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SCHOOL OF GRADUATE STUDIES

A STUDY OF THE FACTORS THAT AFFECT THE USE OF AGRICULTURAL CREDIT AMONG PEASANT FARMERS IN ETHIOPIA: THE CASE OF TWO DISTRICTS

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ASSEFA ADMASSIE

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ABSTRACT

A necessary and important ingredient in the development process of subsistence agriculture is the introduction of improved technology and land management practices. But these are related to the availability of suitable agricultural credit facilities. Although several agricultural credit policies and programmes have been introduced in Ethiopia very few peasant farmers have been integrated into these programmes. Moreover, the proportion of private peasants using agricultural credit has remained unsatisfactory. Except for some short-term credit from the Ministry of Agriculture for input procurement, agricultural credit services available to the peasant farmers are still of a rudimentary nature.

In light or these facts, it would be desirable to find concrete explanations for the low level of credit use by subsistence farmers. Consequently, the central objective of the thesis has been the determinations of both institutional and non-institutional factors which influence subsistence farmers credit use. Since the detailed information base necessary to forward a solution to the problem is not readily available, the case study method has been considered to find such details. Towards this end, two districts were purposively selected on the basis of their response to the introduction of improved technology. A random sample of two peasant associations was drawn from each district and from each peasant association selected, a simple random sample of farm household heads was taken. Data were collected in the months of March and April 1986.

Both qualitative and quantitative techniques were used to analyse the stated objectives. In particular, the techniques of discriminant analysis and multiple linear regression analysis have been applied to

identify the important socio-economic factors that characterize credit users and non-users and those which determine the volume of loan absorbed by a farm household.

The result of the study has shown that subsistence farmers credit use has been limited by institutional factors both before the Revolution and after the Revolution. The findings also show that peasant farmers' credit use is also influenced by a set of social and economic factors. The level of education, the use of improved technology, the size of operational area, inadequate market arrangements together with extension service availability and two of the hypothesised production limitations (need for more land and product price security) have been observed to be the main factors which distinguish borrowers from non-borrowers. The age of the farm household head and investment expenses are also important to classify farmers as borrowers or non-borrowers.

The results of the multiple linear regression analysis have also indicated that the variations in loan size are explained by a set of socio-economic variables. In this regard, income, credit experience, and value of livestock were found to be the main determinants of loan size.

The study reflects that the formulation of an appropriate agricultural credit policy together with other complementary services is important in order to raise agricultural productivity of subsistence farmers in rural Ethiopia.

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1.1 Introduction

Agricultural credit can make an important contribution to a solution of the problem of rural poverty. In order to increase agricultural productivity so as to satisfy the growing demand for food and raw materials farmers must increase their capital investments on modern and improved methods of agricultural production. The use of improved inputs (fertilizer, seeds, pesticides, etc) provision of irrigation facilities, mechanization and other farm activities may demand far larger financial outlays than the farmer can afford. Thus agricultural credit facilitäes should be extended to the farmers so as to enable them adopt improved cultivation methods and increase their productivity. The absence of credit facilities could become a consequential bottleneck to the use of modern technology. In this regard, the problem of peasant farmers deserves special consideration.

Subsistence farmers have the least capacity to finance investments in needed inputs. Lack of capital is a crucial factor for them. Their agricultural production is limited because their real income is low and hence they do not have the capacity to save. Increased farm credit is, therefore, a vital instrument particularly for the subsistence farmers since it is a key to improved output and income. However, peasant farmers' credit use is very rudimentary in Ethiopia. Thus, the extent to which agricultural credit has been used and the factors which influence credit use must be studied in order to design appropriate agricultural credit policies and to allocate scarce resources to their best use.

.../2

1.2 Statement of the problem

Agriculture contribu[illegible] to the domestic food and raw material supply, GDP, employment and to exports from Ethiopia. The needs to increase national levels of food production and foreign exchange earnings would call upon the policy makers to emphasize the development of the sector. However, the rate of growth in agriculture cannot be pushed up unless there is a significant improvement in the economic conditions of the small farmers. A focus on peasant farmers is essential since they are the largest body of producers in the rural areas.

A necessary and important ingredient in the development process of subsistence agriculture will be the introduction of improved technology and land management practices. But these are related to the availability of capital. More specifically the availability of suitable agricultural credits to peasant farmers, who are using traditional methods of cultivation and have limited access to capital, determine the extent of agricultural modernization possible. However, it must be understood that the availability of suitable agricultural credits by itself does not solve all the problems of subsistence agriculture. What is needed is a holistic approach involving properly synchronized input-output framework where credits come as an important component.

A number of credit programmes have been introduced in Ethiopia with the objective of raising agricultural productivity and income of the rural population. Unfortunately, few peasant farmers were integrated into these programmes. While there is a large demand for agricultural loans to be advanced to the rural economy, it may be said that such loans are not

available for peasant farmers in sufficient amounts to have any material impact upon the rural development.[1] More recently a survey undertaken by the Ministry of Agriculture estimated that private peasants using agricultural credit did not exceed 13.6 percent of the whole peasants at any one time in the past.[2] There is no rural credit programme covering all areas of the country and different segments of the farming population. The Agricultural and Industrial Development Bank, which is the main source of agricultural credit in Ethiopia, has not been able to meet the credit needs of the peasantry. Because of its limited capacity, high collateral and other security requirements, over 80 percent of the farming population in the nation has not been eligible for credit from the Bank.[3] More recently, out of 212 million Birr, which was disbursed by the Bank during 1979/80, only one-fifth went to peasant associations and cooperatives.[4] In general the amount provided by the Bank is far from adequate relative to the needs of the sector.

In addition to the inadequacy of credit facilities for the rural population, consumption needs usually appropriate the largest proportion of the credit flow. For instance, the average credit flow to the rural households for the 1983/84 crop season was estimated to be less than 20 Birr of which 80 percent came from non-institutional sources (friends, relatives and local traders) and consumption and social needs absorbed more than 70 percent of the credit flow.[5] The volume of credit used for productive purposes, i.e geared towards the procurement of agricultural inputs such as seeds, implement, fertilizers, etc., is negligible.

In general, except for some short-term credit from the Ministry of Agriculture for input procurement agricultural credit services

available to the subsistence farmers are still of a rudimentary nature. There is an absolute shortage of farm credit. Hence, the peasantry is unable to use improved technology and raise the level of agricultural productivity. In the light of this fact the main problem would be to explore the factors that are responsible for the low level of credit use by subsistence farmers. Since the detailed information base necessary to forward a solution to the problem is not readily available, it is assumed that the case study method will help to provide such details. In the process of investigating the factors responsible for the low level of credit use a number of related issues and questions arise. It would be necessary, for example, to examine the development of agricultural credit policy, review past studies to highlight some of the information gaps, measure the volume of credit, identify the sources and determine the uses and types of credit. It is not possible to provide a solution to the problem raised without giving some thought to these considerations Accordingly this study attempts to identify the social, economic and political factors that influence credit use by subsistence farmers by integrating the ideas posed above.

1.3 Objectives of the study

The study has the following main objectives.

1. To examine critically agricultural credit policies and programmes introduced in Ethiopia both before the land reform and after the reform.

2. To investigate the level, type, sources and uses of rural credit and identify which form of credit is most preferred by farmers in the context in which it is to be deployed.

3. To determine the set of social and economic factors that influence agricultural credit use by farm households, and

4. To find out what actually determine the volume of credit taken by a farm household.

1.4 Significance of the study

In countries such as Ethiopia, where agriculture is the dominant sector of the economy, the level and speed of economic development is determined by the growth of the agricultural sector. Agricultural growth on the other hand implies the increase of agricultural productivity resulting from land augmenting technological change and appropriate economic incentives and assistances. Assistance is particularly needed by peasant farmers who have the least capacity to buy and use improved technologies. The availability of farm credit therefore, becomes an essential component of the modernization of agriculture. The adoption of both mechanical and biological technology , has required the infusion of a large amount of capital which many subsistence farmers can not afford. It is, therefore, necessary to extend credit facilities to the rural population in order to raise agricultural productivity.

Farm credit is often said to be the life blood of agriculture and plays a crucial role in oiling the wheels of agricultural production. But, little is known about the level and nature of the need for agricultural credit both from institutional and non-institutional sources or about the best means of providing it. Information is lacking about the impact of various social and economic factors on rural credit use. Many factors (amount disbursed, cost, repayment and default rates) may well be dependent functions of other socio-economic factors. Therefore, studies are required on these and other aspects of agricultural credit use.

An analysis of factors influencing agricultural credit use would help policy makers to formulate successful rural development programmes. The formulation of successful credit policies and programmes is of paramount importance for it enables the policy makers to allocate scarce resources for the development of the basic sector of the economy. In order to formulate successful strategies, the social, economic and other variables influencing the demand schedule for funds must be studied. An accurate knowledge of the existing condition of peasant farmers is an important precondition not only to the overall agricultural planning process but also to the flow of funds into this sector.

In breif, no matter what the final objectives of the government or the credit institutions may be, it is basically the generation of concrete benefits to the borrower which makes for the success or failure of any credit programme. The designing of appropriate agricultural credit policy that motivate farmers to increase their adoption rate of improved methods of cultivation based upon the ultimate needs of the farmers must be taken seriously. As Horace Belshaw emphasized the provision of farm credit based upon the intimate knowledge about the socio-ecomomic conditions among the peasant societies which present obstacles to ecomomic development and more specifically, credit difficulties in the establishment of effective system of agricultural credit, will assure the progress of the agricultural sector.[6] The basis or the foundations for any decision on credit programmes must, therefore, be the users' interests and viewpoints. This study can help to narrow the gap in knowledge which is pertinent to the formulation of appropriate agricultural credit policy.

1.5 Limitations of the study.

The case study utilizes the responses of farm household heads selected from two districts of Shoa administrative region. Farmer's reluctance to answer questions and give correct information on factors like income, farm size, family size, age, etc., are often considered as limitations of farm level studies. The problem was also anticipated in this study and hence extended discussions with the farmers and peasant association leaders were conducted. A meeting with all the members of the relevant peasant associations was called and clarifications were made on the purpose of the study. On top of this, the enumerators were employed from the farmers localities and were given adequate training on the purpose and content of the study. However, there is room for refinement through repeated studies in the future inspite of the precautions taken.

NOTES

[1]Many studies have confirmed that the proportion of small farmers using agricultural credit particularly from institutional sources is very low. See for example, Johan Holmberg, " Small Farmer Credit in Ethiopia", AID Spring Review of Small Farmer Credit, Vol. VIII, 1973: Lakew Birke," A Farm Credit Study in Ada District", HSIU, Department of Agricultural Economics, Unpublished material, February 1974: Teshome Mulat," Credit and Indebtedness in Rural Ada Woreda", Research Document, Addis Ababa University, IDR, 1974: Mamo Bahta and Harr J.Robinson, An Agricultural Credit Programme for Ethiopia, Stanford Research Institute, California, Menlo Park, 1969. See also Tesfaye Teclu, The Evolution of Alternative Rural Development Strategies in Ethiopia Implications for Employment and Income Distribution, (Michigan State University in Co-operation with IDR, Addis Ababa, 1975).

[2]Ministry of Agriculture, General Agricultural Survey: Preliminary Report 1983/84, Vol.I, Addis Ababa Planning and programming department, October 1984, P.102.

[3]Uma Lele, The Design of Rural Development: An Analysis of Programmes and Projects in Africa, (Washington, IBRD, 1974), P.59.

[4]FAO, Delivery Systems of Agricultural Services to Small Farmers in Africa: Case studies From Ethiopia, Kenya and Nigeria, (Rome, 1983), P.16.

[5]Ministry of Agriculture, Loc. Cit.

[6]Horace Belshaw, Agricultural Credit in Economically Underdeveloped Countries, (Rome, Food and Agriculture Organization, 1959), P.35.

Chapter 2

2. A Critical Review of Agricultural Credit Policies and Programmes in Ethiopia

Agricultural development strategies in general and credit policies and programmes in particular could have important implications over the use of Agricultural Credit. In fact it is the national credit policy which determines to a large extent the success or failure of credit programmes. Farmers could be motivated to use more productive technology if institutional credit is made available to them at reasonable prices. While the demand for agricultural credit is high in Ethiopia, such loans have not been available in sufficient numbers or amounts to have any significant impact upon rural development.[1] The purpose of this chapter is to examine critically the agricultural credit policies and Programmes adopted by different institutions both before The Land Reform and after The Reform and their implications over peasant farmers' Agricultural Credit use.

2.1 Agricultural Development Strategies and Small Farmers' Credit Use Before the 1974 Revolution.

2.1.1 Ethiopia's five-year development plans as related to agricultural credit use

Ethiopia had adopted three successive five year economic development plans. The first five-year Development plan (FFYP) covered the period from 1957 to 1961. The second five-year plan was formulated based upon the experiences and results gained from the FFYP and it covered the period from 1962-1967. Following the termination of the second five-year development plan (SFYP) the third five-year development plan (TFYP) was approved for the period from 1968-1973. However, in view of implementation difficulties and failure to effect the timely development of the next

plan, the plan period for the TFYP for the TFYP was staggered up to 1974. Therefore, the period of reference for this analysis is essentially the period from 1957-1974. However, Ethiopia had several economic and social development programmes even before 1957. To make the discussion complete it would also become important to have an insight over the situation before development plans were drafted.

Immediately after the Italian war the conditions did not allow the co-ordination of activities by means of an economic plan. An economic policy was nevertheless initiated and was carried out by various departments. Separate programmes were worked out in each department which served as a basis for government policy. It was also recognized that the Ethiopian economy primarily depended upon the development of the agricultural sector. The Ministry of Agriculture was established and was given the responsibilities of taking measures to promote the development of agriculture.[2] Several measures were taken by the ministry. Towards this end, a five year programme of agriculture was developed.[3] The main obstacle to expand production was recognized to be the low productivity of land and labour, largely due to the inefficiency of tools and implements employed. Therefore, it was necessary to implement measures such as improving the taxation system, extension of agricultural credits and improving the marketing and transportation facilities. To augument these efforts, an agricultural bank was established under the name of Agricultural Bank of Ethiopia in April 1945.[4] The Agricultural Bank of Ethiopia (ABE) was controlled and supervised by the Ministry of Agriculture (MOA).

The main purpose of the ABE was "to assist small landholders who had suffered devastation of their farms during the Italian occupation by making loans to purchase seeds, livestock and implements and to repair or

reconstruct their homes and farm buildings".[5] It was empowered to grant loans and mortgages on the security of lands, buildings, chattels and crops growing or harvested, on cattle and other farm animals, and to lend money and grant mortgages on industrial and commercial enterprises related to agriculture.

Loans were made to small landholders in Shewa administrative regions on the basis of land-tax receipts for the preceding three years. A certificate from the district governor was also required to make sure that the applicant owned the land. Interest on the loans varied from $3\frac{1}{2}$ percent to 5 percent and were repayable on a staggered basis:20 percent the first year, 30 percent the second year and 50 percent the third and final year[6]. In 1949 another proclamation was issued to extend the powers of the Bank so as to include general banking. Its name was changed to the Agricultural and Commercial Bank of Ethiopia (ACBE). The ACBE operated on a modest scale until it was further reconstructed and absorbed by the Development Bank of Ethiopia (DBE) in 1951.

The programmes that have been directed towards granting small loans to the farming community were generally unsuccessful. During the history of the ABE (1945-1949) and its successor the ACBE (1949-1951) only 740 small agricultural loans were made amounting to 781,150 Birr[7]. Moreover these loans were restricted to the administrative region of Shewa. The size of these loans varied from 500 to 2000 Birr. The lending policies that demand a property pledge had automatically discriminated against the small farmers. Moreover, it was not easy to produce a certificate of ownership of the land because of the landlord-tenant relationship and because of the communal ownership of land. On top of these, loans were generally granted without an inspection of the undertakings of the funds and many of such loans taken by the borrowers were diverted to non-agri-

cultural purposes. All in all small farmers were not able to mortgage the land to secure bank loans and hence their need for credit remained unsatisfied.

As pointed out previously, there were a series of sector plans for agriculture, industry, education, etc., of varying duration and with different characteristics. Though these sector plans served, at least on a modest scale, the useful purpose of focusing attention on planning and development, they were in no real sense integrated. In recognition of this shortcoming coupled with the realization that economic planning in some countries had been introduced as an efficient tool for policy formulation,the government showed inclination to formulate an overall plan for accelerating economic growth. Thus the First Five-Year Development Plan (FFYP) was launched for the period 1957-61. This plan marked the first step in the systematic determination of the country's objectives and the integration of the various programmes. The FFYP gave priority to the development of infrastructures manufacturing industries and related services as shown by the allocation of total investment. The emphasis on infrastructure is clearly

Table 1

Allocation of Total Investment during the
First Five - Year Plan (1957-61) in million Birr

Investment	1957-61
Monetary Investment	534.6
agriculture	40.3
forestry	2.8
mining	37.6
electricity	43.3
manufacturing industry	57.1
building	2.1
Transport and communication	240.0
Trade	4.0
Other services	107.0
Rural investment in kind	139.0
Total Investments	673.6

shown by the allocation of 35.6 percent of the total to transport and communication as compared to 27.03 percent to agriculture and forestry (including farmer's investment in kind).

Agricultural policy during the FFYP had primarily two main objectives. The first objective was to create the basis for a more dynamic long-term development of agriculture and the second to take measures that would achieve a sizeable increase in agricultural production and particularly in marketable crops and raw materials for industry during the planned period[8].

According to the plan, 40 million, i.e., 8 percent of the total monetary investments was allocated to the agricultural sector. This was in addition to the rural investment in kind, estimated to figure 139 million Birr. Funds for the promotion of agriculture were devoted mainly to the strengthening of the administrative apparatus of the MOA and for broadening the scope of its activities. The percent of planned expenditure on agriculture was the lowest among several African countries[9]. The plan had mentioned that investments in agriculture would be encouraged particularly by extending long-term agricultural credit to modern agricultural establishments such as coffee estates, cotton and vegetable farms. Only 10 million Birr was available for bank loans for the above purpose[10]. However, the plan had made no specific and articulated statements concerning the means and ways of providing agricultural credit to small farmers. In fact, this was a time when small farmers were considered unproductive. The rate of growth of the agricultural sector was, therefore, unsatisfactory. Moreover, the agricultural sector of the plan was not implemented and very little progress was made[11]. The FFYP was plagued by the absence and insufficiency of statistical data and the incomplete and unsystematic nature of previous studies. This plan, however, initiated the government

to undertake a more general twenty year development programme form which the second five-year development plan was formulated.

