

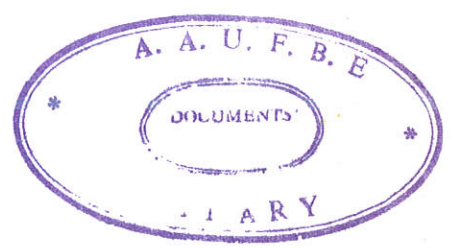
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ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

FOODGRAIN PRODUCTION IN THE STATE AND PEASANT
FARM SECTORS: A CASE STUDY OF COMPARATIVE
ECONOMIC PERFORMANCE IN ARSI REGION

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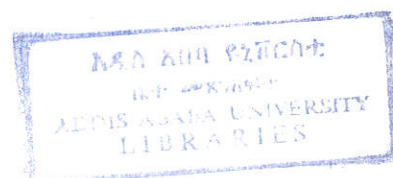
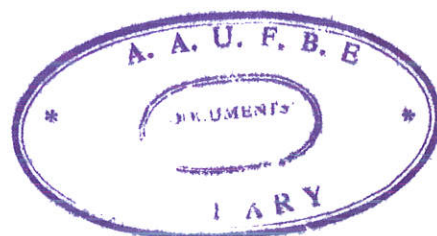
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JUNE 1990

FOODGRAIN PRODUCTION IN THE STATE AND PEASANT
FARM SECTORS: A CASE STUDY OF COMPARATIVE
ECONOMIC PERFORMANCE IN ARSI REGION

A Thesis
Presented to the
School of Graduate Studies
Addis Ababa University



In Partial Fulfilment of the
Requirements for the Degree
Master of Science in Economic
Development and Planning

by

SUFIAN AHMED

June, 1990

242

ADDIS ABABA UNIVERSITY
School of Graduate Studies

FOODGRAIN PRODUCTION IN THE STATE AND PEASANT FARM SECTORS:
A CASE STUDY OF COMPARATIVE ECONOMIC PERFORMANCE
IN ARSI REGION

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ACKNOWLEDGEMENT

I wish to express my appreciation to those who have contributed towards the completion of this thesis.

My first and foremost gratitude goes to my advisor Dr. Teshome Mulat under whose supervision the thesis has been finalized. I am very much grateful to Ato Taye Mengiste for his comments and suggestions.



ABSTRACT

In this study an attempt is made to measure and compare the economic performance of state and peasant farms through a case study method. The economic performance of five state farms in Arsi are compared with that of five peasant associations in the same region. The principal sources of information for this study are the primary data generated at farm level. Various criteria are used to compare the performance of the two farm categories. The empirical results of the study reveal that despite all the priorities they enjoy, state farms are performing poorly relative to the traditional peasant farms. The root causes of inefficiencies in the state farms are identified. Finally, recommendations are made to improve efficiency in the state farms.

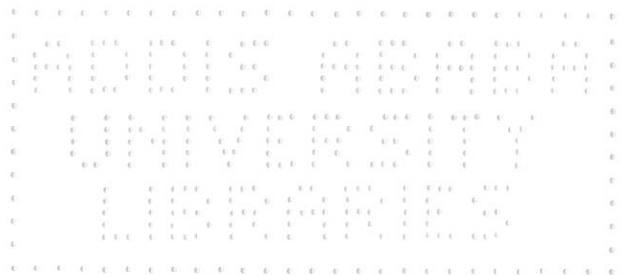


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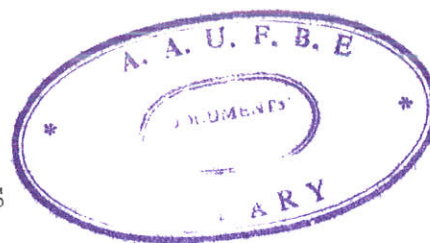
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CHAPTER ONE

1. INTRODUCTION

1.1 Background and Statement of the Problem

Agriculture remains to be the base of Ethiopian economy. It accounts nearly for 50 percent of Gross Domestic Product and most importantly, about 85 percent of the population of the country depend on agriculture for their livelihood. The agricultural sector is characterized by farm fragmentation, stagnation in growth and instability due to climatic variation.

The Ethiopian government has made great effort to transform the agricultural sector on socialist path of development. One of the strategies pursued by the government to facilitate the agrarian transformation has been the establishment and expansion of state farms. Since the initial area of a little over 65,000 hectare in 1979, the state farm total area has expanded to over 200,000 hectare in 1987.¹

The Ethiopian agriculture is dominated by the production of cereals. Cereals account for over 90 percent of total major crop production.² Interms of employment, over 80 percent of rural population concentrate on cereal production. Cereals constitute the major proportion of the population diet. After all, Ethiopia is a country of cereals.

The dominance of foodgrain production is also reflected on state farms. Over 80 percent of the cultivated area of state farm is used for the production of cereals mainly wheat, maize and barley.³ The cropping pattern

of state farms shows the priority given to foodgrain production. Currently, the most important task of state farms is to supply the urban population with marketable foodgrain. In 1987, nearly half of the Agricultural Marketing Corporation's (AMC's) cereal purchases came from state farms including 67 per cent of wheat, 60 per cent of maize and 35 per cent of sorghum.⁴ Infact, state farms are the most important means of the government to ensure food supply to the cities.

At present, the state farm subsector accounts for only about 5 per cent of total crop production.⁵ But, interms of resource allocation, this subsector is the most privilaged one. Over 70 per cent of capital expenditure for the agricultural sector, 90 per cent of improved seeds, 80 per cent of fertilizers are allocated to state farms.⁶ For the subsector that accounts for only 5 per cent of crop production, this allocation of resources is indeed disproportionate. What is alarming more about state farms is that despite the disproportionate allocation of resources, their economic performances have been unsatisfactory.

There is a lot of theoretical literature in economics which show the existence of economies of scale in agriculture. The traditional notion is that large scale mechanized farms are more efficient than small peasant farms. It is in view of this that socialist and a number of developing countries strongly favoured large farms in the hope of achieving rapid increase in production. Recent empirical

findings in some less developed countries, however, do not support the idea that large scale mechanized farms are more efficient than small scale farms.

The debate on the superiority of large scale to small farms has been going on for many years. The controversy started with the publication in 1950's of the results of the Indian Farm Management Studies which showed the inverse relationship between farm size and productivity.⁷ Many subsequent empirical investigations in a number of developing countries support the validity of this phenomenon. Most of these studies have mainly used productivity as an indicator of efficiency. Moreover, the studies have mainly assumed Cobb-Douglas production function.

Sen offered a general explanation for higher productivity in small farms in terms of low opportunity cost of labour in labour surplus economies.⁸ His argument is that in such economies as labour is abundant relative to farm land, it has little alternative job opportunity outside the farms. As a result, the tendency is to employ labour upto the maximum as long as the marginal productivity of labour is positive. The larger farms, on the other hand, depend on hired labour and so they employ labour only to the level at which the marginal productivity of labour is the same as the market wage rate. Therefore, labour input per unit of farm land is higher in the smaller farms than in the larger farms. Moreover, while marginal productivity of labour is less in smaller farms, yield per unit farm land

will be higher as long as the marginal productivity of labour is positive.

Mazumdar also found that higher productivity of land in smaller farm is due to the higher application of labour per acre.⁹ According to Mazumdar, the application of more labour and other inputs is reflected in the higher intensity of land cultivation in smaller farms.

Using the FAO data for 15 developing countries including Ethiopia, Cornia arrived at a result which shows a strong negative correlation between farm size on the one hand and factors of inputs and labour productivity on the other for 13 of these countries.¹⁰ According to this finding, total factor productivity is higher for smaller farms with the exception of very small size farms. The low productivity in the case of very small size farms is due to the diseconomies arising out of their smallness. Thus, according to Cornia, smaller farms are more efficient than larger farms not only in the use of land but also in the use of all other resources.

At present, there are 3 main types of agricultural production in Ethiopia. These are; state, cooperative and peasant farms. These farm categories differ in many respects. As it has been the declared intention of the government to collectivize the agricultural sector, its agricultural policy discriminates against peasant farms. Cooperative and state farms get top priority in terms of resource

allocation and are subsidized. Despite this, it is believed that cooperative and state farms are performing less than the small peasant farms.

The ILO experts have ranked the three farm categories in Ethiopia according to their relative performance.¹¹ The criteria that the experts have used to compare the performance of the three farming systems are: labour absorption capacity, rate of profit on capital, crop yield, potential for accumulation and marketable surplus. On the basis of these criteria, the ILO experts ranked the three farm categories as follows.

Table 1: Performance Comparison of Different Farm Categories.

Criteria	Farm Categories		
	State Farms	Cooperative Farms	Peasant Farms
1. Capacity to absorb labour	3	2	1
2. Rate of profit on capital	3	2	1
3. Crop yield	1 or 2	3	1 or 2
4. Potential for accumulation	3	1	2
5. Marketable surplus	1	2	3

SOURCE: ILO, Socialism from the Grass Root; Accumulation, Employment and Equity in Ethiopia, 1984.

The National Crop Survey of 1986 conducted by the Ministry of Agriculture indicates that productivity on peasant farm is far better than on cooperative farms.¹² Dessalegn, however, argues that the superiority of peasant farm is not so much due to the fact that it is more vigorous than the other farm categories but that it is doing less poorly in comparison.¹³ He considers high personal motivation and flexibility in cropping strategy in the Ethiopian peasant farms as the strong point of the sector.

In Ethiopia, while state farms have been relatively efficient and profitable in the production of such industrial crops as cotton and tobacco, in foodgrain production they have been incurring huge losses. For instance, cereal producing state farms incurred a total loss of 398.4 million birr for the five years period of 1981-1985.¹⁴ This is despite the fact that the Agricultural Marketing Corporation (AMC) pays them higher prices than it pays private peasants.

Foodgrain producing state farms face problem of over-mechanization, highly skilled management demand and uneconomic use of resources. The excessive centralized control structure and the neglect of economic consideration in planning process which is done essentially in physical terms are also other reasons for inefficiencies of these farms.

According to one study conducted by the World Bank, state farms in Ethiopia are socially unprofitable particularly in producing foodgrain.¹⁵ The same study suggested that

state farms should specialize in those production areas where capital intensive and highly specialized technology have comparative advantage. It does not seem that the comparative advantage of state farms lie with the production of foodgrain.

Despite the great effort made to collectivize it, the Ethiopian agriculture remains to be dominated by small peasant farms. Over 90 per cent of the total cultivated land of the country is under peasant farms.¹⁶ These farms are quite small and their production technologies are simple. Interms of resource allocation, the peasant sector is the least favoured one. This is because of the government intention to collectivize the peasants. Today, however, the first priority for Ethiopia should be to increase food production and agricultural growth. To achieve this goal, in allocating resources among different farm categories, efficiency consideration should merit the heaviest weight in the short run.

At present, the diversion of scarce resources to the state farms shows a clear example of an inefficient use of resources. These resources probably could yield higher return if allocated to the peasant sector. Foodgrain producing state farms are inefficient both interms of their productive potential and relative to the performance of peasant farms. The disproportionately large resources allocated to state farms, considering their inefficient use of resources is a serious matter that deserves attention.

In agriculture, the Ethiopian government has been pursuing a resource allocation policy that is imbalance and favours the least efficient state farms. One possible explanation that could justify this policy is if state farms are considered as infant industries with potential future efficiency. But, the reality does not support this argument. State farms have passed a reasonable period of infancy without an indication of improvement. Thus, it can be hypothesised that the resource allocation policy of the government is wasteful and a more rational approach toward the peasant sector probably would improve agricultural growth.

1.2 Objectives of the Study

The debate over the preference of small peasant farms against state farms would be more meaningful if there were empirical studies which show the relative efficiency of these farm categories. Unfortunately, for Ethiopia there are no such empirically supported comparative studies. The studies so far available are at macro level and dealing mainly with the general problems of state farms. No economic study has been conducted for cereal producing state farms.

The only study on comparative performance of different farm categories is the one by Griffeen and Hay.¹⁷ Even this one is of macro type based on the general observation of the authors while they were in Ethiopia for a short

period of time. On the basis of the capacity of each farming type to generate employment opportunity, use resources more efficiently and produce marketable surplus, the study concluded that on the average small peasant farming system has the best potential for improving agricultural growth. So far, there is no empirical study testing this subjective judgement.

Having empirical studies which show the economic performance of state farms both interms of their production potential and relative to the performance of peasant farm is essential for policy makers to make a more rational allocation of resources among different farm catagories. Moreover, such comparative studies should be conducted for different line of production activities. This will enable us to know the area of production for which state farms have comparative advantage.

So far, there is no empirical study which show the economic performance of foodgrain producing state farms. This is the area on which the activities of state farms are more concentrated both interms of cultivated area and crop production and yet, the area in which they appear to be least efficient. It would be very useful to measure and compare the economic performance of foodgrain producing state farms with that of peasant farms. The main objective of the study is to make such comparative evaluation through a case study method.

Specific Objectives are

1. To measure and compare economic performance of selected foodgrain producing state and peasant farms.
2. To identify the root causes for the unsatisfactory performance of foodgrain producing state farms.
3. On the basis of the finding of the study, to make recommendation for possible ways of improving efficiency of state farms under consideration.

1.3 Significance of the Study

Despite the huge resources committed to the state farms, their performance are far below expectation. Particularly foodgrain growing state farms are inefficient incurring substantial losses. To know the extent of inefficiencies of state farms both in terms of their productive potential and relative to peasant farms, it is essential to have empirical studies which show the comparative performance of these two farming systems. For policy makers such information is of great help to make a more rational allocation of resources between the state and peasant farms. Moreover, such study should be conducted for different types of production. So far, there is no such study and this is a modest attempt to fill the gap.

