operational mandate. The issue involves placing appropriate institutions that are well organized in terms of staffing, budget, vision and goals. Moreover, the institutional environment should be stable, and conducive for long-term effect.

e) Appropriate research and technology choice

From the point of view of technology, the irrigated agriculture in Ethiopia could be categorized into traditional, and modern (community-owned, private-owned, and public-owned). The traditional irrigation system is mainly characterized by enormous water loss, uncontrolled water application, low crop productivity, etc. The modern ones are better in relative terms but still have less than 45 percent irrigation efficiency, particularly those that are under surface irrigation. Today there are very few but not exceeding an aggregate of some 3000 ha under low volume (drip and sprinkler) modern irrigation systems. This could be the promising technology choice in terms of water management, fertilizer application, crop protection and increasing yield.

The technology choice is mainly dictated by the cropping pattern, the level of sophistication and the operational capacity of end users, the optimum combination of efficiency in water use and cost effective operation and maintenance. Apart from the formal higher learning institutions of the country, to date there is no center for irrigation technology choice and adaptation. This has immensely contributed to the stagnation and backwardness of irrigation

technology used in the country. Therefore, the establishment of a center for technology choice and adaptation is fundamental to the growth of irrigation development in the county.

The utilization of new technologies, farming practices and appropriate irrigation development would greatly benefit from adoptive research. As water is becoming more critical for agricultural production, it has also more competing use and therefore efficiency of water use will be of prime concern as irrigation development increases.

f) Financing of irrigation/resource mobilisation

The issue of financing irrigation development is critical since irrigation is capital intensive depending on the technology chosen and the scale of intervention. The shining success in food self sufficiency of India and China, the two most populous nations in the world, stems mainly from their use of river basin /valley frame work of planning and implementation together with appropriate technology of irrigation including massive mobilization of their people and indigenous resources (both finance and human resource). Considering the Ethiopian context, different financing/implementation strategies can be contemplated:

g) Small Scale irrigation schemes (less than 200ha) for smallholders.

These refer mainly to the scenario of the highland parts of Ethiopian, whereby an individual farmer owns a plot of land not more than 0.5 ha. Irrigation development on such holding size calls for a kind of cooperative arrangement, as the water source also dictates grouping of farmers to mobilize their labor resource. An example could be the case of the micro-dams based irrigation schemes of Amhara and Tigray Regional states. This scheme uses massive mobilization of community labor and despite its

technical and institutional challenges, is probably the best arrangement for smallholder irrigation development (UNDP/ECA, 1999). It inculcates the spirit of self-reliance and requires limited external resource support to the community; it could be sustainable and forge the determination of the beneficiaries; it can highly influence riparian countries towards cooperation than contempt and sabotage.

h) Medium scale irrigation schemes (200ha -3000ha) for smallholders

These are typically the case in the lowlands of Ethiopia where the irrigation potential is immense. The development of modern irrigation schemes in this category is carried out mainly by public sector/state farms and few private sector entrepreneurs (local and foreign). The prospect to develop this sector depends on the support given by the government in terms of availing the necessary service infrastructures such as roads, means of communication, energy, and headworks of the irrigation network itself, etc. Special programs have to be drawn to provide credit/ fund for developing irrigable land as well as incentives in the form of price protection, input provision at a reasonable rate. A typical case could be the Alwero dam and Gode Weir meant to develop 20,000 hectares of land but have not been used to date (except some 1000 ha of land developed at Gode). The existing irrigation infrastructure of these projects could be used by a number of individuals, particularly those who can form companies to jointly run the farms. This in fact would have served to create a test ground and nucleus for modern and commercial farms owned and run by citizens.

i) Large-scale irrigation schemes (more than 3000 ha)

This will remain to be by and large a public sector intervention until such time that the private sector grows to handle such undertakings. However, the

government's role could be the facilitation of the entry of the private sector into this category by way of providing incentives and protection.

j) Specialized small scale

The intensive farms on specialized and highly commercial crops such as roses, cut flowers, spices etc., which use green houses and most advanced technologies have appealing features for domestic and foreign private sector investors mainly due to their regular cash flow, short pay back period despite their huge investment outlay. This sector needs a large support in terms of credit provision and marketing infrastructure. The efforts being made by the government through the Development Bank of Ethiopia is commendable in this regard although the process of obtaining this credit facility is highly inconsistent, time taking and lacks a proper technical evaluation of the investment magnitude.

k) Promoting rural entrepreneurship and private sector participation

The rural economy needs to be diversified from the existing mono-tuned crop-livestock production system into other economic activities that are either agricultural-based or trade, services and rural industry based. The introduction of irrigation yields the opportunity for diversified business activities. As income increases due to surplus production using irrigation, there will be increased demand for non - farm products and services. Hence, the private sector will be involved to handle these business activities. As these activities require financial and institutional support, the role of the government will be essential in promoting the rural business environment, facilitating or availing capital in the form of credit and technical guide in running the businesses. Rural entrepreneurship and private sector participation need to be encouraged. The nature and profitability of the activities would have to be studied within a river basin framework. This could

be the main direction towards reducing unemployment by engaging particularly the young group of the rural population in activities that would serve and promote the rural economy.

l) Other cross-cutting issues to support development of irrigated agricultural

The agricultural and rural economic diversification and integration need interactions among different sectors at various levels. Within the basin development framework, horizontal and vertical linkage among sectors – water, energy, agriculture, natural resource, etc, have to be firmly established. Thus, a coordinated planning that takes care of the overall linkage and integration among the varied economic activities is a necessity. This will ascertain sustainable development and also ensure higher economic returns. The following are the important cross-sectoral issues that need immediate intervention:

m) Contract/lease/concession of land

The productivity of the agriculture sector is believed to increase with the use of irrigation, which needs capital and skill for its management. The availability of capital and know-how is currently an issue to be solved. One of the prescribed solutions is to invite people with the necessary expertise and capital resources to invest in the sector. Since land is a major resource in the country, its judicial development for the benefit of the people is of paramount importance. The transfer of land use right for small, medium and large-scale irrigation developments needs an efficient and un-bureaucratic arrangement.

The use right of land should cover renting/concession to another party for a defined period of time on a formal contractual arrangement. With the increased rural economic diversification, farmers may opt to rent their land and engage in

other more rewarding business activity. This will increase farmers income, thereby avoiding the fragmentation of land and enhancing consolidation, which also has a favorable effect on large-scale farming and increased production.

n) Employment and rural income generation scheme

The experience of Asian countries reveals that the rural economic diversification within the basin framework is one of the key entry points to tackle the problem of unemployment. The use of irrigation provides an opportunity to boost production and, hence, increased income. This in turn brings about on -farm and off- farm business activities such as trade and services to satisfy the increased demand for non-farm products. This rural business will open the gate for employment and income generation. Therefore, the agriculture based economic diversification needs to be supported with the aim of employment generation. Possible employment generation activities need to be identified within the basin development framework based on the available resource and market situation.

o) Promoting planned migration

The population support capacity (PSC) of most highland areas of the country is saturated and has reached its limit. If natural ecology has to be rehabilitated and environmental degradation has to be reversed, the population density has to be decreased through a planned migration scheme. However, the social, financial, economic and technical viabilities of such intervention schemes must be evaluated first.

Of particular significance in this regard is the promotion of large and medium-scale irrigation schemes in the lowland areas of the country using water from the major rivers of the country that traverse the areas in their long journey to the neighboring countries. As these areas have very low population densities,

the development of irrigation in these areas will not be able to meet labor requirements from the indigenous people. It can only meet the demand by employing labor from the neighboring highlands. In addition, the development of irrigation in these areas will have an additional benefit of promoting resettlement of people from the highly populated areas.

p) Capacity building and mass education

Well-thought out and designed capacity building and education program is necessary for farmers, rural entrepreneurs, project execution agency officers and public administrators. This is required towards the creation of human resource base to perform, manage and direct the various water-centered agricultural activities. Tradition, attitude and other factors that impede the hard working spirit of the people need to be studied, identified and appropriate measures be taken to stump them out. Mass education can help as an important instrument in this respect.

The present efforts made by the water sector to train artisans, low and medium level technicians by running vocational schools in four administrative regions need to be emulated in other regions as well. Moreover similar efforts have to be expanded to train farmers on irrigation technologies and improved crop/animal husbandry. The existing community skill training centers (and farmers training centers) of the rural area could be used as the nucleus for water-centered basic training. Details of training objective, curriculum, etc. should be worked out based on the development realm of each basin in particular and the region in general.

q) Trans-border dimension in water resource development and use

The total annual surface runoff from the 12 river basins of Ethiopia is estimated at 123 billion cubic meter, and 75 percent of this volume drains to neighboring countries (MWR, 2001). This resource, at the moment is more a

liability than an asset for the country. The conversion of this liability into an asset seeks a proper understanding and meticulous planning for its exploitation. Despite the extraordinary natural endowments of these trans-border basins, the people in these basins are facing poverty, and severe environmental degradations.

Cognizant of these potentials and challenges, proper institutions, policies and planning need to be put in place, in order to formulate and secure cooperation from riparian countries. Self-owned development programs and projects in irrigation, hydropower, and soil conservation are much desired with all possible cooperation agreements. By virtue of location, Ethiopia has the largest potential for hydropower generation compared to the neighboring riparian countries. If this resource is properly developed and utilized, it could be the source of a significant amount of income to the national economy by exporting power to the needy neighboring countries. The irrigation potential to ensure food self-sufficiency is also enormous.

Hence, a comprehensive and all-inclusive planning and implementation is long overdue. This would be greatly facilitated if involvement of the civil societies in a form of “think tank“ or “council on trans-border rivers” is encouraged. Such a group would serve the purpose of digesting alternative policy and strategic measures, and consult the government body on interventions and implementation arrangements of programs and projects in the riparian river basins.

10.2.8.5 Enhancing better land and natural resource conservation

Promoting an effective natural resource management, conservation and use is indispensable for agricultural transformation. This is to say that special attention should be given to and concerted effort must be made for

environmental rehabilitation, protection and development as well as appropriate use of land and other natural resources. Action-oriented support in terms of policy, finance and investment are required towards the development of unused/underused or misused resources like agricultural lands and water both in highland and lowland areas. For instance, investments on large- and medium-scale irrigation; forest development and protection of natural resources through land closure and other technical and non-technical interventions, and; forage and rangeland development in lowland pastoral areas that will help bring about sustainable livestock development and improved livelihood for pastoralists.

As mentioned time and again, Ethiopia is endowed with a considerable amount of natural resources –potentially huge arable land with good soils, diverse range of forests, biodiversity and climatic conditions suitable for agricultural production. If the land, water and forest resources of the country are conserved and properly utilised, combined with application of modern inputs (e.g., improved varieties, fertilizer, irrigation and mechanization), Ethiopia can double or even quadruple its agricultural production. The country has so far utilised only about 8.5 million hectares out of the potentially arable area of 112 million ha (GoE, 1995). The total potentially irrigable land is estimated at 3.5 million ha, out of which only about 4 percent (161,000 ha) have been developed, mostly in the Awash River Basin. The Blue Nile, Baro-Akobo and Omo-Gibe river basins have huge irrigable land potential but those resources have not yet been touched. This suggests that Ethiopia surely has much more land that can be brought under cultivation for increased agricultural production. In addition to the area expansion option, it is also possible to develop and rehabilitate the existing agricultural land through conservation-based farming using increased vegetative cover of the landscape for soil and water conservation. Water harvesting and supplementary irrigation would help to cope up with the vagaries of climate.

The country's diversities in agro-climatic conditions offer potentials to grow different crops in different parts at different times, thus allowing multiple harvesting throughout the year. The temperate climate in much of the Ethiopian highlands presents huge potential for expanded production of high value fruit and vegetable crops that are not only important for household income and nutrition security but also for export trade and foreign exchange earnings. This potential has not yet been fully utilized. Effective use of agro-climatic resources, however, calls for matching agricultural technologies (e.g., crop varieties, fertilizer, machinery) and land use practices (grazing, cropping, forest, nature reserve, etc) with agro-ecological zone conditions.

In order to reduce environmental and natural resources problems and enable sustainable development and utilization in Ethiopia the following policy interventions need urgent attention:

a) Conservation-based farming

Conservation-based farming is a farming approach which is characterized by a more efficient use of the soil, water, forest and biological resources and natural processes (e.g., nutrient flows and cycles) through improved soil-water-plant nutrient management. Appropriate policy measures are needed to ensure that rural development is based on soil conservation, afforestation and appropriate watershed management. Soil conservation needs are much wider than just application of conservation structures. They require a general policy by which soil conservation becomes integrated within the wider land se and rural development efforts. The major cause of the alarming rate of soil erosion in Ethiopia is the massive removal of vegetative cover through overgrazing and rapid deforestation coupled with inappropriate cultivation practices. The key strategy should, therefore, be to maintain permanent vegetative cover on the land through perennial cropping, use of green manure and tree-based systems (e.g., afforestation and agro-forestry).

Integrated nutrient management using cost effective combinations of organic/inorganic sources of plant nutrients (i.e., mineral fertilizer combined with organic manures, compost, N-fixing legumes and recycling of crop residues) coupled with better moisture management is a key component of conservation-based farming.

Agro-forestry – the practice of integrating trees and shrubs into the agricultural landscape can be an important pathway to escape environmental degradation, low agricultural productivity and poverty. It is all about the enormous range of useful trees for soil conservation and fertility enhancement, livestock fodder, high value fruits for nutrition and income, fuel wood and timber production and many other uses. Trees on-farm increase soil fertility through biological nitrogen fixation and improve crop yields; provide food for people and fodder for animals; at the same time safeguarding the environment. The World Agro-forestry Centre (ICRAF) has identified a number of agro-forestry systems and practices that can significantly improve soil health (e.g., fertiliser tree systems), agricultural productivity (e.g., conservation hedges and fodder trees) and household income (high value fruit and medicinal trees).