The results achieved and the experiences gained from the FFYP enabled the policy formulators to identify new opportunities with better and improved data base while at the same time clarifying existing problems. The SFYP was a logical continuation of the first but with stronger emphasis laid this time on productive activities designed to provide increasing quantities of consumer goods and on the creation of new job opportunitis for the country's growing population[12].

Realizing that agriculture was the most favourable base for stimulating the country's economic growth, the SFYP stressed the following objectives: To extend the cultivable areas, to improve cattle raising, to erect modern large scale agricultural undertakings, and to establish processing industries based on available raw materials of agricultural origin. The plan also underscored the need for research, experimentation, training, establishment of marketing facilities and establishment of clear title to the land which were essential factors for designing a rural credit programme for the development of agriculture.

Total investments for the SFYP were substantially larger than for the previous plan. Agriculture was to receive 242 million Birr or 14 percent of the total [13]. However, the pattern of investment in agriculture during the SFYP emphasized large scale commercial farms and co-operatives. Of the total investment in agriculture during the plan period about 128 million Birr or more than half was planned to be invested in modern large scale farms[14]. Besides, it was clearly stated in the plan document that "the government will help and stimulate, by all convenient economic and other measures, the establishment and development of big private commercial farms"[15]. All these show that commercialization was the main objective in

agriculture of the SFYP. To help the plan fulfil the targets some institutions were established. These include the Ethiopian Grain Corporation; The Ethiopian Investment Corporation;The Livestock and Meat Board and others. The only articulated statment concerning the assistance that should be rendered to the farmers was that it was intended to provide tools and implements to the peasant farmers through the Development Bank of Ethiopia's Credit extended to the Grain Corporation or farmers' co-operatives[16].

An analysis of the accomplishments of the SFYP indicates that the specific production targets were not met. One of the important reasons for not attaining the targets was the lack of coherence between the structural investiment and the plan. Less was invested in agriculture than the plan had called for. The actual expenditure amounted to only 42.2 percent of the planned expenditure as table 2 illustrates. In addition, the amount budgeted for the Ministry of Agriculture was the lowest of all the Ministries for many years. For instance, the MOA received 5.8 million Birr (2.0 percent) in 1956-66 and only 6.2 million (1.9 percent) in 1966'67.[17] This share ought to have been increased if agriculture was to advance at more rapid rate.

Table 2

Ethiopia's Capital Expenditure in Agriculture in the Second Five-Year Plan (in million Birr)

Agricultural Component	Planned Expenditure	Actual Expenditure	Actual as % of planned
Services	11.8	8.5	72.0
Surveys and studies	36.7	10.7	29.2
Marketing organizations	12.7	7.3	57.4
Commercial farms and peasant's monetary investment	180.6	75.3	41.7
Total	241.8	101.8	42.2%

Source: Mamo Behata and Harry Robinson, P.40

All in all the SFYP did not pay attention to the needs and welfare of the peasant farmers. No concrete measures were initiated regarding Agricultural Credit Programmes for small farmers. Peasants were left at the mercy of private money lenders, and the function of agricultural credit as a promoter of agricultural production remained unutilized. During the SFYP the DBE, the only institution that was responsible for extending credit, stopped lending to small farmers.

The degree of accomplishments of the SFYP were important foundations for the preparation of The Third Five-Year Development Plan (TFYP). The conclusions reached during the preparation of the TFYP were that the growth of agricultural production during the SFYP period was unable to cope up with the growth in population. Hence the TFYP had two policies on agricultural development.

The two approaches that were emphasized by the plan were:

1. The establishment of large scale commercial farms to meet the growing demand for food, raw materials and exportable commodities.
2. To concentrate material and human resources in strategically selected areas in order to promote the economic welfare of the subsistence farmers[18].

The first policy was considered as a short-run solution to get the relatively quick increase needed in agricultural exports and supply of food stuffs for the rapidly expanding urban centres. This policy was made effective by such measures as credit possibilities from the DBE and decree of duty free tractor fuel for those who wanted to undertake commercial agriculture. The expansion of mechanized farms in the country in the late sixties was the result of this policy.

Regarding the peasant farmers it was stated in the plan that extra efforts were needed to promote the economic welfare of the peasant farmers. The concrete policy efforts consist of measures to increase the productivity

of the small farmers in order to make surplus production. Because improvements cannot be done simultaneously in all regions of the country emphasis was placed on selected areas and "package programmes" were initiated. The comprehensive package projects and the minimum package projects are to be viewed as components of this policy. These package projects had credit programmes directed to the subsistence farmers which will be discussed in detail later on in this analysis.

The TFYP had recognized the importance of reorganizing financial institutions to promote the utilization of agricultural credit. The Development Bank of Ethiopia and the Ethiopian Investment Corporation, which was established during the SFYP period were merged together to form the Agricultural and Industrial Development Bank. This was an important measure that showed the recognition of the importance of agricultural credit to the economy. The following section will, therefore, attempt to describe the historical development of agricultural credit institutions together with their achievements and failures in meeting the needs of subsistence farmers.

2.1.2 The Development of Agricultural Credit Institutions

Agricultural credit can be used to assure higher productivity or income among the rural people especially when complemented with inputs and services and well managed credit institutions. Agricultural credit institutions can increase the rate of economic development by facilitating the injuction of capital into agriculture which otherwise would not have been generated within the sector. To undertake such broad responsibilities in an efficient way these institutions should have adequate information about the environment in which they operate and should be provided with well defined national credit policies.

In Ethiopia, the origin of the first agricultural credit institution goes back to the Agricultural Bank of Ethiopia that was established in 1945. The name of this bank was changed to the Agricultural and Commercial Bank of Ethiopia in 1949. However, this credit institution did not succeed in producing an effective agricultural credit programme directed towards the need of small farmers. The growth of agriculture and industry brought with it the evolutions of specialized credit institutions such as the Development Bank, Ethiopian Investment Corporation and later on the Agricultural and Industrial Development Bank.

2.1.2.1 The Development Bank of Ethiopia (DBE)

The Development Bank of Ethiopia (DBE) was established in May 1951 by government proclamation by absorbing the former Agricultural and Commercial Bank of Ethiopia. The primary objective of the Bank was to assist the development of industrial and agricultural production and encourage private capital investment. More precisely the twin functions of the Bank were:

1. To assist in the development of industrial and agricultural production..... and,

2. To foster investment of private capital for productive purposes[19].

In summary, the bank had the power to provide loans, make gurantee, and buy shares of new enterprises. It also provided technical guidance to investors both in the planning and implementation of projects.

The DBE constituted the first attempt at combining the functions of industrial and agricultural banking in Ethiopia. The Bank was exempted from all taxes and customs duties for its own use, including the importation and supply of equipment and materials.

The DBE required a first mortgage on real property and machinery as collateral. In certain cases, assets belonging to third parties were pledged as security. The Bank generally required 200 percent of the value of the loans as security. In cases where the security offered was less than 200 percent the signature of a guranator was essential.

The Bank used to charge seven percent interest on agricultural and fishery loans, and eight percent on other loans plus a 1.5 percent commitment charge on any undrawn portion of a loan[20]. In addition, fees were also charged for the processing of loan applications. Such discriminatory interest charges were deliberately established in order to induce farmers to used credit and improve their farming methods. However, a high collateral requirement, as high as 200 percent of the value of the loan, in the form of real property and machinery had discouraged potential borrowers, especially small farmers, from using the Bank's credit services.

An analysis of the total loans advanced by the DBE over its twenty years operation reveals that most of the loans were made for the industrial sector (Table 3). Between 1951-69, the Bank extended 3840 agricultural and industrial loans valued at 47,190,500 Birr. Of the total amount of loans granted during the same period, industrial loans alone absorbed 27,278,200 Birr (58 percent) while agricultural loans made up the balance of 19,912,300 Birr (42 percent of the total).

Table 3

Loans Granted by the Development Bank (1951-69)

('000 Birr)

Year	Agricultural		Industrial		Others	
	No.	Amount	No.	Amount	No.	Amount
1951-1960	2760	9,497.8	244	13,528.5	182	915.1
1961	95	1,249.1	7	143.2	-	-
1962	70	656.0	29	1,410.0	19	24.0
1963	97	851.0	17	2,763.0	24	39.0
1964	62	1,335.9	16	2,334.4	37	80.5
1965	50	1,353.5	16	2,657.4	47	189.1
1966	36	729.0	7	405.7	12	75.5
1967	134	1,645.0	12	469.0	7	60.0
1968	68	847.0	11	1,657.0	19	172.0
1969	97	1,748.0	12	1,910.0	6	7.0
Total	3469	19,912.3	371	27.278.2	353	1,562.2

Source: Development Bank of Ethiopia, Annual Reports.

In the agricultural sector, loans were made available for a variety of purposes such as, coffee plantations, field crops, dairy farming, fruits and vegetables, etc. Out of the total 19.9 million Birr of loans made to the agricultural sector, 10.8 million Birr went for general agriculture, 7.6 million Birr for coffee plantations and the remaining 1.5 million Birr for small farmers. In terms of the number of loans extended to the agricultural sector between 1951-69, 657 were absorbed by general agriculture, 1527 by coffee plantations and 1285 by small farmers out of the total 3469 agricultural loans.

Table 4

Breakdown of Agricultural Loans for the Period 1951-69

('000 Birr)

Year	General Agriculture		Coffee		Small agriculture	
	No.	Amount	No.	Amount	No.	Amount
1951-60	185	3,132.7	1,290	4,891.8	1,285	1,474.0
1961	24	363.0	71	886.1		
1962	27	498.0	43	158.0		
1963	77	761.0	20	90.0		
1964	43	902.9	19	433.0		
1965	29	931.5	21	422.0		
1966	33	699.0	3	30.0		
1967	110	1,295.0	24	350.0		
1968	53	788.0	15	59.0		
1969	76	1,441.0	21	307.0		
Total	657	10,811.4	1,527	7.626.9	1.285	1.474.0

Source: Development Bank of Ethiopia, Annual Reports

As table 4 shows only 1285 small agricultural loans were made by the DBE. In value terms 1,474,000 Birr was alloted to small farmers. The value of the small agricultural loans ranged from 500 Birr to 1500 Birr. A breakdown of these small agricultural loans disbursed between 1951 and 1960 is given in table 5.

Table 5

Small Agricultural Loans for the Period 1951-60 ('000 Birr)

Year	Number	Value
1951	88	83
1952	69	86
1953	106	101
1954	108	130
1955	116	135
1956	142	168
1957	134	178
1958	312	334
1959	156	190
1960	54	69
Total	1,285	1,474

Source: Development Bank of Ethiopia, Annual Reports

Loans to small scale farmers were basically discontinued in 1961, mainly because of problems arising through the collection of principal and interest. However, it was felt by the institution that small farmers should not be kept without such help[22]. But no tangible measures were taken to overcome the problems of small farmers.

Though peasant agriculture is the mainstay of Ethiopia, finance for peasant farming (both for farm improvement and annual crop finance) has been in short supply. The DBE had stopped small agricultural loans since 1960. The management of the DBE had considered that such loans were not development oriented. Hence the Bank had been reluctant to grant such credit to farmers[22]. The real cost of such small finance, was naturally high;but the unavaibility of credit to peasant farmers can be generally harmful.

Land was considered to be the principal security that farmers were supposed to offer to receive loans. But many farmers were unable to offer the land as collateral for various reasons. Tenants did not have land to offer as security. One of the important pre-requisites for a viable agricultural credit programme, a healthy land tenure system was missing. Another problem associated with the use of land as a security was the lack of a clear title over the land. It was usually difficult to produce a certificate of ownership to get bank loan. Since land was communally owned in many parts of the country, it was not possible to mortgage the land to secure bank loans.

Most of the agricultural loans made during the 1951-60 period were misused for non-agricultural purposes. Loans were made to absentee landlords, merchants, town dewellers government officials and other non-agriculturalists. Many of the loans advanced to such people were used to build houses, open shops, purchase cars and finance marriages and other

festivals[23]. Thus, even the limited agricultural loans were unproductively used.

With regard to large scale agricultural development loans and co-operative loans, there was little success. The DBE had particular interest in the financing of large scale agricultural development projects. However, there were very few competent farm managers who were able to undertake such large scale investments in agriculture. In the case of co-operatives, the DBE was able to make only five loans valued at 636,000 Birr by the end of 1966[24]. This shows that the DBE was also unsuccessful in the financing of large scale agricultural projects.

On top of these, the pre-requisites for a sound agricultural credit programme were not met. Rural credit is only one of the essential factors to accelerate rural development. In order for credit to be an effective instrument in the transformation of the agrarian economy, it should be co-ordinated with other important services. Farmers must be taught the importance of credit as a tool for development, the desirability of using improved seed varieties, fertilizers, and improved methods of farming. An efficient distribution system that makes the necessary inputs available and a marketing programme to provide an outlet for the increased farm produce are needed. But the DBE was trying to finance agricultural development in the absence of all such important services. Hence the contribution of the Bank in financing small agricultural loans was scanty.

2.1.2.2 The Ethiopian Investment Corporation (EIC)

The requirements for long-term agricultural as well as industrial finance were increasing in the mid-sixties. Thus it was decided by the government to create an organization that will mobilize funds both from domestic and foreign sources to be directed to productive investments.

The Investment Bank of Ethiopia (IBE) was established as a government sponsered and financed corporation to supplement the activities of the DBE in September 1963[25]. The main objective of this organization was to "finance projects through investment loans and by share participation, sell shares from its own portfolio, and furnish managerial, technical and administrative assistance to public and private enterprises"[26]. The IBE changed its name to the Ethiopian Investment Corporation (EIC) in 1965 to comply with the monetary and banking proclamation issued in December 1963. The proclamation forbids any person to use the word "Bank" or its derivatives as part of the name of a business without securing a license from the National Bank. Since general banking services were not included in the scope of activities of the IBE, it was necessary to change the name to EIC.

The primary objective of the Ethiopian Investment Corporation was to invest funds in profitable development projects by way of equity participation and medium and long-term loans complying with the development plan of the government. More specifically the corporation was empowered to:

1. Make and participate in loans and sell stocks or other evidence of ownership of any industrial and agricultural business enterprises.

2. Borrow money, locally or from abroad and issue bonds or other evidence of indebtedness.

3. Underwrite, purchase, hold and sell stock or other evidence of ownership of any industrial and agricultural business enterprises[27].

The EIC used to require loans to be secured by a mortgage on the borrower's fixed assets such as land, buildings, machinery and equipment. In some cases gaurantees of third parties, whose assets can be pledged as security for the financial assistance provided was accepted. In addition,

emphasis was also placed on the competence of the management, economic and technical feasibility and financial strength of the projects to be financed.

The corporation had attempted to provide medium and long-term loans to new and already established enterprises. Loans were extended to agricultural and industrial projects, transportation and other areas. Out of the total loans approved by the corporation for the period 1963/64-1969/70 only 10,970,700 Birr (18.2 percent) went to agricultural development as shown in Table 6.

Table 6

Loans Granted by the Ethiopian Investment Corporation (in million Birr)

Year	Agriculture	Industry	Transportation	Others	Total
1963/64	1.147	0.178	0.308	0.472	2.105
1964/65	3.032	5.546	0.016	0.036	8.630
1965/66	2.521	2.658	0.273	0.296	5.748
1966/67	0.611	3.960	17.292	2.002	23.865
1967/68	1.404	1.561	0.017	0.349	3.331
1968/69	1.239	9.853	0.512	0.625	12.229
1969/70	1.016	2.998	0.146	0.310	4.470
Total	10.970	26.754	18.564	4.090	60.378
Percent	18.2	44.3	30.7	6.8	100

Source: Ethiopian Investment Corporation, Annual Reports for 1966 and 1970.

The emphasis on industrial projects and other services is clearly seen from the amount of money allocated to the industrial and transport sector. Close to 80 percent of the loans granted by the EIC went for the expansion of industry and transportation services.

The Ethiopian Investment Corporation had also its due share in initiating and stimulating investments through medium and long-term credits. However, because it tried to cover the entire economy, it was also unable to satisfy the demand for agricultural loans. The corporation had been faced with skilled manpwer and capital shortages. In addition, like its counterpart, the DBE, it required mortgage on real property rather than relying on the paying capacity of borrowers. This was again very embarassing for many farmers.

The preceeding discussions have made it clear that the principal institutions furnishing agricultural credit have not been effective in financing small agricultural loans. Because of problems associated with agricultural loans, it was more tempting for the institutions to make industrial loans since there was greater security. Agriculture had for long continued to be small scale, scattered and unorganized. These and other factors inherent in Ethiopia's agricultural activity has retarded the expansion of agricultural credit particularly for the subsistence farmers.

2.1.3 The Reorganization of the Development Bank of Ethiopia and the Ethiopian Investment Corporation

An examination of the functions entrusted to the DBE and EIC does not reveal any serious justification for the existence of two separate institutions. In a developing country like Ethiopia where experienced personnel are scarce and domestic savings are limited, the running of separate institutions which have had parallel fields of work was surely a waste of resources. Both institutions were established for the purpose of investing in profitable projects in the field of agriculture, industry and other sectors of the economy. It was, therefore, essential to merge those two institutions.

In fact, the International Bank for Reconstruction and Development had suggested the amalgamation of the DBE with the EIC early in 1964. No action was taken to merge the institutions at that moment. Later on, however, the government appointed a high level commission to study the situation and find ways and means to carry-out the merger of these financial intermediaries. The commission recommended "The reorganization and the merger of the DBE and EIC which were basically similar in their functions after it recognized the inefficiencies of running separate financial institutions"[28].

In compliance with the advice of the commission the government decided to merge the two financial bodies. Consequently, the Agricultural and Industrial Development Bank Share Company was established by decree number 55 of 1970 by taking over the assets and liabilities of the Ex-Development Bank of Ethiopia and Ex-Ethiopian Investment Corporation[29]. In view of the felt need of using the scarce resources of the country effectively and to promote sectoral growth of the economy on priority basis, the merger of the institutions was a step in the right direction.

2.1.3.1 The Establishment of the Agricultural and Industrial Development Bank and its objectives.

The Agricultural and Industrial Development Bank (AIDB) which was established in November 1970 as a wholly government owned financial institution took over most of the equity and loan portfolio of the former DBE and EIC. This newly formed development bank was also provided with additional funds by the allocation of "50 percent of the amount due to be distributed to the Ministry of Finance by the National Bank of Ethiopia" for a period of five years starting from 1970[30].

The AID Bank became the government's principal instrument for mobilizing and extending medium and long-term investment funds into economically viable projects mainly in the agricultural and industrial sectors. It provided financial and technical assistance to state, cooperative and private enterprises.