FOOTNOTES

1. Ministry of State Farm Development, 1989.
2. ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
3. CSA: Time Series Data on Area, Production and Yield of Major Crops, 1986.
4. World Bank: Ethiopia-Agriculture, A Strategy for Growth, A Sector Review, 1987.
5. CSA: Time Series Data on Area, Production and Yield of Major Crops, 1986.
6. World Bank: Ethiopia-Agriculture, A Strategy for Growth, A Sector Reveiw, 1987.
7. B.N.Verma and D.W.Bromley: "The Political Economy of Farm Size in India: The Elusive Quest" Economic Development and Cultural Change Vol. 35, No. 4, 1987.
8. Ibid.
9. D.Mazumdar: "Size of Farm and Productivity" Economica, Vol. 32, No. 126, 1965.
10. G.A. Cornia: "Farm Size, Land Yield and the Agricultural Production Functions: An Analysis for Fifteen Developing Countries". World Development, Vol. 13, No. 4, 1985.
11. K.Griffeen and H.Hay: "Problems of Agricultural Development in Socialist Ethiopia". Journal of Peasant Studies, Vol. 13, No. 1, 1985.
12. CSA: Agricultural Sample Survey, 1986/87.
13. Dessalegn Rahmato: The Peasants and the Comrades; Problems and Prospects of Socialist Transformation in Rural Ethiopia, IDR, 1987.
14. MSFD: State Farm Sector Review, 1987.
15. World Bank: Ethiopia-Agriculture, A Strategy for Growth, A Sector Review, 1987.
16. CSA: Time Series Data on Area, Production and Yield of Major Crops, 1986.
17. K.Griffeen and H.Hay: "Problems of Agricultural Development in Socialist Ethiopia". Journal of Peasant Studies, Vol. 13, No.1, 1985.

CHAPTER TWO

2. AGRARIAN TRANSFORMATION AND THE FOOD SITUATION IN ETHIOPIA.

2.1 Agrarian Transformation

The model known as Socialist Transformation of Agriculture envisages the development of large scale farms based on social ownership of means of production. It involves the gradual conversion of private peasant farms into large scale cooperative and state farms. This model was first tested in the Soviet Union. Its application in Eastern Europe and China, however, indicates that adjustments have to be made depending on the conditions in each country.

Over the last 15 years, the Ethiopian government has made great effort to transform the traditional agriculture in light of Marxian Agrarian model. After attributing the sluggish performance of the agricultural sector to the low level of productivity prevailing in peasant farms, the establishment of large scale cooperative and state farms has been considered as a solution. It is in view of this that agricultural development policies and strategies have been designed. Moreover, a number of institutions have been established to facilitate the agrarian transformation.

2.1.1 Modes of Agricultural Production

Following the revolution of 1974, profound changes have taken place in rural Ethiopia. On the basis of the March 1975 Rural Land Proclamation and the subsequent measures taken by the government, the old feudal relations of production have been abolished and new ones have emerged. By recognizing the drawbacks of the tinny and fragmented peasant farms, the Ethiopian government has been doing everything to establish large scale socialist farms. As a result, structural changes have been taking place and new modes of production have emerged in the agricultural sector.

At present, the Ethiopian agriculture is characterized by the coexistence of three different modes of production. These are; (1) State farms, (2) Cooperative farms and (3) Private peasant farms. The relative importance of these different systems of agricultural production in terms of land under major crops and food grain production is given in table 2.

Table 2: Cultivated Land and Foodgrain Production for Different Farm Categories.

Farm Categories	Cultivated Land ('000 ha.)	%	Production ('000 quintal)	%
1. State farms	150.71	2.80	3309.75	5.44
2. Cooperative farms	225.32	4.19	2329.68	3.83
3. Peasant farms	4995.56	92.99	55139.71	90.72

Source: CSA, Agricultural Sample Survey (1986/87)

In the Ten Year Perspective Plan, it is anticipated that systems of production in agricultural sector will undergo dramatic structural changes in relatively short period of time as indicated in table 3.

Table 3: Share of Cultivated Land

Farm Categories	1983/84		1993/94	
	Area('000 ha.)	%	Area('000 ha.)	%
1. State farms	221.4	3.4	502.2	6.3
2. Cooperative farms	88.7	1.3	3,938.8	49.6
3. Peasant farms	6,136.8	95.1	3,500.0	44.0

Source: ONCCP, The Ten Year Perspective Plan, 1975 E.C.

The three farm categories are briefly described in the following pages.

2.1.1.1 State Farms



The state farm subsector was created after the Rural Land Proclamation of 1975 that nationalized the private commercial farms. Of the estimated 750,000 hectare of former commercial farm holdings, about 67,000 hectare which were found to be unsuitable for distribution to the small peasant farmers were converted to state farms.¹ Since then, the size of the state farm subsector has increased significantly. Yet, in national term, it is

very small accounting for less than 5 per cent of the total cultivated land and crop production of the country.

The objectives of state farms are to

1. alleviate the country's food problem
2. produce export commodities
3. promote import substitution
4. create employment opportunities
5. enhance agricultural transformation

In order to achieve the above objectives, the Ministry of State Farm Development (MSFD) is established along the following hierarchies: the Ministry, Corporation, Enterprise and Farms. The Ministry at the top of the hierarchy is a policy making body. The Corporation is an intermediary organ that links the Ministry with Enterprises. The Enterprise is a technical body that coordinates and supervises state farms located in a given administrative region. The lowest organ in the structural hierarchy is the Farm which is the main operational entity. Currently, the Ministry of State Farm Development administers 7 corporations, 14 enterprises, 54 state farms and 17 processing plants and agro-industries.

At present, the activities of state farms are concentrated on production of foodgrain. Over 80 per cent of the cultivated land of state farm is devoted to the production of cereals mainly wheat, maize and barley. The cropping pattern of state farms which show the priority given to the production of foodgrain is shown in table 4.

Table 4: Cropping Pattern of State Farms

Crops	Production ('000 quintal)	%
1. Cereals	3,255.46	98.35
maize	1,706.00	51.54
wheat	1,291.30	39.01
barley	199.40	6.02
sorghum	56.00	1.69
teff	2.70	0.008
2. Pulses	17.90	0.54
3. Others	36.45	1.10
Total	3,309.75	100

Source: CSA, Time Series Data on Area, Production and Yield of Major Crops, 1986/87.

The establishment and the subsequent rapid expansion of state farms reflects the Ethiopian government's believe that this is the best way to ensure the supply of marketable foodgrain to urban areas. Currently, the most important task of state farm is to supply marketable foodgrain to urban centres and the army. For instance, in 1987 nearly half of the Agricultural Marketing Corporation's (AMC's) cereal purchase came from state farms.² Infact, state farms are considered by the government as the most important means to supply the cities with marketable foodgrain.

State farms have played an important role in increasing the production of such industrial crops as cotton and tobacco an area in which they appear to be reasonably efficient and competitive. In foodgrain production, however, most of state farms are not financially viable and have been incurring huge losses. For instance, cereal producing state farms have incurred a total loss of 398.4 million birr for the five years period of 1981-1985.³ This is despite the fact that the Agricultural Marketing Corporation (AMC) pays them much higher prices than it pays private peasants.

The state farm subsector is the most privileged one and has been given top priority over the other farm categories in terms of resource allocation. Over 70 percent of capital expenditure for the agricultural sector, 80 per cent of chemical fertilizers and 90 percent of improved seeds are allocated to state farms.⁴ Its demand for skilled manpower is very high. State farms enjoy the policy of price differential in agricultural marketing. Despite all priorities and subsidies given to state farms, most of them are not financially viable. The extent of financial losses incurred by state farms is given in table 5.

In the state farm subsector, cost of production per unit of output is very high. For instance, the cost of producing one quintal of wheat for the Arsi state farms was 95 birr in 1987. In the same year the price of one quintal of wheat was 45 birr. Yield per hectare on the state farms

Table 5: Annual and Cumulative Losses of State Farms

Year	Annual Losses (million birr)	Cumulative Losses (million birr)
1981	31.4	137.2
1982	68.9	216.2
1983	83.2	304.2
1984	112.2	422.3
1985	101.0	535.6

Source: MSFD, State Farm Sector Review, 1987.

is not better than on peasant farms. In general, efficiency by almost all criteria appears to be low. Despite this, under the Ten Year Perspective Plan, the size of state farm subsector is anticipated to increase from its current level of 200,000 hectare to well over 500,000 hectare by 1994.⁵ The huge financial losses and inefficiencies of the state farm subsector raise doubt as to whether state farms are a proper and long run solution to the problem of supplying the urban population with foodgrain.

2.1.1.2 Cooperative Farms

The other farm category which emerged during the last 15 years is the Agricultural Producers Cooperatives. Cooperatives are formed in three stages once members of Peasant Association (as few as three of them) decided to form cooperative by merging their plots of land or demanding a block of farm land from peasant association (PA).

In the first stage (Melba), land is collectivized, but members can retain a piece of land (upto $\frac{1}{2}$ ha.) for individual cultivation.⁶ Draught animals and farm implements are private property. At this stage, distribution of income from collective farm is based on labour contribution and rents from draught animals and farm implements.

At the second stage (Welba), all agricultural implements and draught animals are collectivized. Only $\frac{1}{10}$ hectare of land is allowed for individual cultivation. Income distribution is based solely on labour contribution.⁷

The third stage (Weland), is reached when several Welbas are merged together. Members are organized into production brigades. At this highest stage of collectivization, high level mechanized production and modern management systems are to prevail.

Collectivization of peasants into large scale cooperative farms has been a major long range policy objective of the Ethiopian government. The low level productivity prevailing in the agricultural sector to a large extent has been attributed to the traditional subsistence peasant production. Collectivization of peasants has been considered by the government as a long run solution to Ethiopia's agricultural problem. The objective of the government is to collectivize, half of the country's peasants by 1994.⁸ To attract peasants, in order to achieve

the above objective, the government provides a number of incentives to producer's cooperatives. These include

1. Producers Cooperatives pay lower agricultural income taxes than private peasants.
2. Producers Cooperatives are paid much higher prices than smallholders by the Agricultural Marketing Corporation (AMC) for their products.
3. Producers Cooperatives get priority access to modern agricultural inputs like fertilizers, improved seeds, tractor, credit and extension service.
4. Producers Cooperatives have priority access to industrial consumer goods over the individual farmers.
5. Producers Cooperatives can demand the allocation of best quality land in a peasant association.

Despite all these incentives, smallholders have been reluctant to join producers cooperatives. Currently, there are only 837 producers cooperatives in the entire country of which 652 are in the first and lower stage, while only 185 are in the second stage.⁹ Infact, only about 1.1 per-cent of Ethiopian peasants are collectivized. In spite of all the priorities, cooperatives are not doing well. In most cases they are less productive than the smallholders.

There is no doubt that collective activities have certain advantages like mobilization of labour for construction of dams, roads, canal, etc. They can also achieve some economies of scale. These advantages, however, should not be exaggerated. There is no empirical evidence which shows that collective production system is more efficient than individual production system either in resource use or in social transformation. On the contrary, countries like China which emphasized and practised collective agricultural production system for many years, recently started to decollectivize and privatize agriculture.

2.1.1.3 Private Peasant Farms

By far, the most important and dominant farming system in the Ethiopian agricultural sector is the smallholder farming. It accounts for over 90 percent of cultivated land and total agricultural production. Besides providing employment for about 80 percent of the country's labour force, virtually all of the agricultural commodities for export originate from peasant sector. Therefore, by Ethiopian agriculture, largely we mean the private peasant farm.

The individual holdings in the peasant sector are quite small, usually less than 2 hectare. Peasants in this sector are organized in Peasant Associations (PAs). There are about 23,500 peasant associations in the country.¹⁰

In the private peasant sector, production technologies are very simple. The types of agricultural implements which the Ethiopian peasants use today, are as old as the history of the farming in the country itself. Capital consists of rudimentary tools and implements. The widely used farm implements in the peasant sector is a wooden plough. Its capacity to dig deep is very limited and as a result, it is necessary to plough several times before sowing.

In general, production technologies and agricultural implements in the peasant sector remain to be what they were many thousand years ago. Draught oxen and wooden plough continue to be the essential complements of capital for Ethiopian peasants. More importantly, even these items are in acute shortage. Nearly 40 percent of Ethiopian peasants do not have an ox and the proportion of peasants who have two or more oxen is 28 percent, while 32 percent have only one ox.¹¹ The extent of under capitalization in the peasant sector could also be seen from the average value of agricultural tools and implements. One study puts the average inventory value of a farmer between 4.25 and 14.00 birr for Arsi region.¹² The use of modern farm inputs in the peasant sector is very limited. For instance, only 10 percent of peasant farmers use chemical fertilizer.

The subsistence production taking place in the peasant sector is essentially to meet the need of a peasant and his family. Ethiopian peasants are very less market oriented.

The extent of their monetization is seen in the insignificant proportion of their marketable surplus of cereals estimated at about 10 percent of total cereal production.¹³

Poverty and underdevelopment in Ethiopia are related to the sluggish performance of agriculture which contributes about 50 percent to the GDP of the country. So far, blame has largely been put on the use of age old backward technology in the private peasant sector. Productivity in the peasant sector, of course, is very low. But, it is also important to know all the factors that possibly have contributed to the prevailing low level productivity in the peasant sector.

One of the factors commonly identified as hindering productivity in the peasant sector is the existing land tenure system. Eventhough the Rural Land Proclamation of March 1975 allows user's right over a maximum of 10 hectare, the actual individual holding in the peasant sector is much lower than this. The national average size of individual peasant holding is 1.5 ha.¹⁴ There is significant variation in the size of holdings between and within peasant associations. Moreover, due to rapid population growth and absence of non-farm employment opportunities, individual farm holdings are diminishing further. This by itself reduces productivity.

The most detrimental aspect of the land tenure system to improve productivity, however, is the absence of incentive for peasants to invest on farm land. Although farm land is

allocated to peasants for private cultivation, retention of a plot of land for a specified person is not guaranteed. As new households are formed in peasant association, land is reallocated to accommodate the new families. In order to ensure the equitable distribution of land of varying fertility and location, land is redistributed frequently.

The other constraint to improve productivity in the peasant sector is the set of government policies regarding compulsory delivery of quota and low prices paid to peasant farmers by the Agricultural Marketing Corporation (AMC). Acute shortage and high prices of modern farm inputs like fertilizers and improved seeds has also constrained productivity in the peasant sector.

Perhaps the most important issue regarding the private peasant sector is the share of resources allocated to this sector. The government gives priority to the state and cooperative farms in resource allocation. The total financial allocation made available for the peasant sector has been low in absolute terms and disproportionately low compared to the other farm categories in view of their contribution to total agricultural output. The long run policy objective of the government has been to collectivize peasants and gradually eliminate the private peasant sector. The argument is that productivity and production in the peasant sector is very low. A more rational approach toward the peasant sector, however, can improve the unsatisfactory performance of the agricultural sector and the food situation.

With the right price incentive and the provision of marketing, credit and extension services, private peasants can increase productivity and marketable surplus. This requires a well functioning private sector and a proper incentive structure. Improved seeds and chemical fertilizer need to be available in sufficient quantities and on time. Minimum Package Program prior to the revolution support the view that Ethiopian peasants are capable of achieving a high level productivity.