Various agro-forestry technologies are finding enormous application in many parts of the tropical world lifting many people out of poverty and mitigating declining agricultural productivity. Such technologies include improved fallows or mixed planting of fast growing legume shrubs to restore soil fertility. Establishment of hedgerows of multipurpose trees to control soil erosion at the same time provides fuel wood and fodder and multi-storey home gardens consisting of an assemblage of multi-purpose trees and shrubs forming vertical canopy strata or tree layers. The southern and south-western highlands have had a traditional system of land use where perennial crops dominate. These systems are relatively ecologically stable as vegetative cover is always high. The greater parts of north-central highlands of Ethiopia

require an agro-forestry-based land use system to conserve the soil, provide much needed fodder and fuel wood. The challenge remains land/tree tenure insecurity, free range grazing of animals and land shortages.

b) Reforestation

Deforestation is followed by a chain of events such as soil erosion and consequent loss of soil fertility, decline in biodiversity, loss of water bodies and loss of habitat for wild animals. Sustainable management of the existing high forests, extensive tree planting programme for protective and community plantations and incorporation of agro-forestry technologies would go a long way to reverse the adverse effects of deforestation and land degradation.

With favourable climatic and soil conditions in the country, it should be possible to expand, protect and sustainably utilise forest resources of the country, which can significantly contribute to economic growth. About 40 percent of the land area of the country receives sufficient rainfall to support the development of closed forests (EPA, 2002). Much of the remaining 60 percent of the land can also support diverse range of woodlands. There are already considerable experience and research results in selecting and planting fast-growing trees to provide both fuel wood and timber. The state's capacity to establish and operate commercial forests has been rather weak while private sector's involvement in the sector is limited mainly due to land tenure insecurity. Private sector involvement and establishment of private forests is particularly important to boost the economic contribution of forest resources.

It is also important to put in place a more realistic forest policy and legislation to conserve, develop and sustainably utilise forest resources. A key policy challenge is finding a strategy for conservation and sustainable use of forests (i.e., conservation of resources while at the same time meeting the need of the

local communities) in today's context of resource demand and competition. The existing protectionist forest policy did not help in relieving the pressure from forests. Indeed, state ownership and control of natural forests excluded communities from use and management of forests, which led to prevalence of illegal tree felling, encroachment for grazing and cultivation. In today's world of decentralisation, it is imperative to take participatory forest management approach as a strategic direction in partnership with the local communities. This again requires redefinition of the roles and responsibilities of local communities and the government in forest management.

Talking about forest conservation, it is imperative to emphasize the need for alternative sources of household energy (fuel wood, charcoal) in order to minimize deforestation. The ever-increasing fuel wood crisis is becoming an economic, social, and environmental problem in the country. Thus, there is an urgent need to develop and disseminate appropriate alternative technologies that can reduce, if not substitute, biomass energy requirements. These can include use of solar energy, micro-hydropower development for rural electrification, and wood saving technologies for improving energy efficiency.

c) The need for tenure security

In addition to other economy wide policies appropriate resource tenure and rights policies are imperative for agricultural and rural transformation. The land question is a long standing and unresolved issue in Ethiopia. It is often argued that absence of land and tree tenure security is a major disincentive for investment in long-term improvement of the land (e.g., perennial cropping, agro-forestry based land use). Although it is said that individual farmers have been given rights to the improvements they bring on their land by their labour or capital, uncertainty over land rights is still prevailing in Ethiopia. Because trees have long gestation or rotation period, the decision to plant trees is greatly influenced by farmers' perceptions of risks and secured access to land.

Many studies have documented that there is a clear link between land tenure security and land-related investments. For instance, the study by Deininger et al. (2003) showed that not only are the land rights in Ethiopia highly insecure but also that higher tenure security and transferability could enhance investment and agricultural productivity. According to the study increasing tenure security can have a clear impact on agricultural performance. Through its impact on investment in soil and water conservation terraces alone, abolition of further land redistribution is estimated to increase annual output by about 1.5 percent. Adding transferability of land rights would, according to estimates of the study, increase output by an additional 4.4 percent. The findings suggest that improving security of land ownership and transferability of land can have a significant impact on overall output and household welfare. Many people argue that the land policy of the current government aggravates the problems of deforestation and soil degradation.

Therefore, sound and amicable land policy needs to be contemplated to address the issue of land tenure security. Devising appropriate and suitable land tenure systems under the prevailing varying circumstances (crop farming, pastoral, customary tenure and other common resources holding systems) which will create conducive atmosphere for investment in land, better management and utilization of land resources deserves special attention.

d) The need for land use policy

There is a lack of land use policy in Ethiopia that prohibits farmers from using marginal lands that are not suitable for farming. Land use policy that regulates the allocation of land to the appropriate activities (e.g., crop cultivation, grazing, forests, etc) is urgently needed to minimize and avert current destructive and abusive use of land. The current land use system leads to serous problems of overgrazing, deforestation and cultivation of steep slopes (even slopes more than 60 percent are cultivated).

In order to realise the full productive potential of land, sustainable land use strategy must be designed according to the land capability classification. Land suitability assessment provides growers and decision makers with information on actual and potential suitability of land for a specific use. The basic environmental factors that determine land capability are landforms, soil conditions and the climate (rainfall, temperature and the length of growing period). Land that is not suitable for cereal farming such as areas with shallow and stony soils and steep slopes with erosion hazard should not be ploughed; should rather be left for afforestation and watershed protection. Lands of over 45 percent slope should be taken out of cropping and such watersheds should be put under forests or closed for regeneration of natural vegetation. If farmers are forced to cultivate such lands, strict regulations should be enacted so that farmers employ durable soil and water conservation measures that do not collapse easily under such steep slope conditions.

Free range grazing is believed to be the underlying cause of soil erosion and deforestation as it causes massive removal of the vegetative cover of the land, thus aggravating the problem of erosion. Thus, controlled grazing is recommended but this again requires reducing the number of livestock population and devising more intensive methods of fodder production. The recent decision taken by the Tigray Regional government to practice zero grazing in at least part of the region is commendable and would generate a lot of practical lessons for other regions.

e) The need for on-farm agro-diversity conservation

On-farm conservation has recently attracted enormous attention. It requires crediting farmers and linking conservation with sustainable utilization of components of agro-biodiversity. Policy can, for instance, start with creating awareness and rewarding farmers who have maintained unique traditional

varieties of crops. As long as farmers' contribution to agro-diversity is not valued and as long as crop genetic resources are not valued for their own sake, the level of crop diversity produced mainly by farmers will be negatively correlated to the over-all agricultural development in a specific region, leading to an uncontrolled loss of genetic resources. There is a need for policy instruments and strategies that protect the rights of the farmers and mechanisms for sharing the benefits accrued from biodiversity resources. The experience so far shows that strategies that ignore farming community in bio-diversity conservation and management are bound to fail. This has been witnessed in many of the protected areas of the country that relay on land use segregation from which agriculture is excluded resulting in competition and conflict.

Government should have long-term development vision and program for potential areas and vital resources of the country. Moreover, finance and subsidized credit should be made available for the development of these strategic resources, targeted at high potential areas and strategic crops.

10.2.9 Promoting appropriate land consolidation measures

In the long-term, agricultural transformation needs changes in farm structure. The prevailing excessive dominance of the smallholder peasant sector in Ethiopia is not a healthy situation. The emergence of viable farm sizes is one of the prerequisites for agricultural growth. Farm size has significant effects on technology adoption and utilization capacity. Currently, the existence of millions of small and scattered farms has posed a significant challenge not only to production, but also to the marketing systems. The CSA Agricultural Enumeration survey data of 2001/2002 shows that there are over 27 million parcels of land under annual/temporary crops and over 7.4 million under permanent crops. The parcels have average sizes of 0.30 hectare for annual

cropping system and about 0.1 hectare for permanent crops. Appropriate mechanisms of land consolidation (e.g. through group farming) should be sought for effective improved technology utilization and improved productivity levels and agricultural growth.

The role of rural land markets in enhancing agricultural transformation cannot be undermined. A recent study explored the role of rural land markets in enhancing agricultural productivity in Ethiopia (Deininger et. al, 2003). The study concluded that markets seem to transfer land from large and less efficient to small and relatively more efficient producers as predicted by theory. The authors argue that their results strongly support the hypothesis that rental transfer of land from households with low agricultural ability and relatively abundant land endowments to those with high agricultural ability and scarce endowments. The policy implication of such a study is that improving tenure security and facilitating the functions of land rental markets would contribute to better resource allocation and productivity impacts.

10.2.10 Alternative household rural energy and agricultural transformation

Development and promotion of alternative rural energy sources will have significant impact on agricultural transformation for three basic reasons. Alternative energy source will release the current use of crop residues and cow dung for firewood to be used for soil fertilization. This could be an affordable and a sustainable means of soil fertilization for small farmers. The second aspect relates to the use of alterative energy sources for the development of small–scale agro-processing enterprises. Access to improved energy sources will improve labour productivity in farming and processing activities. Thirdly, alternative energy source will contribute to the reduction of the problem of deforestation; promote environmental rehabilitation and the maintenance of a healthy agro-ecosystem. Wind energy, biogas, hydropower,

and solar energy technologies could be thought as alternative and sustainable energy sources.

10.3 Addressing the demand side constraints

The agricultural sector is constrained not only by supply side problems that inhibit agricultural productivity but also with demand side problems. The transformation of the agricultural sector and indeed the whole economy, therefore, calls for several interventions on the demand side. This section discusses some of the necessary incentive mechanisms to enhance the transformation process and the enabling environment that should be put in place for the agricultural transformation. Some of the demand side issues that need urgent attention include pricing and marketing issues, employment issues as well as urbanization and rural urban linkage issues which are as important as improving productivity and production of the agricultural sector.

10.3.1 Improving agricultural producers' price

Agricultural products are often susceptible to temporal and spatial fluctuations in prices. Improving producers' prices so that there would be adequate incentive to improve product quantity and quality through the development of an efficient agricultural marketing and information system is a critical factor for agricultural transformation. Agricultural producers need to receive fair price for their products in order to be motivated to improve the quantity and quality of their agricultural production. This will not only encourage farmers to adopt yield-increasing technologies but it will also allow them to use improved technologies that will lead to agricultural growth in a sustainable manner.

Among the possible measures to improve producers' price are price stabilization measures, establishing a warehouse system, availing cash and facilitating access to it through credits for producers to distribute the time of sells their product in relation to price regimes, etc. The introduction of a system for grain storage under what is known as Warehouse Receipts System (WRS) recently by the government is a step in the right direction. The warehouse issues a transferable document (warehouse receipt) against stock deposited, and this may be used as security for a loan, or transferred to a buyer of the underlying goods. It helps to regulate the fluctuations of product prices, reduces post-harvest loses and facilitates grain market system.

Other measures to improve the producers' price include more investment in infrastructure and communication to reduce transaction costs and price risks to producers and traders; local purchase of food aid programs; monitoring of food aid needs so that disruptive effects on local product markets would be minimized; and support for the organization and dissemination of market information.

10.3.2 Improving market access

Availability of infrastructure is a critical factor for market access. Investment on infrastructure and communication is vital in order to reduce the cost of farm inputs and farm outputs. An efficient transport and communication system would also help fast and timely movement of farm inputs and products. In addition to investment in hardware infrastructure, adequate attention needs to be given to proper utilization of the resources by developing proper regulatory frameworks.

The Ethiopian government has made some notable investments on infrastructure, especially on road development. High potential areas where the return from such investments will have significant developmental effects

should be given priority. The existing road development programs should be re-evaluated in terms of their impact on agricultural development and opening up other potential development areas. Despite significant investment in major highways, rural areas in many places still suffer from lack of transport facilities and are forced to incur unfair costs of transportation for goods and services. A mechanism should be developed to support and encourage private sector vehicle owners to provide transportation services to more rural areas. In this respect, some kind of subsidy and development of rural transport fund could be created. Creation of more rural towns and market centres would also help in creating market access and opening up for competition. This would also facilitate access to consumer goods and encourage more market integration for agricultural production activities.

10.3.3 Promoting rural-urban linkages and supporting the development of the non-farm sector

Efforts made to transform the Ethiopian agriculture will not have a lasting effect without equal attention being given to the development of the non-agricultural economic sectors, especially the agro-processing industries. Giving due emphasis to the equally vital role of urbanization, the development of non-farm economic sectors, and encouraging strong linkages among farm and non-farm sectors is critical for the success of any agricultural transformation process. Urbanization and growth in the non-farm sectors serves as an input for agricultural development by providing market outlets for agricultural products and by providing cheap farm inputs and services needed by the farm sector. The positive contribution of encouraging mobility of labor and urban-rural migration must also be appreciated. The central issue while discussing the need for a strong rural-urban linkage is a central issue since it will have useful implications on the economy-wide improvement of employment and income. It should be emphasized that the

extent of effective domestic demand for farm products is a major determinant to agricultural transformation.

The agricultural development strategy has heavily emphasized interventions on the supply side only with minimal attention to the demand side problems. It is only when farmers get more access to low cost improved farm inputs from the manufacturing and service sectors that they will be motivated to produce more products of higher quality. On the other hand, farmers will sustainably invest in better productive technologies when there are buyers with sustainable and high purchasing power and demand for farm products, both at industry and household levels. Such relationships signify the need for economy wide investment in order to generate more employment opportunities and improve the purchasing power of the consumer.

10.4 Introducing supportive measures and creating enabling environment

10.4.1 Empowering the rural people as actors of rural transformation

Many interventions in the Ethiopian agriculture and rural development efforts so far consider the rural community as receivers of prescriptions from above. However, the achievements realized to date have been very low despite several interventions. The persistent failures of many agricultural and rural and development interventions in Ethiopia largely stem from the inability to transmit better development ideas, technology and practices to farmers in participatory and accountable manner. There are no farmers' organizations (e.g. unions) at the moment in Ethiopia that would advocate for farmers' interest and make their voices heard. It is necessary that farmers should be empowered to participate in the decisions that affect their lives. They should have an organization that promotes their interest. Their real participations in the decision

making exercise will ensure sustainability of the intervention, inculcate a sense of ownership, and improve the efficacy of the development interventions.