The purposes for which the AID Bank was established have been enumerated in the general statement of policy that was adopted in 1970. The principal objectives include:

1. To assist in the development of the country by mobilizing and investing all available funds in economically and financially viable projects.

2. To act as the government's principal instrument for extending long and medium-term credits and equity investment in agricultural, industrial and other projects.

3. To augment its activities wherever appropriate and necessary with advisory or other services in planning, management, accounting, etc.

4. To foster the growth of share ownership in the country and to encourage Ethiopian investors to participate in the capital of projects in which it has interest.

5. To select projects, subject to sound investment criteria, on as broad a geographical and sectoral basis as far as possible[31].

A close examination of these objectives indicates that the basis of evaluation of projects to be financed was their financial viability. Sound management practices, adequate accounting records, and the like were lacking in Ethiopia at that time. However, such factors were considered as basic requirements for financing investments by the AID Bank. The Bank gave preference to those farmers with managerial skills and resident farmers. Thus, very little attention was given to the welfare of the society and peasant farmers were not eligible for loan.

2.1.3.2 The Agricultural Credit Policy Adopted by the AID Bank

The agricultural credit policy adopted by the Bank emphasized that agricultural development should be given priority to make the sector's contribution as effective as possible. In order to help in the development of the agricultural sector, the agricultural credit policy aimed at increasing domestic food production, export diversification, establishing a basis for industrial raw materials, increasing the purchasing power of the population, and popularizing the spread of new technology[32].

The Bank had attempted to grant long and medium term agricultural loans to large and medium state farms, package projects and co-operatives. However, it had made restrictions on the use of such loans. The purpose for which medium and long-term loans were made include:

1. Purchase of agricultural and agro-industrial machinery, equipment, implements and spare parts.
2. Land development, improvement and preparation.
3. Construction of farm buildings, storage facilities and barns.
4. Purchase of livestock for dairy and beef production.
5. Provide storage, marketing and credit service to assist farmers and assure the collection of its loans.
6. For fencing, well drilling, and related water supply equipment[33].

In the case of short-term loans to cover working capital requirements for fuel, lubrication, insecticides, etc., borrowers were compeleted to cover such expenses from commercial banks or from their own savings. The AID Bank considered such loans only if "there were farm development plans and financial projections which were satisfactory to the Bank'[34].

Loan applications from large scale farms and co-operatives were normally accepted and approved irrespective of their locations. On the other hand, loan applications from small farmers were accepted only.

1. When the project to be financed lies within a reasonable distance from a branch office.

2. Where the Bank had sufficiently large number of other borrowers in the area or

3. Where the Bank had made adequate arrangement with other government agencies for the supervision of such borrowers[35].

Because the Bank considered that it was too costly it emphasized the development of co-operatives to meet the credit needs of the small farmers. It was claimed that co-operative societies provide a channel through which credit could reach small farmers.

Collateral Requirements and Interest Rates

It is a common practice to examine an applicant's repayment capacity for a loan. Collateral requirements have to be fulfilled so that the bank can redeem its resources in cases of defaulting borrowers. Such requirements may also help to ensure the effective utilization of credit. A very high standard of collateral requirement would, however, exclude some viable projects from receiving loans.

Prior to the land reform, the AID Bank's agricultural credit policy demanded high security requirements from farmers. These requirements made the bank's credit service inaccessible to the peasants. The Bank sought, as collateral, mortgages on real estate. Preference was given to mortgages on property with Town Title Deeds. In the case of farmers who used to take crop loans which were repayable in less than one year and were mostly taken in kind, personal guarantees were accepted.

The value of the property offered as collateral was determined based on the free market price decreased by 25 percent. The following table gives the collateral needed as percent of the advanced loans.

Table 7

Collateral Requirements

Type of Borrower	Collateral needed as percent of advanced loan
Special resident farmers and share companies	(100 - 125) percent
Resident farmers	(125 - 150) percent
Non-resident farmers	(175 - 200) percent

Source: AID Bank, "Statement of Policy of AID Bank", P.14

In addition to the above requirements farmers were also obliged to sell their produce at fixed prices to the subsidiary of the Bank to enforce repayment. This had definitely prohibited farmers from benefiting from any price increase.

The AID Bank also required that all property put up as collateral including machinery and equipment purchased from the proceeds of the loan to be adequately insured. All expenses incurred in this case were covered by the borrower himself.

The AID Bank used to charge an interest rate of $9\frac{1}{2}$ percent for both working capital and investment capital. Although the interest rate collected can serve as a source of funds there is always danger that the number of participating farmers may diminish from time to time if they feel that the rate is high. Interest payments on agricultural loans were generally high in Ethiopia as compared with some African countries[36].

The AID Bank ought to have at least charged lower rates than Commercial Bank. However, the interest rates on agricultural loans were higher than consumption loans, for instance, while the lending rates for fertilizer loans were 10½ percent, Commercial Bank of Ethiopia was charging 10 percent on personal loans[37]. All these show that the interest rate policy of AID Bank was inconsistent with its basic objectives.

The preceeding discussions have attempted to review the agricultural credit policy adopted by the AID Bank prior to the Revolution in terms of the general objectives of the policy, collateral requirements, interest charges, etc. It can be concluded that the policy had not been in general directed to benefit small farmers. It failed to achieve the stated objectives.

Although the policy aimed at increasing the domestic food production, loans were made to big commercial enterprises and landlords who were engaged in cash crop or export crop production. Subsistence farmers were unable to buy new technologies and improve their productivity. Hence, the idea of increasing the domestic food production continued to be an illusion. In addition, tenants were reluctant to request loans and improve their farming occupation since the increased production was appropriated by the landlords.

Many small farmers who were seeking assistance were also unable to secure bank loans because of the high collateral requirements. The credit policy of AID Bank was not concerned with the welfare of the rural masses. The Bank's service was only accessible to the landlords and big commercial farmers who at that time were able to offer the collateral requirements needed.

The AID Bank credit policy had also disqualified the subsistence farmers who were living in remote rural areas. According to the policy the Bank was only concerned with farmers who were living within reasonable

distance from its branch offices or with those farmers who were inside the operations of package projects. But the number of farmers who were within reasonable distance from the AID Bank branch offices or inside the operation of package programmes was very small. Hence, the credit policy had a built in bias, against small farmers. The problem of small farmers' credit need was recognized only in 1974, when the board of directors of AID Bank recommended that financial and technical assistance should be provided to the large percentage of peasant farmers not served by the package programmes[38].

On top of these stringent conditions, the Bank had also worsened the problem of the subsistence farmers by demanding that all property offered as collateral should be adequately insured at the expense of the borrower. The cost of adequately insuring the property was, however, too much. Farmers were also deprived off any temporary price increase since they were compelled to sale their produce to the Bank's subsidiary.

2.1.3.3 The Loan Operations of the AID Bank

Inspite of the stated limitations of the policy, the AID Bank has made a marked effort to finance development activities. The establishment of the AID Bank had created a favourable expanding investment condition. For instance, the DBE and the EIC together made only a total of 81.706 million Birr from 1963 to 1970 while tha AID Bank was able to approve a total of 215.063 million Birr in five years time.

Table 8

Summary of Loans Approved to Different Sectors by the AID Bank Before the Revolution (in million Birr)

Year	Agriculture	Industry	Others	Total
1970/71	13.166	1.836	1.041	16.043
1971/72	19.152	5.711	3.306	28.169
1972/73	17.132	28.959	1.021	47.112
1973/74	26.183	19.527	2.164	47.874
1974/75	64.766	11.099	na	75.865
Total	140.399	67.132	7.532	215.063
Percent	65.28	31.22	3.50	100

na = not available

Source: AID Bank Annual reports

As the above table indicates the agricultural sector received the largest single proportion of the total credit disbursed by the Bank over the five years. Only a little more than one-third of the total loan was advanced to the industrial sector.

The breakdown of the agricultural loans advanced to the different credit takers shows that multi-purpose cooperatives, privately owned modern farms, dairy development projects and later on the Agricultural Inputs Marketing Service Share Company were the main recipients of the AID Bank's agricultural loans.

Table 9

Breakdown of Agricultural Loans to Different Loan Groups (in million Birr)

Year	Individuals		Cooperatives		Others[a]		Total	
	No.	Amount	No	Amount	No	Amount	No.	Amount
1970/71	132	5.803	4	7.363	-	-	136	13.166
1971/72	106	8.448	10	10.703	-	-	116	19.152
1972/73	117	5.039	12	3.561	25	8.522	154	17.132
1973/74	149	5.541	17	10.389	18	10.254	184	26.184
1974/75	30	2.957	14	7.166	10	54.643	54	64.766
Total	534	27.789	57	39.182	53	73.429	644	140.400
Percent	82.92	19.79	8.85	27.91	8.23	52.30	100	100

Source: AID Bank Annual Reports

[a] Includes diary development projects and the Agricultural Inputs Marketing Share Company in 1974/75.

Those labelled as co-operatives were not co-operatives of small scale subsistence farmers. They were co-operatives of relatively smaller commercial farmers engaged in the production of cash crops such as cotton, coffee and sesame[39]. In addition people who were not farmers (for instance merchants) by occupation were also members of the co-operatives. This implies that the assistance rendered by the AID Bank for Co-operatives was not directed to the benefits of the subsistence farmers. Moreover, the number of co-operatives was very small. Those grouped as individual farmers were mainly farmers who own large farms and mostly engaged in the production of cash crops. Therefore, the credit needs of the subsistence farmers were not met by the AID Bank.

In general, the Bank excluded more than 80 percent of the farming population from its credit programme due to its inflexible requirements of collateral and other security measures. In order to alleviate the credit the credit problem of the small farmers, the Bank conceived the small farmers credit programme (SFC) in 1974. A pilot programme was expected to be launched during the next year "to study the special needs of small farmers in regard to credit needs for farm inputs, operating expenses, and post harvest and per-marketing requirements"[40]. The next year, however, saw the outbreak of the revolution and the state's attention was shifted to the socialized sector. Therefore the SFC was not implemented.

2.1.4 The Development of Package Projects and their Credit Programmes

As pointed out earlier, Ethiopia was compelled to adopt an integrated rural development strategy in order to accelerate the economic growth and development of agriculture. This idea was particularly necessary because of capital and manpower shortage, and was emphasized during the third five-year development plan period (1967-1973). As a result several comprehensive, and minimum package projects have been initiated and

implemented. The Chilalo Agriculture Development Unit (CADU) and the Walamo Agriculture Development Unit (WADU) were the first two comprehensive projects established in Arssi and Sidamo administration regions respectively. In addition to these comprehensive projects minimum package programmes were also launched.

Lack of credit institutions to serve small farmers prompted the package projects to include credit as a major component of their packages and organize farmers in such a way that it would be easier and less costly for AID BANK to provide credit to small farmers. Thus, it would also be important to evaluate the performances of these credit programmes. The following sections will attempt to examine the evolution of the comprehensive and minimum package projects, and the effectiveness of their credit programmes.

2.1.4.1 The Evolution of CADU and Its Credit Programme.

In view of developing peasant's agriculture the government deemed it necessary to establish a comprehensive project in Chilalo Awraja based upon preliminary investigation and recommendation of the Swedish International Development Authority (SIDA). Chilalo was selected on the basis of its natural conditions, marketing and ownership conditions and the possibilities for expansion. Hence CADU was started in September 1967 with the following objectives.

1. To raise the real income of farmers mainly with holdings of 20 hectares or less.
2. To elicit participation of small farmers and local government authorities for the development work.
3. To control adverse employment effects and, generate new additional employment opportunities.
4. To narrow income disparities by directing efforts mainly towards farmers in the lower income brackets.

5. To search for suitable methods to further rural development, and
6. To train staff and create possibilities of applying the experience gained at CADU in other areas[41].

The integrated activities of the CADU programmes considered both social and economic development in that it included, adaptive research on crops and livestock production, development of improved farm implements, dissemination of tested technological packages through extension programmes, provision of agricultural credit and marketing services, building of infrastructure, promoting soil conservation measures and the like.

The credit programme of CADU was launched in 1968, the purpose of which was to promote the introduction of innovations, by giving farmers the possibilities to buy the new inputs in credit at reasonable prices, and partly to improve the economic situation of the farmers[42]. As a result farm credit was:

1. Provide only in kind and for production purposes, and
2. Only of short and medium-term nature with the maximum payable period being five years[43].

The minimum amount of credit an individual farmer can borrow was laid down to be 50 birr with down payments ranging from 25 percent to 75 percent. In addition two guarantors of reputable character were stipulated necessary as security for the loan, one of whom was required to be the landlord if the borrower was a tenant. A signed lease agreement between the tenant and the landlord was also needed. Such stringent security requirements by CADU had excluded the poorest segement of the target population from the credit programme. Many small farmers were unable to afford the required downpayment. Some landlords were not willing to sign the lease agreement[44].

Initially all classes of farmers were eligible to participate in the credit programme. However, since big landlords benefited more from such a policy it was compelled to restrict participation only to

landowners cultivating less than 20 hectares and tenants cultivating less than 30 hectares.

The AID Bank made credit available to CADU in the form of inputs at an interest rate of 10 percent per annum. CADU, on the other hand, disbursed the credits at an interest rate of 12 percent, the extra 2 percent being intended to cover the risk and supervision costs.

A breakdown of the total amount of credit distributed by the project shows that both the volume of credit and the number of participants have increased substantially. The total amount of loan distributed had increased from 15,700 Birr in 1968 to 1,437,517 Birr in 1971. The number of participants had also increased significantly. This marked increase after 1970 is believed to be the result of the revised policy of the project that favoured small farmers.

Table 10
Credit Disbursement by CADU (1968-1973)

Year	Number of Borrowers	Amount (Birr)	Average Loan (Birr)
1968	189	15,700	83
1969	868	158,461	180
1970	4769	502,875	106
1971	14164	1,437,517	102
1972	12624	1,108,632	88
1973	13302	961,938	72

Source: Tesfaye Tecle, an economic evaluation of agricultural programmes in Ethiopia, 1974, P. 89

The participation rates and the loan size declined after 1971 probably because of the fall in the price of wheat in 1972 which may have contributed to their decision of not using farm inputs[45]. Another probable reason could be the fact that large number of farmers had begun buying the farm inputs in cash[46].

An analysis of the loans advanced to different income classes (land size is used as a proxy for income) shows that farmers with higher holdings accounted for larger amount of credit (see table 11). Tenants constituted only 8.5 percent of all credit users in 1968 and 15.4 percent in 1969 in the CADU project area. But the number of tenants and small landowners increased as of 1970 in response to the restriction made on credit takers.

Table 11

Breakdown of CADU Credit Among Different Groups of Farmers

Year	Total number of Borrowers	Percent tenants	Percent owner cultivators
1968	189	8.5	91.5
1969	868	15.4	84.6
1970	4769	27.6	72.4
1971	14164	38.7	61.3
1972	12624	30.4	69.6
1973	13302	21.9	78.1

Source: 1. Henock Kifle, An Analysis of CADU Credit Programme 1971/72 - 1972/73.

An appraisal of the operation of CADU credit programme reveals that the package programme had not been successful in narrowing income disparities although it had helped to bring about economic growth. The aristocratic land tenure system helped large owners to benefit more than small holders from the credit programme. Moreover, many tenants were displaced from their holdings by landlords who realized the benefits generated by the credit programme and mechanized their farms. This income disparity had accentuated even after the revised policy was adopted by the project.

2.1.4.2 WADU and its Credit Programme

The Walamo (now Walayita) awraja was also high in the priority list of areas selected for package programmes as envisaged in the third plan. The area was one of the most densely populated regions in the country. The awraja was primarily selected because inhabitants (the walayitas) were socially cohesive and traditionally familiar with group activities and organizations[47]. The region was considered to be an area where rural research and development programme could have a maximum impact. Therefore, the Walamo agricultural Development unit (WADU) was established in November 1969 with a world Bank credit assistance to accomplish some major tasks which included:

1. To raise the incomes of small highland farmers and settlers
2. To help in bringing about a shift from subsistence to monetized agriculture in the district.
3. To increase the government's tax revenues, and
4. To demonstrate the impact of the development effort and provide data for the formulation of other development projects in Ethiopia[48].

The above objectives were to be achieved through an intensive and integrated approach which included the provision of advices, road construction, land clearing and soil conservation, extension services, livestock innoculation campaign, construction of marketing and coffee processing centers and an agricultural credit programme for improved seeds, fertilizers and improved farm implements.

Like CADU, this project also used to get funds for the credit programme from the AID Bank at an interest rate of 10 percent per annum, and used to lend it to farmers in the form of farm inputs at an interest

rate of 12 percent. But WADU provided cash loans for consumption purposes in addition to the production credit. This was done deliberately to help the farmers stop borrowing from local money landers for holiday celebrations.

Unlike the case of CADU, all classes of farmers owner-cultivators as well as tenants, small scale as wall as large scale farmers were eligible for credit from WADU as long as they were fulltime farmers within the project area.

With regard to security requirements, WADU has more liberal security requirement than CADU because all it required was that each borrower presents two guarantors that were acceptable to the screening committee. There were, however, indications that poor tenants sometimes found it difficult to find guarantors who were acceptable by the committee.

The credit activities of WADU had expanded both in terms of the number of participants as well as in terms of the total value of credit advanced. Moreover, as table 12 illustrates the average loan size has been constantly increasing over the years. This was mainly due to the introduction of cash advances (or consumption loans) since 1971.

Table 12

Credit Extended by WADU (1970/71 - 1972/73)

Year	Number of Farmers	Amount (Birr)	Average loan (Birr)
1970/71	3,923	80,169	20
1971/72	4,791	159,339	33
1972/73	7.040	303,960	41
1973/74	10,000	na	-

Source: Tesfaye Tecle, (1975), op. cit, P.31

Although the above table shows that the participation rate of farmers expanded significantly, the number of participating tenant farmers was not up to the expected level. Like the case of CADU credit programme, bigger cultivators took larger quantities of inputs distributed by WADU on credit. The proportion of tenants who took credit from WADU was 11.2 percent in 1970/71 and 12.1 percent of all credit takers in 1971/72 (see table 13) even though about 40 percent of the farmers in the area were pure tenants[49].

Table 13

Breakdown of Loan Between Different Classes of Borrowers in WADU

Year	Total Number of sales	Percent Tenants	Percent owner Cultivators
1970/71	3,923	11.24	88.76
1971/72	4,791	12.14	87.86
1972/73	7,040	na	na
1973/74	10,000	na	na

Source: Tesfaye Tecle 1975, op.cit., p.31

Inspite of WADU's Liberal Credit eligibility and collareteral requirements tenants did not find it worth taking the risk of purchasing yield increasing inputs on credit under the prevailing share cropping arrangements.