2.2 The Food Situation in Ethiopia

2.2.1 The Paradox of Rich Agricultural Potential and Chronic Food Shortage.

The Ethiopian economy is based on agriculture and it is the oldest industry that is deeply rooted in the Ethiopian culture. Agricultural land is the single most important natural resource of the country. The total area of Ethiopia is 1.24 million square km. Nearly 70 percent of the country's total area is cultivable. But, out of the total agricultural land, the cultivated portion is only about 20 percent. According to one survey, the area under major crops in any particular year does not exceed 8 percent of the total agricultural land.¹⁵

Ethiopia is endowed with suitable climatic conditions and fertile soil for agricultural production. Variation in climatic conditions enables the country to produce different

crops. Many crops are believed to have originated in Ethiopia. Ethiopia is an important gene centre for a number of cereals. Teff and enset are hardly known anywhere else. The steep relief in the high lands and the extensive low lands enable the country to have a multitude of extremely variable agro-ecological zones and produce a multiplicity of crops. Various types of cereals, pulses, oil seeds and root crops are grown in different parts of the country. Not all types of crops, however, are equally important in terms of cultivated land and total crop production. Cereals account for more than 90 percent of major crop production. Cereals constitute the major proportion of the population diet. The cropping pattern of major crops is given in table 6.

Enset is also an important source of food contributing about 8 to 10 percent to the total food supply of the country.¹⁶ It serves as a staple food crop for millions of people living in southern and southwestern parts of the country. In addition, yams and potatoes are making about 5 percent of the total food supply.

Another important source of food is the livestock sector. Ethiopia is very rich in animal resources. It has about 27 million cattle, 42 million goats and sheep, 1 million camels and a poultry population of 52 million.¹⁷ The fishery sector is also another important resource area of food. The Red Sea Coast has an estimated annual fish output potential of 66,000 tons, while the Rift Valley lakes

Table 6: Cropping Pattern of Major Crops (1986/87)

Crops	Cultivated Land		Production	
	'000 ha.	%	'000 quintal	%
1. Cereals	4,786.31	85.4	56,364.24	90.01
Teff	1,272.48	22.71	10,332.24	16.50
maize	1,012.62	18.67	17,153.63	27.39
barley	897.99	16.03	9,932.18	15.86
sorghum	762.65	13.61	9,631.70	15.38
wheat	661.86	11.81	7,753.20	12.38
millet	137.62	2.45	1,197.81	1.91
oat	41.09	0.07	363.53	0.05
2. Pulses	602.53	10.75	5,407.77	8.63
3. Other	212.34	3.79	844.91	1.34
Total	5,601.18	100	62,616.97	100

Source: CSA, Time Series Data on Area, Production and Yield of Major Crops, 1981/87.

are estimated to have the potential of over 26,000 tons of annual fish catch.¹⁸ The livestock and fishery sectors, however, have not yet been exploited. Its actual production and contribution to the total food supply is very low.

Ethiopia is endowed with water resources. The country has 14 big and medium river basins with annual water run-off of about 115 million cubic meters.¹⁹ It has vast area of potentially productive agricultural land on which it is possible to increase crop production significantly. On the whole, Ethiopia is endowed with rich and large agricultural land, livestock, fishery and water resources. The

existence of such vast and fertile agricultural land and water resources makes the potential for increasing production very high. Recently, the rainfall condition in the country appears to be deteriorating. In comparison with many African countries, however, Ethiopia still enjoys favourable climatic conditions. In spite of the substantial deterioration, the agricultural resources of Ethiopia indicate the potential for increasing food production.

Ethiopia is a country whose potential for producing food has been subjected to the expression of great expectation in the past. Recently, such optimistic opinions have been withdrawn and replaced by gloomy forecast. Most observers are captivated by Ethiopia; its rich agricultural potential and at the same time puzzled by its problem (chronic food shortage and pervasive poverty). It is really a paradox that a country with such immense agricultural resources could not feed its population and relies on external food aid and import. Over the last 10 years, millions of Ethiopians have been depending on external food aid. Moreover, as the domestic food production lags behind population growth, the government has been compelled to allocate substantial amount of scarce foreign exchange to import food. Table 7 shows the share of food import in the total value of imports during the last 10 years.

Table 7: Food Import

Year	Food Import (million birr)	Total Import (million birr)	Food Import as % of Total Import
1975	19,726	613,095	3.2
1976	32,497	736,674	4.2
1977	28,975	810,926	3.5
1978	42,274	1,080,825	3.9
1979	60,715	1,174,569	5.1
1980	90,898	1,423,299	6.3
1981	112,713	1,526,641	7.3
1982	124,320	1,623,397	7.6
1983	214,891	1,813,326	11.8
1984	171,622	1,951,104	8.7
1985	500,566	2,046,442	24.4
1986	496,236	2,278,708	21.7

Source: CSA, Compiled from Statistical Abstracts.

Hunger and poverty are challenges facing Ethiopia today. As agriculture is the base of the economy, hunger and poverty probably will continue to prevail unless conditions in the agricultural sector are improved. To reverse the situation, adjustments have to be made in agricultural development policies and strategies. Factors like recurrent drought and civil wars have exacerbated the deterioration of agricultural and food production.

Despite all these, the country has rich agricultural resources, favourable climate, a huge unexploited livestock population and plentiful agricultural labour force. It is

this contrast of rich agricultural resource base on the one hand, and the prevailing hunger and poverty on the other which many observers found puzzling about Ethiopia. It is a paradox that food shortage and hunger prevail in a country with such immense potential. This situation needs a thorough analysis why a country with such great agricultural potentials could not feed its people.

Another striking feature about the food situation in Ethiopia is the coexistence of food surplus with food deficit areas. This is mainly the consequence of government grain marketing policy which until very recently restricted grain movement and the inadequate infrastructural development.

2.2.2 State of Foodgrain Production

Cereals account for over 85 percent of cultivated land and 90 percent of major crop production. Cereals constitute the major proportion of the population diet. Therefore, by foodgrain we mean largely cereals. If we look at the trend in the food production particularly cereal production, it reveals a picture of virtual stagnation and deterioration. Cereal production between 1974 and 1986 increased in 7 out of 12 years whereas, production fell in 5 out of 12 years (table 8.)

Table 8: Trends in Cereal Production

Year	Production (million quintals)	% change over the Previous year
1974	37,947	
1975	46,980	23.64
1976	43,701	-6.97
1977	39,853	-8.90
1978	40,804	2.38
1979	45,843	12.34
1980	56,118	22.41
1981	53,283	-5.15
1982	67,182	26.08
1983	55,267	-17.84
1984	42,398	-24.29
1985	48,199	13.68
1986	56,364	16.94

Source: Compiled from Statistical Abstracts.

The Ethiopian agriculture remains primitive and largely subsistence. Until 1958, however, the traditional farming was producing 'enough' and the country was self-sufficient in food. Before this period, Ethiopia was a net exporter of foodgrain. For instance, in 1947 Ethiopia exported 150,000 tons of grain.²⁰ After 1958, Ethiopia became a net importer of food as there was a need for importing large quantity of grain. The importation of food continued until the present day more importantly in an increasing manner. The importation of food is depriving the country of a significant share of its scarce foreign exchange.

Because of low productivity in the agricultural sector, per capita food production is extremely low. Domestic food production remains far below the minimum level diet requirement of the population. Average per capita daily calorie intake of the population is as low as 1740.²¹ The deterioration in domestic food production coupled with significant post harvest losses have led to rapidly increasing dependence on food aid and import resulting in a drain on meagre foreign exchange.

The extent of food crisis now facing the country is such that the very survival of millions of Ethiopians is threatened. Recently, Ethiopia is identified with famine and starvation. Food shortage has widespread effects and implication. The inflationary pressure caused by food shortage is very high. Food shortage also means lower labour productivity in the future for survivals of famine today are tomorrow's labour force.

The chronic food problem facing Ethiopia has four major dimensions.

1. Rapid population growth

The population of Ethiopia is growing at an alarming rate (2.9%). The country virtually has no population control policies. The rapidly growing population that provide one of the essential inputs (labour) at the same time create a growing demand for food and this makes attainment of food self-sufficiency very difficult. The problem is

exacerbated by the fact that domestic food production lags behind population growth.

2. Stagnation and deterioration in food production.

The recent trend is that domestic food production is deteriorating and unstable. Domestically produced per capita food availability is diminishing. Moreover, there are years of acute food shortage and widespread starvation.

3. Massive food aid and import

As a result of recurrent drought and virtual stagnation of food production, Ethiopia has become increasingly dependent on food aid and import.

4. Degradation of agricultural resources

The prevailing damaging farming practices and the increasing pressure on land resulted in a situation which is depleting in an alarming manner the soil of Ethiopia (the very basis for the existence of the population).

Deterioration of natural resources, civil wars, diminishing incentives, farmer's/weak infrastructure, inadequate resource allocation to the private sector together with recurrent drought have contributed to a greater or lesser extent to the sluggish performance of agriculture and acute food shortage. Under Ethiopian situation, increasing food supply is essential to improve productivity in agricultural sector.

2.2.3 Factors Impeding Agricultural/Food/Production

The occurrence of two famines within the past decade makes food supply in Ethiopia a controversial issue. Opinions as to the cause of decrease in the domestic food production are diverse. Some regard natural factors such as the deterioration in climate condition as the prime cause for the prevailing food shortage.²² Others put blame largely on government policies and make it fully responsible for the prevailing low level productivity and the food shortage.²³

It could be inferred, however, from findings of various studies that the worsening food situation in Ethiopia is not merely due to one factor alone, but because of several unfavourable conditions impeding over the agricultural sector. It is important to know all the factors that have contributed toward the worsening food situation. There are a number of them. Generally, these constraints to improve the food production could be discussed under the following headings: Policy Constraints, Problem of land holding system and Technological Problems.

2.2.3 Policy Constraints

Imbalance resource allocation: Relative to its importance in the national economy, the agricultural sector does not receive its due attention in terms of resource allocation. The share of financial investment made available to agriculture is very low. For instance, the percentage of total

financial investment for the agricultural sector over the last 5 years on the average is only 15 percent.²⁴ For the sector that generates half of the country's GDP, this is indeed very low.

The most important issue regarding resource allocation, however, is the share made available for different farm categories, namely state, cooperative and peasant farms. It is a well known fact that the intention of the government has been to collectivize the agricultural sector. The government blames the subsistence peasant production for the sluggish performance of the agricultural sector. Moreover, the government found it difficult to plan activities in the peasant sector.

After attributing the problem of low productivity in the agricultural sector largely to the subsistence nature of production in the peasant sector, the government decided in favour of collectivization. It has been the declared intention of the government to bring half of the cultivated land of the country under cooperative farms by 1994. Alongside the cooperative is the state farm subsector which is regarded as a model in transforming the traditional agriculture.

In spite of all the efforts made to collectivize it, the Ethiopian agriculture remains basically to be dominated by smallholders. In its policy of agrarian socialism, the Ethiopian government discriminates against smallholders.

State and cooperative farms enjoy top priority in resource allocation. Distribution of agricultural inputs among different farm categories is given in table 9.

Table 9: Share of Different Farm Categories in Agricultural Inputs and Total Production.

Farm Categories	<u>% Share in Distribution of</u>			% contribution to total agri. Production
	Bank Credit	Fertilizer	Improved Seed	
1. State farms	92	82	92	5.44
2. Cooperative farms	8	8	6	3.83
3. Peasant farms	-	10	2	90.82

Source: World Bank, Ethiopia-Agriculture, A Strategy for Growth, A Sector Review, 1987.

As it can be seen from table 9, the allocation of resources among different farming categories is highly imbalance. This is true particularly when we look at the contribution of the different farm categories to the total agricultural production (table 9).

Farmer's incentives: The most important issue regarding government policy probably is the existence of policies that do not encourage peasants to improve productivity and produce more. The unsatisfactory performance of agriculture is related to the erosion of farmer's incentives. Of course, what constitutes proper incentive is a very complex issue involving many factors. In Ethiopian case, farmer's

incentives involve not just pricing and marketing but, the creation of economic environment conducive to unleashing the latent potential for agricultural development.

One of the constraints to increase agricultural productivity is the very low prices paid to peasant farmers and the vigorously enforced compulsory delivery quota of agricultural commodities. The constraint of fixed low price is made more restrictive by making it uniform for all locations and quality. The depressive effect of low fixed prices for delivery quota is more reinforced by the restriction on private traders and on the movement of agricultural commodities from surplus to deficit areas. The net effect of the combination of the disincentives has been stagnation and reduction in the production of quota commodities. In many cases, peasants have shifted some or all of their resources to producing non controlled commodities.

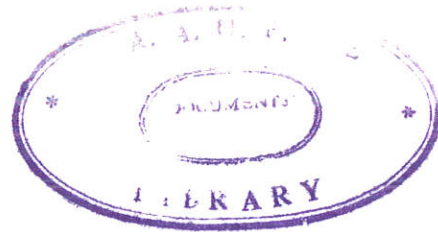
Limited availability, high prices and untimely delivery of farm inputs also have detrimental effect on agricultural and food production. The cumbersome marketing organizations involved in moving agricultural inputs usually result in a failure to provide the right type of inputs at the right time. Price policy has an impact on utilization of improved inputs and increasing productivity. Moreover, small peasants do not have access to bank credit in order to utilize such inputs as chemical fertilizers and improved seeds. Availability of essential industrial consumer goods is just as important

to a farmer as his ability to market his products. A strong disincentive emerges when items highly demanded by the peasants are not available on the market.

2.2.3.2 Problem of Land Holding System

Empirical studies on this subject reveal that distribution and redistribution of land in the post land reform period has aggravated the problem of land fragmentation.²⁵ The existing land holding system under which land is made available for use by a farmer possess special problem in improving agricultural productivity. Of course, the implementation of land reform is a remarkable fact which basically altered the rural social structure and removed a major obstacle to agricultural growth, namely the inequitable distribution of land and the extortionation of tenants. The agricultural growth potential created by the land reform, however, remains largely unexploited as the new land holding system turned into a scenario where farmers are again uncertain over their holdings.

Although land is allocated to a household for private cultivation, retention of an allotment for a specified person is not guaranteed. As population grow and new households are formed, land is redistributed to accommodate the new families. In order to distribute land of varying fertility and location equitably, allocation to a single household will generally be made up of several small scattered plots. Overtime, holdings are diminished in size and further



fragmented. This in itself reduces productivity. Without the ability to offset the decreasing holding size by improving land productivity or increasing off farm incomes, peasants regress into self-sufficiency and ultimately into absolute poverty.