Grassroots farmers' organizations offer an effective channel for extension contact with large numbers of farmers, as well as for creation of opportunities for participatory interaction between farmers and organizations involved in extension services. Feedback on farmers' needs, production problems, and results of technology adoption activities from such groups will be an increasingly important consideration (Burton et al, 1997). Efforts should be made to facilitate the formation of self-help groups, associations, unions, societies, cooperatives, etc.

Organizational support to improve their bargaining capacity and to enhance their participation in local problem identification and devising intervention measures is imperative. Hence, efforts should be made to create capable and responsible organizations, efficient and appropriate institutions (including marketing systems) that provide services for agricultural and rural development. Empowerment of farmers (men and women) and their free and genuine participation in development endeavours must be at the centre of the new way of thinking. There can not be more dedicated organization than farmers' own organizations/unions that can work to defend the rights of farmers. Support should be given towards establishing and strengthening farmers' union.

10.4.2 Good governance and institutional stability

Political stability and good governance, and institutional stability are important prerequisites for economic and social development in any country. More should be done to improve the working efficiency and the stability of institutions. Good governance requires accountability, transparency and participation of farmers and pastoralists as partners that could make a

rational decision. It also emphasises the recognition of their needs and promoting a transparent development agenda with them.

10.4.3 Promoting the development of civil society organizations and the private sector

Civil society organizations and the private sector are important partners for agricultural and rural development. Private sector can play an important role in agricultural and rural transformation. Hence, one of the strategies to support agricultural transformation should be to promote rural institutions and business associations for effective participation. Room should be given for a decentralized, market-led and demand-driven service delivery system. Prompting the sense of partnership and collaboration between civil society organizations, the state and the private sector is essential. The role of the government should be focused on interventions that need public involvement including the formulation and enforcement of the necessary regulatory measures, investment in infrastructure, education and research.

Experience elsewhere shows that there is a growing involvement of the private sector in agricultural research and extension. The private sector could serve as an important partner in technology generation and transfer. It can be helpful in the delivery of the services and in facilitating access to seed and agrochemical, and in advising farmers on their use, etc. It is necessary to provide the private sector some space and recognize its role in effecting the agricultural development process.

Civil society organizations are important links between the community and the government. NGOs and CSOs should lobby and advocate for the rights of the poor and powerless smallholder farmers and pastoralists. They can contribute a lot in creating awareness, and advocating for justice in the marketing and distribution systems. Establishing and enforcing law and order that govern the market system is not only vital for promoting the performance

of markets but is also good to ensure food safety, and to protect the welfare of producers and consumers.

10.4.4 Developing an appropriate population policy

The ever increasing Ethiopian population, particularly rural population, has been exerting enormous pressure on the country's development capacity and opportunities. At an annual growth rate of close to 3 percent, the rising population pressure has partly led to land and environmental resource degradation, and has significantly undermined human resources development.

Hence, an appropriate population policy is vital for the transformation of agricultural and rural development. In order to enable the country achieve the desired development goals, means for controlling the population explosion should be thought of. In this respect, a balanced population growth that is commensurate with the rate of advancement in the economy needs to be achieved through effective fertility reduction strategies using family planning measures and by educating men and women.

A current crucial issue in the human resources development in Ethiopia is how to control and eventually eradicate the looming HIV/AIDS crisis. HIV/ AIDS is spreading also into rural areas affecting the productive segments of the rural labour force. Control of the epidemic should be regarded as a major factor contributing towards achieving agricultural transformation and rural development in Ethiopia.

10.4.5 Strengthening eco-tourism for rural development

In addition to acknowledging the current and potential value of natural resources, the development of eco-tourism contributes to alternative income source for rural communities and diversification of their income sources. Eco-

tourism is a relatively new development concept. Ethiopia being highly endowed with rich natural environment and landscape, there is high potential to promote this sector to support rural and agricultural transformation at large. Introducing innovative types of nature conservation and realising benefits out of it can diversify the income of rural people. In this respect eco-tourism should be promoted as one option to engage rural communities in realizing environmental conservation and development for their benefit[69].

For instance, promoting smallholder forest development as a business enterprise could be a viable means of alleviating pressure on scarce agricultural land. Associated enterprises like apiculture and honey production, spices and fruit trees can be another example.

10.4.6 Improving social protection, safety net programs and nutrition

A specially designed safety net program is necessary in areas where recurrent drought has degraded the productive asset bases and capacity of the communities and households. Disaster management and mitigation should be an integral part of development planning endeavours in such vulnerable and high risk areas. It is necessary to integrate external aid (food and cash) with the medium to long-term development strategies. Aid and supports should be targeted at asset creation and regeneration of the productive capacities of the rural communities under such circumstances. The recent initiative called Productive Safety-net Program by the government in many W*oredas* in the country is a commendable job. It must be effectively

[69] There are many examples of development in the Southern African countries where tourism is a highly valuable economic sector. NGOs are helping rural communities in building their capacity to develop the concept, management, entrepreneurship, and product development in rural-centred tourist attractions. Currently, a good example of such a development is found in Namibia (Maxi, 2004).

implemented in order to achieve the desired goal of reducing food insecurity of millions of Ethiopians.

Programs on awareness raising on better nutrition, and facilitating access to adequate supply should be an integral component of interventions towards child and human resources development at large. Alterative income generation and diversification measures need to be considered as special features of such development programs.

Bibliography

Ababu Dekeba, Workneh Ayalew and B. P Hegde. (2004). Observations on the Performance of Crossbred Dairy Cattle in Smallholder Herds in Degem District, North Shoa, Ethiopia. Asfaw Yimegnuhal and Tamrat Degefa (eds). Proceedings of the 11th Annual Conference of the Ethiopian Society of Animal Production. Farm Animal Biodiversity in Ethiopia: Status and Prospects. August 28-30, 2003. Addis Ababa, Ethiopia. Pp 209-214.

Ababu, Dekeba. (2002). Evaluation of Performance of Boran Cows in the Production of Crossbreed Dairy Heifers at Abernosa Ranch, Ethiopia. M.Sc. Thesis. Alemaya University, Ethiopia.

Abdulai, A and Delgado, C. L. (1995). Re-establishing Agriculture as a Priority for Development Policy in sub-Saharan Africa. International Food Policy Research Institute, USA.

Abebe Demisse. (2000). Current Status of Biodiversity Conservation in Ethiopia. Paper presented at the International Conference on a Biodiversity Challenge for Ethiopia, February 2-4, 2000, Addis Ababa.

Abebe Haile Gabriel and Bekele Hundie. (2005). Post Harvest Grain Management and Food Security in Ethiopia. In The Future of the Smallholder Agriculture in Eastern Africa: The Roles of State, Markets, and Civil Society. Steven Were Omamo et al (eds). IFPRI Eastern Africa Food Policy Network. Pp 307-346.

Addis Tribune. (2005). City Administration Overwhelmed by Demand for Plots of Land in the Capital. A Weekly English News Paper, March 18, 2005, Addis Ababa.

ADE. (1999). An Analysis of Grain Market Integration in Ethiopia. ADE, Traverse d'Esope, 1348 Louvain-la-Neuve – Belgium, 1999.

Adugna Jabessa. (2003). Irrigation and Water Harvesting Program as a Mechanism to Fight against Drought. Paper Presented at the Development Debates (Dealing with High Risk) organized by EDRI. July 2003, Addis Ababa.

African Development Bank (ADB). (2003/04). "*African Economic Outlook*", Development Centre of the OECD, Tunis.

Ahmed M M., S. Ehui and Yemesrach Assefa. (2003). Dairy Development in Ethiopia. Socio-economics and Policy Research Working Paper 58. ILRI (International Livestock Reserach Institute) Nairobi, Kenya. 47 pp.

Aklilu Kidanu and Dessalegn Rahmato. (2003). "Vulnerable Livelihoods: People's Security Survey of Urban Households in Ethiopia" *Presentation made at the* Symposium on Socio-Economic Security and Decent Work in Africa, Dar-es-Salaam, Tanzania, 12-13 May 2003.

_____. *(2000). Listening to the Poor: A Study Based on Selected Rural and Urban Sites in Ethiopia.* FSS Discussion Paper No. 3, Forum for Social Studies, Addis Ababa, May.

Aklilu Kidanu and Hailom B. (2003/4). "HIV/AIDS and Poverty in Ethiopia", Miz-Hassab Research Center, Addis Ababa.

Alemayehu Geda. (2002). Macro-policy and Agricultural Development in Ethiopia. Geberehiwot et al. (eds). Proceedings of the 11th Annual Conference of the Ethiopian Economy, Nov. 2 – 4, 2001. Ethiopia

Alemayehu Mengiste. (2002). Land Surface Water Harvesting Techniques and Application as Drought Mitigation Measure in the Nile Basin.

_____. (2002). Lessons learned from implementation of the Ethiopian Fourth Livestock Development Project: Experiences and Results. Ethiopian Journal of Animal Production. Vol 2 (1): 25-47.

_____. (1999). Conceptual Formulation Paper on Rural Reform Towards Sustainable Economic and Social Transformation. Unpublished paper.

Amartya, Sen. (1999). *Development as Freedom,* Anchor Books, New York.

Arnon, I. (undated). Modernization of Agriculture in Developing Countries: Resources, Potentials, and Problems. Second edition. John Wiley and Sons.

Assefa Admassie. (2004). A Review of the Performance of Agricultural Finance in Ethiopia: Pre- and Post-reform Periods. Paper presented at the workshop organized by the International Development Economics Associates (IDEAs), Ethiopian Economic Association (EEA), and CODESRIA Addis Ababa, December 17 to 19, 2004. Unpublished.

Azage Tegegne, Workneh Ayalew, Berhanu GebreMedhin and Salvador Fernandez-Rivera. (2003). Opportunities for Improving Dairy Cattle Production in Ethiopia. In: Assefa Abraha, Getachew Tikubet and Johan Baumgaertner (eds). Resource Management for Poverty Reduction: approaches and Technologies. Selected Contributions to Ethio-Forum 2002. Ethiopian Social Rehabilitation and Development Fund, Addis Ababa, Ethiopia. Pp 107-126.

Azage Tegegne, Million Tadesse, Alemu Yami and Yoseph Mekasha. (2000). Characterization of Urban and Peri-urban Dairy Production in Ethiopia. Urban Agriculture Magazine, Vol. 1(2): 23-24.

Badiane, O. (1999). Agricultural Recovery and Structural Transformation in African Countries. IFPRI, 2033 K Street, NW, Washington, DC, 20006.

Barbier, Edward. (1998). The Economics of Land Degradation and Rural Poverty Linkages in Africa. The United Nations University, UK.

Bay, A.P.M. (1997). The Seed Sector in sub-Saharan Africa: Alternative Strategies. Proceedings: International Workshop on Seed Security for Food Security.

Florence, Italy, 30 November / 1 December 1997

Belachew Hurisa. (2003). Livestock Marketing and Pastoralism. Paper presented at the Ethiopian Pastoralists Forum, Addis Ababa.

Belachew Hurrissa and Jemberu Eshetu. (2003). Challenges and Opportunities of Livestock Marketing in Ethiopia. In : Yilma Jobre and Getachew Gebru (eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp 1-13.

Benin, S., Ehui S. and Pender, J. (2002). Policies for Livestock Development in the Ethiopian Highlands. Socio-economics and Policy Research Working Paper 41. ILRI (International Livestock Research Institute), Addis Ababa, Ethiopia. 29 pp.

Berhane Gebrekidan, Seme Debela and Ibrahim Mohamed. (2004). Development and Application of Agricultural Technology in Ethiopia: A discussion paper presented at a conference organized on the occasion of celebrating the 50th Anniversary of the Establishment of the Alemaya University, October 23 and 24, 2004.

Berhane Mekete and Workneh Ayalew. (2003). Use of Farmer Dairy Co-operatives to Promote Systematic Dairy Marketing: Lessons from India. In Yilma Jobre and Getachew Gebru (eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp 81-87.

Berhanu Adenew. (2004). The Food Security Role of Agriculture in Ethiopia. Electronic Journal of Agriculture and Development Economics (ESA/FAO). Vol. 1, No. 1, 2004, pp. 138-158.

Berhanu Admassu. (2002). Welcome Address: Animal Health and Poverty Reduction Strategies. In: Proceedings of the 16th Annual Conference of the Ethiopian Veterinary Association (EVA), 5-6 June 2002, Ghion Hotel, Addis Ababa, EVA, Addis Ababa.

Berhanu Nega. (2003). Development Options for Ethiopia. Rural, Urban or Balanced? In The Role of Urbanization in the Socio-economic Development Process. Berhanu Nega and Befekadu Degefe (eds). EEA/EEPRI publications, 2003.

Bezabih Emana, Kejela Gemtessa, Dhunfa Lemessa, Gezehegn Ayele. (2005). Functions of the Informal Finance in the Rural Economy of Ethiopia: Empirical

Evidences for Increased Economic Role.' Paper presented at the Third International Conference on the Ethiopian Economy. June 2-4, 2005. Addis Ababa.

Bigsten, A., Bereket Kebede, Abebe Shimelis and Mekonnen Tadesse. (2003). "Growth and Poverty Reduction in Ethiopia: Evidence from Household Panel Surveys", *World Development*, Vol. 31 (1): 87 –106.

Bojo, J. and Cassels, D. (1995). Land Degradation and Rehabilitation in Ethiopia: A Reassessment. AFTES Working paper No. 17. World Bank, Washington DC, 48 pp.

Bosman, H. G. and H. A. J. Moll. (1995). Appraisal of Small Ruminant Production Systems: Benefits of Livestock and Missing Markets: The Case of Goat Keeping in South-western Nigeria. In: Bosman, H. G. (1995). Productivity Assessment in Small Ruminant Improvement Programmes: A case Study of the West African Dwarf Goat. PhD Thesis. Department of Animal Production Systems, Wageningen Agricultural University, Wageningen, pp 157 - 182.