2.1.4.3 The Credit Programme of Minimum Package Projects

Even though "comprehensive" packages such as CADU and WADU were essential components of the development process they were found to be too costly both in terms of manpower and financial resources to be expanded on a large scale. The plan to reach 90 percent of the farming population within fifteen to twenty years through large scale expansion of intensive package projects became doubtful as early as 1970. For this reason the strategy of "minimum package" which was based on the concept

of concentrating efforts only on few proven innovations (such as fertilizers and improved seeds) was developed to reach a large number of farmers by employing methods and innovations developed and tested in the Comprehensive Packages. Thus the first phase of the Minimum Package Project (MPP-I) was launched in 1971 with technical assistance from SIDA. The second phase was planned for 1975-80 but due to the land reform and other problems it was delayed until 1980. The official terminal date of the project was in May 1985.

In order to administer the MPP and to Co-ordinate and supervise the Comprehensive Package Projects, the Extension and Project Implementation Department (EPID) was established in 1971 as an autonomous department within the Ministry of Agriculture. With the establishment of EPID, all previous extension programmes of the Ministry terminated. MP areas were selected from all parts of the country on the basis of availability of tested innovations adapted to the area, importance of small scale farming in the area, past experience with respect to farmers' response to innovations and their attitude towards change. Usually model MPP areas were located along the main road encompassing an area of 3-5 kms on either side of the road. The launching of MPP had made it possible to demonstrate to the farmers improved agricultural practices and necessary farm inputs on credit basis.

Lending policies and procedures of MPP were generally similar to that of the comprehensive projects. EPID was appointed as one of the agents of AID Bank in granting credit. An estimate of the inputs required for a given season by the MPP was provided by EPID to the AID Bank, which was responsible for procuring inputs. The distribution of credit, the making of follow-ups and the collection of repayments were the responsibilities of EPID.

The MPP adopted CADU's modified credit policy by limiting participation to farmers who were cultivating 20 hectares or less. All loans were given in kind. Short-term loans in the form of seeds, fertilizer, herbicides and insecticides were offered. Credit in the first year was limited to a maximum of 200 Birr but was possible to increase it to 400 Birr in the second and subsequent years. No minimum credit limit was stipulated. Even then loans were provided only to those farmers who had settled all their previous loans with EPID. In addition, if 90 percent of the borrowers in a given extension area had not repaid their loans in full with in two months after the due date, no further credit programmes was to be undertaken[50].

The collateral requirements of the MPP were also similar to the security requirements adopted by CADU with slight differences. The MPP required a signed Lease Agreement between tenants and landlords and two guarantors one of whom was to be the landlord if the borrower was a tenant. The project required a 25 percent down payment for all loans while CADU required downpayment ranging from 25 percent to 75 percent.

It was stated earlier that the provision of agricultural credit to the farmers was an integral component of the MPP in order to enable farmers to buy new innovations on credit basis. In response to this objective there were 9 MPP areas in seven administrative regions which distributed 6722.5 quintals of DAP and 1035 quintals of urea to 4691 participants. As time went on, the credit programme expanded and it covered all but Arssi administrative region by 1973.

Table 14

Distribution of EPID Loans to MPP Areas

Year	Amount of Fertilizer (Qt.)	Amount of Seed (Qt.)	Credit Participants		
			Number of Sales	Percent Tenant	Percent Owner cultivator
1971	9460.3	222	4691	11.2	88.8
1972	20174.0	200	12706	12.1	87.9
1973	35160.0	860	25424	15.4	84.6
1974	78475.0	2000	55000	na	na

Source: EPID, EPID Phase II-Proposals for the Expansion of EPID During 1975/76 - 1979/80, August 1974

Inspite of the marked increase in the number of participants of the credit programme of the MPP, the number of participating tenants was again unsatisfactory. Tenants constitute at least 50 percent of the farming population of all MPP areas[51]. But not more than 15 percent of all beneficiaries of the credit programme were tenants (see table 14). Besides, the percent of pure tenants was very unsatisfactory. For example, for 1973 alone, 4.9 percent were pure tenants with the remaining 10.5 percent being farmers who both own and rent land[52].

The main reasons for such a low tenant participation were basically two. The first was the disincentive that the feudalistic land tenure system created on the tenant's decision to adopt new inputs that involve risks associated with credit. The second reason was the unwillingness on the part of the landlords to participate in the cost of credit but took over half of the output. On top of this some landlords were not willing to sign a lease agreement to their tenants to participate in the credit programme.

In addition to the land-tenure system, there were other weaknesses also. The marketing structure for agricultural commodities did not favour small farmers. The price offered for agricultural products was low. As a

result farmers were less inclined to use improved inputs. For instance, the producer's price for grain was so low in 1972 that farmers were unable to repay their debts. It is, however, astonishing to see that the price of fertilizer was rising constantly at the same time. The operation of the MPP was also discriminatory. Trade centers through which credit was distributed were established along the main road. Credit services were extended only 3-5 kms. On either side of the road. Hence farmers who dwell away from the major road were not able to benefit from the credit services provided by the programme.

2.2. Agricultural Development Strategies and Agricultural Credit Use After the Land Reform.

2.2.1 Agricultural Development Strategies and Institutional Reforms:

Before 1974, the majority of Ethiopians in rural areas had poor access to the major productive resource, land, and a very tenuous security of its use. Tenants, which in Ethiopia amounted to at least 50 percent of the farming population, could not feel secured since their welfare was dependent safely on the judgement and good will of landlords. The inequitable distribution of land wealth acted as a bottleneck to economic growth and development by depriving the poor of sufficient incentive to work for higher productivity. Therefore, it was necessary to dismanatle the land holding system in order to accelerate rural development and increase the incomes of the rural masses. This was the first task of the new government which came into power following the 1974 Revolution.

The proclamation to provide for the public ownership of rural land was issued on March 4,1975. The basic aim of the reform was to change the agrarian relations so that the peasant masses could be liberated from age old feudal opression and injustice. The proclamation has stressed the need for institutional changes which are fundamentals for

the realization of the aims of the land reform. Consequent to the land reform several institutions have been established in rural Ethiopia.

The rural population of Ethiopia was organized into peasant associations. These associations are the basic units through which the government and other institutions mobilize the rural people to achieve given objectives. They have become strong links between the state and the peasantry in political, social and economic matters. In particular they have played an active role in the distribution of land among the rural population. By the end of 1983 there were about 19,771 peasant associations with an estimated total membership of over 5.3 million peasants[53].

Along with the development of peasant associations the formation and expansion of service Co-operatives was intensified in rural Ethiopia. The main functions of the service Co-operatives include the marketing of produces, providing storages and supplying inputs and consumer goods. According to the proclamation of December 1975, service co-operatives were to be formed each with not less than three and not more than ten peasant associations[54]. An estimate of the Ministry of Agriculture showed that about 3,913 service co-operatives representing over 4.6 million peasants have been formed by the end of 1984[55]. Most of the service co-operatives have given priority to the establishment of co-operatives shops, and have not yet been in a position to fulfill their other economic functions adequately.

In addition to peasant association and service co-operatives, producers' co-operatives have been promoted to socialize the rural economy. The main objective of establishing the producers co-operatives was to organize the rural people into effective production units operatd and managed by themselves. To effectively discharge their duty they have been accorded priority in the distribution of inputs and credit.

Despite considerable assistance, the promotion of producers' co-operatives has been slow. There were only 1,489 producers co-operatives with a total membership of 94,368 peasants by the end of 1984[56]. The membership of producers co-operatives constitute about 0.3 percent of the rural population. In the sphere of production the contribution of producers' co-operatives is meager, less than 2 percent. Agricultural output is still dominated by the private peasant sector which accounts for over 90 percent of the cultivated land and crop production (see table 15).

Table 15

Total Area Cultivated and Total Production (1978/75-1984/85)

Year	Area ('000 Hectares)				Production ('000 Quantals)			
	State farms	Coops & settlement	Private peasants	Percent to priv. peasants	State farms	Coops & settlement	Private peasants	Percent to priv. peasants
1978/79	158.6	na	5927.3	97.4	1600.5	na	47482.9	96.7
1979/80	148.9	na	6187.3	97.7	2370.1	na	74726.4	96.9
1980/81	234.3	51.2	6004.9	95.4	3555.2	389.3	65254.6	94.3
1981/82	247.7	72.4	5918.9	94.9	3788.1	783.1	62094.0	93.9
1982/83	258.1	83.4	6044.1	94.7	3425.1	1125.9	63531.8	93.3
1983/84	178.1	118.2	6137.0	95.4	2789.2	1088.2	61535.9	94.1
1984/85	199.9	122.3	5781.5	94.7	3615.1	859.6	45102.2	90.9

Source: ONCCP, 5th and 6th Development Campaign Programmes and ten Years Indicative Plan (Amharic)

Following the land reform of 1975, private commercial farms established before the revolution were transformed into state farms. The most important objectives of the state farms are to promote import substitution, to produce export commodities and industrial raw materials and to bring additional land under cultivation[57]. Inspite of these objectives,

state farms have been producing cereals and other domestic food staples. On the average state farms comprise less than five percent of the total cultivated land and produce not more than five percent of the total agricultural production.

State farms have been most of the time handicapped by financial and economic problems. Although they are mechanized and consume about 80 percent of the fertilizer supply and over 70 percent of the improved seeds distributed, their yield are reported to be no higher than the peasant sector[58]. They have been mostly engaged in horizontal expansion. More recently, however, they have attempted to improve existing farms rather than increasing the size of their farms because of inefficiencies resulted from such expansions.

The Ministry of Agriculture was also reorganized in line with the new development path. New departments were established to take over the functions of EPID. Agricultural Development Department, Animal Resource Development Department, peasant associations and co-operative Development Department, soil and Water Conservation Department, Fisheries Development Department, Training and Engineering Service Department were established. To reduce work load, and administrative difficulties the extension services of the Ministry were more concentrated at the Woreda level. Hence phase II of the MPP covered over 440 Woredas through the provision of inputs and technical advice to raise agricultural production. In any case, the service rendered to the peasant sector have not been adequate relative to the demand. The Ministry of Agriculture, therefore,developed and launched a new programme called the Peasant Agricultural Development programme (PADEP) in an effort to improve the performance of earlier programmes.

This programme focuses on improving extension services and re-directing agricultural research towards peasant sector requirements. Hence, farming systems research has become an integral component of the programme. The programme is designed to be operational in 8 zones designed as PADEP zones. From the 8 zones 250 high potential Woredas have been selected as reas of emphasis. This approach is believed to be more productive than the approach followed by the MPP, where limited resources have been thinly spread over 440 Woredas.

2.2.2 Agricultural Credit Use After the Revolution

Agricultural credit in pre-Revolution Ethiopia was not as productive as it ought to have been primarily because of the existing feudal land-tenure system. As a result of the Rural Land Proclamation of March 1975 a revision of the old agricultural credit policy was necessary and subsequent institutional re-arrangements were made. A new agricultural credit policy was drafted and implemented in 1976. The following sections will try to examine the fundamental objectives of the AID Bank and the basic features of the revised credit policy together with the achievements of the Bank.

2.2.2.1 The Aims of AID Bank in Post-Revolution Ethiopia.

The Board of directors of AID Bank adopted a revised policy statement on August 30,1976 in accordance with the declaration of the "Ethiopian Socialism" and in line with the declaration of Economic policy of socialist Ethiopia[59]. Unlike the previous policies of AID Bank which emphasized the development of private enterprises, the credit facilities of the Bank after the land reform are to be used to encourage the creation and expansion of the socialized sector. This is in accordance with the credit directives of the National Bank of Ethiopia which states that ".... financial institutions will use their credit facility as a factor of strengthening and expanding the socialized sector.... Therefore, under

this criterion banks will accord preferential treatment to the socialized sector i.e. state farms and Co-operatives"[60]. The AID Bank which is entrusted with the duty of extending credit to the agricultural, industrial and service giving sectors of the economy has the following specific duties:

1. To extend medium and long-term loans for economically feasible projects thereby ensuring a balanced regional distribution of projects;

2. To extend short-term agricultural production credits.

3. To participate in the mobilization of financial resources from domestic as well as foreign sources by designing appropriate financial instruments; and

4. To co-operate with other development agencies ir project identification by taking a part in or by providing support to promote an efficient use of financial resources in accordance with the national objectives[61]. In order to effectively discharge these and other responsibilities and promote the nation's agricultural development, the Bank had adopted new lending policies which emphasized the development of state and co-operative farms.

2.2.2.2 Basic Features of the Revised Credit Policy

The Revised credit policy of the AID Bank emphasized more on financially, economically and socially viable projects in the extension of credit. Accordingly it is stated in the credit policy that investment credit should be extended only to those projects that have received a thorough appraisal. The appraisal of a project's economic and social viability is assessed on the basis of its contribution to accelerated economic growth and employment, the extent to which it contributes to foreign exchange earnings and savings, its impact on regional development, its potential for encouraging structural change and its impact on the environment[62].

The new credit policy has relaxed collateral requirements required by the Bank. In fact, the Bank has given prime importance to the viability of a project rather than to security requirements. In this regard, the revised policy of the Bank stated "the Bank ... will rely primarily upon the financial strength of the project itself, the potential productivity of the project, and upon the management capability and reliability of the borrower...."[63]. Loan applications will not be prevented from being considered if other requirements for the project's viability and social contribution are satisfied. Furthermore, the revised policy indicates that government guarantee, fixed assets, chattel mortgage, work in progress, crop in progress and farm animals could be accepted as collateral[64]. The Bank requires the keeping of adequate records and encourages the use of cost accounting procedures. It is also authorized to make periodic inspection and audits.

The project evaluation criteria and the requirements are usually applicable only to private farmers and industrial establishments. Consequently, small farmers which are required to put up a fixed asset in the form of buildings and machinery as collateral are being discouraged from using credit. The Bank's emphasis on high standards of management capabilities has also prohibited peasants from using its credit facilities.

On the other hand the Bank does not require collateral from co-operatives and state farms for loans. The only requirement for co-operatives to receive bank loans is to be registered under the co-operative law and provide a certificate of registration from the Ministry of Agriculture. It does not mean, however, that viability of the co-operatives is not considered. The Bank examines and evaluates the managerial capability, record keeping, market prospect for the produce and other factors before extending a line of credit. Credit request of state farms is a government decision and are granted loans without any collateral.

The AID Bank's activities were limited to the big cities and their surroundings before the Revolution. Attempts were made to expand the scope of its activities after the Revolution. It has opened 9 branch and 11 sub-branch offices in nine administrative regions. The principal criteria used for establishing branch offices is the general economic development prospects of a region. To this effect branch offices are concentrated in cash-crop producing regions and in regions where state farms exist. Some regions do not have, therefore, access to the Bank's services. Although that emphasis should be given to those areas with higher development potential, other regions should also receive their due share of the Bank's services. There is no reason why the Bank cannot have branch offices in regions like Gamogofa and Bale.

2.2.2.3 Loan Operations of AID Bank After the Revised Policy of 1976

It has been stated earlier that the expansion of production to meet the basic needs of life is an important objective of development institutions. Financial institutions such as AID Bank could play a vital role in achieving development objectives by participating in credit granting to fulfill the needs of productive enterprises. Because agriculture is the back-bone of the Ethiopian economy most of the AID Bank's loan activities are directed towards this sector.

A breakdown of agricultural loans approved to the socialized sector for the last few years reveals that state farms have absorbed most of the agricultural credit disbursed by the Bank. The credit share of co-operatives is insignificant as compared to the share of state farms as the following table discerns.

Table 16

Loans Approved to the Socialized Sector and the Share of Agricultural co-operatives and state farms (000' Birr)

Year	Amt. approved to the socialized sector	Amt.approved to co-operatives	Percent to co-operatives	Amount to state farms	Percent to state farms
1976/77	93,100.6	2,136.9	2.3	90,963.7	97.7
1977/78	164,134,7	11,823.3	7.2	152,309.7	92.8
1978/79	111,537.9	11,948.6	10.7	99,589.3	89.3
1979/80	279,298.9	23,405.4	8.4	255,893.5	91.6
1980/81	481,072.8	19,157.8	4.0	461.915.0	96.0
1981/82	320,038.9	23,600.2	7.4	296,438.6	92.6
1982/83	433,106.0	57,383.4	13.2	375,722.5	86.8
1983/84	199,267.9	28,367.9	14.2	170,900.0	85.8

Source: AID Bank, loan position of State farms, unpublished.

Although the volume of total credit advanced by the Bank showed a drastic change particularly in the late seventys, the magnitude of assistance rendered to cooperatives has not been significant as shown by the above table. The volume of credit has been simply increasing because of the increased borrowings by the state farms. The main reason for the inadequate participation of cooperatives in the credit programmes of the Bank is the small number of cooperatives eligible for bank loans. Inspite of the bank's stated policy which declared that preferrential treatment would be given to cooperatives to help in their rapid expansion, it required them to be duly registered with the Ministry of Agriculture in order to receive its assistance. The number of registered cooperatives up to 1984 was only 141[65]. Consequently, the expansion of cooperatives is greatly retarded for lack of supporting services such as credit.

State farms together with cooperatives are given preferrential treatment in obtaining financial assistance from the AID Bank . In accordance with this policy the state farms have appropriated over 80 percent of the total agricultural loans (see table 16). However, the contribution of state farms to the total agricultural production has always been less than 10 percent. This condition therefore, needs to be changed if agricultural credit is to be used to improve agricultural productivity.

State farms are not required to put up collateral in order to obtain loans from the bank. The bank only makes appraisals of the projects for which credit is requested. The making of project appraisal is, however, only a matter of formality. The AID Bank as a financial intermediary of the state, cannot reject the loan application of state farms since the implementation of a project is most often a political decision. Even if a project turns out to be not viable as evaluated by the bank's project evaluation criteria, the assistance should be provided. The Bank can only scale down some loans by reducing some of the proposed costs.

An analysis of the type of credit advanced to cooperatives would also show that most of the loan advances are short-term credits that help in crop production and that are payable in one year. These include the provision of seeds, fertilizers, pesticides, fuel, lubricants, etc., in credit. The rationale behind concentrating on short-term credits to cooperatives is the belief that the cooperatives are still premature in their organizational capacities and in their managerial capabilities. In addition, it is believed that the members have better exposure and are well acquianted with production credits that could remunerate them within a short period of time.