The most detrimental aspect of the existing land holding system, however, is the elimination of incentive for peasants to invest in agricultural land. Smallholders are uncertain over their holdings as cooperatives can claim the best quality of agricultural land in peasant associations. This does not stimulate peasants to invest in longer term land improvement. Thus the worst aspect of the old land tenure system, from the stand point of improving agricultural productivity has been incorporated into the new land holding system.

2.2.3.3 Technology Problems

Other constraints to improve agricultural productivity and food production are primitive production technology, weak infrastructure, degradation of agricultural resources and complete dependence on rainfall. These constraints to a large extent are a reflection of the country's overall technological backwardness.

Ethiopian peasants still farm as their fore fathers of many thousands years ago. Agricultural tools and implements are simple. The basic complements of capital for

Ethiopian farmers are wooden plough and oxen. The capacity of wooden plough pulled by a pair of oxen to plough deep is very limited. Weeding and harvesting are done by hand with sicles. Cleaning is done by winnowing the crop to the wind. With these rudimentary tools and primitive techniques of production, it would be unfair to expect much from Ethiopian peasants to overcome the deteriorating agricultural and food situation. The use of modern farm inputs is extremely limited. Improved seeds, chemical fertilizers and modern agricultural implements are still unknown and unavailable to a large number of Ethiopian peasants.

Another manifestation of technological backwardness is the virtual absence of irrigation farming. Ethiopia is extremely dependent on rainfall. Crop failure and loss of livestock occur with abnormal weather pattern. To reduce dependency on rainfall condition which is deteriorating, irrigation should be developed. Out of the estimated 21.25 million hectare of irrigable land, only about 4 percent is irrigated.²⁶ Practically, there is no water management technique such as construction of dams and reservoirs. It is a well known fact that food shortage in Ethiopia to some extent is the result of recurrent drought or untimely rain. During ample rainfall time most of the rain water drain off to the neighbouring countries. A good water management can conserve this for use when needed.

A further manifestation of technological backwardness in rural Ethiopia is the absence of proper grain storage facilities. The extent of grain loss due to the absence of proper crop protection is alarming. By some account it is estimated that the amount of crop loss due to inappropriate harvesting and storage facility is as high as 30 percent of the total crop production.²⁷

Inadequacy of rural infrastructure such as roads have been a further constraints to improve the food situation. Nearly 3/4 of Ethiopian farmers are more than a half day's walk from all weather roads. The lack of roads has constituted a major impediment to extension service, input supply and output marketing.

In general, the fundamental issue in the food problem is the fact that the agricultural sector has not been accorded the necessary priority in the allocation of resources and in giving due attention in the development policies. To improve the food situation, the important requisite is the will to channel sufficient resources to the agricultural sector and to formulate proper policies that stimulate peasants to produce more. The problems to improve the food situation are indeed formidable but not insurmountable.

A number of constraints to overcome the food problem are of institutional nature which can be eliminated or moderated through modification of government policies. Some are technological problems which can only be eased

gradually with substantial investment. Extensive efforts are being made by international organizations in collaboration with the Ethiopian government to improve the food situation. These international organizations and donor's came up with a series of proposals for policy reforms.²⁸ From the recent changes made in the economic policy, it seems that the Ethiopia government is complying with the proposals of international organizations. The policy changes to eliminate compulsory quota delivery and to establish free and open market, if implemented may improve agricultural and food production. Improved incentives for peasants in the form of better prices and less restricted market are necessary but not sufficient conditions for attainment of the national goal of self-sufficiency in food. The policy changes probably will increase the incomes of peasants, but per capita food production will continue to deteriorate. To overcome this will require elimination or substantial easing of the technological problems.

FOOTNOTES

1. MSFD: State Farm Sector Review, 1987
2. World Bank: Ethiopia-Agriculture; A Strategy for Growth: A Sector Review, 1987.
3. MSFD: State Farm Sector Review, 1987.
4. World Bank: Ethiopia: Agriculture; A Strategy for Growth A Sector Review, 1987.
5. ONCCP: The Ten Year Perspective Plan, 1975 E.C.
6. PMAC: A Proclamation to Provide for the Establishment of Cooperative Societies, Procl. No. 138 of 1978, March 1978.
7. Ibid.
8. ONCCP: The Ten Year Perspective Plan, 1975 E.C.
9. Ministry of Agriculture; Cooperative Promotion and Extension Division, 1987.
10. Ibid.
11. Alamaya University: Papers Presented on National Seminar on Integrated Strategies in the Food Sector of Ethiopia, 1986.
12. Ministry of Agriculture: Constraints to Increasing Crop Production, 1986.
13. ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
14. Ibid.
15. Alamaya University: Papers Presented on National Seminar on Integrated Strategies in the Food Sector of Ethiopia, 1986.
16. ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
17. Ibid.
18. Ibid.
19. Ibid.
20. Melaku Teferra: The Food Situation in Ethiopia, 1987.

21. ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
22. Abebe Tefferri: State Policies, Agricultural Development and Food Production in Ethiopia, 1984.
23. Willion A. Faught: An Appraisal of Ethiopia's Agricultural Prospects, 1987.
24. World Bank: Ethiopia-Agriculture: A Strategy for Growth, A Sector Review, 1987.
25. Fassil G.Kiros: "Agricultural Land Fragmentation: A Problem of Land Distribution Observed in some Ethiopian Peasant Association". Ethiopia Journal of Development Research, Vol. 4, No. 2, 1980.
26. ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
27. Ibid.
28. William Faught: An Appraisal of Ethiopia's Agricultural Prospects, USALD, 1987.

CHAPTER THREE

3. METHODOLOGY

3.1 Selection of the Study Area

A case study method is used to measure and compare the economic performance of the state and private peasant farms. To avoid computational problem, only those farms which produce predominantly one crop were considered. For the purpose of this study, the selection of farms which produce primarily wheat was made on the basis of the consideration of the importance of wheat in the cropping pattern of state farms. About 42 percent of the total crop production of the state farm is wheat.¹ Infact, state farms are important wheat producers accounting for about 17 percent of the national wheat production.²

Once the decision regarding the selection of the type of crop was made, the next step was to select the study area. For the purpose of this study, state and peasant farms in the Arsi administrative region which largely grow wheat were selected. The selection of Arsi is made on a number of consideration, principally:

1. Arsi is the major wheat producing region. It accounts for about 10 percent of the country's total wheat production.³ This is relatively high for a very small region such as Arsi. In Arsi, wheat is a very important crop grown both on the state and peasant farms. This can be seen from the cropping pattern of the State and peasant farms in Arsi.

Table 10: Wheat as Percentage of Total Cereal Production in Arsi (1986/87).

Farm Categories	Wheat Production ('000 quintals)	Total Cereal Production ('000 qu.)	Wheat as % of Cereal Production
State farms	543.40	643.08	84.4
Peasant farms	1,434.06	4,260.48	33.6

Source: CSA, Agricultural Sample Survey, 1986/87.

2. To make a realistic comparison between state and peasant farms, the two farm types should be in the same agro-ecological zone. In other words, the two farming systems to be compared must be homogeneous in terms of soil type and climatic condition. This is to rule out the possibility that differences in the economic performance between the state and peasant farms are due to variation in soil quality, climate and other natural factors. In Arsi, there are state and peasant farms with similar soil and climate characteristics and in fact bordering each other.

3. Due to the activities of Chillalo Agricultural Development Unit (CADU) and later Arsi Rural Development Unit (ARDU), peasants in Arsi have been exposed to the use of improved agricultural inputs and technique of production. For instance, the rate of fertilizer application among Arsi peasants is one of the highest in the country.

This makes it more meaningful to compare the economic performance of peasant farms with that of modern state farms.

4. Most of state farms in Arsi have been in existence for quite a long period of time and relatively have good and complete data.

In general, considering homogeneity of the two farm types with respect to soil and climatic conditions and taking into account ARDU and State Farms in Arsi as the good sources of data, wheat growing state and peasant farms in the Arsi administrative region were selected.

3.2 Sampling, Data Collection and Method of Analysis

3.2.1 Sampling Method

As indicated above, the objective of the study is to compare the economic performance of the state and private peasant farms through a case study method. The comparison is made between each one of the state farm and one of the peasant associations near and around the state farms. The point here was to get representative sample farms both for the state and peasant sectors. Purposive and Simple Random Sampling methods were utilized. Regarding sample farms for the state farm subsector, state farms in Arsi region were purposely selected. The reasons for the selection of these farms are given above. There are six state farms in Arsi. It was found impossible, however, to get complete data for one of the farms, namely Temella

which was established only 3 years ago. Except Temella, the remaining 5 state farms in Arsi are considered in the study.

Regarding sample farms for the private peasant sector after obtaining list of those peasant associations (PAS) that are found near and around the state farms in that locality, one PA corresponding to each state farm was purposely selected. The selection was made on the basis of the similarity of the PA with respect to its soil, climate and other natural factors with that of the state farm in that locality. Data on soil type and climatic conditions were obtained from Arsi Rural Development Unit (ARDU) and the state farms. From each of the selected PA, 50 households were randomly selected. Therefore, all in all, the sample size for this study is represented by 5 state farms, 5 PAs and 250 private peasants.

3.2.2 Sources and Data Collection

The principal sources of information for this study are the primary data generated at farm level from the state and peasant farms. Standardized questionnaires were prepared for both farm categories. One questionnaire was designed for state farms to obtain time series data on the required informations, such as, farm size, crop production, labour employment, seeds, fertilizers, pesticides, wages, salaries, etc. In addition, questions regarding conditions of labour recruitment, payment and incentive systems, marketing,

transport and specific problems facing each farm were also included in the questionnaire. The questionnaire was completed by farm managers. The data were cross checked.

A separate socio-economic questionnaire was prepared for private peasant farmers to obtain informations regarding size of land holding, fertilizer consumption, oxen ownership, inventory of farm tools and implements. Twelve grade complete students were employed for the purpose of interviewing the peasants. They were given intensive orientation on various aspects of the questionnaire.

It is a well known fact that usually it is difficult to get the required data such as, the amount of income from peasants. This is because, first, peasants do not keep records and tend to forget. But, most importantly, they do not tell their incomes out of fear of government taxation and contribution. This is true, particularly in Arsi administrative region, where peasants are required to make a lot of contribution known by different names. Arsi peasants are extremely suspicious about someone who is new and asks them their incomes. They regard him as a government agent who comes to impose upon them additional contribution. In addition, it is the custom of Arsi peasants not to count and disclose the number of livestock that one owns. They say that counting livestock causes the death of animals.

In order to overcome such problems and to convince the peasants, it is advantageous to know the customs and languages of each locality. In this respect, my knowledge

of the customs and language of Arsi peasants helped me a lot. Once I convinced the peasants about the purpose of the study, they were open and disclosed the required information. The data gathered were cross-checked. For the study, field survey was conducted during the month of February 1988, just after harvesting season. This was an ideal time for data gathering purpose as it was easy to get peasants who would stay at their houses. Discussions with extension agents were found extremely useful.

Secondary data were also extensively utilized. The main sources of secondary data were Arsi Rural Development Unit (ARDU), Arsi Agricultural Development Enterprise, Ministry of State Farm Development and Central Statistical Authority (CSA).

3.2.3 Method of Analysis

Both quantitative and qualitative methods are used. Simple analytical tools like ratios and percentage are employed to analyse the data. Efficiency indicators like land productivity, cost of production and benefit/cost ratio are computed and compared. In addition, production functions are also used to compare the economic performance of the state and peasant farms. Details of these methods are in chapter four.

3.3 Introduction to the Study Area

3.3.1 Arsi Region (General)

Arsi administrative region is located southwest of Addis Ababa. It covers an area of 24,000 square km. Prior to the division of the country into the new administrative regions, Arsi was divided into three Awrajas. These are; Chillalo, the largest of the three covering 47.5 percent of the total area of the region, Ticho, with 30 percent of the total area of Arsi and Arba Gugu, the remotest of the three Awrajas.

According to the 1984 population census, the population of Arsi is 1,662,232 of which 93.5 percent live in rural areas and engaged in agricultural activities. The average family size is about 5 persons and the density of population is 70 percent per square km.⁴

Most of the Arsi region is well situated for agricultural production. The region has conducive agricultural resource base. Yield per hectare for Arsi has always been greater than the national average. As a result, Arsi, which is the smallest of all the regions covering less than 2 percent of the total area and accounting for less than 4 percent of the population of the country, contributes about 10 percent to the national cereal production. Arsi is one of the leading cereal producing regions and was designated "Surplus Producing". About a quarter of Agricultural Marketing Corporation's (AMC's) total cereal purchases come from Arsi.

Crop farming is the single most important agricultural activity of Arsi peasants. The major crops grown are wheat, barley, maize, sorghum, teff, beans and peas. Of all the crops, wheat and barley are the leading crops, particularly in Chillalo Awraja. Most of Arsi farmers raise livestock as secondary activity. But, there are places, particularly in the low land area of Arba Gugu Awraja, where dairy farming is still the principal source of income.

The presence and activities of CADU and later ARDU have made significant impact on the economic and social life of Arsi peasants. The projects have exposed Arsi farmers to improved agricultural inputs. Arsi peasants are more aware of and ready to accept new innovations. As a result, Arsi has been an experimental place for agricultural innovations. It is in Arsi that the two integrated rural development programmes, namely CADU and ARDU were implemented.

In the last 15 years fundamental changes have taken place in Arsi in the modes of agricultural production. New modes of agricultural production namely state and cooperative farming systems have emerged and became increasingly important. The pace and intensity of agrarian socialism in Arsi have been fast and high. Arsi is the region where villagization program was first tested. The process of collectivization in Arsi has been very intense. Peasants were hurriedly organized into producers cooperatives.

There are over 395 producer's cooperatives in Arsi and most of them have reached the highest stage cultivating about 14 percent of the crop land of the region. This is substantially a high figure than the national average. In general, the extent of agrarian socialism in the Arsi region is depicted in table 11 in which the relative share of the three farm categories are given.

Table 11: Share of Different Farming Categories in Agricultural production and cultivated land (1986/87).

Farm Categories	A R S I				E T H I O P I A			
	Land (['] 000 ha.)	%	Produc- tion (['] 000 qu.)	%	Land (['] 000 ha)	%	Produc- tion (['] 000 qu.)	%
State farms	31.88	7.09	653.38	10.73	150.71	2.80	3,309.75	5.44
Cooperative farms	62.83	13.97	757.73	12.44	225.32	4.19	2,329.68	3.83
Peasant farms	354.82	78.93	4,678.16	76.82	4,995.56	92.99	55,139.75	90.72

Source: CSA, Agricultural Sample Survey, 1986/87.