Burton, E. S., Robert, P. B. and Andrew, J. S. (1997). Improving Agricultural Extension: A Reference Manual. FAO and the International Program for Agricultural Knowledge System (INTERPAKS), Rome.

CAI Jianming. (undated). Peri-urban Agricultural Development in China: A New Approach in Xiaotangshan, Beijing. Institute of Geographical Sciences and Natural Resource Research (IGSNRR).

Campbell, J. (1991). Land or Peasants? The Dilemma Confronting Ethiopian Resource Conservation. African Affairs, 90: 5-21.

Catley, A., Mohammed Sheik Daid, Mohammed Ali Farah, Ahmed Sheik Mohammed and Ismael Handule. (1997). Veterinary Services in the Somali National Regional State, Ethiopia. A situation analysis. Save the Children (UK), Regional Bureau of Agriculture, Veterinary Services Support Project, Somali National Regional State, Save the Children (UK), Addis Ababa.

Central Statistical Authority (CSA). (2004). Report on Farm Management Practices. Agricultural Sample Survey (2003/04). Volume III. Statistical bulletin 305. Addis Ababa.

_____. (2004). *Statistical Abstract*. Addis Ababa.

_____. (2001-2004). "Report on Large and Medium Scale Manufacturing and Electricity Industries Survey", Statistical Bulletins: 248, 265,281 & 321, Addis Ababa.

_____. (2003 d). *Statistical Abstract*, Addis Ababa.

_____. (2003 c). Report on Cottage/Handicrafts Manufacturing Industries Survey, Addis Ababa.

_____. (2003 b). Report on Small Scale Manufacturing Industries Survey, Addis Ababa.

_____. (2003 b). Statistical Report on Socio-economic Characteristics of the Population in Agricultural Households, Land Use, Area and Production of Crops. Part I. Ethiopian Agricultural Sample Enumeration, July, 2003.

_____. (2003 a). Statistical Report on Farm Management Practices, Livestock and Farm Implements, Part II. Ethiopian Agricultural Sample Enumeration, July, 2003.

_____. (2003 a). Report on Large and Medium Scale Manufacturing and Electricity Industries Survey, Addis Ababa.

_____. (2003). Report of Urban Bi-annual Employment Survey, October 2003. FDRE, CSA, Addis Ababa.

_____. (2003). Ethiopian Agricultural Sample Enumeration, 2001/2 (1994 E.C.). Statistical Report on Farm Management Practices, Livestock and Farm Implements. Part II. Central Agricultural Census Commission. July 2003. CSA, Addis Ababa. 345 pp.

_____. (2002). Ethiopia: *Statistical Abstract*. Addis ababa, 2002.

_____. (1999). The 1994 Population Housing Census of Ethiopia. Results at the Country Level, Analytical report, Vol., II June 1999, Addis Ababa.

_____. (1997). Report on Small Scale Manufacturing Industries Survey, Addis Ababa.

_____. *Monthly Price Bulletins*, various issues.

Commission International des Irrigations et du Dranage. (2001). Water for Food and Rural Development.

Coppock, D. L. (1994). The Borana Plateau of Southern Ethiopia: Synthesis of Pastoral Research, Development and Change, 1980-1991. International Livestock Centre for Africa (ILCA), Addis Ababa, Ethiopia. 393 pp.

_____. (1993). Vegetation and Pastoral Dynamics in the Southern Ethiopian Rangelands: Implications for Theory and Management. In: Behnke, R. H. Jr., I. Scoones and C. Kerven (eds.). Range Ecology at Disequilibrium. New Models of Natural Variability and Pastoral Adaptation in African Savannas. Overseas Development Institute, London, UK. pp 42-61.

D.A. Rondinelli. (1983). Applied Methods of Regional Planning: the Urban Functions in Rural Development Approach, Clark University.

Deininger, K. Songqing, Berhanu Adenew, Samuel G. Selassie, and Mulat Demeke.

(2003). Land Tenure, Rural Land Transactions and Impacts on Farmers' Efficiency: Evidence from Ethiopia. World Bank WP No. 2992, 2003.

Deininger, K., Songqing, Berhanu Adenew, Samuel G. Selassie, and Berhanu Nega. (2003). Tenure Security and Land-Related Investments: Evidence from Ethiopia. World Bank WP No. 2991, 2003.

Delgado, C. M Rosegrant, H Steinfeld, S. Ehui and C Courbois. (1999). Livestock to 2020: The Next Food Revolution. Food, Agriculture and the Environment Discussion Paper 28. International Food Policy Research Institute, Washington.

Demil Teketay. (2002). Forest Research in Ethiopia: Past, Present and Future. Proceedings of a National Conference on Forest Resources of Ethiopia: Status, Challenges and Opportunities. Addis Ababa.

Dereje Tadesse G. (2005). On-farm Phenotypic Characterization of Cattle Genetic Resources and their Production Systems in South and North Wollo Zones of Amhara Region, North Eastern Ethiopia. MSc Thesis. Alemaya University of Agriculture. 139 pp.

Dessalegn Rahmato. (2004). The Agricultural Policies of the Imperial Regime: What Lessons Can We Draw? Unpublished research paper.

Devendra, C. (1992). Goats and rural prosperity. In: Pre-conference Proceedings: Plenary Papers and Invited Lectures. V International Conference on Goats, 2 - 8 March, 1992, New Delhi, pp 6 – 25.

Domestic Animal Genetic Resources Information System (DAGRIS). (2004). Version 1. (eds J.E.O. Rege, W. Ayalew and E. Getahun). ILRI (International Livestock Research Institute), Addis Ababa, Ethiopia. [http://dagris.ilri.cgiar.org] +CD-ROM.

Ethiopian Agricultural Research Organization (EARO). (2000 b). Soil and Water Research Programme Strategy. Ethiopian Agricultural Research Organization, Addis Ababa.

_____. (2000 a). Forestry Research Strategic Plan. Ethiopian Agricultural Research Organisation, Addis Ababa.

_____ (2000). Fishery Research Strategy. Animal Science Research Directorate. EARO, May 2000. 58 pp.

Economic Committee. (1999). Promoting Agricultural Productivity and Competitiveness in Sub-Saharan Africa, GCA/EC/N.2/4/1999. http://www.gca-cma.org/eecdoc99.htm

Ehui, S, H Li-Pun, V Mares and B Shapiro. (1998). The Role of Livestock in Food

Security and Environmental Protection. *Outlook on Agriculture* 27(2): 81 - 87.

Engida Mersha. (2000). Agro-climatic Classification of Ethiopia. Ethiopian Journal of Natural resources, 2(2):115-135.

Environmental Policy of Ethiopia. (EPA) (2002). National review report on the implementation of Agenda 21. A report prepared for the World Summit on Sustainable Development (WSSD), August 2002, Johannesburg, SA.

_____. (1997). Environmental Protection Authority.

Eshetu Mulatu and Habtemariam Kassa. (2001). Evolution of Smallholder Mixed Farming Systems in the Harar Highlands of Ethiopia: The Shift Towards Trees and Shrubs. Journal of Sustainable Agriculture 18 (4): 81-112.

Ethiopian Customs Authority. (2005). Unpublished livestock export data in recent years.

Ethiopian Economic Association/Ethiopian Economy Policy Research Institute. (EEA/EEPRI) (2005). "Industrialization and Industrial Policy in Ethiopia", Research Report, February 2005, Addis Ababa

_____. (2003/04). Industrialization and Industrial Policy In Ethiopia. Report on the Ethiopian Economy. Volume III, 2003/2004.

_____. (2003) "The Role of Urbanization in the Socio-Economic Development Process", Addis Ababa

_____. (2003). "The Role of Urbanization in the Socio-Economic Development Process", eds. Berhanu Nega and Befekadu Degefe, Addis Ababa.

_____. (2002). Land Tenure and Agricultural Development in Ethiopia. Addis Ababa, 2002.

_____. (2000/01) "Second Annual Report on the Ethiopian Economy", Vol. II, Addis Ababa

_____. (2000). Annual Report on the Ethiopian Economy. Vol. I. 1999/2000. Befekadu Degefe and Berhanu Nega (eds). Addis Ababa.

_____. (2000). Statistical Database.

_____. (1999/00). "First Annual Report on the Ethiopian Economy", Vol. I, Addis Ababa

_____. (1998). Economic Focus. Vol. 1. No.5. EEA. Addis Ababa.

Ethiopian Forestry Action Programme (EFAP). (1994). Ministry of Natural resources development and Environmental Protection. Vol. II Final Report, Addis Ababa.

Ethiopian Investment Commission, *Annual Report*, various issues.

Eyasu Elias. (2002). Farmers' Perceptions of Soil Fertility Change and Management. SOS-Sahel and ISD, Addis Ababa

Eyasu Elias and Scoones. (1999). Perspectives on Soil Fertility Change: A case Study from Southern Ethiopia. Land Degradation and Development 10: 195-206

Eyob Tekalign. (2005). "The Emerging Global Commodity Chain: Wither Ethiopian Coffee", Proceedings of the Second International Conference on the Ethiopian Economy, Addis Ababa

FAO. (January 2003). Information on Fisheries Management in the Federal Democratic Republic of Ethiopia. Interenet information.

_____. (2002). Production year book 2001. Vol. 55. FAO, Rome.

_____. (2001). World Statistical Compendium for Raw Hides and Skins Leather and Leather Footwear for the years 1982-2000. Rome Italy. (as cited by Girma Mekonnen, 2003).

_____. (1999). Production Year book 1998. vol. 52. FAO, Rome.

_____. (1997). The Agro-processing Industry and Economic Development. In The State of Food and Agriculture 1997 (SOFA).

_____. (1996). Guide Lines for Planning Irrigation and Drainage Investment Projects.

_____. (1996). Production Yearbook 1995. vol. 48. FAO, Rome.

_____. (1986). Ethiopian Highlands Reclamation Study. Final Report, Volume 1. FAO, Rome, 334 pp.

FAO/WFP. (2005). Crop and Food Supply Assessment Mission to Ethiopia, 2004.

FAOSTAT data. (2004). [http://apps.fao.org/faostat/form?collection=Production. Livestock.Primaryand Domain=Production and servlet=1andhasbulk=0andversion=extandlanguage=EN] last updated February 2004. Last accessed 23 April 2005.

FARM-Africa, London (UK), ILRI, Nairobi (Kenya). (1996). Goat types of Ethiopia and Eritrea. Physical description and management systems. FARM-Africa. London (UK). 76p.

Fasil Kiros. (1993). The Subsistence Crisis in Africa: The Case of Ethiopia. OSSREA, Addis Ababa.

Federal Democratic Republic of Ethiopia (FDRE). (2003). The New Coalition for Food Security in Ethiopia: Food Security Program, Volume I. November 2003. Addis Ababa.

_____. (2002). *Agriculture Sector Review*. Agriculture and Rural Development Department, ONAR.

_____. (2002). Statement on Pastoral Development Policy.

_____. (2002). Food Security Strategy. Addis Ababa, Ethiopia.

_____. (2001). Ethiopian Water Resources Management Policy. Official document of the Ministry of Water Resources, Ministry of Water Resources.

_____.(2001) Ethiopian Water Sector Strategy'. Official Document of the Ministry of Water Resources. Ministry of Water Resources.

Feleke Tadelle. (2004). "Urban Poverty Studies in Ethiopia - Reflections on the methodological issues", a paper presented at the EEA/ EEPRI Chronic Urban Workshop, 16-18 August, 2004, Semien Hotel, Addis Ababa, Ethiopia.

Feseha Gebreab, Aregay Waktola, Dejene Mekonnen. (2004). Agricultural Education Past, Present and Future. A discussion paper presented at the 50th Anniversary of the Alemaya University. October 2004. Alemaya.

Flanagan, F. (2002). Veterinary Service Delivery in Other African Countries and Approaches to Privatisation: A discussion paper. In: Yilma Jobre (ed). Proceedings on Setting of Minimum Standards and Guidelines for the Training of Community-Based Animal Health Worker Services (CbAHWS), and Rationalization of Veterinary Privatization Process in Ethiopia. National Workshop PACE-MOA/FAO/CAPE-AU-IBAR. February 2- 5, 2002. Palace Hotel, Nazareth, Ethiopia. pp. 61-68.

Forum for Environment. (2001). Ethiopian Civil Society preparation for Rio + 10. Hinrich Boll Foundation. Forum Publications Series No.1. Organization for Social Science Research in Africa.

Gebrehiwot Ageba and Wolday Amha. (2004). Micro and Small Enterprises Development in Ethiopia Survey Report, Addis Ababa.

Gebremeskel Dessalegn, T.S. Jayne and J.D. Shaffer. (1998). Market Structure, Conduct and Performance: Constraints on Performance of Ethiopian Grain markets. Working Paper 8, GMRP, MEDaC, 1998.

Gemedo Dale. (2004). Vegetation Ecology, Rangeland Condition and Forage Resources Evaluation in the Borana Rangelands, Southern Oromia, Ethiopia. PhD Thesis. Georg-August University of Goettingen, Goettingen, Germany. 253 pp.

George Dimithe, S.K. Debrah, B.L. Bumb and D.I. Gregory. (2000). Improving Agricultural input supply Systems in sub-Saharan Africa: A Review of Literatures. International Fertilizer development Center, P.O. Box 2040, Muscle Shoals, Alabama 35662, USA.

Gerard Greenfield. (undated). Free Market Freefall: Declining Agricultural Commodity Prices and the Market Access Myth (undated internet source). http://www.ppl.nl/bibliographies/wto/files/1899.pdf.

Getahun Tafesse. (2005). "Agricultural Growth and Poverty Reduction in Ethiopia", EEA/EEPRI Working Paper, Unpublished.

Girma Mekonnen. (2003). Opportunities and Challenges of Hides and Skins Trade in Ethiopia. In : Yilma Jobre and Getachew Gebru (eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. pp 49-59.