Table 17

Loans Approved for Cooperatives by Type of Credit ('000 Birr)[a]

Year	Short-term	Medium and Long'term	Total Credit	Percent of short-term to Total Credit
1975	7,166.0	-	7,166.0	100.0
1976	3,242.7	-	3,242.7	100.0
1977	8,262.1	5,077.9	13,340.0	61.9
1978	10,844.1	3,194.1	14,038.2	77.3
1980[b]	53,561.1	2,467.5	56,029.0	95.6
1981	50,775.5	5,641.7	56,417.2	90.0
1982	56,585.9	2,726.5	59,312.4	95.4

Source: AID Bank, Annual Reports.

[a]Includes EPID fertilizer loans

[b]For 18 months (i.e. July 1,1979 to December 31,1980).

The provision of short-term credit would only help to alleviate the immediate short-term problems. A large proportion of short-term loans to long-term investment loans means that a significant portion of credits granted is not used for long-term productive investment but for short-term operating expenses. Medium and Long-term credits facilittate basic structural change of the process of agricultural production. However, the magnitude of assistance to cooperatives in terms of medium and long-term credit is inadequate.

The credit facilities extended to state farms by the Bank is also mostly to finance short-term working expenses. As table 18 demonstrates, most of the loans approved to state farms are used to finance short-term expenses. Like the case of cooperatives, the proportion of long-term investment capital is low.

Table 18

Loans Approved to State Farms by Type of Credit

('000 Birr)

Year	Short-term Working Capital	Long-term Investment Capital	Percent of Working Capital
1976/77	69,911.9	21,051.8	76.86
1977/78	118,824.3	33,485.4	78.02
1978/79	78,741.2	20,848.1	79.07
1979/80	111,046.8	144,864.7	43.40
1980/81	261,322.5	200,592.5	56.57
1981/82	266,784.7	29,643.9	89.99
1982/83	265,065.1	110,657.4	70.55
1983/84	162,135.2	8,764.8	94.87

Source: AID Bank, "Loan position of State farms" Unpublished.

Even though the National Bank has declared that priority should be given to the public sector in the provision of credits, consideration has also been given to the credit needs of private establishments. The new credit policy guidelines issued by the National Bank in May 1976 stated that;The new credit policy will accelerate further the process of transformation (of cooperatives) in particular and the degree of socialization in general without denying the required credit facility to private individual enterprises engaged in socially desirable activities[66]. The AID Bank has refrained from establishing a lender - borrower relationship directly with peasant associations. However, the bank had continued to extend credit for productive purposes to MPP areas through the Ministry of Agriculture as well as to other development organizations. The Bank has adopted such a measure because the formation of cooperatives is delayed.

The supply of institutional credit in the form of inputs to subsistence farmers dates back to June 1968, when FAO-FFHC (Food and Agricultural organizations, - food for hunger Campaign) and the Ethiopian Government raised a revolving fund for the purpose of distributing fertilizer to small farmers[67]. The programme was divided into two phases. Phase one which was started in 1967, was related to the use of fertilizers on 450 selected farms in Shashemene, Nazreth and Debre Zeit areas. The second phase which started in 1968 dealt with the selection of farmers who saw the results of the fertilizer demonstration and expressed the desire to use fertilizer for their crops. Since then small farmer fertilizer loans were granted to farmers not only to farmers in the three areas but also to other areas. FAO advanced the fund, equivalent to 4500 US dollars to the Ministry of Agriculture for this purpose[68]. However, this programme was terminated when EPID was established.

After the establishment of EPID, agricultural credit in the form of inputs has been distributed to bodies other than the cooperatives within the area covered by the MPP through this department. Production inputs have been imported and channeled to the Ministry of Agriculture by the AID Bank from 1971-1973. Later on the Agricultural Inputs and Marketing Service (AIMS) was established as a subsidiary company of the AID Bank. It was responsible for Importing and distributing the Inputs from 1974-1976. Between 1977-1983, The Agricultural Marketing Corporation (AMC) was responsible for the input procurement and distribution task. More recently the Agricultural Input supply corporation (AISCO) was established and given a legal entity in September 1984 to undertake the function of input procurement and distribution activities[69]. This corporation is administered by the Ministry of Agriculture.

The main objective of this new corporations is the supply of agricultural inputs to the peasantry in order to increase the quantity

and quality of agricultural products. This corporation assumes the responsibility of extending modern technology to the farming population more effectively and efficiently. At present the activities of AISCO are only extended up to the delivery of inputs to the Ministry of Agriculture centers only. However, it is envisaged that it will be in a better position to effectively discharge its duties when it is staffed with adequate personnel and when its structure goes up to the peasant association level. The AID Bank has an agreement with AISCO on importing, distribution and collection of fertilizer credit.

Inspite of these institutional reforms the demand for credit by the subsistence farmers has remained unsatisfied. The contribution of private peasants to the total agricultural output is vast as demonstrated by table 15. However, the proportion of agricultural credit alloted to them is very small. The following table shows the magnitude of assistance extended to the private peasants over the last few years.

Table 19

Loans Approved to Socialized Sector and to Privated Peasants

('000 Birr)

Year	Amount to Socialized Sector	Amount to Private Peasants	Percent to Private Peasants
1978/79	111,537.9	18,026.9	16.16
1979/80	279,298.9	29,025.2	10.39
1980/81	481,072.8	33,808.9	7.03
1981/82	320,038.9	32,610.4	10.19
1982/83	433,106.0	27,633.0	6.38
1983/84	199,267.9	34,308.9	17.22

Source: Ministry of Agriculture, Unpublished data.

Overall the agricultural credit policy adopted after the land reform proclamation has been primarily used as an instrument to encourage and strengthen the socialized sector. Accordingly the AID Bank has given preferential treatment to co-operatives and state farms. Special assistances and monetary incentives have been mainly directed to such establishments. Nevertheless, the number of eligible co-operatives for bank loan is unsatisfactory and hence the major beneficieries of AID Bank's credit are state farms. On the other hand, efforts were made and are still being made to extend credit assistance to the peasantry. But the magnitude of such assistance is very negligible and insufficient when compared with the contribution that the private peasants are making towards the national agricultural production. Thus the distribution of agricultural credit is not based on economic rationality but entirely on government preference even after the land reform.

NOTES

1. See, Henock Kifle, An Analysis of CADU Credit Programme 1968/69- and its Impact on Income Distribution, (CADU: Assela, 1971) and Mamo Bahta and Harry J. Robinson, Loc. cit.
2. Negarit Gazeta, 2nd year, number 5, 1943, p.29.
3. "Ethiopia's First Five-year Development Plan", Ethiopia observer, Vol. 3, number 4, 1959, pp 106-135.
4. Negarit Gazeta 4th year, number 8, 1945, p. 46.
5. Sylvia Pankhurst, "The Development Bank of Ethiopia", Ethiopia observer, Vol. 3(2), 1959, p.40.
6. Mamo Bahta and Robinson, Op.cit., p. 87.
7. Ibid.
8. Imperial Ethiopian Government, The First Five-Year Development Plan (1957-1961), (Addis Ababa), p. 63.
9. See Ministry of Agriculture, Second Five-Year Plan (1962-1967) (Addis Ababa, 1962), p. 20.
10. Imperial Ethiopian Government, OP. cit., p. 22.
11. Ministry of Agriculture, OP.cit., p. 22.
12. See Imperial Ethiopian Government, Second Five-Year Plan (1963-1967) (Addis Ababa, October 1962), p. 34.
13. Ibid., p. 115.
14. Ibid.
15. Ibid. p. 124.
16. Ibid., p. 122.
17. Mamo Bahta and Robinson, op.cit., p. 40.

18. Imperial Ethiopian Government, Third Five-year Development Plan (1968-1973), (Addis Ababa, June 1968), pp. 190-193.

19. Negarit Gazeta, 11th year, number 7, 1951, p. 23.

20. "Source of Development Financing,"Ethiopia observer, vol. 10(4), 1966, p. 302.

21. Development Bank of Ethiopia, Annual Report, (Addis Ababa, 1961), p.6.

22. Sylvia Pankhurst, OP.cit., p. 41.

23. Mamo Bahta and Harry Robinson, OP.cit., p. 88.

24. Ibid., p. 188.

25. Admassu Bezabeh, "Ethiopian Investment Corporation and its Activities", Ethiopian Trade Journal, vol. 6(1), 1968, p. 14.

26. "The Ethiopian Investment Corporation," Ethiopia observer, vol. 10 (4) 1966, p. 303.

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29. Negarit Gazeta, 29th year, number 30, 1970, p. 176.

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36. See, for example, World Bank, Bank Policy on Agricultural Credit, (Washington, D.C. 1974), annex table.

37. World Bank, Economic Memorandum on Ethiopia, Washington D.C., December 1981), p. 66.

38. Agricultural and Industrial Development Bank, Annual Report, (Addis Ababa, 1974), p. 44.

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41. Tesfaye Tecle, OP. cit., pp. 3-4.

42. Henock Kifle, OP. cit, p. 3.

43. Ibid.

44. Tesfaye Tecle, "An Economic Evaluation of Package Programmes in Ethiopia". unpublished Ph.D. dissertation, cornell University, 1974, p. 87.

45. For example, CADU was to pay an average price of only 19 Birr per quintal in 1972 as compared to 23.20 Birr in 1971.

46. During the 1972 crop year, 1500 farmers have bought inputs valued at 164,000 Birr in cash. See CADU, Work Programme and Budget for 1972/73 (Assela, October 1971).

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48. Ibid., pp. 12-13.

49. Tesfaye Tecle, The Evolution of Alternative Rural Development Strategies in Ethiopia: Implications for Employment and Income Distribution, (Michigan state University in Co-operation with IDR, Addis Ababa, 1975), p. 30.

50. Tesfaye Tecle, Agricultural Package Projects, (Addis Ababa, 1973), p. 69.

51. Tesfaye Tecle, The Evolution of Alternative Rural Development Strategies in Ethiopia: Implications for Employment and Income Distribution, (Michigan State University in Co-operation with IDR, Addis Ababa,1975), p.51.

52. EPID, EPID Phase II-Proposals for the Expansion of EPID During 1975/76-79/80 and for Support by SIDA, (Addis Ababa, August 1974), p. 70.

53. See ግብርና ሚኒስቴር ከየካቲት አስከ የካቲት አዲስ አበባ 1976 ገጽ 11

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55. Tennassie Nichola, "Agricultural Research and Extension in Ethiopia: The State of the Art" Research report, Addis Ababa University, IDR, March, 1986, p. 4.

56. Ibid., p. 3.

57. FAO, Agrarian Reform and Rural Development in Ethiopia: Report of The Highland Level WCARRD Follow-up Mission to Ethiopia, Report No. 7, 1981, p. 22.

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60. National Bank of Ethiopia, Credit Policy for Banks, (Addis Ababa, 1977), pp. 3-4.

61. AID Bank, "Short note on the AID Bank and Its Financial Requirements for Development Financing," Unpublished material, Addis Ababa, Sept. 1981, pp. 1-2.

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63. Ibid., p. 5.

64. Ibid., p. 6.

65. See ግብርና ሚኒስቴር ከየካቲት አስከ የካቲት አዲስ አበባ 1976

66. National Bank of Ethiopia, Quarterly Bulletin, Vol. 2(4), December 1976, pp 1-2.

67. Mamo Bahta and Harry Robinson, OP. Cit., p. 96.

68. Ibid., p. 97.

69. Negarit Gazeta, Proclamation number 269, September 1984.

CHAPTER 3

Review of the Literature

Many rural development efforts have now centered on the wider adoption of improved technology. Farmers must spend additional sum of money on improved seeds, fertilizers, and farm implements to increase their agricultural productivity. But because of the low level of real income which is a reflection of low productivity, peasant farmers in particular can not undertake such investments without external credit support.[1] Therefore, credit has become one of the essential factors to accelerate the rate of adoption of modern technology Agricultural credit is a mighty weapon for increasing productivity and improving the living conditions of the farmers.

However, credit does not by itself promote productivity increases unless it is accompanied by other complementary services. It is only one of the many factors in the complicated process of agricultural production. As an FAO publication clearly stated " the expansion of agricultural credit without the provision of adequate amount of extension education is a medicine which may be worse than the disease."[2] It should be tied operationally with other services provided to modernize agriculture. There should be agricultural education programme, technical advice and adequate infrastructure including institutional infrastructure. A system for the timely supply of inputs at a reasonable price and an outlet for agricultural products must also exist. On top of these institutions willing to lend to small farmers on terms the farmers consider attractive must exist.[3]

In response to the problem of capital shortage of the rural population numerous credit programmes have been established in developing countries. Yet inspite of such programmes few small farmers have been integrated into these programmes. The FAO study had indicated that in many developing countries less than 10 percent of the institutional credit is available to rural areas, and even more important only a small fraction of this credit is available to small farmers.[4] Uma Lele's study had shown that very little of the available institutional credit has been directed towards the development of small holder subsistence farmers in Africa.[5] A study in Nigeria had also revealed that many small farmers were unable to satisfy their demand for loanable funds from formal institutions.[6] In general although financial resources provide opportunities for productive employment, small farmers have been far more limited in their access to these opportunities than other segments of society.

Thus, many small farmers had no choice but to rely on non-institutional credit sources (friends, relatives, local traders, etc.) to satisfy their credit needs. Heidhues has demonstrated that the proportion of non-institutional credit was estimated to be over 2/3 of the total agricultural credit in Africa.[7] Oluwasanmi and Alao have also found that middle men and merchants were the most important sources for both productive and non-productive rural credit in Nigeria for small farmers.[8] The popularity of non-institutional credit is explained not only by its availability but also by its simple procedures. Inspite of its popularity, the non-institutional credit has not been able to provide the amount of credit needed for a broadly based

innovation process nor has it been generated in sufficent amounts necessary to meet long-term funds for investments. It is mainly used to meet immediate consumption needs.

Several researches have been conducted in developing countries in order to examine small farmers' use of agricultural credit. Reasons are advanced by these studies why small farmers do not use credit. Some of theıreasons offered are (a) farmers have sufficient liquidity to cover their planned expenditures, (b) they do not consider the expected returns high enough to warrant borrowing and (c) they are discouraged from borrowing because of high transaction costs involved.[9] Therefore, in order to increase small farmers' use of credit some studies have attempted to primarily foucs on determining the factors that would increase the demand for funds among small farmers.

Miller and Ladman have developed a model that incorporates both the productivity and transaction cost factors and explains the quantity of credit demanded by a farm household, where the household uses funds to satisfy both production and consumption requirements.[10] The farm household's demand for credit is the excess demand of the farm household's demand for funds over the supply of internal funds that are available in the household. The excess demand together with the costs of borrowing determine the quantity of credit demanded.

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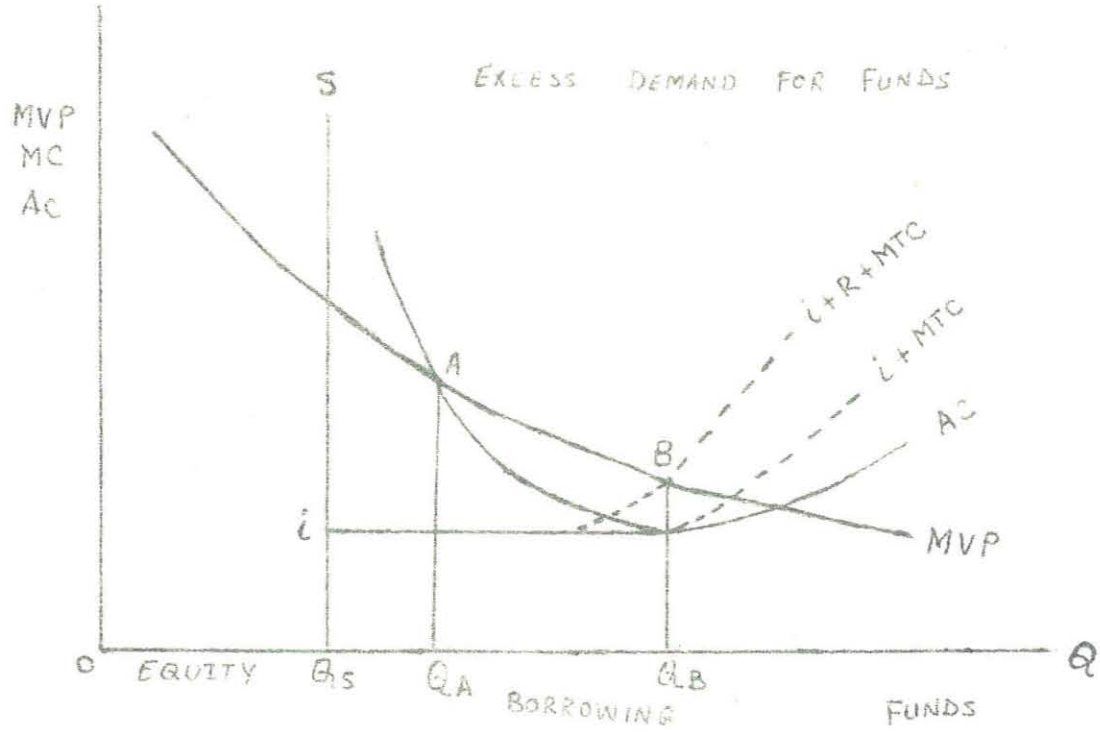
FIGURE 1



The model has three components, the farmer's demand schedule, the supply schedule and the costs of credit curves. The marginal value product (MVP) schedule is the farm household's demand for funds and reflects diminishing marginal utility for funds (see figure 1). The demand for funds is the portion of the schedule to the right of the supply schedule (S). The costs of credit are represented by the average cost curve (AC) which is composed of fixed transaction costs such as filling out application and other forms, obtaining the necessary information, paying required fees, trips to lender's office, etc., and the marginal cost schedule (MC) which is composed of interest rate, marginal transaction costs and marginal risk costs.

A farmer will not want to borrow if the expected average costs are greater than the expected average returns. Q_A is the borrowing threshold and the farmer will be willing to borrow up to Q_B where the MC equals MVP.

The supply schedule is determined by the asset level of the farm household and $0Q_s$ funds would be supplied from the farmer's internal funds while Q_sQ_b would be borrowed from external sources. Because the fixed transaction costs are high initially the AC is also relatively high, but decline as more funds are borrowed.

The demand schedule for funds, the supply of internal funds and the borrowing and the costs associated with the use of external funds are each affected by a set of social, economic and political factors. Characteristics associated with a higher demand schedule for funds, a lower equity funds supply and lower borrowing costs each contribute toward raising the quantity of credit demanded by a farm household studies have attempted to determine the various socio-economic characteristics associated with the excess demand for funds model.