3.3.2 Arsi State Farms

Prior to the Rural Land Proclamation of March 1975, there were many private commercial farms in Arsi region. To some extent these farms were the result of the demonstration effect of Chillalo Agricultural Development Unit (CADU)

where land lords had found commercial farms more profitable. Most of these farms were quite profitable.

Following the Rural Land Proclamation of March 1975, these farms were nationalized and most of them were distributed to peasant farmers. The remaining farms which were found unsuitable for distribution were reorganized into state farms. The other state farms in Arsi were established during the last 15 years, some on new vergin land and others by removing and reallocating the inhabitants. At the beginning the size of each farm was very large.

At present there are six state farms in Arsi administrative region. One of the farms, namely Ardaita was handed over to the ministry of agriculture in 1975 E.C. and now it serves as a training centre. State farms are located in different parts of Arsi region. The names, location and size of the Arsi state farms are given in table 12.

Table 12. Name, Location and Size of the Arsi State Farms.

Farms	Distance from Adiss Ababa(km)	Awraja	Size(ha)
1. Addelle	263	Ticho	5,806
2. Dixis	225	"	7,326
3. Garadella	305	Chillalo	5,241
4. Goffer	325	"	4,698
5. Lole	218	"	3,037
6. Temella	291	"	5,421



The principal crop of the Arsi state farms is wheat. Arsi state farms account for a significant share in the state farm subsector both in terms of cultivated land and crop production. This could be seen from table 13 in which the percentage share of the Arsi state farms in the total land under major crops and cereal production for the whole state farm subsector is given.

Table 13. Land Under Major Crops and Cereal Production for Arsi and the Whole State Farms in the Country.

Year	State Farms in the Country		State Farms in Arsi			
	Land ('000 ha)	Production ('000 qu.)	Land ('000 ha)	%	Production ('000 qu.)	%
1980	186.07	2,562.70	38.60	20.7	646.25	25.6
1981	192.86	2,846.66	44.41	23.0	560.20	19.6
1982	172.20	2,545.35	36.09	20.9	405.07	17.4
1983	136.68	2,027.65	30.75	22.4	508.60	25.0
1984	137.88	2,250.22	33.91	24.5	568.93	25.2
1985	153.55	2,767.36	33.24	21.6	643.17	23.2
1986	150.71	3,309.75	31.46	20.8	310.14	9.3
1987	151.82	3,212.60	31.54	20.7	547.62	17.0

Source: CSA, Time Series Data on Area, Production and Yield of Major Crops, 1986/87.

Despite the fact that Arsi region has relatively favourable agricultural resource base, productivity on the Arsi state farms appears to be low. Moreover, cost of production

for these farms are high. As a result, they are incurring huge losses. Each farm in Arsi is operating under specific environments. The farms differ in soil quality, climatic conditions and most importantly, they differ with regard to their economic performances. Each farm in the region has its own specific problems. To make recommendation, in order to improve efficiency of these farms, it is essential to know the conditions under which each farm is operating. Toward this end, a brief description of each state farm in Arsi region is given in the following pages.

1. Addelle State Farm

One of the six state farms in Arsi region is the Addelle state farms. The farm is found in Ticho Awraja at a distance of 138 km from Assella (the capital city of Arsi administrative region) and of 263 km from Addis Ababa. The topography of the farm varies from flat to rolling. The mean annual rainfall is 850 mm and the mean annual temperature is 14°C. At present, the size of the farm is 5,806 ha. Addelle state farm was established in 1972 E.C. largely by removing and marginalizing peasants. The principal crop is wheat. Soil at Addelle state farm is black clay and is very difficult for tillage. As a result, there is frequent machine breakdown. The farm is rainfed. Weather condition is erratic and as a result, production fluctuates from year to year. The farm has serious weed problem and plant diseases.

2. Dixis State Farm

Dixis state farm is found in Ticho Awraja. The farm was established hurriedly in 1970 E.C. without any feasibility study. Dixis farm is 98 km from Assella and 225 km from Addis Ababa. The mean annual rainfall and temperature being 950 mm and 13.5°C respectively. There are 310 permanent employees on the farm. The size of the farm is 7,236 ha. Given the hardness of the soil and with the type of the machine the farm has, it has become difficult to cultivate the land properly and on time. As a result, always there has been uncultivated land. Considering the type of the soil and availability of machines, the size of the farm is too large to manage. Frost (Woorch') is a very serious problem of the farm which frequently has resulted in total crop failure.

3. Garaddella State Farm

The Garaddella farm is 305 km from Addis Ababa on the way to Bale Gobba. The farm was established on the place of nationalized commercial farms. Later on, peasants from the surrounding area were removed and the size of the farm was expanded tremendously reaching 12,000 ha. in 1977 E.C. The most serious problem of the Garaddella state farm is the unpredictable rainfall pattern. There are years for instance like 1979 E.C. when there was very little rainfall. In years like this one there was total crop failure. In 1979 E.C. crop yield per hectare was only 3 quintal. What

is puzzling about Garaddella state farm is that there is a big lake near the farm which is increasing in volume and covering part of the farm land from year to year. On the other hand, the farm depends totally on unpredictable rainfall. There is no apparent reason why the lake can not be used for irrigation.

4. Goffer State Farm

Goffer State farm was established in 1972 E.C. in unplanned manner by 'evicting' peasants from the land. At the beginning, the size of the farm was well over 10,000 hectare. Later on, however, it was reduced substantially and at present the size of the farm is 4,698 hectare. The farm has serious water logging problem. As the farm does not have proper drainage system there has been frequent crop failure during years of excess rainfall which is not uncommon. Goffer state farm is an example of modern "enclave" in the midst of traditional agriculture. The surrounding peasants are mainly pastoralists. The pastoralists are hostile toward Goffer state farm as the farm has claimed their grazing land.

5. Lole State Farm

Lole farm is in Chillallo Awraja only 45 km fram Assella. The topography of the farm is flat. There are 185 permanent employes. Wheat and barley are the principal crop of the farm. The farm was established by reorganizing the

nationalized commercial farms. Lole state farm differs from the other state farms in the region in many respects. The size of the farm is relatively small (3,037 ha.). The soil of the farm is suitable for cultivation. The farm is free of water logging and salinity problems. The surrounding community benefit a lot from Lole state farm. They use the school and clinic of the farm. The farm demonstrates to the peasants the advantage of modern farm inputs.

3.3.3 Sample Peasant Associations (PAs)

As indicated earlier, the objective is to compare the economic performance of state farms with that of private peasant farms. For this purpose 5 state farms in Arsi administrative region were selected. To compare the performance of each of these farms with that of peasant farms, one peasant association (PA) from the surrounding area of each state farm was selected. Therefore, all in all, 5 PAs were selected. The sampled PAs and the corresponding state farm with which each of them compared are the following.

<u>Sample PAs</u>	<u>State Farms</u>
1. Temmamma	Addelle
2. Sude Dalecha	Dixis
3. Mamuda Tuse Ol	Garaddella
4. Kome Bitacha	Goffer
5. Arawacha	Lole.

The principal crops of these peasant associations are wheat and barley. From each sampled PA, 50 households were randomly selected. From the selected private peasant farmers, the required information such as cultivated land, crop production, labour input, seed and fertilizer application, inventory of farm implements, oxen ownership etc. were collected. The sampled PAs differ interms of size of membership. There is also significant variation within and among sample PAs interms of size of land holding.

Table 14: Membership, No. of Sample Households and Average Land holding.

PA's	Total Membership	No. of Sample Households	%	Average Land holding (ha.)
1. Temmamma	150	50	33	1.60
2. Sude Dalecha	100	50	50	2.32
3. Mamuda Tuse 01	265	49	18	1.60
4. Kome Bitacha	202	50	24	1.09
5. Arawacha	276	49	17	1.68

FOOTNOTES

1. CSA: Agricultural Sample Survey, 1986/87.
2. Ibid.
3. Ibid.
4. CSA: Population and Housing Census. 1984.

CHAPTER FOUR

4. DATA ANALYSIS AND FINDINGS

4.1 Farm Performance

The objective is to measure and compare the economic performance of state and peasant farms through a case study method. For the purpose of this study, five state farms in Arsi administrative region were selected. The economic performance of these farms are compared with that of peasant farms in the same region.

The two farm categories are operating under different policy environment. State farms are considered by the government as models in the process of agrarian transformation and hence enjoy top priority in resource allocation. On the other hand, the agricultural policy of the government discriminates against the peasant sector in terms of resources allocation and agricultural pricing. Despite all the priorities and subsidies they enjoy, state farms are not performing well. It is widely believed that state farms are doing poorly even relative to the traditional peasant farms. This notion, however, needs to be verified empirically. Various efficiency indicators can be used to measure and compare the economic performance of the two farm categories. For this study, four criteria are used to measure and compare the economic performance of the state and peasant farms in Arsi. The criteria are (1) Land productivity, (2) Cost of production (3) Employment creation and (4) Resource use efficiency.

4.1.1 Land Productivity

The simplest criterion to compare the economic performance of the two farm categories is land productivity. The principal crop of the farms under consideration is wheat. The five state farms in Arsi administrative region grow crop only during "Meher" (the main season), while some of the sample peasant farms produce during "Belg" season as well. In measuring and comparing the land productivity of the two farm categories, however, "Belg" production is not included. Land productivity for the two farming systems is summarized in table 15.

As it could be seen from table 15, the land productivity of state farm is not much better than the traditional peasant farms. This is, of course, despite the fact that these state farms are highly mechanized and use all sorts of modern agricultural inputs and in some cases occupy the best quality farm land by marginalizing the peasants. To know whether improvements regarding land productivity are being made over time, average annual growth rate of land productivity was calculated. The average annual growth rate of land productivity (Table 15) indicates that over the last 8 years, land productivity of Arsi state farms has not been improving.

Table 15: Land Productivity (1973/74 - 1980/81 E.C.) State and Peasant Farm in Arsi.

State Farms	Land Productivity 1980/81 E.C. Q/ha.	Average Annual Growth rate of land Productivity (1973/74- 1980/81)		PAs	No. of Household	Land Productivity 1980/81 E.C.	
		Mean	Std. dev.			Mean	Std. dev.
1. Addelle	10.51	8.20	43.86	Temmanma	50	5.92	2.41
2. Dixis	10.34	4.40	37.11	Sude Dalecha	50	11.47	2.60
3. Garaddella	15.14	1.92	16.92	Mamuda Tuse	49	18.43	7.53
4. Goffer	10.61	0.76	29.29	Kome Bitacha	50	8.83	2.58
5. Lole	24.26	1.83	8.37	Arawacha	49	19.27	5.82
As a whole	14.17	3.42	2.18	As a whole	248	12.75	6.98

There is variation among the state farms interms of land productivity. Regarding the peasant farms, there is substantial variation among the sample PAs interms of land productivity. Moreover, yield per hectare greatly differs among sample households.

Land productivity is found to be very low for two of the sample PAs, namely Temmamma and Kome Bitacha. In the case of Temmamma, farmers of this PA were "evicted" from the land when Addelle state farm was established in 1972 E.C. As the good quality farm land was given to Addelle state farms, the peasants are marginalized and compelled to cultivate the poor quality soil. As a result, land productivity for Temmamma PA is extremely low (only 5.92 quintals per hectare).

The other PA with low land productivity is Kome Bitacha. Again, the main reason for the low level of land productivity for this PA appears to be the fact that the peasants are marginalized as the good quality agricultural land was given to Goffer state farm and producers cooperatives. In addition, a good part of agricultural land of Kome Bitacha was designated and demarcated as "government forest land". The land holding size in Kome Bitacha is very small and diminishing. As a result, many peasants from Kome Bitacha have migrated to the near by towns of Kofele and Shashemene.

4.1.2 Cost of Production

It is not correct to compare and evaluate the economic performance of the state and peasant farms on the basis of land productivity criterion alone. This is because land productivity does not indicate the cost incurred to produce a quintal of grain. Therefore, in addition to land productivity, we have to use cost of production as an additional criterion to evaluate the two farm categories.

The principal agricultural inputs in the traditional peasant sector are land, labour and draft animals. The major cost elements and their valuation for the peasant farms are as follows.

1. Labour- Labour input was measured in man-days (man-days were standardized by making eight hours of working time of an adult peasant equivalent to one man-day). The opportunity cost of agricultural labour in the study area is the employment opportunity for the daily labourers in the state farms. The wage rate for daily labourer in Arsi state farms is 1.94 birr per day. Therefore, 1.94 birr was used as shadow wage rate to convert man-days into cost of labour input.

2. Seed: The Agricultural Marketing Corporation (AMC) farm gate price was used to get the cost of seed input.

3. Fertilizer:- Cost of fertilizer input was calculated by taking the price of fertilizer that the peasants were charged by Service Cooperatives which distribute fertilizer to peasant farmers.

4. Oxen: It is a well know fact that for the Ethiopian peasants oxen are the primary capital input. Yet, this essential capital element is in short supply. Farmers who do not own a pair of oxen, in many cases, hire and pay certain amount of rent. The payment rate varies from region to region. In the case of the study area (Arsi region), the payment for using one ox for one year is about five quintals of grain. The AMC farm gate price of five quintals of grain was used as the cost of an ox per year.

The major cost elements for Arsi state farms are:-

1. Cost of direct materials:- This includes the cost of seed, fertilizer and chemicals. Arsi state farms are large users of imported fertilizers, herbicides, pesticides and other chemicals.

2. Cost of machine use:- The cost of machine use is based on the charge rates fixed by the Ministry of State Farm Development for different types of agricultural machinery.

3. Indirect Cost:- It includes costs of farm overhead and borrowing.

The cost of production per quintal for the two farm catagories is given in table 16. In 1980/81 E.C., the cost of production per quintal of grain for Arsi state farms, on the average, was 101.68 birr. In the same year, peasant farms, on the average, incurred 35.09 birr to produce a

quintal of grain. Crop yield per hectare for state farms which on the average happened to be slightly greater than that of peasant farms, therefore, appears to be achieved at the expense of high financial cost of production.

Over the last 8 years, cost of production per unit of output for Arsi state farm has been increasing substantially. This could be seen from the average annual growth rate of cost of production which is given in table 16.

There is significant variation among the 5 PAs interms of cost of production per quintal of grain. For the two PAs, namely Temmamma and Kome Bitacha for which yield per hectare was found to be low, cost of production per unit of output also happened to be relatively high. The extent of variability among the sample households within a peasant association interms of production cost is also high. Similarly, there is variation among the 5 state farms interms of cost of production per unit of output.