GMRP. (1997). The Regulation of Fertilizer Prices: Impacts and Policy Implication. Grain Market Research Project, Ministry of Economic development and Cooperation, Addis Ababa, 1997.

GoE. (1995). Agricultural Policy. Transitional Government of Ethiopia. March 1995, Addis Ababa.

Gordon H., Chiri A. and Abate T. (1995). Environmental and Economic Review of Crop Protection and Pesticide use in Ethiopia. Winrock International Environmental Alliance, US, 117pp.

Govereh, J., T.S. Jayne, and James Nyoro. (1999). Smallholder Commercialization, Interlinked Markets and Food Crop Productivity: Cross-Country Evidence in Eastern and Southern Africa. Department of Agricultural Economics and the Department of Economics, Michigan State University.

Gryseels, G. (1988). Role of livestock in mixed smallholder farms in the Ethiopian Highlands: A case study from the Baso and Worena Woreda near Debre Berhan. Dissertation. Agricultural University. Wageningen, The Netherlands. 249 pp.

Haan, de C., H. Steinfeld and H. Blackburn. (1997). Livestock and the Environment: Finding a Balance. European Commission Directorate-General for Development, Brussels, Belgium. 115 pp.

Habtemariam Kassa. (2005). Historical Development and Current Challenges of Agricultural Extension with Particular Emphasis on Ethiopia. Working paper No. 2/2005.

_____. (2003). Livestock and Livelihood Security in the Harar Highlands of Ethiopia: Implications for Research and Development. Doctoral Thesis. Swedish University of Agricultural Sciences, Uppsala. Acta Universitatis Agriculturae Sueciae. Agraria 388. 163pp.

_____. (1999). Livestock Production, Household Food Security and Sustainability of Smallholder Mixed Farms in the Harar Highlands of Ethiopia. A Case Study from Kombolcha District. MSc. Thesis. Department of Rural Development Studies. Swedish University of Agricultural Sciences, Uppsala, Sweden. 114 pp.

Hanotte, O.; Bradley, D.G.; Ochieng, J.W.; Verjee, Y.; Hill, E.W.; Rege, J.E.O. (2002). African Pastoralism: Genetic Imprints of Origins and Migrations. Science 296: 336-339.

Hayami, Y. (1997). Development Economics: From the Poverty to the Wealth of Nations. Oxford University press, New York.

Hegde, B.P. (2002). Cattle Breeding Strategy to Improve Milk Production in Ethiopia. Alemaya University, Alemaya, Ethiopia (Memiograph).

Holloway, G., C Nicholson, C Delgado and S. Ehui. (2000). How to Make a Milk Market : A Case Study from Ethiopian Highlands. Socio-Economics and Policy Research Working Paper 28. ILRI (International Livestock Research Institute), Nairobi, Kenya, 28 pp.

Homann, S. (2004). Indigenous Knowledge Of Borana Pastoralists in Natural Resource Management : A Case Study from Southern Ethiopia. PhD Thesis. Institute of Animal Breeding and Genetics of the Justus Liebig University Giessen. Giessen, Germany. Cuviller verlag Goettingen, Germany. 234 pp.

Hurni, H. (1988). Degradation and Conservation of the Resources in the Ethiopian Highlands. Mountain Research and Development, 8 (No. 2/3): 123-130.

IBC (Institute of Biodiversity Conservation). (2004). State of Ethiopia's Animal Genetic Resources – Country Report. A contribution to the First Report on State of the World's Animal Genetic Resources. IBC. May 2004 Addis Ababa, Ethiopia, 90 pp.

Jahnke, H. E. (1982). Livestock Production Systems and Livestock Development in Tropical Africa. Kieler Wissenschaftsverlag Vaul, Kiel, Germany. 253 pp.

Jean-Marie Cour. (2003). A Demo-economic Analysis of Long-term Structural Changes in Ethiopia". In the Role of Urbanization in the Socio-economic Development Process. Berhanu Nega and Befekadu Degefe (eds). EEA/EEPRI publications, 2003.

Jember Teferra. (2004). "Support for the Destitute in Urban Ethiopia", paper presented at the workshop on Chronic Urban Poverty in Ethiopia, 16 –18 August, 2004, Semien Hotel, Addis Ababa, Ethiopia.

Johnston, B. F. and Mellor, J. W. (1995). The Role of Agriculture in Economic Development. In Agricultural Economics. Peters . G. H. (editor). PP. 537 – 544.

Kamara, A. (2001). Property Rights, Risk and Livestock Development in Southern Ethiopia. Socio-economic Studies in Rural Development. Volume 123. PhD Dissertation. Goerg-August University of Goettingen (Germany). Wissenschaftsverlag Vauk, Kiel, Germany. 197pp.

Kassahun Awgichew. (2001). Comparative Performance Evaluation of Horro and Menz Sheep of Ethiopia under Grazing and Intensive Feeding Conditions. PhD Thesis. Humboldt University of Berlin (Germany). Unpublished. 173pp.

Kassaye Hadgu. (2002). Current Status of Community Based Animal Health Programme (CBAHP) in Ethiopia. In: Yilma Jobre (ed). Proceedings. Setting of Minimum Standards and Guidelines for the Training of Community-Based Animal Health Worker (CbAHWs), and Rationalization of veterinary privatization process in ethiopia. National Workshop PACE-MOA/ FAO/CAPE-AU-IBAR. February 2- 5, 2002. Palace Hotel, Nazareth, Ethiopia, pp.16-21.

Kebede Tafesse. (1997). Towards Seed Industry Development in Ethiopia. Proceedings of the International Workshop on Seed Security for Food Security. Florence, Italy, 30 November / 1 December 1997.

Kedir, A. and Mickey, A. (2004). Chronic poverty in Ethiopia: Panel Data Evidence, paper prepared for the workshop on Chronic Urban Poverty in Ethiopia, 16 – 18 August, 2004, Semien Hotel, Addis Ababa, Ethiopia.

Kirsch, O. D., Goricke, F.V., and Worz, J.F.G. (1989). Agricultural Revolution and Peasant Emancipation in Ethiopia: A Missed Opportunity, Saarbrucken, Fort Lauerdale.

Krishnan, P. (2000). Public Sector Pay and Private Sector Wage Premiums: Testing Alternative Models of Wage Determination. Available at: http://www.csae.ox.ac.uk/conferences/2000-OiA/pdfpapers/krishnan.pdf.

Krit Carlier, JanDouwe Meindertsma, Getahun Tafesse, Berhanu Adenew, Joseph Abdissa, Kibre Moges, Worku Gebeyehu, Jifar Tarekegn. (2003). Unit Costing of (Sub-) Programmes in Agriculture, Education, Health, Roads and Water, Ethiopia. ECORYS-NEI and Ethiopian Economic Association. Final Report. Addis Ababa, 23 December 2003.

Lakew Desta. (2004). Concepts of Rain Water Harvesting and its Role in Food Security: Ethiopian Experience. Paper presented at a workshop entitled Water for Socio-Economic Transformation - Underpinning the MDGs. A workshop organized by the Ministry of Water Resources.

Lall, S. (1996) “Learning from the Asian Tigers: Studies on Technology and Industrial Policy”, Macmillan & St. Martin’s Press, New York and London.

Lawson, D. A. McKay and J. Okidi. (2003). Poverty Persistence and Transitions in Uganda: A Combined Qualitative and Quantitative Analysis, CPRC Working Paper No. 30, University of Manchester.

Liedhlm, C and D.C. Mead. (1999). Small Enterprises and Economic Development: The Dynamics of Micro and Small Enterprises, Routlidge, London.

Lipton, Michael. (1977). Why Poor People Stay Poor? Grower Pub. Ltd. London.

Lohsmar, B. (2003). "China's Agricultural Water Policy Reforms. Increasing Investment, Resolving Conflicts, and Revising Incentives". US Department of Agriculture, Agriculture Information Bulletin No.782.

Maxi, L. (2004). Community-based Tourism in Namibia. Paper presented at the International Conference of the Pan African Program on Land and Resources Rights. 21-23 October 2004, Nairobi, Kenya.

McDowell, R E. (1988). Strategies for Genetic Improvement of Cattle in Warm Climates. Proceedings of the Second National Livestock Improvement Conference. 24 - 26 February 1988, Addis Ababa. Institute of Agricultural Research, Addis Ababa, Ethiopia.

_____. Improvement of Livestock in Warm Climates. W H Freeman & Co. San Francisco.

McKay and Kedir. (2004). Chronic Poverty in Urban Ethiopia: Panel Data Evidence. University of Bath and University of Leicester.

Mcmillan, M, Assefa Tigneh, Yohannes Agonafer, Kibre Moges and Amdissa Teshome. (2003). Ethiopia: Trade and Transformation Challenges. Diagnostic Trade and Integration Study. Volume 2, Annex 8.

Ministry of Economic Development and Cooperation (MEDaC). (1999). Survey of livestock and fisheries development. MEDaC Agricultural Development Department, Livestock Team, Addis Ababa, Ethiopia. 65 pp.

Mekonnen Tadesse, Bereket Kebede and Abebe Shimelis. (1998). Urban Poverty Trends in Ethiopia, Addis Ababa.

Mengistu Alemayehu. (2004). The genetic Resources Perspective of Equines In Ethiopia and their contribution to rural livelihoods. In. Asfaw Yimegnuhal and Tamrat Degefa (eds). Proceedings of the 11th Annual Conference of the Ethiopian Society of Animal Production. Farm Animal biodiversity in Ethiopia: Status and prospects. August 28-30, 2003. Addis Ababa, Ethiopia.pp81-85.

Ministry of Health. (2004). "AIDS in Ethiopia Report", Addis Ababa, Ethiopia.

Ministry of Information. (2002). Industrial Development Strategy, Amharic Version, Addis Ababa.

Ministry of Trade and Industry. (1997). Micro and Small Scale Enterprises Development Strategy, Addis Ababa.

Ministry of Water Resource. (2001). Profiles of Basin Master plan studies.

Mitlin, D. (2003). The Economic and Social Processes Influencing the Level and Nature of Chronic Poverty in Urban Areas., CPRC Working Paper, No. 29, University of Manchester.

Mitlin, D. (2004). "Chronic Urban Poverty: Issues and Implications. A presentation made during the EEA/ EEPRI Chronic Urban Workshop, 16-18 August, 2004, Semien Hotel, Addis Ababa, Ethiopia.

Ministry of Agricultre and Rural Development of the Government of Ethiopia (2004). Pastoral Areas Development Plan (PADS). Phase II Report. Techniplan in collaboration with MCE and Agristudio. Rome and Addis Ababa. 2004.

_____. (2000). Agro-ecological Zones of Ethiopia. Natural Resources Management and Regulatory Department of the MoA. Addis Ababa.

_____. (1998). Agro-ecological zones of Ethiopia. Natural resources management and regulatory department of MoA. With technical support from German Agency for Technical Cooperation (GTZ), Addis Ababa.

_____. (1994 c). The National Agricultural Extension System of the Transitional Government of Ethiopia. Task Force Evaluating Agricultural Extension System. MoA, November, 1994. Addis Ababa. 40 pp (Amharic Text).

MoA/NFIU. (1993). Agronomic Feasibility of the Proposed Recommendation and Comparison with the Previous Recommendations. General paper No. 43, Addis Ababa, Ethiopia.

Ministry of Finance and Economic Development (MoFED). (2004). *National Income Accounts*, June 2004.

_____. (2002). "Poverty Profile of Ethiopia, 1999/2000", Tassew and Tekie, WMU, MoFED, FDRE, Addis Ababa.

_____. (2002). Ethiopia: Sustainable Development and Poverty Reduction. Strategy Paper for Promoting Development and Poverty Reduction. Federal Democratic Republic of Ethiopia. Addis Ababa, Ethiopia. (Draft).

Mohammed Aliy. (2004). Estimation of Genetic Parameters of Birth Weight, Age at First Calving and Milk Production Traits in Holstein Friesian Dairy Herds Kept in Three State Farms. MSc Thesis. Alemaya University. 90pp.

Moorhouse, P. and Ayalew Tolossa. (1997). Consultancy report on cost recovery in delivery of animal health services, RDP Livestock Services.

Morley, Samuel A. (1999). The Impact of the Macro-economic Environment on Urban Poverty; CEPAL, 1999.

MSU. Ethiopian Grain Market Research Project. U.S. Agency for International Development and Michigan State University. March 1995 – September 1998. http://www.aec.msu.edu/agecon/fs2/fact/idwp54c.htm.

Mulat Demeke and Tadele Ferede. (2005). Grain Marketing in Addis Ababa, Ethiopia. In The Future of the Smallholder Agriculture in Eastern Africa: the roles of State, Markets, and Civil Society. Steven Were Omamo et al (eds). IFPRI

Eastern Africa Food Policy Network. Pp 233- 306.

Mulat Demeke et. al. (2004). Smallholder Vegetable Production under Irrigation in Ethiopia: A Case Study in Meki, Ziway, and Awassa Areas. Poverty Reduction through Irrigation and Smallholder Markets (PRISM), July 2004, Addis Ababa. Unpublished.

Mulat Demeke. (2000). Ethiopian Agriculture since 1991: Its Performance and Challenges Faced. A symposium for reviewing Ethiopia's socio-economic performances 1991-1999.

_____. (1999). Agricultural Technology, Economic Viability and Poverty Alleviation in Ethiopia. Paper presented to the agricultural transformation policy workshop, Nairobi, Kenya, 27-30 June, 1999.

_____. (1998). Explaining the Poor Performance of Agriculture. The Structure and Performance of Ethiopian Agriculture (Draft).

Mulat Demeke. Ali, S. and Jayne, T.S. (1997). Promoting Fertilizer Use in Ethiopia: The Implication of Improving Grain Market Performance, Input Market Efficiency and Farm Management. Grain market Project. Working paper No. 5. Addis Ababa, Ethiopia.

National Bank of Ethiopia (NBE), (2005), *Quarterly Bulletin* 2004/05, Vol. 20, No. 1, Addis Ababa.