The scale of operations of the farm as determined by the amount of land owned by the farm household (farm size) is one of the important factors that determine the position of the demand schedule that has received attention in the literature. The factor is believed to have an important bearing on the farmer's decision to use or not to use external funds. Heffernan and Pollard showed that farmers with more land and income are agricultural credit users than other farmers in Jamaica.[11] A similar study in Bolivia also indicated that those farmers who exceeded the borrowing threshold were those with relatively higher operational area.[12] Farm size was also observed to be a significant determinant of credit demand in Nigeria.[13]

Another important variable that will have impact on the productivity and resources acquired with credit is the level of education attained by the farmer. The demand schedule could be affected by the level of education, which will have an impact on the farmer's ability to understand and execute sophisticated changes and practices. It is from this perspective that Baum emphasized that education and capital should be considered as technical complements in agricultural production.[14] Several empirical studies have shown that farmers who used agricultural credit are normally those with higher levels of education as compared to those who did not use external funds.[15] In contrast to this assertion borrowers were observed to have lower levels of education than non-borrowers in Jamaica.[16] This finding which was inconsistent with what was anticipated was explained by the unavailability of improved technology in the country.

The number of years a farmer has operated a farm may be indicative of his managerial ability and the willingness to utilize economic opportunities credit may provide and raise the demand for funds. According to Heffernan and Pollard's study the likelihood of a farmer being a borrower increases as the number of years he has managed a farm increases.[17] The Nigerian case, however, showed that farming experience was negatively related with the demand for credit.[18] This was explained by the availability of accumulated wealth which helped farmers to become economically more independent.

The use of improved technology is another variable highly related with agricultural credit use. A higher level of the use of improved technology is expected to raise the demand schedule. Moreover,

agricultural credit is mostly provided to farmers in terms of inputs and hence, higher level of the use of improved technology implies more use of credit. Sarma and Prasad obtained a positive and significant relationship between the demand for credit and the use of improved technology.[19] In Bolivia borrowers were differentiated from other groups by their greater use of improved technology.[20] Pandey et al have also attempted to quantify the increase in credit demand due to the adoption of new farm practices.[21] They arrived at the conclusion that there was a significant increase in demand for credit as a result of the adoption of new technology. Parkash Mehta's study has also indicated that the non-availability of capital appeared to be the most important constraint affecting the decision process of adopters in the Punjab.[22] All these studies reveal that the use of improved technology is associated with the use of credit.

Farmers who had undertaken some kind of investment activity are more likely to be users of credit. On farm investment expenses could serve as proxies of the level of sophistication and the degree of committment to farming. A higher level of investment expenses is anticipated to raise the demand schedule. Farmers who exceeded the borrowing threshold and used credit were found to have higher investment expenses than non-borrowers in Bolivia.[23] The above proposition was also empirically supported by the study conducted in Jamaica.[24]

The supply of internal funds is expected to be affected primarily by the farmer's liquidity position as determined by the cash flows and asset level available in the household. Greater liquidity allows for a larger supply of equity funds. The supply of internal funds is expected to

increase with the farmer's age since assets are accumulated over time. Hence it is anticipated that older farmers demand less external funds than younger ones. In addition older farmers may have less desire to improve their agricultural production, particularly if their childern are grown and moved away from the farm. Several empirical studies have shown that the requirement for credit declined as the farmer advances in age and his ability to farm diminishes.[25]

The degree of commitment to agricultural pursuits to maintain a livelihood is another important variable influencing the decision of the farmer to innovate and demand more external funds. Miracle stressed that farmers who have a reliable stream of income from off-farm employment i.e., farmers who do not have to rely solely on farming to subsist, may be under less pressure to increase farm production and hence to demand more funds.[26] Income from off-farm employment increases the farm household's internal liquidity providing more capital with which to undertake farm level activities or innovations. This proposition has been asserted by the study undertaken in Jamaica.[27]

The level of wealth a farmer enjoys would also influence the borrowing behavior of farmers. Those farmers with more income and livestock are usually categorized as borrowers. In addition farmers with more land and income were found to be credit users.[28] Araujo's study has also showed that borrowers had higher income and assets than non-borrowers in Brazil.[29] A study in Bolivia also indicated that borrowers had more cattle than other groups.[30]

A greater distance from the farm to the lender would also raise costs due to greater expense in travel and in time commitment for

visits to the lender. Hence distance from district extension office, which is the closest site or source of formal credit is expected to influence the borrowing behaviour of farmers. Farmers living far away from the offices also lack market information and the communication gap is wide. As a result farmers living closer to extension offices and market centers are anticipated to be borrowers. A study in Bolivia, however, showed that non-borrowers lived closer to the market and the extension office, contrary to the expectations.[31] This was explained by the relatively easier access to off-farm employment in the area. With alternative income generating opportunities available, these farmers could become less eager to expand production or improve the level of their technologies and hence have less desire to borrow for agricultural production.

The degree of expected variation in product prices, the arrangements and efficiency of marketing and extension services may also add the risk costs for the farmer and hence affect the demand schedule for funds. A price risk can be an important reason for not using credit. Similarly accessibility to markets and extension services may also restrict the borrowing potential of farmers. Borrowers were found to be highly concerned about product price variation and accessibility to markets.[32]

Although farmers may have greater ambition to expand production they can encounter certain limitations. Some important factors which are used as proxies of production limitations may also have certain influence on the decision of the farmer to use or not to use agricultural credit. The need for more land, labour, oxen and the like are

usually important variables characterizing borrowers. The study of Miller and Ladman has showed that borrowers were significantly characterized by their need for more workers. On the other hand since both borrowers and non-borrowers had strong desire to increase their land holdings it did not serve to differentiate borrowers from non-borrowers.[33]

The survey made so far has attempted to highlight some of the important determinants of credit use both from theoretical considerations and from empirical studies. It is also essential to examine the studies made in Ethiopia on the subject of agricultural credit use. Hence, the following paragraphs would review the studies made on agricultural credit in Ethiopia.

Chronologically, the earliest study on agricultural credit in Ethiopia was undertaken by Mamo Bahta and Harry Robinson.[34] This study, showed that credit for small farmers was not provided in sufficient number or amount. The report further mentioned that small farmers were unable to use agricultural credit because of high interest rate charged by credit institutions. Hence in order to promote small farmers' credit use it was recommended to lower interest rates and establish a co-ordinated agricultural credit system consisting of an educational extension and distribution programme for agricultural inputs.

Attempts were also made later on, to evaluate the credit programmes of the package project. The participation rates of different classes of farmers, repayment performances, and effect of credit programmes on income distribution are some of the factors examined. The evaluation of the CADU and WADU credit programmes have shown that both the volume of credit disbursed by the programmes and the participation rates of farmers, especially subsistence farmers, were limited.[35] This was the

outcome of the land tenure system which denied many small farmers the right to own the land they tilled. After scrutinizing the credit programmes many of the studies recommended that an integrated approach, which includes the construction of roads, improving marketing systems, getting land reform, expansion of extension activities together with education, reorganization of financial institutions and the introduction of new policies, must be undertaken.

Other studies have also showed that agricultural credit use was not wide spread particularly among peasant farmers. For instance, Teshome Mulat (1974) indicated that institutional credit did not reach small farmers in Ada Woreda.[36] This was also confirmed by another study undertaken in the area.[37] These studies recommended that the banking system and other related government organizations must be reorganized and the level of education of the farmers must be raised if agricultural credit use was to be promoted.

The agricultural credit policies adopted by lending institutions before the land reform did not favour small farmers. Teshome Amanuel who attempted to examine the agricultural credit policy found out that the policy had neglected the credit needs of small farmers and had actually accentuated income disparities.[38] Other studies have also shown that the credit policy of AID Bank had failed to consider the credit needs of small farmers even after the land reform.[39] Although there was much evidence that peasant farmers were willing to invest in fertilizers, pesticides, improved seeds, and better farm implements the Bank was unsuccessful in its effort to reach these farmers. In seeking remedial measures to these and other problems an integrated approach was again recommended.

All these studies underscored the fact that subsistence-farmers in Ethiopia have not been well acquainted with credit use and they were not served well by credit institutions. In addition the studies did not attempt to characterize credit users and non-users. On top of this, most of these studies were undertaken before the land reform within a different socio-political formation and hence their relevance to the present conditions is limited. Although the social, economic and political conditions may vary greatly between countries and between regions, there could be present within many countries, common conditions and needs that must be met before establishing a rural credit system. Hence, this study is undertaken from such perspectives and can serve as a basis for future studies.

NOTES

[1]Several studies have asserted that subsistence farmers do not usually have sufficient capital to be invested in such expenditures. Hence they need external assistance. See for instance, Ted L.Jones, "Agricultural Credit Institutions". in Institution in Agricultural Development, Melvin A.Blase(ed), Iowa, The Iowa State University Press, 1971: Gordon Donald, Credit for Small Farmers in Developing Countries, (Colorado, Westview Press, Inc., 1976); A.T. Mosher, Getting Agriculture Moving,(New York, Frederick Praeger, 1966); Ragnar Nurkse, Problems of Capital Formation in Underdeveloped Countries, (New York, Oxford University Press, 1963) and see also Franz Heidhues, " Agricultural Credit and Agricultural Development," Economics, Vol. 31, 1985.

[2]FAO, Agricultural Credit Through Cooperatives and Other Institutions, (Rome, 1965), P.9.

[3]Gordon Donald, OP. Cit., P.27.

[4]FAO, Agricultural Credit for Development, world conference in credit for farmers in developing countries, (Rome, 1975), P.3.

[5]Uma Lele, OP. Cit., P. 59.

[6]H.A. Oluwasanmi and J.A. Alao, " The Role of Credit in the Transformation of Traditional Agriculture: The Western Nigerian Experience," The Nigerian Journal of Economic and Social Studies, Vol. 7(1), March 1965, P.33.

[7]Franz Heidhues, OP. Cit., P. 65.

[8]H.A. Oluwasanmi and J.A. Alao, Loc. Cit.

[9]Theodore Schultz, Transforming Traditional Agriculture,(New Heaven, Connecticut: Yale University Press, 1976). See also Michael Lipton, " Agricultural Finance and Rural Credit in Poor Countries," World Development, Vol. 7(4), 1976.

[10]Calvin Miller and Jerry R.Ladman, " Factors Impeding credit Use in Small Farm Households in Bolivia," The Journal of Development Studies, Vol. 19(4), July 1983, PP. 522 - 538.

[11]Peter J.Heffernan and Stephen K. Pollard, " The Determinants of Credit Use Among Small Farmers in Jamaica," Social and Economic Studies, Vol. 32(1), March 1983, PP. 23 - 41.

[12]Calvin Miller and Jerry Ladman, OP. Cit.

[13]Yakub L. Fabiyi and K.O. Osotimehin." An Analysis of the Impact of Credit on Rice Production: A Case Study of ONdo and OYo States, Nigeria," Savings and Development, Vol. 4, 1984, PP. 351 - 360.

[14]E.L Baum et al, Capital and Credit Needs on Changing Agriculture (Iowa, the Iowa State University Press, 1961).

[15]See for example, Miller and Ladman, OP. Cit and Paulo F. Araujo, " An Economic Study of Factors Affecting the Demand for Agricultural Credit at the Farm Level," Cited in Social and Economic Studies, Vol. 32(1), March 1983.

[16]Heffern and Pollard, OP. Cit.,

[17]Ibid.

[18]Fabiyi and Osotimehin, OP. Cit.

[19]P.V. Sarma and K. Siva Prasad, " Demand for Credit in Andra Pradesh," Indian Journal of Agricultural Economics, Vol. 33(4), 1978. PP. 98 - 109.

[20]Miller and Ladmen, OP. Cit.

[21]R.N. Pandey, B. Prasad, D.S. Rawat and P.J. Kumar, "Changes in Credit Use with Advancement in Agriculture," Indian Journal of Agricultural Economics, Vol. XXXIII(4), 1978, PP. 145 - 1[illegible].

[22]Parkash Mehta, " Impact of Working Capital on Adoption of Cropping Pattern in the Punjab State," Indian Journal of Agricultural Economics, Vol. XXXIII(4), 1978, P.163.

[23]Miller and Ladman, OP. Cit.

[24]Heffernan and Pollard, OP. Cit.

[25]See for instance, Heffernan and Pollard, OP. Cit., Miller and Lodman, OP. Cit., and Oluwasanmi and Alao, OP. Cit.

[26]Marvin Miracle, " Subsistence Agriculture, Analytical Problems and Alternative Concepts," American Jurnal of Agricultural Economics. Vol. 50(2), May 1968, PP.292 - 310.

[27]Heffernan and Pollard, OP. Cit..

[28]See A.S. Kahlon and Harbhakan Singh Bal, " Factors Associated with Farm and Farm Family Investment Pattern in Ludhina (Punjab) and Hissar (Haryana) Districts (1969 - 70), "cited in Social and Economic Studies, Vol. 32(1), March 1983 and also Prabjit Singh and Gurbachan Singh," a study into the pattern of distribution of institutional credit among different categories of farmers," cited is Social and Economic Studies, Vol. 32(1), 1983.

[29]Paulo Araujo, OP. Cit.,

[30]Miller and Ladman, OP. Cit.,

[31]Ibid.

[32]Ibid.,

[33]Ibid.,

[34]Mamo Bahta and Mary Robinson, OP. Cit..

[35]Henok Kifle, OP. Cit., Holmberg, OP. Cit., and Seyoum G/Egziabher, " Agricultural Credit in Ethiopia and Some Suggested Improvements," Unpublished B.A. Thesis, Addis Ababa University, 1970.

[36]Teshome Mulat, " Credit and Indebtedness in Rural Ada Woreda." Research Document, Addis Ababa University, IDR, 1974.

[37]Lakew Birke, "A Farm Credit Study in Ada District," HSIU, Department of Agricultural Economics, Unpublished Matetial, February 1974.

[38]Teshome Amanuel, " Agricultural Credit Policy of Ethiopia," Unpublished B.A. Thesis, Addis Ababa University, 1978.

[39]See Bekry Mohammed, " A Critical Assessment of the Contribution of AID Bank to the Ethiopian Agricultural Development," Unpublished B.A. thesis, AAU, 1983 and Kebede Tesfaye," Agricultural Credit in Ethiopia: Strategies for Its Allocation and Effective Utilization," Unpublished M.Sc. Thesis, AAU, 1982.

CHAPTER 4

Design and Conduct of the Study and Some Aspects of Credit Use in the Study Areas

4.1 Introduction:

The preceding chapters have attempted to examine briefly the agricultural credit policies and programmes introduced in Ethiopia and tried to review past studies on the subject to provide the necessary background to the study. The evaluation of the policies and programmes has shown that the use of agricultural credit is not wide spread in Ethiopia. Both the number of loans and the quantity of credit used is low. This low level of agricultural credit use could partly be attributed to inappropriate strategies and policies adopted. However, small farmers' credit use can also be influenced by a host of social, political and economic factors. To this end, the central objective of this study has become the identification of factors that determine credit use among peasant farmers. The case study method is, therefore, considered in order to find out and characterize the most important factors influencing credit use at the farm level.

Chapter 4 and 5 will be concerned with the identification of factors influencing credit use as well as the determination of the magnitude of the loan taken by private peasant farmers. To this effect several aspects of rural credit use such as the sources, the forms, the reasons for borrowing and other similar features in the study areas will be described at first. Then the variables that are hypothesised to affect agricultural credit use and loan size will be investigated and

quantified using statistical techniques. But a brief description of the sample areas and some farm and family characteristics along with the method of selecting the study areas is necessary before embarking on the determination of the factors affecting credit use.

4.2 Location of the Study Areas:

The data for this study were obtained from a small scale field survey conducted in the months of March and April 1986 in two districts of Shoa Administrative Region. The districts were selected according to a set criteria which will be discussed in the next section. Shoa Administrative Region is one of the 14 Administrative Regions of Ethiopia and is located at the center of the country. It has 11 Awrajas and 107 Woredas. The Region has the largest population of the Nation out of which over 91 percent live in the rural areas.[1] For the purpose of this study Lume Woreda from Yerer Kereyu Awraja and Kewet Woreda from Yifat and Timuga Awraja were purposively chosen.

Lume Woreda is one of the 10 Woredas of Yerer Kereyu province. It is located at about 65 kilometers Southeast of Addis Ababa along the main road to Hararghe, Sidamo, Bale and Arssi Administrative Regions. In addition the Addis Ababa Djibouti railway line passes through this woreda. The total surface area of the woreda is about 787.37 square Kilometers.[2] Lume Woreda is adjacent to Ada Woreda where much developmental activities have been taking place. The average elevation of the Woreda ranges from 1500 meters to 2500 meters above sea level. It has fertile soil which is generally good for crop production. The main crops grown in the Woreda include Teff, Wheat, Maize, Sorghum, Barely, etc.,

FIG.2. SHOA ADMINISTRATIVE REGION AND LOCATION OF THE STUDY AREAS

SCALE 1·5 : 4,000,000
Kilometers

which are typical cereals grown by the traditional Ethiopian highland peasants. In addition pulses such as field peas, lentils and chick peas are also grown in the area in some cases. There were 65 peasant associations, 2 producers co-operatives and 10 service cooperatives in the Woreda when this survey was conducted.

On the other hand, Kewet Woreda is located at about 220 Kms. Noretheast of Addis Ababa along the main road to Dessie. It covers a total area of 626.00 square Kms according to a recent Central Statistical Office estimate.[3] The average elevation of the Woreda also ranges from 1500 meters to 2500 meters above sea level. This Woreda grows the crops that are typical of highland peasant agriculture in Ethiopia, primarily cereals. At the time of this survey there were 43 peasant associations and 13 service cooperatives in the whole Woreda. The formation of producers cooperatives and the villagization programme were just started when the sample survey was undertaken.

4.3 Sample Design:

As mentioned earlier, the necessary data for this particular study was obtained from a field survey. A two stage simple random sampling procedure was used to generate the required information. This sampling method was preferred after considering many factors. Usually the cost, the method of analysis and the degree of precision required are the main factors that will influence the choice of the sample design to be used in a study.[4] The simple random sampling method is preferred when small-scale surveys are conducted because the estimation of sampling errors and significance tests that are in common use are based upon the simple random sampling procedure. The chance of making mistakes in simple

random sampling could also be less than it is in the case of other sampling designs. This sampling procedure is also preferred by many investigators because of its simplicity and accessibility. However, when it is believed that the population is hetrogenous, other sampling designs such as stratified sampling technique can be used to improve results. But there will not be any gain in precision from stratifying the population if the characteristics of the different strata do not differ significantly.