The cost of producing one quintal of grain in Arsi state farms during the last 8 years, on the average, was 75.61 birr. On the other hand, the Agricultural Marketing Corporation's (AMC's) farmgate price for the agricultural products of these farms, on the average, remains to be 45 birr per quintal. As a result of this great divergence between cost of production and selling price, Arsi state farms have been incurring huge losses every year. The AMC farmgate price was used to calculate the losses. The extent of losses incurred by the 5 Arsi state farms over the last 8 years measured as Gross Revenue from sale minus Total Cost of Production is given in table 17.

Table 16: Cost of Production (1973/74-1980/81 E.C.) State
and Peasant Farms in Arsi.

State Farms	Cost of Production 1980/81 E.C. Birr/quintal	Average Annual growth rate of cost of production (1973/74-1980/81 E.C)		PAs	No.of Household	Cost of production Birr/quintal (1980/81 E.C)	
		Mean	Std.dev.			Mean	Std.dev.
1. Addalle	89.90	6.80	41.09	Temamma	50	49.27	17.93
2. Dixis	104.83	15.79	70.14	Sude Delecha	50	25.17	6.43
3. Garaddella	154.96	77.29	166.58	Mamuda Tuse	49	24.72	8.00
4. Goffer	104.41	18.64	52.66	Kome Bitacha	50	46.49	18.41
5. Lole	54.31	25.57	14.86	Arawacha	49	30.53	12.51
as a whole	101.68	28.81	27.92	as a whole	248	35.00	16.51

Table 17: Annual Losses - Arsi State Farm(1973/74-1980/81 E.C.)

Farms	Crop Year(E.C)	Gross Revenue	Total Cost	Loss
Addelle	1973/74	2,645,370	5,185,117	(2,539,747)
	1974/75	4,542,300	6,059,603	(1,517,300)
	1975/76	2,638,395	5,950,922	(3,312,527)
	1976/77	4,410,315	6,139,629	(1,729,314)
	1977/78	5,168,835	5,918,201	(749,366)
	1978/79	4,593,825	5,747,213	(1,153,388)
	1979/80	2,771,235	5,295,735	(2,524,500)
	1980/81	2,747,565	5,489,107	(2,741,542)
		29,517,840	48,785,527	(16,267,687)
Dixis	1973/74	5,453,395	10,317,939	(4,864,544)
	1974/75	4,934,835	9,001,941	(4,067,106)
	1975/76	3,854,025	8,481,093	(4,627,068)
	1976/77	7,167,645	9,633,362	(2,465,717)
	1977/78	6,263,865	8,836,811	(2,572,946)
	1978/79	7,946,955	7,288,614	(658,341)
	1979/80	3,185,340	7,821,346	(4,636,006)
	1980/81	3,409,920	7,943,892	(4,533,972)
		42,215,980	69,324,998	(27,108,918)
Garaddella	1973/74	7,453,665	9,121,485	(1,667,820)
	1974/75	8,688,420	11,480,168	(2,791,748)
	1975/76	8,395,650	10,129,228	(1,733,578)
	1976/77	6,106,005	11,328,581	(5,222,570)
	1977/78	7,591,005	9,256,127	(1,665,122)
	1978/79	4,140,765	4,645,280	(504,515)
	1979/80	585,585	3,568,815	(2,983,230)
	1980/81	6,779,205	5,377,860	(1,401,345)
		49,740,300	64,907,544	(15,167,244)

Table 17 Cont'd.

Farms	Crop Year (E.C.)	Gross Revenue	Total Cost	Loss
Goffer	1973/74	4,522,590	5,664,489	(1,141,899)
	1974/75	4,363,065	7,282,205	(2,919,140)
	1975/76	2,748,375	5,790,110	(3,041,735)
	1976/77	2,409,345	6,396,018	(3,986,673)
	1977/78	2,906,955	6,013,007	(3,106,052)
	1978/79	3,803,085	4,294,256	(491,171)
	1979/80	2,040,705	5,032,990	(2,992,285)
	1980/81	2,242,845	5,204,021	(2,961,176)
		23,036,965	45,677,096	(22,640,131)
Lole	1973/74	2,395,655	2,582,630	(186,975)
	1974/75	2,650,320	2,678,280	(27,960)
	1975/76	2,454,030	2,817,102	(363,072)
	1976/77	2,793,690	3,377,806	(584,116)
	1977/78	3,562,200	3,827,019	(265,819)
	1978/79	3,408,300	2,969,099	(439,201)
	1979/80	3,221,235	3,366,744	(145,509)
	1980/81	3,316,500	4,002,703	(686,203)
		23,801,930	25,621,383	(1,819,453)
Grand Total		168,313,000	251,316,000	(83,003,000)

The ratio known as benefit/cost ratio could also be a good indicator to make comparative evaluation between the state and peasant farms. The ratio is calculated by dividing Gross Revenue by Total Cost of Production. It shows the amount of return per unit of cost incurred. In computing the benefit/cost ratio for the two farms categories under consideration, market prices were used. The calculated ratios for the state and peasant farms in Arsi are given in Table 18.

Table 18. Benefit/Cost Ratio-State and Peasant Farms in Arsi.

State Farms	<u>Benefit/Cost Ratio</u>		PAS	<u>Benefit/Cost Ratio</u>	
	Mean	Std.Dev.		Mean	Std.Dev.
1. Addelle	.63	.16	Temmamma	.66	.19
2. Dixis	.60	.23	Sude Dalecha	1.26	.33
3. Garaddella	.75	.31	Mamuda Tuse	1.32	.39
4. Goffer	.55	.18	Kome Bitacha	.72	.21
5. Lole	.92	.10	Arawacha	1.08	.28
as a whole	.69	.24	as a whole	1.01	.40



4.1.3 Employment Creation

In a country like Ethiopia where there is unemployment problem, the creation of employment opportunity should be one of the most important objectives of development policies. In rural Ethiopia, the extent of disguised unemployment is believed to be substantially high. Moreover, the agricultural labour force is relatively cheap. Therefore, in view of the virtual absence of employment opportunity for the agricultural labour outside the agricultural sector, farming system that employs more of this cheap factor of production would be commendable.

One of the stated objectives of state farms has been to create employment opportunity in order to alleviate the unemployment problem of the country. Cotton growing state farms have contributed a lot toward this goal. As the production of cotton is of labour intensive nature, these farms employ quite a large number of people. In the case of foodgrain production, however, state farms are highly mechanized to create sufficient employment opportunity for unskilled agricultural labour.

Arsi state farms employ very few workers relative to their size. For instance, the land/labour ratio calculated as hectare per one permanent worker for the Arsi state farms as a whole is 24.08. This means that for every 24 hectare there is only one permanent employee. Moreover, as they are highly mechanized, Arsi state farms could not create

employment opportunity for the peasants in the region. These farms employ very few daily labourers and that is mainly during the weeding season. In general, as Arsi state farms are highly mechanized, their demand for unskilled agricultural labour is relatively low. On the other hand, production in the peasant sector is characterized by high level of labour intensity. The degree of labour intensity could be measured by taking the ratio of labour input per hectare.

To assess the extent of labour intensity of the state farms, time series data for the last eight years on direct labour input and cultivated area were used, while for the peasant farms cross-sectional data for the crop year of 1980/81 E.C. were utilized. The degree of labour intensity measured as man-days per hectare for the state and peasant farms under consideration is given in Table 19.

From table 19, it could be inferred that the labour absorption capacity of the state farm is substantially lower than that of peasant farms. Therefore, if we are to evaluate the two farm categories, namely state and peasant farms on the basis of employment creation criterion, the preference is clearly in favour of the latter one.

In Ethiopia, the limiting factor of production is capital. Labour is relatively abundant and cheap. Under such condition, it would be advisable to choose labour intensive method of production. Foodgrain producing state

Table 19: Labour Intensity (1973/74 - 1980/81) State and Peasant Farms in Arsi.

State Farms	Labour Intensity (1980/81) Man-days/ha	Average Annual growth rate of labour Intensity		PAs	No.of Household	Labour Intensity (1980/81 E.C) man-days/ha.	
		Mean	Std.dev.			Mean	Std.dev.
1. Addelle	16.84	13.82	43.43	Temmamma	50	80.84	26.13
2. Dixis	10.56	8.58	46.62	Sude Dalecha	50	60.76	16.23
3. Garaddella	11.76	4.01	65.98	Mamuda Tuse	49	104.70	30.21
4. Goffer	9.84	18.04	86.21	Kome Bitacha	50	100.04	30.98
5. Lole	21.70	10.82	31.25	Arawacha	49	107.27	23.01
As a whole	14.14	9.64	46.78	As a whole	248	90.94	32.25

farms, however, are not making sufficient use of cheap agricultural labour. On the contrary, these farms are highly mechanized and depend to a large extent on imported agricultural machinery.

The level of mechanization of state farms could be seen from their capital labour ratios. For the Arsi state farms, this ratio is computed on the basis of the value of fixed assets per employee. In calculating this ratio net value of fixed assets i.e. net of accumulated depreciation was used. Moreover, in computing the ratio only permanent workers were considered. The capital labour ratio for the five Arsi state farms is given in Table 20.

Table 20: Average Annual Value of Fixed Asset/Employee-Arsi State Farms (1973/74-1979/80 E.C.).

State Farms	Value of Fixed Assets	No. of Employee	<u>Fixed Assets</u> <u>Employee</u>
1. Addelle	3,768,417	227	16,600
2. Dixis	7,597,485	278	27,329
3. Garaddalla	4,930,336	305	16,165
4. Goffer	3,721,323	300	12,404
5. Lole	1,574,393	142	11,087
as a whole	21,591,954	1,252	17,245

As it could be seen from table 20, the capital labour ratio is relatively large particularly for a country like Ethiopia where the fixed assets are to be imported and given

the acute shortage of foreign exchange. In the case of Arsi state farms, the major cost element is the cost of machine use. The cost of machine use for these farms were estimated on the basis of the charge rates fixed by the Ministry of State Farm Development for different types of machinery. The annual cost of machine use as percentage of total cost of production for the five Arsi state farm is summarized in table 21.

Table 21: Average Annual Cost of Machine Use-Arsi State Farms. (1973/74 - 1980/81 E.C.)

Farms	Cost of Machine Use	Total Cost	Cost of Machine as % of Total Cost
1. Addelle	1,588,980	5,723,190	27.76
2. Dixis	2,030,831	8,665,624	23.43
3. Garaddella	2,039,541	8,113,443	25.13
4. Goffer	1,481,919	5,709,637	25.95
5. Lole	715,498	3,202,797	22.33
as a whole	7,856,771	31,414,694	25.00

Regarding the peasant sector, virtually there is no "capita" input in the conventional usage of the term. The Ethiopian peasant are extremely undercapitalized. For Ethiopian peasants, capital consists of rudimentary agricultural implements like wooden plough and "Marasha". The single most important capital element in the traditional peasant

sector is draught animals (principally oxen). But, this essential capital element is in acute shortage. The situation of oxen ownership in the five sample PAs is summarized in Table 22.

Table 22: Oxen Ownership (1980/81 E.C.)

PAs	Oxen/household		% of Households with			
	Mean	Std.Dev.	No Ox	One Ox	Two Oxen	>two Oxen
1. Temmamma	.60	.67	50	40	10	0
2. Sude Dalecha	1.32	1.05	26	28	40	6
3. Mamuda Tuse	1.24	.90	24.48	30.61	42.85	2.04
4. Kome Bitacha	.70	.67	42	46	12	0
5. Arawacha	2.18	1.21	10.2	12.24	48.97	28.57
as a whole	1.19	1.06	30.53	31.37	30.76	7.32

The proportion of sample households without oxen is 30.53 percent, while 31.37 percent of them have only one ox. There is substantial variation among households with respect to oxen ownership.

Modern agricultural inputs are still either unknown or unavailable to a large portion of Ethiopian peasants. For instance, the proportion of farmers who use chemical fertilizer does not exceed 10 percent. In the case of the study area (Arsi) which is regarded as one of the leading regions in fertilizer consumption, shortage in the supply of fertilizer coupled with its high price relative to the price of agricultural products have discouraged and prevented

peasants from using fertilizer in the recommended amount. The rate of fertilizer application in the five sample PAs is summarized in table 23.

Table 23: Fertilizer Application Rate (1980/81 E.C.)

PAs	No. of Households	Q/ha Mean	Std. Dev.
1. Temmamma	50	0.01	0.70
2. Sude Dalecha	50	0.40	0.26
3. Mamuda Tuse	49	0.38	0.37
4. Kome Bitacha	50	0.45	0.57
5. Arawacha	49	0.63	0.20
as a whole	248	0.37	0.39

The recommended fertilizer application rate by the Institute of Agricultural Research (IAR) is one quintal per hectare. The application rate in the sample PAs is lower than this norm.

The extent of variation among the households with respect to fertilizer application is significantly high. This could be seen from the standard deviation column in table 23. In some of the sample PAs only very few peasants were found using fertilizer. For instance, in the case of Temmamma PA, it was found that only one farmer applied fertilizer during the crop year of 1980/81 E.C.

4.1.4 Resource Use Efficiency

Of all the criteria, efficiency in resource use probably would be the most comprehensive one to make comparative evaluation between different farm categories. Various methodologies have been developed to measure and compare performance of farms of different size.

One of the widely used methods for measuring efficiency in agriculture is the Cobb-Douglas production function. The function has simple functional form. The general form of Cobb-Douglas production function is

$$Y = b_0 X_1^{b_1} X_2^{b_2} \dots X_n^{b_n} e^u \dots \dots \dots (1)$$

where

Y = quantity of output

X_i = quantity of input i (i = 1-n)

b_i = output elasticity of input i (i = 1-n)

b₀ = constant term

u = error term

The general functional form of (1) is empirically estimated by transforming it into the log linear form of

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_n \ln X_n + U \dots \dots \dots (2)$$

The coefficients of Cobb-Douglas specification have important economic interpretations. Marginal productivity of inputs could be derived from the Cobb-Douglas specification. Information, regarding the degree of returns to scale could also be obtained from specification of this type.

For all these reasons, the Cobb-Douglas production function has been used in this study as one more criterion to evaluate the economic performance of Arsi State Farms against that of peasant farms in the same region. Separate production functions for the two farm categories are specified. The variables used in the model are given in table 24.