_____. (2002/2003). *Annual Report*. Addis Ababa.

_____. (2001/02). *Quarterly Bulletin* - Fiscal Year Series Volume 16, No. 4- Fourth Quarter 2000/2001. NBE, Addis Ababa (as cited by Sintayehu Gebre-Mariam (2003)).

_____. *Annual Report*, various issues

National Office of Population (NOP). (2003). ICPD Review Report, National Office of Population, Addis Ababa.

_____. (2003). Ten-Year Review and Appraisal of the Dakar/Ngor Declaration and the ICPD Program of Action in Ethiopia, Addis Ababa, August 2003.

Nienke, B. and Menelik, S. (2003). The Agricultural Science and Technology Indicators (ASTI) for Ethiopia. Country Brief No. 9. ISNAR, October 2003.

OAU-IBAR. (2000). Financing Livestock and Animal Health Services in Sub-Saharan Africa: The case of Cameroon, Ethiopia, Kenya, Mali, Tanzania and Uganda.

OCHA. (2003). Ponds Filled with Challenges. http://eth.org/Archieve/DownloadableReports/Waterharvesting//2003.pdf

Ørskov, E R and E F Viglizzo. (1994). The Role of Animals in Spreading Farmer's Risks: A New Paradigm for Animal Science. Outlook on Agriculture, Vol. 23

(2): 81 - 89.

Paueswang, S. (1990). "The Peasant Perspective" in Pausewang, S. et. al. (eds), Ethiopia: Options for Rural Development. Zed Books, Boulder and London, pp. 213 – 226.

Peng, Y., Zucker, L. G, and Draby, M. L. (1997). Chinese Rural Industrial Productivity and Urban Spillover. National Bureau of Economic Research, Working Paper No. 6202.

Perrings, C. (2001). The Economics of Bio-diversity Loss and Agricultural Development in Low-income Countries. In: Lee DR and Barrett C.B (editors). Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment. CABI publishing, New York, USA

Pretty N. Jules. (1995). Regenerating Agriculture. Policies and Practice for Sustainability and Self-reliance. Earthscan publications ltd, London.

Rabinovitch, Jonas. (1997). Governance for Sustainable Growth and Equity, International Colloquium of Mayors and Managers UNDP's Urban Development Team, NY.

Rege, J.E.O. (1999). The state of African cattle genetic resources. I. Classification framework and identification of threatened and extinct breeds. FAO/UNEP Animal Genetic Resources Information Bulletin. no. 25. p. 1-25.

Resal. (1999). An Analysis of Grain Market Integration in Ethiopia.

Rischkowsky, B. (1996). Untersuchungen zur Milcherzeugung mit Saanenkreuzungsziegen in kleinbäuerlichen Betreiben Malawis. Dissertation. Justus-Liebig-Universität-Gießen, Gießen.

Robert, F. Ash. (2000). China's Agricultural Reforms: A Twenty Year Retrospective. The Contemporary China institute, School of Oriental and African studies, University of London.

Roger A. R. and Xiaoping, S. (Undated). The Rural Frontier as Safety Valve: The Industrialization of the Chinese Regions. Paper presented at the Conference of Regional Development: The Challenge of the Frontier at the Negev Center for Regional Development, Beer Sheva, Israel.

Sadoulet, E. and De Janvry, A. (1995). Quantitative Development Policy. John Hopkins University Press.

Sansoucy, R, M A Jabbar, S Ehui and H Fitzhugh. (1995). The Contribution of Livestock to Food Security and Sustainable Development. In: Wilson R T, Ehui S and Mack S (eds). (1995). Livestock Development Strategies for Low Income Countries. Food and Agriculture Organization/ International Livestock Research Institute, Nairobi, Kenya, pp 9 – 21.

Seme Debela. (1988). Agricultural Research and Food Production in Ethiopia: In Yilma Kebede (eds) Ethiopian Journal of Agricultural Sciences, Volume X No. 1-2.

Sherman, D. M. (2000). Community-based Animal Health Programs: A Catalyst for Economic and Social Development for the Rural Poor. In: Lucas Gruner and Yves Chabert (eds). (2000). Proceedings of the 7th International Conference on Goats, 15 - 21 May, 2000, Tours, France. Institut de l'Elvag and INRA. Part I: 514 – 518.

Shibru Tedla and Kifle Lemma. (1998). Environmental Management in Ethiopia: Have the National Conservation Plans worked? Environmental Forum. OSSREA Publication No 1.

Sileshi Zewdie. (2002). An Overview of the Veterinary Services Delivery in Ethiopia. In: Yilma Jobre (Ed). Proc. Setting of Minimum Standards and Guidelines for the Training of Community-Based Animal Health Worker (CbAHWs), and Rationalization of Veterinary Privatization Process in Ethiopia. National Workshop PACE-MOA/ FAO/CAPE-AU-IBAR. February 2 - 5, 2002. Palace Hotel, Nazareth, Ethiopia. Pp 43-48.

Sintayehu Gebre-Mariam. (2003). Historical Development of Systematic Marketing of Livestock and Livestock Products in Ethiopia .In : Yilma Jobre and Getachew Gebru (eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proc. 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp 15 – 21.

Solomon Nega. (2002). Setting of Minimum Standards and Guidelines for the Training of Community Based Animal Health Workers (CbAHWs) in Ethiopia: A discussion paper. In: Yilma Jobre (Ed). Proceedings on the Setting of Minimum Standards and Guidelines for the Training of Community Based Animal Health Workers (CbAHWS), and Rationalization of Veterinary Privatization Process in Ethiopia. National Workshop PACE-MOA/ FAO/CAPE-AU-IBAR. February 2- 5, 2002. Palace Hotel, Nazareth, Ethiopia, pp.22-40.

Solomon Wolle. (2004). "Micro and Small Enterprises Sector in Ethiopia" in the Proceedings of the International Workshop on the Role of Micro and Small Scale Enterprises in the Economic Development of Ethiopia, eds. Worku Gebeyehu and Daniel Assefa, Addis Ababa.

Stangel, P J. (1995). Nutrient Cycling and Its Importance in Sustaining Crop-livestock Systems in sub-Saharan Africa: An overview. In: Powell J M, S Fernández-Rivera, T O Williams and C Renard (eds). Livestock and Sustainable Nutrient

Cycling in Mixed Farming Systems of sub-Saharan Africa. Volume II: Technical Papers. International Livestock Centre for Africa, Addis Ababa, Ethiopia, pp 37 - 59.

Tadelle Dessie. (2003). Phenotypic and genetic characterization of local chicken ecotypes in Ethiopia. PhD Dissertation. Humboldt-Universitat, Berlin (Germany). 209pp.

_____. (1996). Studies on Village Poultry Production Systems in the Central Highlands of Ethiopia. M.Sc Thesis, Swedish University of Agricultural Sciences.

Tafesse Mesfin. (2001). What Should a Pastoral Development Strategy Constitute Towards Poverty Reduction among Pastoral Communities in Ethiopia? In: Yonas Admasu (ed). Poverty Reduction Strategy and Pastoral Development. Proceedings of the Second National Conference on Pastoral Development in Ethiopia. Pastoralists Forum Ethiopia. Addis Ababa, Ethiopia. pp. 95-108.

Takele Taye. (2005). On-Farm Phenotypic Characterization Of Sheko Breed Of Cattle And Their Habitat In Bench Maji Zone, Ethiopa. MSc Thesis, Alemaya University. 120 pp.

Tamire Hawando. (1996). Deforestation in Ethiopian highlands. Norwegian Church Aid. Addis Ababa

Teferra Gebre-Meskel and Abaye Tedla. (1995). Development opportunities in animal agriculture. In: Proc. Second Annual Conference of the Ethiopian Society of Animal Production. 26-27 May 1993, Addis ababa, Ethiopia. Ethiopian Society of Animal Production, Addis Ababa, Ethiopia.

Tesfaye Alemayehu. (2004). "The Analysis of Urban Poverty in Ethiopia", a Paper submitted for the EEA/ EEPRI Chronic Urban Workshop, 16-18 August, 2004, Semien Hotel, Addis Ababa, Ethiopia.

Tesfaye Alemu Tucho. (2004). Genetic Characterization of Indigenous Goat Populations of Ethiopia Using Microsatellite DNA Markers. PhD Thesis. National Dairy Research Institute (Deemed University), Karnal, Haryana, India. 259 pp.

Tesfaye Zegeye and Senait Regass. (2003). The Role of Research in Technology Development and in Mitigating Risk and Achieving Sustainable Development. Paper presented at the 7th Annual Conference of the Agricultural Economics Society of Ethiopia, August 2003. Unpublished.

Tessy Kurian and Ancy Thomas. (2004). Accelerating the Pace of Ethiopian Development Problems and Potentials. Paper presented at the 2nd International Conference organized by the Ethiopian Economic Association, 3-5 June 2004. Addis Ababa.

Thewodros Kitaw. (2002). The Current Situation of Private Veterinary Practice in Ethiopia. In: Yilma Jobre (ed). Proceedings on Setting of Minimum Standards and Guidelines for the Training of Community-Based Animal Health Worker Services (CbAHWS), and Rationalization of Veterinary Privatization Process in Ethiopia. National Workshop PACE-MOA/FAO/CAPE-AU-IBAR. February 2- 5, 2002. Palace Hotel, Nazareth, Ethiopia. Pp 49-54.

Thomas, R., Valerie, K., Eric, C., Thomas, J., Kimseyinga, S., and Daniel, C. (1997). Determinants of Farm Productivity in Africa. A synthesis of four case studies". USAID. Technical Paper No. 75.

Tilahun Amede (ed). (2003). Natural Resource Degradation and Environmental Concerns in the Amhara Regional State, Ethiopia: Impact on Food Security, March 2003, Bahir Dar, Ethiopia. 278 p.

Todaro, M. P. (1989). Economic Development in the Third World. Longman, Inc., New York.

Tsehay Redda. (1998). Prospects of Ethiopian Dairy Development. Proceeding of the Role of Village Dairy Co-operatives in Dairy Development: Prospects for Improving Dairy in Ethiopia, 22-24, April 1998, Addis Ababa, Ethiopia. pp. 149-151.

UN. (2003 July). World Population Data Sheet of the Population Reference Bureau.

_____. (2003). *World Population Prospect*: The 2002 Revision, Vol. 1 comprehensive tables, New York.

UNCTAD. (2004), "The Least Developed Countries Report 2004", New York and Geneva.

_____. (2002), "The Least Developed Countries Report 2004", New York and Geneva.

UNDP. (2004). "Secondary Cities: Urban Poverty Participatory Action Research Initiative (ARI)", draft national report, Addis Anteneh and Associates, Addis Ababa.

_____. (2003). The United Nations World Water Development Report.

_____. (1998). Overcoming Human Poverty. New York.

_____. (1997). *Human Development Report*, New York.

_____. (1997). Agricultural Sector Development. Economic Report No. 3. UNDP Country Office. Addis Ababa

UNDP/ECA. (1999). Concepts and Implementation Arrangement of the Sustainable Agricultural and Environmental Rehabilitation Programme in Ethiopia. Joint Production of the National Regional States and United Nations Economic Commission for Africa.

UN-EUE. (2002). Review and Consequences of Reduction in Agriculture Input Sales in 2002. A Situation Analysis, UN Emergencies Unit for Ethiopia. November 2002.

UNDP/FAO. (1984). Assistance to Land Use Planning, Ethiopia: Geomorphology and Soils. Field Document 3. FAO, Rome.

von Kaufmann, R. R. and K. J. Peters. (1990). Achievements and Difficulties in Ruminant Livestock Development in the Humid and Sub-humid Zones of West and Central Africa. In: Kuil, H, R W Paling and J E Huhn (eds). 1990. Proc. 6th International Conference of Institutes for Tropical Veterinary Medicine. 28 August – 1 September, 1989, Wageningen, The Netherlands, Faculty of Veterinary Medicine, Utrecht University, Utrecht, The Netherlands, pp 21 - 28.

Westphal, E. (1975). Agricultural Systems in Ethiopia. PhD thesis, Agricultural University of Wageningen,

Wilson, R T. (1988). Small Ruminant Production Systems in Tropical Africa. Small Ruminant Research 1:305 - 325.

Winrock International, USA. (1992). Assessment of Animal Agriculture in sub-Saharan Africa. Winrock International, Morrilton, Arkansas, USA.

Wit, de, J, J K Oldenbroek, H van Keulen and D Zwart. (1995). Criteria for Sustainable Livestock Production: A proposal for implementation. *Agriculture, Ecosystems and Environment* 53: 219 - 229.

WMU. (1999). Poverty Situation in Ethiopia, Addis Ababa.

WMU MoPED. (1997). Participatory Poverty Assessment in Ethiopia, Addis Ababa.

Wolday Amha. (2004). Microfinance in Ethiopia: Performance, Challenges, and Role in Poverty Reduction", Occasional Paper No. 7, Addis Ababa.

Wondwosen Asfaw. (2003). Influence of Animal Diseases and Sanitary Regulations on Livestock Export Trade and Cases of Export Restrictions. In : Yilma Jobre and Getachew Gebru (Eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proc. 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp23-34.

Wood, A. (1990). Natural Resource Management and Rural Development in Ethiopia. In: Pausewang, S., Fantu, C., Bruce, S. and Eshetu, C., (editors). Ethiopia: Options for Rural Development. Zed Books Ltd, London and New Jersey, 187-198.

Woody Biomass Project. (2001). A strategic Plan for Sustainable Development, Conservation and Management of the woody Biomass Resources. Oromia Regional State, woody Biomass Inventory Project, Ministry of Agriculture.

Workneh Ayalew. (2000). Do Smallholder Farmers Benefit More from Crossbred (Somali x Anglo-Nubian) than from Indigenous Goats? PhD Thesis. Georg-August University of Goettingen, Germany. Cuvillier Verlag. Goettingen, Germany. 155pp.