In view of all these factors, the simple random sampling precedure was preferred and used for this study. Although the purpose of the study was the basis for determining the specific study areas, factors like cost, time and logistics constraints were also given weights. As mentioned earlier the main issue dealt in this study is the use of agricultural credit by private peasant farmers. Agricultural credit use is often closely associated with the availability and use of output-increasing or cost-saving technologies appropriate for small farmers. Although the availability of profitable technology is not a sufficient condition for credit programmes to be successful it is, nevertheless, an essential ingredient. Moreover, improved technologies have been mostly provided to farmers in credit in the form of agricultural inputs. Therefore, the level of modern technology use is an indicator of the extent of agricultural credit use. On the other hand if credit is not readily available once mew technology becomes available, farmers will be less likely to share the benefits resulting from its use.

The level of agricultural development did not permit farmers in Ethiopia to use modern technology extensively in general. Nonetheless, some regions have relatively greater experience in the use of improved technology than others. Agricultural inputs, mostly fertilizers and improved seeds, have been distributed to farmers for quite a long time in some areas particularly in Shoa administrative region by the government. Farmers in Ada, Nazereth and around Shashemene have been using fertilizer since the early 1970's. In these areas the farmers have reached a stage where they think that it is not possible to raise their crop production without using modern inputs. In other areas of the country, however, many farmers either do not have access to agricultural inputs or are reluctant to adopt the technologies because of the risk factors or because they are unfamiliar with the improved technologies.

Hence, the criterion used to select one of the study areas was the availability and extent of modern technology use. Based upon this subjective evaluation Lume Woreda from Yerer Kereyu Awraja was purposively selected as a fair representative of areas with wider and greater use of improved technology. Discussions with experts in the Ministry of Agriculture have shown that farmers in Lume Woreda have been highly responsive to the introduction of improved technology and have been using fertilizers and improved seeds for over a decade-since the Woreda is adjacent to Ada Woreda, where several fertilizer trails and demonstrations have been taking place, farmers in the Woreda were easily convinced of the use of improved technology. The information barrier was greatly reduced to those farmers and hence, they have adopted improved technology for a long time.

In contrast to Lume woreda, the other study area was intended to be an area in which the rate of adoption of modern technology is relatively slow. Because improved technology does not exist in sufficient amount and when it is available, it is not rapidly adopted, the importance of institutional credit is limited. However, farmers also recieve considerable amounts of credit from informal sources, such as relatives, friends and traders to meet their consumption needs. Thus, when studing credit use among peasant farmers, it also becomes essential to examine some aspects of the non-institutional credit including the magnitude, the important sources, and the uses of credit. Kewet Woreda was, therefore, chosen from Yifat and Timuga Awraja as a representative of technologically backward and traditional areas. There is a very limited use of improved technology in the Woreda. Very few farmers have been using only agricultural chemicals. According to the information obtained from the Ministry of Agriculture, farmers in Kewet Woreda are not responsive to modern imputs such as fertilizers and improved seeds. Despite repeated efforts by extension agents, they have preferred to use a traditional farming technique known as "Gay", where the soil will be burnt rather than to use fertilizer and/or improved seeds. Hence, Kewet Woreda was chosen as the second study area after considering all these factors.

In addition to difference in the use of improved technology, the two Woredas show some degree of variation in the level of cooperativization. Producer's cooperatives have been formed and well organized in Lume Woreda. There were two producer's cooperatives in the Woreda and preparations were also underway to form more producer's cooperatives

in the Woreda at the time of the survey. On the other hand the level of cooperative development was relatively low in kewet Woreda. Attempts were being made to establish producer's cooperatives at the time of the sample survey in the district.

The study areas are both in Shoa Administrative Region simply to keep some degree of uniformity in cultural, ecological, institutional and infrastructural patterns. Similarities are also assumed in terms of cropping pattern, climate, altitude, rainfall and in other similar elements. From each Woreda two peasant associations were randomly selected, as the first stage sampling units, and then a random sample of farm household heads was drawn from each peasant association. Two peasant associations were considered to be adequate since it was assumed that there is homogenity on types of crops, management, cultural practices and on other elements between peasant associations within one district. This assumption enables us to reduce the total cost without altering much the efficiency of the estimators.

4.4 Sample Size.

After deciding the sample design and the study areas are chosen, the sample size should also be determined. Usually the sample size is determined after due consideration is made on inter-farm variability, the complexity and coverage of the questionnaire and the funds that are feasible.[5] When inter-farm variability of the population characteristics is missing like our case, the experience of other data generating institutions and previous researchs could provide good approximations on the required sample size. In this regard, usually 2.5 percent to 5 percent of the total farm households from the relevant peasant associations can be considered to be fair representatives of the population for

a micro-level study.[6] An alternative approach to determine the sample size in the absence of estimates of standard errors is to use the non-centrality parameter method.[7] According to this method, the F-tests of variance, which is given by the ratio of mean squares, each based upon a given number of degrees of freedom can be expressed as:

$$F^2 = \frac{R^2}{1 - R^2}$$

The non-centrality parameter (λ) is a simple function of F^2 and the error (denominator) degrees of freedom (V).

$$\lambda = F^2 . V$$

On the other hand the error degrees of freedom (V) is given by

$$V = N - U - 1$$

Where, U is the degrees of freedom for the numerator, which is simultaneously equal to the number of independent variables. It is then a simple matter to rewrite the above relationship as follows to get the required sample size (N).

$$V = \frac{\lambda}{F^2}$$

$$N - U - 1 = \frac{\lambda}{F^2}$$

$$N = \frac{\lambda(1 - R^2)}{R^2} + U + 1$$

Now, in order to determine the sample size (N), a standard table that gives different values of λ for a specified level of significance, number of independent variables and a desired power of a test is used.[8] R^2, the percent of explained variation is to be estimated from similar types of researches undertaken earlier in Ethiopia or in other developing countries. Unfortunately, we do not have similar researchs undertaken

in Ethiopia previously. Studies on the subject in other developing countries have, however, estimated the values of R^2. According to the studies the values of R^2 ranged from as high as 48 percent to as low as 25 percent.[9] Generally, a low value of R^2 implies that larger sample size is required while a high value of R^2 suggests that a small sample size is adequate. Thus, for this study a value of $R^2 = 0.25$ was considered which suggested that a random sample of 50 household heads must be drawn from each peasant association. Overall more than 200 farm household heads were interviewed from both Woredas, 102 from Lume Woreda and 103 from Kewet Woreda. According to some studies a peasant association has on the average from 200 to 300 farm household heads.[10] Hence a sample of 50 household heads from each peasant association means that over 20 percent of the household heads from each peasant association are included in the sample.

A socio-economic questionnaire was prepared and enumerators who have completed grade twelve and who are able to speak the local languages were employed. They were given sufficient training on various aspects of the survey for over three days. Moreover, in an attempt to get honest responses from the farmers, a meeting was called in which all farmers took part and explanations and briefings were given to them about the objectives of the survey. The following table shows the number of farm households in each peasant association and the number of sampled farmers from each.

TABLE 20

PEASANT ASSOCIATIONS SELECTED AND THE NUMBER OF SAMPLED FARMERS FROM EACH ASSOCIATION.

Woreda	Peasant associations Selected	Number of households	Number of sampled farmers.
Lume Woreda	Kurma peasant association	112	42
	Momo peasant association	187	60
Kewet Woreda	Balch peasant association	171	46
	Jubamba peasant association	221	57
Total		691	205

4.5 Selected farm and family characteristics.

Several farm and family characteristics were surveyed in the two Woredas. Data were collected on many characteristics of farm households including resource use, production, income, age, level of education and the likes. The results of the survey on these socio-economic characteristics are described in this section.

The sampled Woredas encompass private peasant farmers, most of whom utilize traditional production techniques. The average farm size alloted to individual households is small. Most of the sampled farmers occupy less than 2 hectares of land. Farms of more than 3 hectares constituted only a little more than 10 percent of all farms in both study areas (see table 21). Teff, Maize, Wheat, Sorghum and Barely are the dominant crops grown in the Woredas occupying more than 80 percent of the cultivated land in Lume and over 95 percent of the total land cultivated during the crop year under study by the sampled farmers in Kewet Woreda.

TABLE 21

DISTRIBUTION OF FARM SIZE (PERCENT)

Woreda		Hectares			
		Less than 1	1-1.99	2-2.99	3 & above
Lome	all farms	-	36.27	42.16	21.57
	Borrowers	-	32.79	45.90	21.31
	non-borrowers	-	43.90	34.15	21.95
Kewet	all farms	5.83	66.02	22.33	5.82
	Borrowers	-	64.44	22.22	13.33
	Non-borrowers	10.34	65.52	24.14	-

Although the average farm size is small in the Woredas, the farmers derive their livelihood mainly from the land they cultivate and from livestock production like other subsistence Ethiopian farmers. More than 95 percent of the total income was derived from the farm and from livestock production in the districts for the agricultural year considered (table 22). In addition to on-farm income the peasants also abtained some income from other sources. The major sources of off-farm income identified in the Woredas include gifts from relatives and friends, weaving, trading and similar activities, as well as the sale of own labour, fire wood and grass. The mean household income for the farmers for the agricultural year considered was about 984 Birr and 575 for farmers in Lume and Kewet Woredas respectively. However, off-farm income constituted less than five percent of the total household income in the two districts.

TABLE 22

ON-FARM AND OFF-FARM INCOME OF SAMPLED FARMERS (IN BIRR)

Income	Source	Lome			Kewet		
		No	Mean value	Percent of Tot	No	Mean value	Percent of Tot
On-farm Income	Crop	102	888.17	94.00	103	409.19	75.87
	Livestock and Livestock products	37	156.28	6.00	58	231.16	24.13
	Total			100.00			100.00
Off-farm	Gifts	12	91.67	27.78	11	71.82	21.43
	trading, weaving, etc.	13	110.38	36.24	5	102.00	13.83
	selling labour	8	91.25	18.43	9	50.22	12.26
	fire wood sales	13	53.46	17.55	28	69.11	52.48
	Total	46			53		

As mentioned above most of the farmers utilize traditional agricultural production techniques and consequently their farm income has remained low. One possible explanation for the backwardness of their implements is their low level of education. The level of education in both Woredas is rather low. The level and quality of education that farmers have attained is an important determinant of how resources are efficiently put into their best use. A farmer with little or no educational background does not know how wisely to use his resources, cannot wisely use loans and cannot protect his interests in his dealings with lenders. Hence, the extent of credit use could be influenced by the level of education of the farmer. According to the sample survey only four percent

of the household heads has more than four years of formal education (see table 23). Over 30 percent of the household heads are illiterate. Even those who can read and write, can hardly understand and evaluate the costs and benefits of using agricultural credit.

TABLE 23.

LEVEL OF EDUCATION AND FARMING EXPERIENCE

Characterstic		Lome		Kewet	
		No	Percent	No	Percent
Educational Level	Illiterate	23	22.55	46	44.66
	Read and write	55	53.92	41	38.81
	1-4 yrs. of schooling	16	15.68	15	14.56
	Over 4 yrs of schooling	8	7.84	1	0.97
	Total	102	100	103	100
Years of Farming	Less than 20 years	43	42.16	34	33.01
	20 - 24	13	12.75	22	21.36
	25 - 29	9	8.82	14	13.59
	30 - 34	9	8.82	12	11.65
	35 - 39	8	7.84	11	10.68
	40 - and over	20	19.61	10	9.71
	Total	102	100	103	100

The number of years the farmer has managed the farm can be an indication of the farmer's committment to the farming occupation and farm management ability as mentioned earlier. Hence, farming experience is also anticipated to have some influence on agricultural credit use. More than 50 percent of the sampled farmers have had more than 20 years of farming experience. In Ethiopia farmers enter into the farming occupation while they are still young and remain farmers for the whole of their lives.

It would be very difficult for them to change this occupation. This can be deduced from the age distribution of the farm household heads (see table 24). More than half of the farmers interviewed were found to be 40 years or over in both Woredas. Age is also thought to be an important factor in the farmer's decision to use or not to use credit. Rogers indicated that earlier adopters of new innovations and improved methods of cultuvation are younger in age than late adopters.[11] A farmer who is relatively advanced in age will be less likely to require external assistance particularly in areas where accumulation is possible.

TABLE 24

HOUSEHOLD HEAD'S AGE DISTRIBUTION.

Age group in years	Lome		Kewet	
	Number of farmers	Percent of tot.farmers	Number of farmers	Percent of tot.farmers
Less than 20	1	0.98	2	1.94
20 - 24	13	12.75	2	1.94
25 - 29	11	10.78	11	10.68
30 - 34	14	13.74	22	21.36
35 - 39	9	8.82	16	15.53
40 - 44	12	11.76	15	14.56
45 - 49	13	12.75	11	10.68
50 - 54	6	5.88	15	14.56
55 - 59	12	11.76	5	4.85
60 and over	11	10.78	4	3.88
Total	102	100	103	100

4.6 Some Aspects of Agricultural Credit Use in the Study Areas.

So far we have examined some personal and farm characteristics of the sampled farmers. But we have not yet investigated the significance of agricultural credit use in the areas. Therefore, in this section we shall attempt to scrutinize the situation of agricultural credit use in the study areas interms of the magnitude, the sources, the types of and uses of credit. Detailed data were obtained on these factors. In the case of those farmers presently not using credit, data about the possible reasons for non-use were obtained. In addition the desired form of credit to be deployed in the future was also investigated.

Out of the total farmers, which are 205, interviewed 108 or 53 percent have used agricultural credit during the 1984/85 crop year as illustrated by table 25. The rest have refrained from taking loans either from formal sources or from informal sources.

TABLE 25.

NUMBER OF HOUSEHOLDS HEADS WHO TOOK CREDIT.

Classification of farmers	Lume woreda	Kewet woreda	Total
Borrowers	61	45	108
Non-borrowers	41	58	97
Total	102	103	205

4.6.1 Sources and Forms of Credit.

For these farmers who had taken loans, the sources from which they obtained the loans and the forms in which they received the loans were investigated. The major sources of credit identified in the study areas

are the Ministry of Agriculture, relatives and friends. The Ministry of Agriculture provides a significant proportion of the credit for farmers in Lume Woreda through the service co-operatives whereas relatives and friends were found to be the only sources of credit available to farmers in Kewet Woreda. In the pre-revolution period landlords and merchants were the main sources of credit for farmers. Since the 1974 Revolution in general, and the rural land proclamation of March 1975 in particular, the role of these traditional sources of credit has become negligible. Relatives and friends have now become the main source of credit, particularly consumption credits.

Over 60 percent of the total credit disbursed to farmers during the agricultural year under study in Lume Woreda was in the farm of fertilizers, improved seeds, pesticides and the like. Such production credits are usually offered to farmers who have settled all their previous debts and those who can provide 15 percent downpayment. The Ministry of Agriculture survey for the 1983/84 crop season also indicated that over 47 percent of the farmers in Lume Woreda were borrowers, and 73.5 percent got loans from formal sources while less than 25 percent recieved loans in kind from informal sources.[12] Generally if farmers are aware of the benefits that production credit can generate, they will be inclined to use more the formal credit sources. On the other hand, although the informal sector is also an important source of credit for farmers, in many places it can hardly be used for production purposes. It is insufficient for a sustained agricultural development.

TABLE 26

SOURCES AND FORMS OF CREDIT.

	Woreda	Sources and forms	Number	Amount (Birr)	Percent of amount	Percent of tot.farmers
Sources	Lume	Ministry of Agriculture	60	6075	62.61	67.42
		Relatives	13	1503	15.47	14.61
		Friends	16	2125	21.90	17.98
		Total	89	9703	100	100
	Kewet	Relatives	39	4868	72.79	70.91
		Friends	16	1820	27.21	29.09
		Total	55	6688	100	100
Forms	Lume	Cash	24	3113	32.08	23.76
		Kind	77	6590	67.92	76.24
		Total	101	9703	100	100
	Kewet	Cash	49	5615	83.96	73.13
		Kind	18	1073	16.04	26.87
		Total	67	6688	100	100

Credit assistance is being provided to farmers in the districts in the form of cash and/or in kind, the two conventional forms of credit. Over 70 percent of the borrowers received improved seeds and fertilizer credits in Lume Woreda during the 1983/84 crop year. On the other hand most of the borrowers in Kewet Woreda took cash loans. In this Woreda less than 20 percent of the total credit obtained was in kind (see table 26). The determination of the farms in which credit has to be deployed to the users depends upon the state of development. Usually if it is thought that the state of development is so low and the disbursment of cash funds could be used for purposes other than those intended, then it would be desirable to deploy credit in kind. On the other hand if it is assumed that the beneficiary is

capable of making goods use of funds placed at his disposal, then credit can be disbursed in cash. Such controls can be successful in preventing state funds from going unproductively into consumption. However, it would be difficult to prevent farmers from using their own funds which would otherwise have been used for the purpose for which the loan was taken for other purposes including consumption. The fungibility of financial resources is often overlooked in many agricultural credit policies. It is also questionable whether financing consumption is necessarily unproductive.[13] The subsistence of the farmer and his family is, infact, essential to maintain production.

Regardless of which form of credit is received and irrespective of the sources of credit, the farmers have specific reasons for borrowing. The case study has, therefore, attempted to investigate how the loans were used.

4.6.2 Reasons for borrowing

The purposes for which loans were taken by the farm households in the study areas are summarized in table 27. Over 70 percent of the total credit advanced to farmers in Lume Woreda was used for productive purposes. Improved seeds and fertilizer loans accounted the highest proportion of this credit. However, most of the farmers in Kewet Woreda used the loans to meet immediate consumption needs. The low level of agricultural production in this Woreda, as illustrated by the low level of real income, has compelled the farmers to allocate a significant portion of the credits they obtained from their relatives and friends for the purchase of food.

TABLE 27.

USES OF LOANS IN THE STUDY AREAS.