Table 24: Variables used

Variables	Definition and Measurement
Output (Y)	Agricultural production in quintal as well as in value term using AMC farm gate price.
Land(X_1)	Cultivated land in hectare
Labour(X_2)	Labour input measured in man-days and wages.
Material(X_3)	Cost of direct material inputs. It includes cost of seed and fertilizer.
Capital(X_4)	For the state farm, this is the cost of machine use based on the charge rates fixed by the Ministry of State Farm Development. For the peasant farm, this variable is the number of oxen.
Farm overhead(X_5)	This is the administrative cost at farm level.
Indirect Cost(X_6)	This variable is used in the model specified for the state farm. It includes the administrative cost of enterprise and corporation plus cost of borrowing.

Time series data of eight years obtained from five Arsi state farms were fitted to the log linear functional form of (2). Ordinary Least Square method (OLS) was used to estimate the parameters. The estimated coefficients of parameters are summarized in table 25. In conducting Chow Test, it was found that there is variation among the farms. As a result, separate production functions were specified for each of the five state farms.

Judging the specification on the basis of the standard error, R^2 and F - ratio, it appears that the data well fitted the model. As it could be seen from table 25, however, not all coefficients are statistically significant. In other words, not all variables determine the level of production. To determine the important variables, step wise regression was conducted. Results of step wise regression reveal that only some of the variables are important in influencing the level of output.

For Addelle and Dixis state farms, all coefficients are statistically significant implying that all the variables are important in determining the level of output. In the case of Garaddella, direct material input and cost of borrowing on the one hand and output on the other hand are uncorrelated. For Goffer, land and overhead cost proved to be the important variables, while in the case of Lole, land and labour are the important variables in influencing the level of output.

According to the step wise regression results, land is an important variable which strongly influences the level of production on all the five state farms. The coefficient of land for three of the farms is negative. The prevalence of negative elasticity of land for the big size farms (Addelle, Dixis and Garaddella) with positive elasticity for the small size farm (Lole) is an indication of the existence of inverse relationship between farm size and productivity.

Labour is another important variable that significantly influences the level of production on four of the state farms. Except for Garaddella, the sign of the coefficient of labour is positive for the remaining farms. Farm overhead cost is also an important variable in influencing production. Surprisingly enough, the sign of this variable is positive for three of the farms. The stepwise regression results also show that for three of the farms, cost of machine use significantly determines the level of production.

The coefficient of material input for Dixis is negative and statistically significant implying the application of disproportionately large quantity of direct material inputs (seed, fertilizer, pesticides) in relation to other factors of inputs. This farm has serious weed problem. As a result, the rate of pesticide application is relatively large.

Regarding the peasant farms, cross-sectional data for the crop year of 1980/81 E.C. collected from 248 private peasants in five PAs were fitted to the log linear functional

Table 25: Estimated Coefficients - State Farms

State Farms	Constant	C O E F F I C I E N T S						R ²	F-ratio	Standard error of estimates	n
		X ₁ Land	X ₂ Labour	X ₃ Material	X ₄ Machine	X ₅ Farm over head	X ₆ Indirect cost				
1 Addelle	-39.5137	-2.2027* (.3718)	.3774* (.0594)	1.9475* (.2452)	1.2378** (.1003)	2.5084*** (.1882)	2.6020** (.2052)	.99	94.92	.014	8
2 Dixis	11.8342	-4.8249* (.6997)	2.1641* (.2224)	-3.1083 (.4430)	1.8127* (.2408)	1.9915* (.3111)	-.4962 (.2586)	.99	21.47	.034	8
3 Geraddella	-10.2473	-2.3042 (.5993)	-.6381 (.2963)	.2464 (.4742)	2.6420* (.2792)	2.4091* (.3236)	-.7988 (.4364)	.99	70.26	.050	8
4 Gaffer	7.3379	1.1496 (.8056)	.3115 (.2958)	.4433 (1.194?)	.0086 (.5660)	-.3778 (1.1442)	-.9467 (.9526)	.88	1.24	.120	8
5 Lole	1.2247	.7145 (.2314)	.4534* (.0730)	-.3674 (.1384)	.2773 (.0515)	.2580 (.5190)	-.3561 (.0984)	.99	122.60	.006	8
As a whole	-.2218	-.2649 (.4007)	.4926*** (.1663)	.6189 (.4188)	.4110 (.2936)	.4007 (.2816)	-.8238* (.4276)	.59	8.23	.152	40

Figures in parenthesis are standard errors

*** Significant at 1% level

** " " 5% "

* " " 10% "

n = number of observations

form of (2). The estimated coefficients for the five PAs are given in table 26. Again, in conducting Chow Test, it was found that there is variation among the five PAs. Accordingly, separate production functions were specified for each PA.

On the basis of the values of R^2 , standard error and F-ratio, it appears that the model provides a good fit for the underlying data, especially for a cross-sectional data of the type used in this study. The calculated F-ratio for each PA indicates the overall significance of the regression model.

The coefficient of labour for all the five PAs is statistically significant. Moreover, for the five PAs, the sign of coefficient of labour is positive. Its magnitude ranges from .2598 to 1.6864. This implies that labour is the most important variable that positively influences the level of production on peasant farms.

Except for Temmamma, the coefficient of land for the remaining PAs is statistically significant with positive sign implying that land is another important variable which favourably influences the level of agricultural production in the peasant sector. In the case of Temmamma, the coefficient of land is not significantly different from zero meaning that for Temmamma PA, land is not an important variable in determining agricultural production. This is not surprising as the peasants of this PA are marginalized and compelled to cultivate the poorest quality farm land.

The peasants were "evicted" from their land when the Addelle state farm was established in 1972 E.C.

For Temmamma PA, the coefficient of fertilizer is not statistically significant and with negative sign implying that fertilizer application does not have positive impact on the level of agricultural production. Fertilizer application rate in Temmamma is extremely low. For instance, only one farmer was found applying fertilizer in 1980/81 E.C. crop year.

Marginal productivity of land and labour (the two most important factors of production) was calculated for the state and peasant farms under consideration. The results are summarized in table 27. For three of the state farms, namely Dixis, Garaddella and Addelle marginal productivity of land is negative in the magnitude of -71.31, -33.36 and -32.26 respectively. The size of these farms, with negative marginal productivity of land, are very big. For Lole state farm, the marginal productivity of land is 16.74. The size of this farm is small compared to the other farms. For the five state farms as a whole, marginal productivity of land is -4.23.

The prevalence of negative marginal productivity of land in the state farms probably could be due to the fact that the size of these farms are too big. In other words, it indicates that these farms employ disproportionately large amount of farm land in relation to other factors of

Table 26: Estimated Coefficients - PAs

PAs	Constant	C O E F F I C I E N T S					R ²	F-ratio	Standard error of estimate	n
		X ₁ Land	X ₂ Labour	X ₃ Seed	X ₄ Fertilizer	X ₅ Oxen				
1 Temmamma	-3.5376	.1558 (.1504)	1.6864*** (.2695)	.2200 (.1533)	-.0069 (.0493)	.1003 (.0906)	.69	19.70	.094	50
2 Sude Dalecha	-.7111	.3609*** (.1039)	.6810*** (.1648)	.1560*** (.0517)	.0181 (.0135)	.0218 (.0333)	.75	27.54	.056	50
3 Mamuda Tuse	-.9040	.6015*** (.2481)	.8457*** (.1939)	.0061 (.1466)	.0695*** (.0201)	.1200 (.1088)	.78	31.11	.023	49
4 Kome Bitacha	.0982	.6198*** (.0956)	.2598** (.1217)	.0915 (.0863)	.9404*** (.0094)	.0075 (.0442)	.89	75.54	.059	50
5 Arawacha	-2.0275	.5978*** (.1499)	1.2856*** (.2067)	-.0097 (.0708)	.0605 (.0794)	.1088* (.0624)	.90	79.64	.080	49
As a whole	-1.7955	.3789*** (.0626)	1.0408*** (.0897)	.1674*** (.0554)	.0997*** (.0088)	.1132*** (.0366)	.84	264.50	.126	248

Figures in parenthesis are standard errors

***significant at 1% level

** " " 5% "

* " " 10% "

n = number of observations

production. The negative marginal productivity of land for the state farms implies that any additional farm land will decrease agricultural production.

Regarding the peasant farms, marginal productivity of land is positive for all the PAs ranging from .92 to 11.51. This implies that any additional farm land in the peasant sector will increase agricultural production significantly. On the basis of marginal productivity of land, therefore, it is preferable to redistribute agricultural land from the state to peasant farms.

Marginal productivity of labour was also calculated for both farm categories. The marginal productivity of labour in value term is given in table 27. In the case of the state farms, marginal value productivity of labour is positive for most of the farms ranging in magnitude from 3.46 to 50.22. For the five state farms as a whole, marginal productivity of labour is 9.1. For the peasant farms as a whole, marginal productivity of labour is 2.86. This implies that additional labour input will increase agricultural production more on the state than on peasant farms. Therefore, on the basis of marginal productivity of labour, it seems advisable to reallocate labour from the peasant to state farms.

Table 27: Marginal Productivity of Land and Labour
State and Peasant Farms.

State Farms	MPP _{Land}	MVP _{Labour}	PAs	MPP _{Land}	MVP _{Labour}
1 Addelle	-32.26	6.27	Temamma	.92	2.14
2 Dixis	-71.31	50.22	Sude Dalecha	11.08	2.39
3 Garaddella	-35.36	-14.69	Mamud Tuse	4.13	2.74
4 Goffer	14.74	3.46	Kome Bitacha	5.47	0.42
5. Lole	16.74	8.98	Arawacha	11.51	4.38
As a whole	-4.23	9.10	As a whole	4.83	2.86

MPP_{Land} = Marginal Physical Productivity of land

MVP_{Labour} = Marginal value productivity of labour

1.2 Factors Impeding Productivity in State Farms

Despite the allocation of large amounts of resources, the performance of state farms as a whole in terms of productivity, financial returns as well as innovative capacity to initiate agrarian transformation remains below expectation. There are a number of factors that have contributed to the inefficiencies in the state farms. Generally, the followings are considered as the main reasons for the prevailing low level efficiency in the state farm subsector as a whole.

1. State farms were hurriedly established and this gave rise to managerial and organizational problems.
2. The control mechanism in the state farm subsector is extremely centralized involving many organizational hierarchies. As a result, decisions are delayed. Moreover, this gave rise to unnecessary overhead cost.
3. Most of the state farms are heavily capitalized with equipments much of which frequently are out of operation due to shortage of spare parts.
4. In state farms, planning is done basically in physical terms without considering the financial and economic aspects.
5. Even if state farms are paid higher prices than private peasants by the Agricultural Marketing Corporation (AMC), they are still paid below import parity prices.

In addition to the above general problems prevailing in the state farm subsector, there are also problems specific to each state farm. In the case of the state farms in Arsi administrative region there are a lot of factors contributing to the unsatisfactory performance of these farms. On the basis of field survey and the information gathered, the followings are identified as serious problems hindering productivity in the Arsi state farms.

- (i) Most of the types of agricultural machinery in Arsi state farms are not suitable for the type of the soil of these farms. For instance, in the case of Addelle and Dixis, where the soil is very hard, there is frequent machine breakdown. Most of the agricultural machinery are out of operation. There is acute shortage of spare parts.
- (ii) Most of the farms have serious weed and plant disease problem. The farms have been using the same variety of seeds for many years. Moreover, the same type of chemicals have been in use for a long period of time. As a result, weed and other plant diseases have become resistant to chemicals.
- (iii) The size of each farm in Arsi is several thousand hectare. Considering the availability of other factors of production, it is found that the size of these farms are too big to manage.

- (iv) Some of the state farms in Arsi were established on new land without any feasibility study regarding the suitability of the soil. Later on, it was found that the soil at some of the farms is not suitable for cultivation. For instance, the land at Goffer has serious water logging problem frequently resulting in crop failure. At Addelle, the soil is very hard to cultivate properly and on time.
- (v) The farms do not have sufficient social services for the workers.
- (iv) There are shortages of trained technicians and tractor operators.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The Ethiopian economy is based on agriculture which is the oldest industry that is deeply rooted in the Ethiopian culture. Poverty and underdevelopment in Ethiopia are related to the sluggish performance of agriculture which contributes nearly 50 per cent to the GDP. The agricultural sector is characterized by farm fragmentation, stagnation in growth and instability due to climatic variation.

Ethiopia is endowed with suitable climatic conditions and fertile soil for agricultural production. The country has huge and largely unexploited livestock and fishery sectors. Ethiopia is a country whose potential for producing food has been subjected to the expression of great expectation in the past. Recently, such optimistic opinions have been withdrawn and replaced by gloomy forecast. The extent of food crisis now facing the country is such that the very survival of millions of Ethiopians is threatened. It is a paradox that a country like Ethiopia with rich agricultural resource base could not feed its people and relies on external food aid.

At present, there are three main types of agricultural production in Ethiopia. These are: state, cooperative and private peasant farms. As it has been the declared intention of the government to collectivize the agricultural

sector, its agricultural policy discriminates against peasant farms. State and cooperative farms get top priority interms of resource allocation and are subsidized.

The Ethiopian government has made great effort to transform the agricultural sector on socialist path of development. One of the strategies to facilitate the agrarian transformation has been the establishment of state farms. Currently, the state farm subsector accounts for only about 5 percent of total agricultural production. But interms of resource allocation, this subsector is the most privileged one. Over 70 percent of capital expenditure for the agricultural sector, 90 percent of improved seeds and 80 percent of chemical fertilizers are allocated to the state farms. For the subsector that accounts for only 5 percent of agricultural production, this allocation of resources is indeed disproportionate.

What is alarming about state farms is that despite the disproportionate allocation of resources, their economic performance have been unsatisfactory. The Ethiopian government has been pursuing a resource allocation policy that is imbalance and favours the least efficient state farms. One possible explanation that could justify this policy is if state farms are considered as infant industries with potential future efficiency. But the reality does not support this argument. State farms have passed a reasonable period of infancy without any indication of improvement. Therefore, the resource allocation policy

of the government appears to be wasteful and a more rational approach toward the peasant sector probably may improve agricultural growth.

To know the extent of inefficiency of state farms relative to peasant farms, it is essential to have empirical studies which show the comparative performance of the two farm categories. For policy makers such information is of great help to make a more rational allocation of resources between the state and peasant farms.

In this study, an attempt has been made to compare the economic performance of five state farms in Arsi with that of private peasant farms in the same region. Four criteria were used to compare the performance of the two farming systems. The criteria are; (1) land productivity, (2) cost of production, (3) employment creation and (4) marginal productivity of factor inputs.