Workneh Ayalew and Woudyalew Mulatu. (2005). Farmers' Practices in the Management of Trypanosomosis in the Ghibe Valley, South-western Ethiopia. In. Asfaw Yimegnuhal and Tamrat Degefa (eds). Proceedings of the 12th Annual Conference of ESAP (Ethiopian Society of Animal Production). 12-15 August 2004. Addis Ababa. Volume I, PP 57- 65. Worku Tessema, (2000). Stakeholder Participation in Policy Processes in Ethiopia. IIED working paper No. 17.

Workneh Ayalew and B. Rischkowsky. (2004). Perspectives of Maintaining Community-based Animal Health Services in the Highlands of Eastern Hararghe: implications of Operating under Unclear Policy Environments. Ethiopian Veterinary Journal. Vol. 8(1): 39-57.

Workneh Ayalew, Ephrem Getahun, Markos Tibbo, Yetnayet Mamo and Rege J. E.O. Proceedings. (2004). Current State of Knowledge on Characterisation of Farm Animal Genetic Resources in Ethiopia. Asfaw Yimegnuhal and Tamrat Degefa (eds). Proceedings of the 11th Annual Conference of the Ethiopian Society of Animal Production. Farm Animal Biodiversity in Ethiopia: Status and Prospects. August 28-30, 2003. Addis Ababa, Ethiopia. pp 1-22.

Workneh Ayalew, B. Rischkowsky J.M. King, E. Bruns. (2003 b). Crossbreds Did Not Generate More Net Benefits than Indigenous Goats on Ethiopian Smallholdings. Agricultural Systems Vol.76 (3). pp 1137-1156.

Workneh Ayalew, J.M. King, E. Bruns, B. Rischkowsky. (2003 a). Economic Evaluation of Smallholder Subsistence Livestock Production: Lessons from an Ethiopian Goat Development Program. Ecological Economics Vol. 45(3): 473-485.

Workneh Ayalew, J M King, E W Bruns and B Rischkowsky. (2002). Practicalities of Sustaining a Goat Crossbreeding Programme in Eastern Ethiopia. Ethiopian Journal of Animal Production. Vol.2 (1): 71-85.

World Bank. (2005). Managing Water Resources to Maximize Sustainable Growth. A Country Water Resources Assistance Strategy for Ethiopia (Draft).

_____. (2005), A Better Investment Climate for Every One. *World Development Report.*

_____. (2003 b), Ethiopia: Diagnostic Trade Integration Study. Draft, Addis Ababa.

_____. (2003 a) *World Development Indicators* 2003.

_____. (2002). Database (CD-Rome).

_____. (1996). Ethiopia Social Sector Report, The World Bank Country Report, 1996, Washington, D.C.

_____. (1985). The Smallholder Dimension of Livestock Development. A Review of Bank Experience. Operations Evaluation Department. Report No. 5979. Washington D.C.

Xinshen, D., Jordan, C., James, K., Detlev, P., Liangzhi, Bingxin, Y., and Yukitsugu, Y. (2004). Agricultural Growth Options and Investment Strategies in Ethiopia - A Spatial Multi- Market Model Analysis for 2004 – 2015. International Food Policy Research Institute. (*First Draft*). January 2004.

Yacob Aklilu. (2003). Critical Issues Impacting Livestock Trade in Kenya, Ethiopia and Sudan. In : Yilma Jobre and Getachew Gebru (Eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp35-47.

Yeraswork, Admassie and Fantu Guta. (2003). Spatial Population Balance and Rural Viability in Ethiopia. Research Report on the Role of Agriculture made for FAO and Ethiopian Economic Association. Addis Ababa.

Zegeye Yigezu. (2003). Imperative and Challenges of Dairy Production, Processing and Marketing in Ethiopia. In : Yilma Jobre and Getachew Gebru (eds). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22-24, 2002. ESAP, Addis Ababa. Pp60-67.

Zerihun Gudeta, Herman D. Van, S. and Klopper, O. (2004). Agriculture versus Non-agriculture in the Ethiopian Economy: A Comparative Performance since the 1960s". In Proceedings of the First International Conference on the Ethiopian Economy. Alemayehu Seyoum et. al (eds). Vol. II, 2004. pp. 115-130.

Zewdu Wuletaw. (2004). Indigenous Cattle Genetic Resources, Husbandry Practices and Breeding Objectives in North-Western Ethiopia. M. Sc. Thesis. Alemaya University, Ethiopia.

Annex

Annex 1.1: Number, investment capital and employment creation of investment projects under implementation and operation by sector, 1 Hamle 1995 - 30 Sene 1996 Eth.c.

	Implementation				Operation			
			Permanent	Temporary			Permanent	Temporary
	Number	Capital	Employment	Employment	Number	Capital	Employment	Employment
Domestic	1265	10439870.81	72385	92996	2177	12793398.14	83844	289280
Foreign	123	6732903.34	15028	9372	100	3052006.71	16061	6370
Public	12	5826869.5	2822	407	14	2379602.3	855	271
Total	1400	22999643.65	90235	102775	2291	18225007.15	100760	295921

Source: Ethiopian Investment Commission

Annex 2.1: Distribution of small scale industries by industrial group (% share)

Industrial group	No of firms	Persons engaged	Fixed assets	Value-added
Grain mills	85.44	84.75	88.50	79.21
Food except grain mills	2.17	2.65	3.97	4.61
Textiles	0.07	0.08	0.16	0.23
Wearing apparel, dressing and dyeing of fur	3.02	2.04	0.47	1.90
Luggage, handbags and footwear	0.05	0.06	0.04	0.03
Wood and cork, except furniture, articles of straw & paints materials	0.52	0.68	0.72	0.48
Paper products	0.01	0.03	0.05	0.23
Publishing, printing and recording media	0.72	0.71	1.68	1.29
Chemicals	0.01	0.01	0.01	0.06
Non-metallic mineral products	0.33	0.49	0.35	0.85
Fabricated metal, except machinery & equipment	4.10	3.99	1.58	6.73
Machinery and equipment, NEC.	0.09	0.11	0.04	0.10
Motor vehicles and their engine parts and accessories	0.02	0.03	0.10	0.03
Furniture	3.45	4.37	2.34	4.26
Total	100.00	100.00	100.00	100.00

Source: Own calculation based on CSA (2003 (b)).

Annex 2.2: Workers' educational background (percent)

Industrial group	Not stated	Below grade 3	4 to 8	9 to 12	Above 12
Grain mills	10.23	19.3	47.7	21.4	1.3
Food except grain mills	4.4	8.2	42.8	42.2	2.4
Textiles	1.5	11.76	47.8	35.3	4.4
Wearing apparel, dressing & dyeing of fur	2.45	5.7	43.2	47.3	1.3
Luggage, handbags and footwear	1.9	0	36.8	52.8	9.4
Wood and cork, articles of straw & paints	1.9	8.5	35.9	50.4	3.7
Paper products	0	4	24.0	48.0	24.0
Publishing, printing and recording media	2.5	1.9	15.8	70.7	9.2
Chemicals	0	0.0	10.0	60.0	30.0
Non-metallic mineral products	2.5	14.9	36.0	42.6	3.7
Fabricated metal, except machinery & equip	1.3	3.7	37.9	52.1	5.0
Accessories for machinery and equipment	1.1	1.1	34.8	59.8	3.3
Accessories for motor vehicles	0	10.5	52.6	31.6	5.3
Furniture	1.2	5.3	36.6	53.2	4.0
Total	8.8	16.9	46	26.6	1.8

Source: Calculated based on Central Statistical Authority's (2003b) data.

Annex 2.3: Major constraints for not working at full capacity in percent

Industrial groups	Market	Raw materials	Spare parts	Other problems
Grain mills	57.5	9.5	14.4	18.6
Food except grain mills	58.5	16.5	5.4	19.6
Textiles	71.4	4.8	4.8	19.1
Wearing apparel, dressing and dyeing of fur	74.9	5.0	0.8	19.2
Luggage, handbags and footwear	64.3	0	0	35.7
Wood and cork, except furniture, articles of straw & paints	63.5	17	3.1	16.4
Paper & paper products	25.0	0	25	50
Publishing, printing and recording media	71.0	8.9	4.8	15.4
Chemicals	100.0	0	0	0
Non-metallic mineral products	41.8	38.8	1.0	18.4
Fabricated metal products, except machinery & equipment	66.2	7.7	1.2	24.9
Machinery & equipment	75.9	0	6.9	17.2
Parts and accessories for motor vehicles	100.0	0	0	0
Furniture	52.6	15.8	3.7	28
Total	58.3	9.8	12.7	19.2

Source: Central Statistical Authority (2003 (b)).

Annex 2.4: The different stakeholders' coverage of support

Did you receive support from	Yes		No	
	No.	percent	No.	percent
Donors	1	0.2	972	99.8
International NGOs	7	0.7	967	99.3
Local NGOs	4	0.4	970	99.6
Governments projects/institutions	24	2.5	950	97.5
Training provides	7	0.7	967	99.3
Banks	45	4.6	929	95.4
Microfinance institutions	27	2.8	947	97.2
Cooperatives	3	0.3	971	99.7
Business associations	20	2.1	954	97.9
Other institutions	28	2.9	946	97.1

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa in G/Hiwot and Wolday (2004).

Annex 4.1: Trends in real expenditure per capita by region (Birr)

Region	1995/96			1999/00			% Change		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	903.60	1113.46	935.18	828.90	995.92	853.77	-8.27	-10.56	-8.71
Afar	1105.62	2464.69	1595.21	997.81	1618.13	1178.28	-9.75	-34.35	-26.14
Amhara	917.23	1271.08	960.70	1046.54	1490.06	1087.74	14.10	17.23	13.22
Oromiya	1183.95	1498.39	1215.86	1020.46	1354.00	1055.05	-13.81	-9.64	-13.23
Somali	1166.42	2079.07	1268.13	1070.81	1476.47	1210.83	-8.20	-28.98	-4.52
Benishangul-G.	1026.81	1641.79	1063.51	925.32	1513.43	965.40	-9.88	-7.82	-9.23
SNNP	945.48	1180.63	961.95	933.43	1348.80	962.26	-1.27	14.24	0.03
Gambella	1223.47	1354.22	1279.95	900.83	1222.70	981.20	-26.37	-9.71	-23.34
Harari	1768.36	1459.68	1599.45	1394.74	1349.78	1370.46	-21.13	-7.53	-14.32
Addis Ababa	1113.20	1568.96	1560.34	1214.10	1711.66	1701.21	9.06	9.10	9.03
Dire Dawa	1054.29	1397.06	1259.26	1068.56	1359.81	1274.52	1.35	-2.67	1.21
Total	1035.33	1411.32	1087.83	994.73	1452.54	1056.71	-3.92	2.92	-2.86

Annex 4.2: Proportion of GDP sources for the city of Addis Ababa, at constant prices

No	Description	Ethiopian Fiscal Year				
		1988	1991	1994	1995	1996
1	Agriculture	0.6	0.5	0.6	0.5	0.5
2	Industry	22.3	22.3	22.6	21.8	24.0
3	Service	77.0	77.2	76.8	77.7	75.5
	Total	100.0	100.0	100.0	100.0	100.0

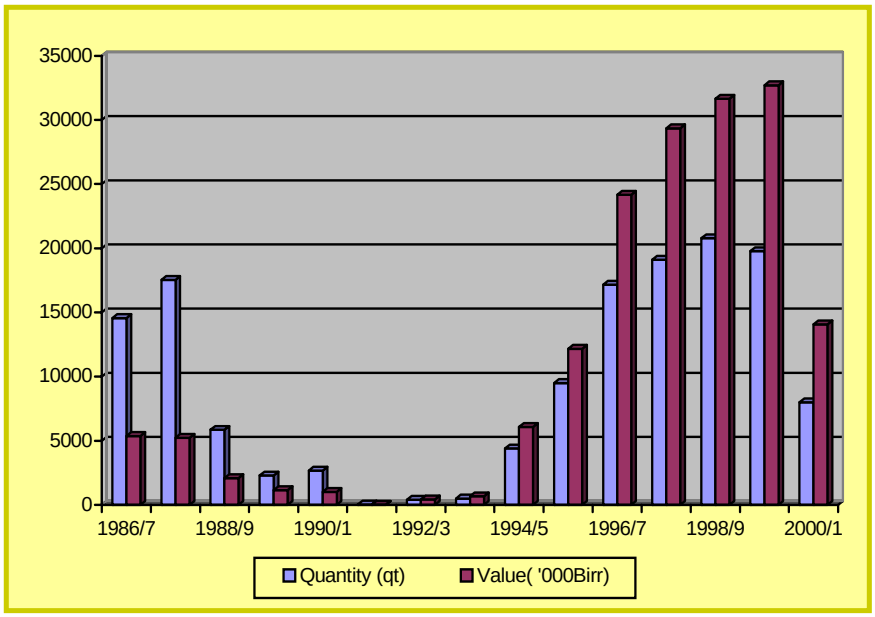
Source: Based on information obtained from the Addis Ababa City Administration.

Annex Table 5.1: Import and export of cereals over the past 40 years (MT).

Year	Commercial import of cereals		Cereals exported	
	Maize	Wheat	Maize	Wheat
1964/65	0	0	1,486	0
1965/66	6	6,600	2,400	0
1979/80	22,000	180,000	0	0
1980/81	325	385,000	0	0
1981/82	15,800	170,000	0	0
1982/83	6,000	250,000	0	0
1983/84	8,240	294,038	0	0
1984/85	121	202,673	453	0
1985/86	19,200	404,343	0	0
1986/87	21,000	403,668	500	0
1987/88	45,000	324,135	0	3
1988/89	11,800	920,000	0	0
1989/90	740	300,000	0	0
1990/91	39	540,000	0	0
1991/92	78	695,000	0	0
1992/93	166	830,000	0	0
1993/94	21,000	358,100	0	0
1994/95	36,300	553,583	0	0
1995/96	24,500	509,500	0	0
1996/97	20,500	295,000	0	0
1997/98	26,800	187,200	0	0
1998/99	30,000	463,000	1,701	20
1999/00	35,000	550,000	979	20
2000/01	12,011	1,164,000	385	2
2001/02	6,361	1,031,000	1,327	0
2002/03	3,189	657,000	12,848	94
2003/04	11,582	1,603,103	746	58

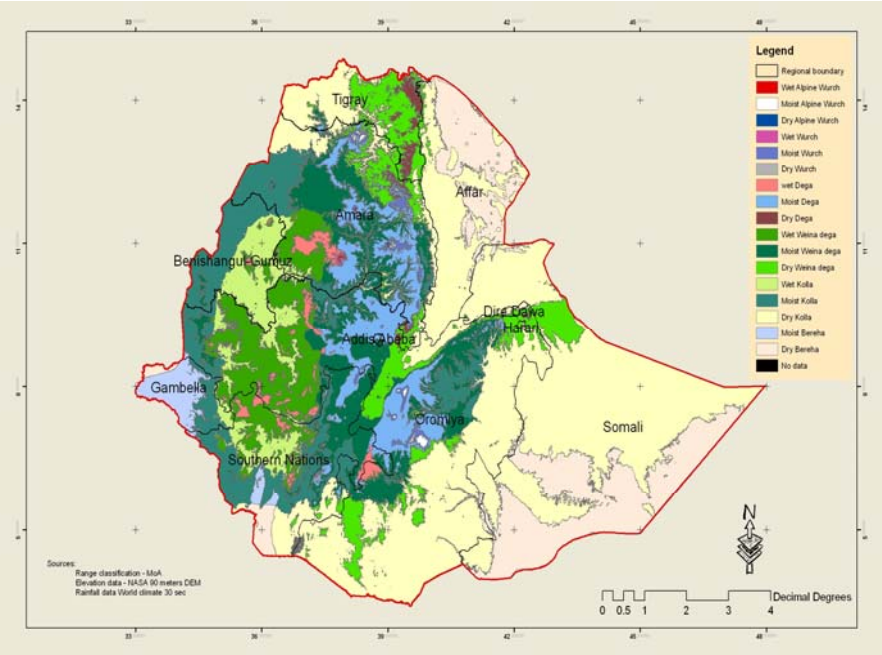
Source: FAOSTAT. Data on food aid from 1995 to 2001 was obtained from the World Bank study.

Annex Figure 5.1: Quantity (quintals) and value ('000 Birr) of exported meat products between 1986 and 2001

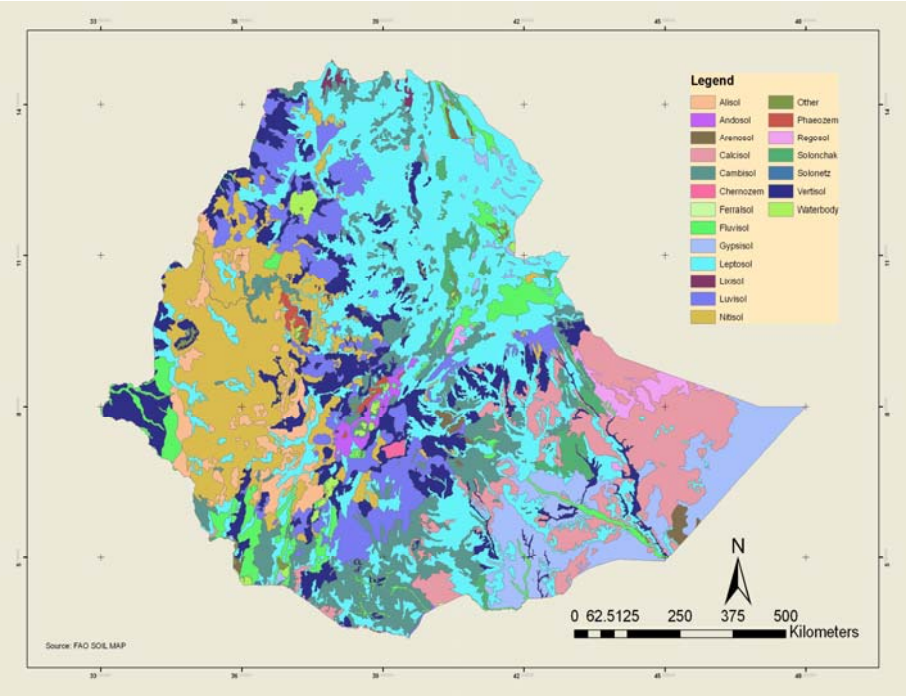


Source: Sintayehu (2003), as adapted from NBE (2001)

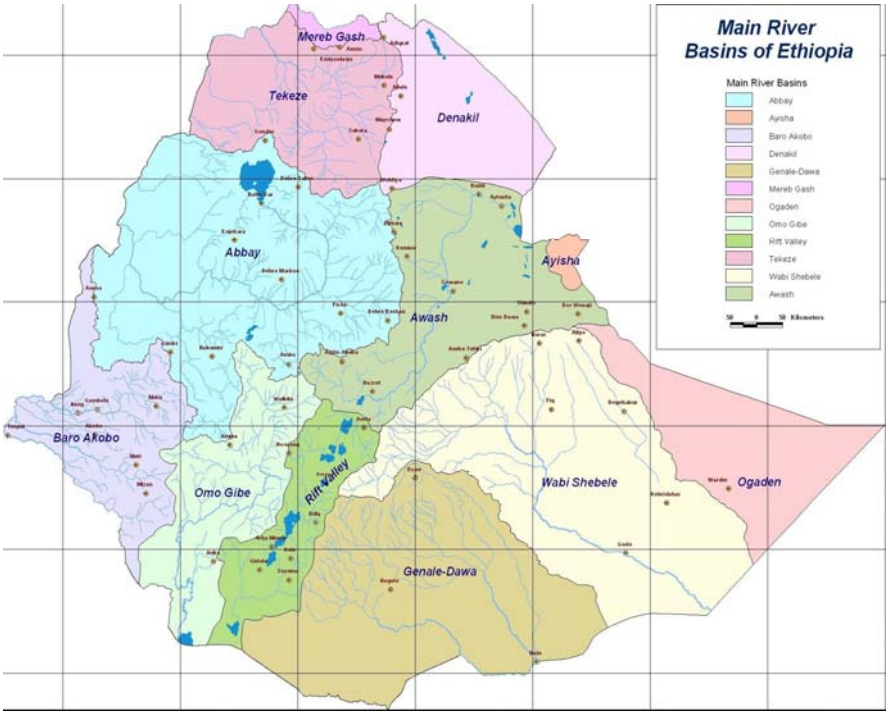
Map 6.1: Agro-climatic Zones of Ethiopia



Map 6.2: Major Soils of Ethiopia



Map 6.3: Basin map of Ethiopia



Annex Table 6.2: River Basins in Ethiopia

Basins	Level of studies	Area (km^2)	The national Regional States falling within the Basin	Area (km^2)
Abbay	Master plan	199,812	Amhara, Oromiya, Benshangul Gumuz	199,812
Tekeze	Master Plan	86,510	Tigray and Amhara	86,510
Mereb	Master Plan	5,893	Tigray	5,893
Baro-Akobo	Master plan	76,000	Benshangul Gumz,Gambella, Oromiya and SNNPRS	76,000
Omo-Gibe	Master plan	79,000	Oromiya and SNNPRS	79,000
Awash	Water Resources Master plan	110,000	Amhara, Oromiya and Affar	110,000
Rift Valley lakes	Reconnaissance	52,000	Oromiya and SNNPRS	52,000
Genale-Dawa	Reconnaissance	168,100	Oromiya SNNPRS and Somali	168,100
Wabi shebelle	Master plan	200,214	Somali, Oromiya, Harari and very small part of SNNPRS	200,214
Danakil	Reconnaissance	64,380	Tigray,Afar and Amhara	64,380
Ogaden	Reconnaissance	77,120	Somali	77,120
Ayisha	Reconnaissance	2,223	Somali	2,223

Source: Profile of Basin Master plan studies (MWR), 2001

Annex Table 6.3: Preliminary list of identified project sites for immediate implementation

IDENTIFIED PROJECTS (BY BASIN)	GROSS IRRIGABLE AREA	Potential
AWASH VALLEY	**Ha**	
1. Tibila	7,800	
2. Angelele Bolhamo	14,000	
3. Maro Gala	18,000	
4. Lower plains irrigation	63,000	
Sub total	102,800	205,400
BLUENILE BASIN		
5. Megech Gravity scheme	7,000	
6. East Megech pumped	6,000	
7. West Megch pumped	7,000	
8. N.E. Tana pumped	5,000	
9. Ribb Gravity	15,270	
10. Gumara Gravity	12,900	
11. Gilgil Abbai (Koga)	24,000	
12. Upper Beles Gravity/pumped	63,000	
13. Upper Birr	24,000	
14. Debohila	4,200	
15. Lower Birr	6,600	
16. Upper Guder	5,000	
17. Finchaa	6,500	
18. Amarti Neshi Multipurpose	8,500	
19. Arja Diddessa Multipurpose	16,800	
20. Dabana Multipurpose	6,100	
21. Angar Multipurpose	30,000	
22. Dabus	15,000	
23. Rahad	53,000	
24. Galegu	11,600	
25. Dinder Multipurpose	58,000	
26. Tekeze	30,000	
27. Angareb and Goang Pumped	4,000	
Sub total	419,470	1,700,000
BARO GILO - AKOBO VALLEY		
28. Itang pumped	5,000	
29. Alwero Gravity	10,000	
Sub total	15,000	600,000
OMO VALLEY		
30. Lower Omo pumped Scheme	3,000	
RIFT VALLEY LAKES		
31. Galana Valley	12,000	
32. Upper Sagan	4,300	
33. Chow Bahir	12,500	
34. Bilate	7,800	
35. Lake Zwai	5,500	
Sub total	45,100	90,394
WABE SHEBELLE		
36. Gode West	8,300	
37. Gode South	38,400	
38. Kugno	10,260	
39. Kelafo	15,020	
40. Mustahil	3,100	
Sub total	83,380	75,080
Grand Total	665,750	2,670,874

Source: Compiled by Author, 2005 Master plan studies of the respective basins, archive 2001.

Annex Table 7.4: Recommended optimum fertilizer application by soil, crop and region (in kg ha^{-1} of N-P_2O_5)

Region and Type of Cereals	Soils								
	Vertisols	Nitosols	Cambisols	Andosols	Luvisols	Black	Red	Brown	Gray
Tef									
Shoa	80-60	50-55	50-50	45-55	n/a	80-65	50-55	50-50	40-55
Gojjam	80-75	45-60	50-50	n/a	n/a	80-60	45-55	50-60	n/a
Across the Country	80-60	40-55	50-50	45-50	45-50	75-60	40-50	50-55	75-50
Wheat									
Shoa	75-50	80-80	80-70	65-60	n/a	75-45	80-75	80-80	80-80
Arsi/Bale	55-60	80-80	55-35	n/a	n/a	80-80	55-80	60-60	n/a
Across the Country	70-55	70-65	55-54	50-45	50-70	75-55	90-50	75-70	50-45
Barely									
Shoa/Arsi/Bale	80-80	60-60	-	-	-	60-70	50-65	55-60	-
Across the Country	45-45	60-65	-	-	-	70-70	55-65	55-60	-
Maize									
Shoa/Gojjam	-	75-80	50-50	50-55	50-55	80-80	80-80	55-50	50-55
Bako	-	75-33							
Jimma	-	69-46							
Across the Country	-	75-80	50-50	50-55	50-55	65-55	65-75	55-50	55-55
Sorghum									
Across the Country	-	46-23	-	-	-	40-30	35-75	-	-

Source: (MoA/NFIU, 1993; EARO, 2000b).

Annex Table 7.5: SWOP Analysis of Irrigation Sub-sector in the Past

Period	Activity/ Basin	Strength	weakness	Opportunity/ Potential
1956-1967	Blue Nile study	- allocation of efforts, resource for basin wide study and project formulation of Abay - laid strong foundation for hydro-meteorological data collection - laid basis for water engineering expertise development	- was not in any transformed in to physical development except fincha project 6000 ha.	- Basis for project formulation at later date.
1962-1981	- Awash Valley - Wabisheble - Rift valley - Tekeze/Mereb	- implementation of integrated irrigation projects linked to agro -processing in Awash valley - pioneer in large scale irrigation projects of 75,500 hectares in Awash valley - basin master plan study to develop irrigation in wabishebelle, rift valley and Tekeze/Mereb - established water sector planning and efforts to form data base of hydro-meteorology in respective basins.	- driven mainly by economic forces and neglected, social and environmental aspects in Awash valley. - no sufficient attention and resource mobilization to launch irrigation projects except in the Awash basin. - no attention for traditional irrigation schemes improvement in all basins	
1981-1992	- Awash valley - Omo- ghibe - Genale - Wabi sebelle - Abay	- established local expertise and intensified state owned irrigation development in Awash valley - formulated and implemented projects in Omo, Genale, basin - state engagement in small scale projects to curb drought effects in Wollo, Harar, Wolega etc., regions	- highly centralized and state owned intervention with complete ban of private sector involvement. - less emphasis for market driven development. - neglect of irrigation extension . - Limitation of skilled manpower availability - less emphasis on allocation of resource (budget, manpower, policy)	- in lighten the pubic at large on the need of irrigation to tackle drought. - stronger irrigation development using state farms
1992-todate	- all major river basins - regions effort	- creation of Ministry for water sector - formulation of water policy and strategy - allocation of budget for master plan studies and execution of the same. - regions engaged by their own in irrigation development following decentralization - better but incomplete articulation of trans-boundary rivers issue.	- un clear and ineffective use of the water sector policy and strategy to exit from drought crises. - un clear arrangement between basin planning and federal government structure - Neglect of balanced small, medium and large scale irrigation development.	- putting efforts to place more appropriate institutional arrangements. - laying the basis for legislative and frame works of planning for the water sector development