On the basis of land productivity it was found that state farms are not doing better than peasant farms. Land productivity in state farms is not much better than the traditional peasant farms. In some cases yield per hectare for state farms was found to be even lower than that of peasant farms. This is despite the fact that the state farms under consideration are highly mechanized and in some cases occupy the best quality farm land by marginalizing the peasants. The average annual growth rate of land productivity indicates that over the last 8 years, no

improvement has been made interms of yield per hectare.

Cost of production per unit of output is found to be extremely high for state farms. The cost of producing one quintal of grain in Arsi state farms is three times higher than that of peasant farms. Moreover, during the last 8 years cost of production per unit of output for Arsi state farms has been increasing substantially. The larger proportion of the cost of production for Arsi state farms is found to be indirect cost. The indirect cost, which includes enterprise and corporation overhead plus cost of borrowing, accounts for about 50 percent of the total cost of production.

State farms are highly mechanized by Ethiopian standard. As a result, these farms could not create employment opportunity. Arsi state farms have 20-30 hectare per employee. The farms are heavily dependent on imported agricultural machinery. The cost of machine use for Arsi state farms is substantially high. The farms do not make use of peasant labour and hence create virtually no employment opportunities for the surrounding community.

Marginal productivity of land for state farms is found to be lower than that of peasant farms. Infact, for most of the state farms, marginal productivity of land is negative. The prevailence of negative marginal productivity of land in the state farms is principally due to the excessive oversize of the farms. The state farms under consideration have large amount of farm land in relation to other factors of production.

Regarding the peasant farms, marginal productivity of land is found to be positive. This implies that any additional farm land in the peasant sector will increase agricultural production. Therefore, on the basis of marginal productivity of land, it is commendable to redistribute agricultural land from the state to peasant farms.

On the other hand, marginal productivity of labour is found to be higher for the state farms. The high magnitude of marginal productivity of labour for Arsi state farms indicates that these farms employ very little amount of labour relative to other factors of production (particularly in relation to farm land). Considering the availability of cheap agricultural labour it would be preferable to employ more of this factor of input in the state farms.

In general, in this study it was found that the private peasant farms in many cases are doing better than the state farms. In peasant farms yield per hectare is higher, cost of production per unit of output is lower and marginal productivity of land is higher. However, it should be borne in mind that this is only in relative terms, i.e., when it is compared to the state farms. Otherwise, it does not mean that productivity in peasant sector is satisfactory.

The peasant sector is facing a number of problems. Agricultural policy of the government discriminates against private peasants in terms of resource allocation and

agricultural pricing. Private peasants do not have access to modern agricultural inputs. The land holding system does not encourage peasants to make long term investment on agricultural land-in-order to improve productivity. In some cases, particularly in the study area, peasants were "evicted" and marginalized in order to establish state and cooperative farms. Production technology in the peasant sector is extremely backward. It is against all these odds that the private peasants are doing relatively better than the most privileged state farms.

5.2 Recommendations

The empirical results of the study show that despite all the priorities they enjoy, state farms are performing poorly relative to the traditional peasant farms. State farms are facing a lot of problems. The issue is how to improve efficiency of state farms. Toward this end, on the basis of the findings of the study, the following recommendations are made.

1. Regarding objective: State farms have many objectives. Of all the objectives one seems to dominate the others. The primary objective of state farms has been to supply the urban centres and the army with foodgrain. Needless to say, it seems as if this objective is to be achieved at any cost (at least implicitly). Given the extremely high cost of production in the state farms, this objective should be reassessed. In other words, the objective of

supplying the urban economy with food grain must incorporate cost element.

2. Regarding planning: At present, planning in the state farm sector is done essentially in physical terms. Farms are evaluated on the base of target quota (usually volume of production and cultivated area). This makes farm managers concentrate on the attainment of the target and rather neglect the cost incurred in achieving the target. To make state farms cost conscious planning has to be done basically in economic terms. Moreover, farms should be evaluated on the basis of efficiency criteria.

3. Regarding organizational hierarchy: The control mechanism in the state farm sector is excessively centralized. In the process of decision making farms do not have saying. Decisions regarding any activity are referred to higher tier level (usually corporation). In the case of Arsi state farms decisions regarding even routine activities such as types of crops to plant, time of cultivation etc. are first, referred to Arsi Agricultural Development Enterprise then, the enterprise refers to the Southern Agricultural Development Corporation. In this way before the decision is made and reach the farms, considerable period of time will elapse. On the other hand, it is a well known fact that time is a crucial factor in agriculture as every activity has to be accomplished within a specified period of time.

The excessively centralized control system which leaves the farms without power in the process of decision making makes the people at the farm level feel less responsible. To shorten the period of decision making and give the farms certain power, the present control mechanism needs to be decentralized.

The existing organizational hierarchy in the state farm subsector which involves many tiers (farms, enterprise, corporation and ministry) gave rise to unnecessary and too much over head cost. If the enterprise is given more power in coordinating the activities of state farms, there is no apparent reason to have the corporation.

4. Regarding agricultural pricing and marketing: State farms operate in the economic environment which is largely created by the government. State farms themselves are the creation of the government. The prices of agricultural products of state farms are fixed. Even if they are paid higher prices than private peasants, state farms are still paid much below import parity prices. On the other hand, prices of agricultural inputs have been increasing. Therefore, to improve efficiency in state farms, this condition regarding the high and increasing prices of agricultural inputs on the one hand, and the low and fixed prices for the output of these farms needs to be reconsidered.

The principal buyer of foodgrain from the state farms is the ministry of defence. The main reason why state farms are incurring large amount of interest cost is that

they are not paid on time. In some cases, it was found that state farms have been supplying the army with foodgrain on credit without being paid for more than 8 years.

5. Regarding mechanization: Foodgrain producing state farms are highly mechanized by Ethiopian standard. They are heavily dependent on imported agricultural machinery. Given the scarcity of foreign exchange and taking into account the relatively abundant agricultural labour, labour intensive method of production should be used in the state farms.

BIBLIOGRAPHY

- Abebe Tefferri: State Policies, Agricultural Development and Food Production in Ethiopia, 1984.
- Alamaya University: Papers Presented on National Seminar on Integrated Strategy in the Food Sector of Ethiopian, 1986.
- Alemayehu Lirensso: Food Aid and Its Impact on Ethiopia, Agriculture, IDR, 1986.
- Alemneh Dejene: Peasants, Agrarian Socialism and Rural Development in Ethiopia, Westview Press, Inc., 1987.
- _____ : Smallholder Perception of Rural Development and Emerging Institution in Arsi Region Since the Ethiopian Revolution, Harvard Institute for International Development, 1986.
- Bardhan. P.: "Size, Productivity and Return to Scale", Journal of Political Economy, Vol. 81, No. 6, 1973.
- Brandt Hartmut: "Couses and Consequences of Inadequate Productivity and Development in Sub-Saharan Agriculture", Economics, 29(1984).
- Chachu Ndiss: Economic Performance and Assessment of Ujama Strategy; A Comparative Analysis of Collective Development Strategy in Tanzania's Economic Development, 1976.
- Cohen J.M.: Smallholder's Vs. Agricultural Collectives; Agricultural Debates in Ethiopia Since the Revolution, 1988.
- Cohen. J.M. and Isaksson: "Food Production Strategy Debates in Revolutionary Ethiopia" World Development, 16(1988)
- Cornia. G.A. "Farm Size, Land Yield and the Agricultural Production Function: An Analysis for Fifteen Developing Countries", World Development, Vol. 13, No. 4, 1985.
- CSA: Agricultural Sample Survey, 1986/87.
- ____ : Population and Housing Census, 1984.
- ____ : Time Series Data on Area, Production and Yield of Major Crops, 1986.
- Dessalegn Rahmato: The Peasants and the Comrades; Problems and Prospects of Socialist Transformation in Rural Ethiopia, IDR, 1987.

- Dunhman. J.: Agriculture; Capitalist and Socialist, 1975
- FAO/MOA: Highland Reclamation Study, Resources for Rural Development in Ethiopia, 1984.
- Fasil G.Kiros: "Agricultural Land Fragmentation: A Problem of Land Distribution Observed in Some Ethiopian Peasant Association" Ethiopian Journal of Development Research, Vol. 4, No. 2, Oct. 1980.
- Fatemeh. E.: "An Evaluation of Productive Performance of Agri businesses" Economic Development and Cultural Change 33(1985).
- Faught William: An Appraisal of Ethiopia's Agricultural Prospects, USAID, 1987.
- Gittinger P.: Economic Analysis of Agricultural Projects, London, 1972.
- Griffeen K. and Hay.H. "Problems of Agricultural Development in Socialist Ethiopia" Journal of Peasant Studies, Vol. 13, No. 1, 1985.
- Haile Yesus Abegaz: The Organization of State Farms in Ethiopia After the Land Reform, 1982.
- Hebden Julia: Application of Econometrics, Oxford, 1983.
- Hnaemeka.D.I: "Estimating Agricultural Production Function for Some Families in Western Nigeria". Developing Economies, Vol. 15, No. 1, 1977.
- ILO: Socialism From the Grass Roots: Accumulation, Employment and Equity in Ethiopia, 1982.
- Jackson, Douglas: Agrarian Policies and Problems in Communist and Non Communist Countries, London, 1971.
- Karcz. F: Soviet and East European Agriculture, London, 1967.
- Leibenstein H.: "Allocative Efficiency Vs - X Efficiency" American Economic Review, Vol. 56, No. 3, 1966.
- Mobawonku. W. and Osufi: "Incomes and Factor Productivity in Nigerian Peasant Agriculture" Indian Journal of Agricultural Economics, Vol. 34, No.3, 1979.
- Mahbub Hassain: "Size and Productivity in Bangladesh Agriculture" The Bangladesh Economic Review Vol. 11, No. 1, 1974.

- Mazumdar Dipak: "Size of Farm and Productivity", Economics Vol. 52, No. 126, 1965.
- Melaku Teferra: The Food Situation in Ethiopia, 1987.
- Ministry of Agriculture: Cooperative Promotion and Extension Division, 1987.
- _____ : Constrtraints, to Increasing Crop Production, 1986.
- Mollett. J.A.: Planning For Agricultural Development, New York, 1984.
- ONCCP: The National Food and Nutrition Strategy for Ethiopia, 1987.
- _____ : The Ten Year Perspective Plan, 1984.
- PMAC: A Proclamation to Provide for the Establishment of Cooperative Societies, Procl. No. 138 of 1978, March 1978.
- Sahota, G.S.: "Efficiency of Resource Allocation in Indian Agriculture", American Journal of Agricultural Economics, 50(1968).
- Saini, G.R: "Resource Use Efficiency in Agriculture" Indian Journal of Agricultural Economics 24(1969)
- Sampath, R.K: "Nature and Measurement of Economic Efficiency in Indian Agriculture" Indian Journal of Agricultural Economics, 34(1979).
- Shimeless W/Haimanot: Economic Evaluation: A Case Study of Ethiopia State Farms, 1985.
- Stanis, V: The Socialist Transformation of Agriculture Moscow, 1976.
- Tisdell, C.A: "Conceptual Issues in the Measurement of Economic and Productive Efficiency". The South African Journal of Economics, Vol. 53, No. 1, 1985.
- Verma, B.N. and Brandy W: "The Political Economy of Farm Size in India". Economic Development and Cultural Change. Vol. 55, No. 4, 1987.
- Wadekin. K: Agrarian Policies in Communist Europe, London, 1982.

- World Bank: Ethiopia-Agriculture, A Strategy for Growth, A Sector Review, 1987.
- _____ : Ethiopia-Recent Economic Development and Future Prospects, 1984.
- _____ : Ethiopia-Review of Farmers Incentives and Agricultural Marketing and Distribution Efficiency, 1983.
- Yates Frank: Sampling Methods for Censuses and Surveys, London, 1981.
- Zellner. A, etal: "Specification and Estimation of Cobb-Douglas Production Function", Econometrica, Vol. 34, No. 4, 1966.
- Zerihun Allem: The Process of Planning and its Implementation in the State Farm Sector, 1982.

APPENDIX I

Questionnaire Prepared for State Farms in Arsi

Objective: The objective of this questionnaire is to obtain information which will be helpful to evaluate the economic performance of state farms in Arsi and to identify problems facing these farms. The use of the information will be limited to academic circle. Therefore, you are kindly requested to fill in the necessary information.

Name of the farm _____

Distance from Addis Ababa _____

Awraja _____

Woreda _____

Altitude _____

Topography _____

Mean annual temprature _____

Mean annual rainfall _____

1. Please give us a brief historical account of the farm _____

2. What are the objectives of the farm (rank them)?

2.1 Production of foodgrain /-----/

2.2 Employment creation /-----/

- 2.3 Profit generation /----7
- 2.4 Provision of innovative and technical service /---7
- 2.5 Other, specify _____

3. How is the farm's performance evaluated?

- 3.1 Volume of output /----7
- 3.2 Area of cultivated land /----7
- 3.3 Profit generated /-----7
- 3.4 Other, specify _____

4. What are the major problems facing the farm?

5. Land allocated for different crops(ha.)

Y E A R (E.C.)										
Crops	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81

6. Amount of crops produced (quintal)

Y E A R (E.C)										
Crops	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81

APPENDIX II

Questionnaire Prepared for Private Peasants in Arsi

Awraja _____

Woreda _____

PA _____

Date of Inquiry _____

1. Name _____
2. Age _____
3. Sex _____
4. Educational level _____
5. Position held in PA _____
6. Family members

<u>Name</u>	<u>Age</u>	<u>Sex</u>
_____	_____	_____
_____	_____	_____

7. What are the major crops you produce?

8. Do you produce during "Belg" season?

9. If yes, which crops?

10. How many quintals did you produce during last "meher" and "Belg"?

<u>Crops</u>	<u>"Meher"</u>	<u>"Belg"</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

11. How many plots of farm land do you have?

12. Size of holding (ha. or Timad)

<u>Cultivated</u>	<u>Farrow</u>	<u>Grazing</u>	<u>Total</u>
_____	_____	_____	_____

13. Cultivated area and Crop production

<u>Crops</u>	<u>Area(ha)</u>	<u>Production(quintal)</u>
_____	_____	_____
_____	_____	_____

14. How many days in a week do you work on your farm?

15. How many hours in a day do you work on your farm?

16. How many oxen do you have?

17. If you do not have a pair of oxen, how do you cultivate your land?

18. Farm tools/implements

Tools/implements	Quantity	Value	Remark

19. Do you use fertilizer?

20. If no, why?

21. How many quintals of fertilizer did you use last year?

22. Seeds used for different crops

Crops

Seeds (quintal)

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Name Sufian Ahmed

Signature 