Woreda	Uses	Number	Amount (Birr)	% of Amount	% of Total
Lume	Purchase of food	16	1728	17.81	15.81
	Purchase of seeds	20	948	9.77	19.80
	Purchase of fertilizer	57	5642	58.15	56.44
	Purchase of oxen	3	1160	11.96	2.97
	Clothings	2	80	0.82	1.98
	Medical expenses	2	95	0.98	1.98
	Others	1	50	0.52	0.99
	Total	101	9703		
Kewet	Purchase of food	40	4558	68.15	51.28
	Purchase of seeds	12	523	7.82	15.38
	Purchase of oxen	2	560	8.37	2.56
	Clothings	8	295	4.41	10.26
	Medical expenses	6	377	5.64	7.69
	Purchase of impliments & Herbicides	7	250	3.74	8.97
	Others	3	125	1.87	3.85
	Total	78	6688		

4.6.3 Impediments to Credit Use.

As shown in table 25, some 47 percent or 97 farmers did not use agricultural credit during the crop year under study. The reason for not using credit have been explored. In the responses to the multiple choice questions, of which factors inhibited them from using credit, the farmers had some predominant responses. Over 30 percent of the sampled farmers identified fear of repayment ability as the major impediments to credit use in Lume Woreda, while a little more than 10 percent of the sampled farmers in

Kewet Woreda were impeded from using credit because they thought they would be refused the loans. The corresponding figure for Lume Woreda is relatively small, showing that the presence of credit facilities from formal institutions has facilitated the problem of refusal by the lenders. A significant number of farmers in Kewet Woreda also mentioned that credit has not been available either from public institutions or from private sources. Most of the responses imply that risk costs relative to expected returns are high.

TABLE 28

IMPEDIMENTS TO CREDIT USE IN THE STUDY AREAS.

Impediments	Lume		Kewet	
	Number	Percent	Number	Percent
Fear of repayment	18	33.96	9	11.69
Fear of refusal	9	16.98	35	45.46
Lack of information	5	9.43	7	9.09
No need for credit	14	26.43	4	5.19
Unavailability of credit	-	-	21	27.27
High interest rate	5	9.43	-	-
Others	2	3.77	1	1.30
Total	53	100	77	100

4.6.4 Desired Forms of Credit in the Future.

To formulate any meaningful agricultural credit policy in the future it is essential to take into account the users' interest. The viewpoints and the desire of those who are expected to use credit must be documented before a credit programme is launched. The sampled farmers were, therefore, asked if they would want to use credit in the future or not. For those

who responded in the affermative the desired form of credit was also investigated. The responses are summarized in table 29. Most of the farmers indicated that they would want to use credit if it is available. In fact, some of them pointed out that it is not possible to maintain the existing levels of production, let alone to increase, if they do not receive credit assistance in the form of inputs. After the Land Reform, which abolished the Land lord-tenant relationship, the demand for input credit has increased.

TABLE 29

PROJECTED CREDIT NEEDS

Responses	Lume		Kewet	
	Number	Percent	Number	Percent
Want to borrow	77	75.49	83	80.58
Do not want to borrow	25	24.51	20	19.42
Total	102	100	103	100
Desired forms				
Kind only	46	59.74	16	19.28
Cash only	6	7.79	44	53.01
Mixed	25	32.47	23	27.71
Total	77	100	83	100

With regard to the preferred form of credit, production credit is most preferred in Lume Woreda, while cash is perferred in Kewet Woreda to satisfy immediate consumption needs. Because farmers are acquainted with the use of improved technology, they wanted improved seeds and fertilizer loans to be continued and increased in magnitude. They are aware of the benefits

generated by using new technology. On the other hand, farmers in Kewet Woreda are unfamiliar with modern production inputs they did not have the desire for production credit. It is, therefore, important to acquaint farmers in technologically backward areas with the use of improved technology before credit facilities are extended. Through the increase in the usage of new technology, the demand for credit would be raised and hence, production can be increased and the short-term problem of consumption would be alleviated.

NOTES

[1]Central Statistical Office, Population and Housing Census, (Addis Ababa: May 1984), P.15.

[2]Central Statistical Office, Area by Rural Region, (Addis Ababa: February 1986), P.17.

[3]Ibid., P. 16.

[4]C.A. Moser and A. Jalton, Survey Methods in Social Investigation, (London: Heinmann Educational Books LTD., 1971), P. 90.

[5]Tesfaye Teclu, "A Micro-Level Farm Study of the Impact of the Agrarian Reforms on Resource Use and Income: A Comparative Approach," Research Proposal, IDR, June 1977.

[6]Ibid.,

[7]See J. Cohen, Statistical Power Analysis for the Behavioral Sciences, (New York: Academic Press, 1977), PP. 407 - 453.

[8]Ibid.,

[9]See, for example, Heffernan and Pollard, OP. Cit., Miller and Ladman, OP. Cit., and Fabiyi and Osotimehin, OP. Cit.

[10]See FAO, Delivery System of Agriculture Services to Small Farmers in Africa: Case Studies from Ethiopia, Kenya and Nigeria, (Rome, 1983), P.3., and Mulat Demeke, "The Supply Response of Subsistence Peasants: The case of Teff Growers in Some Districts of Shoa," Addis Ababa University, Unpublished M.Sc. Thesis. 1984. P. 57.

[11]Everett M.Rogers, Diffusion of Innovations, (New York: the Free Press of Glencoe, 1962), P. 172.

[12]Ministry of Agriculture, OP. Cit., P. 480.

[13]Walter Schaefer-Kehnert and John D.Von Pischke, Agricultural Credit Policy in Developing Countries, World Bank Reprint Series, Number 280, (Washington, 1982), P.8.

CHAPTER 5

Factors Affecting Credit Use and Volume of Credit Among Private Peasant Farmers

5.1 Method of Analysis

As stated earlier the main thrust of the paper is to identify and study the factors that determine farm - household credit use among peasant farmers. The required data were collected from a field survey and the analysis was made using a computer package known as P-STAT. 8 that is available at the University. The statistical technique that is used in the analysis is known as Discriminant Analysis. Discriminant Analysis is a multivariate statistical technique that helps to study differences between mutually exclusive groups with respect to several variables simultaneously. Based upon a vector of measurements, observed on an individual, it would be possible to assign the individual into one of several mutually exclusive groups.

In many prediction studies the dependent variable may be nominal rather than continuous, that is, it may involve group membership rather than a score along a continuum. Under such case discriminant function analysis must be used instead of the standard regression analysis, because the standard regression analysis requires the dependent variable to be a continuous variable. Moreover, in regression analysis the weights or the coefficients are selected so as to minimize the difference between a pearson's predicted and actual criterion score whereas in discriminant analysis the coefficients are selected so as to maximize correct classification. Discriminant analysis is useful to classify

an object into one of several alternative populations given certain characteristics and for determining the relative importance of differert variables in predicting group membership[1]. The Linear Discriminant Function (LDF), which is the most widely used method in classification problems, relates the independent variables (discriminating variables) to the dependent variables (groups) to determine a linear function and hence, establish an optimal classification rules[2].

In order to assign an individual into one of two known normal populations with means μ_1 and μ_2 respectively and with the same covariance matrix, Σ, we need to devise some rule such that after observing a vector of attributes, we can decide to what population we shall assign the individual associated with those attributes. To accomplish this task the Bay's classification rule can be used against the prior probabilities P_1 and P_2. This rule is given by:

Assign the individual to group 1 if:

$$G_1 : \left[X - \tfrac{1}{2}(\mu_1+\mu_2) \right]^T \Sigma^{-1} (\mu_1-\mu_2) > K \quad \ldots\ldots\ldots\ldots \quad (1)$$

Assign the individual to group 2 if;

$$G_2 : \left[X - \tfrac{1}{2}(\mu_1+\mu_2) \right]^T \Sigma^{-1} (\mu_1-\mu_2) < K \quad \ldots\ldots\ldots\ldots \quad (2)$$

where,

$$K = \text{Log}_e \frac{P_2(C_1/2)}{P_1(C_2/1)} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

and $C_1/2$ = The cost of classifying the individual from group 2 to group 1.

$C_2/1$ = The cost of classifying the individual from group 1 to group 2.

The linear function $\left|X - \frac{1}{2}(\mu_1+\mu_2)\right|^T\Sigma^{-1}(\mu_1-\mu_2)$ of the components of the observation vector X, is called the discriminant function, and the components of $\Sigma^{-1}(\mu_1-\mu_2)$ are called the discriminant function coefficients. It should be noted that if $P_1 = P_2$ and $C_1/2 = C_2/1$, then K = 0 and the optimal rule reduces to the classical Fisher's linear discriminant function which is given as:

$$G_1 : X^T\rho > \tfrac{1}{2}(\mu_1+\mu_2)^T\rho \quad \text{.....(4)}$$

$$G_2 : X^T\rho < \tfrac{1}{2}(\mu_1+\mu_2)^T\rho \quad \text{.....(5)}$$

where:

$$\rho = \Sigma^{-1}(\mu_1-\mu_2) \quad \text{..... (6)}$$

The optimal rule developed above assumes that the population means μ_1 and μ_2 and the covariance Σ are known together with the form of the density function. However, such assumptions will not be always valid in practice. Hence, the distribution is assumed to be normal and the parameters μ_1, μ_2 and Σ are estimated.

The maximum likelihood estimators of μ_1 and μ_2 are $\bar{X}_1$ and $\bar{X}_2$, respectively. The pooled sample dispersion S, will be the estimator of Σ. Using these sample estimators the classification rules given under equation 4 and equation 5 become:

$$\text{Assign to } G_1 \text{ if } X^Td > \tfrac{1}{2}(\bar{X}_1 + \bar{X}_2)^Td \quad \text{..... (7)}$$

$$\text{Assign to } G_2 \text{ if } X^Td < \tfrac{1}{2}(\bar{X}_1 + \bar{X}_2)^Td \quad \text{..... (8)}$$

where:

$$d = S^{-1}(\bar{X}_1 - \bar{X}_2) \quad \text{..... (9)}$$

and X^Td now becomes the linear discriminant function.

The discriminant score, based on which an individual will be assigned to group one (G_1) or to group two (G_2) can now be computed from the following linear mathematical relation that is derived from the above equations.

$$Z_i = b_o + b_1X_{1i} + b_2X_{2i} + b_3X_{3i} + \ldots\ldots\ldots + b_nX_{ni} \ldots\ldots\ldots(10)$$

where,

X_{ji} = The i^{th} individual's value of the J^{th} variable.

b_j = The discriminant function coefficients.

Z_i = The i^{th} individual's discriminant score.

Thus, a person will be assigned to group one if his discriminant score is greater than $\frac{1}{2}(\bar{X}_1 + \bar{X}_2)^T d$, to group two otherwise.

The technique of discriminant analysis has been used quite extensively since 1936, when R.A. Fisher first used it, by many researchers. Although Fisher developed the method to solve problems in physical anthropology and biology, several social scientists have made extensive use of the technique later on to study and solve social problems. Psychologists, political scientists, geographers economists have used discriminant analysis to examine whether two or more groups differ significantly or not.

One of the first successful business applications of discriminant analysis was in credit operations.[3] Good credit risks can be separated from poor credit risks on the basis of demographic and socioecomomic variables that can be obtained from credit application forms. For instance, David Durand applied discriminant function analysis to differentiate between consumer installment loans which prove good risks and those which do not by means of a set characteristics of both the loans and borrowers.[4] For a sample of 484 good and 485 bad loans for purchases of used cars, he obtained a Linear combination of four characteristics (down payment, price, monthly income, and length of contract) which discriminate between good and

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bad loans appreciably better than a variety of indices based upon single variates. Pandey and Muralidharam also used the method to identify the socio-economic factors that characterized defaultors and non-defaultors in agricultural finance in India.[5] The utilization of loans and operated size of holdings were found to be the major characteristics that classified the borrowers into defaultors and non-defaultors.

Bromley had also shown that discriminant analysis can be used to identify the most feasible strategy out of a range of possible strategies that rural areas might adopt to promote their economic development.[6] Adelman and Morris have also utilized the methodology to devise an objective criteria for selecting underdeveloped countries with immediate development potential.[7] The result of their analysis showed that a single discriminant function of only four variables accounted for 97 percent of the discriminable variance between the various groups. The technique has also been extensively used by several other researchers.[8]

The classification rules given under equation 7 and equation 8 based upon the LDF are derived on the basis of certain assumptions.[9] There are some arguments on the relative efficiency of discriminant analyses particularly when one or more of these assumptions hold. Some have argued that the logistic discriminant must be used it the assumptions are violated. Lachenbruch summarized the results of a number of studies on discrete data and concluded that the general indications seem to be that the linear discriminant function performs fairly well on discrete data of various types.[10] Press and Wilson, presented two studies involving nonnormal data and found that the apparent error rates were smaller for the logistic discriminant than the linear discriminant function. The differences were not

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great and the authors felt that the two methods would not generally give markedly different results.[11] Krzanowski also found that both methods yielded almost identical results for several sets of mixed binary-continuous data.[12] On the other hand moore demonstrated that for binary data the linear discriminant function gives poor results when compared to the logistic discriminant function.[13] In a simulation study Crawley concluded that the logistic discriminant function is preferred when the distributions are clearly nonnormal or the dispersion matrices are clearly unequal.[14] However, the time required for compilation and execution of the programmes are shown to be higher for the logistic discrimination than it is for the Linear discriminant function.[15]

All these studies imply that the linear discriminant function method can be used as a classification procedure if the data are not clearly nonnormal and if the dispersion matrices for the groups are not too different. However, it is not clear what differences in the sample dispersion matrices can be tolerated. In this particular study we have a mixture of binary and continuous data which demonstrates a moderate departure from normality. But as shown by several studies above moderate departures can be tolerated. In addition, the dispersion matrices are assumed to be not markedly different. In light of these considerations the linear discriminant function approach has been used to identify the important socio-economic variables that characterize credit users and non-users.

To identify the important factors that determine the variation in loan size, the standard regression analysis is used. A linear regression analysis is anticipated and the model is estimated using the ordinary least square method.

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5.2 Definition of Variables Affecting Credit Use.

The variables hypothesised to affect credit use and considiered by this study include the following:

Dependent Variable, is the observed status of the household head,[16] and

= 1 if the household head was a borrower during the 1984/85 agricultural year

= 0 if he was a non-borrower during the agricultural year considered.

Independent Variable.

1. Age of the household head measured in years.
2. Farming experience of the household head again measured by the number of years the farmer has operated the farm.
3. Education, the level of education attained by the farm household head. Dummies are used in this case.

   = 1 if the farmer has completed grades 1-4.

   = 2 if he has completed any grade between 5-8

   = 3 if he has completed above grade 8.
4. Farm size refers to the total area owned by the farm household and is measured in Hectares.
5. On-farm Income: Pertains to the total earnings of the farm household from the land, livestock and livestock products measured in Birr.
6. Off-farm Income: This refers to all income generated either fram off-farm employment or from transfer payments measured in Birr.

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7. Distance from District Extension Office: It is measured by the time it will take the farmer to reach the extension office from his dewelling.

8. Investment Expenses: These are expenses for the purchase of livestock, tools and machinery, and capital investments such as wells, irrigation and other constructions measured in Birr.

9. Livestock: refers to the estimated value of livestock owned by the household measured in Birr.

10. The use of Improved Technology: This is a dummy variable, and

= 1 if the household bought fertilizer or agricultural chemicals or used improved seeds during the crop year considered.

= 0 otherwise.

11. Production Limitations: This is a set of dummy variables measuring the household's stated impediments to producing more. The limitations considered are:

(i) Land

= 1 if insufficient land was stated as an impediment

= 0 otherwise.

(ii) Labour

= 1 if lack of labour is stated as an impediment

= 0 otherwise.

(iii) Oxen

= 1 if shortage of oxen is stated as an obstacle

= 0 otherwise.

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(iv) Price:

= 1 if product price security is stated as an impediment

= 0 otherwise.

(v) Market and Services

= 1 if accessibility to market and services at reasonable price is stated as an impediment

= 0 otherwise.

So far it has been attempted to describe the method used in this analysis and define the hypothesised variables. It is now possible to present the empirical findings of the analysis.

5.3 Empirical Results.

As pointed out earlier, the sampled farmers were classified into two groups, borrowers and non-borrowers. Information on the predetermined characteristics influencing credit use were collected. Data on hypothesised variables related to credit use were assembled. Some proxy measures were used as necessary and this section briefly presents the results of the analysis.

The t - values presented in table 30 and table 31 indicate the significant variables of the predetermined variables. There exist significant differences among group means for six of the 15 variables hypothesised to affect the behavior of credit users and non-users for Lume Woreda. Again 6 variables had significant mean differences for the other study area. These significant mean differences show that the two group means are far enough apart for these variables. In particular age, level of education, the use of improved technology, two of the hypothesised

production limitations (need for more land and need for more workers) as well as investment expenses are the most important factors for which there exist significant mean differences between the two groups for Lume woreda.

TABLE 30

GROUP MEANS DIFFERENTIATING CHARACTERISTICS BETWEEN BORROWERS AND NON-BORROWERS AND ASSOCIATED t-RATIES FOR LUME WOREDA

Variable	Borrowers	Non-borrowers	t-Values.
Age (X_1)	40.05	46.54	1.99^{xx}
Farming experience (X_2)	23.41	28.42	1.55
Education (X_3)	2.23	1.91	2.67^{xxx}
Farm size (X_4)	2.48	2.26	1.22
Distance from extension office (X_5)	58.03	67.56	1.59
On-farm income (X_6)	958.60	897.20	0.66
Off-farm income (X_7)	48.30	28.90	0.96
Investment expense (X_8)	122.85	52.51	2.15^{xx}
Livestock (X_9)	879.85	929.76	0.49
Improved technology (X_{10})	0.98	0.39	8.97^{xxx}
Need for more land (X_{11})	0.56	0.29	2.71^{xxx}
Need for more labour (X_{12})	0.38	0.29	1.83^{x}
Need for more oxen (X_{13})	0.48	0.42	0.60
Price security (X_{14})	0.13	0.09	1.23
Market and services (X_{15})	0.28	0.22	0.93
Number of Observations	61	41	

Significance level: 1 percent (xxx), 5 percent (xx) and 10 percent (x).

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On the other hand the t-ratios for Kewet Woreda show that significant differences exist between the means for farming experiance, farm size, education, the need for more oxen, age and investment expenses. The other variables were not significant because of their large standard deviations from the means within each group.

TABLE 31

GROUP MEANS OF DIFFERENTIATING VARIABLES BETWEEN BORROWERS AND NON-BORROWERS AND ASSOCIATED t-VALUES FOR KEWET WOREDA

Variables	Borrowers	Non-borrowers	t-values
Age (X_1)	35.38	43.07	3.68^{xxx}
Farming experience(X_2)	21.09	26.86	2.69^{xxx}
Education (X_3)	0.87	0.61	3.14^{xxx}
Farm size (X_4)	1.83	1.38	3.12^{xxx}
Distance from extension office.(X_5)	101.56	105.69	0.54
On-farm income (X_6)	497.59	526.71	0.74
Off-farm income (X_7)	43.64	36.00	0.59
Investment expenses (X_8)	110.89	38.54	2.91^{xxx}
Livestock (X_9)	563.02	560.38	0.02
Improved technology (X_{10})	0.22	0.12	1.38
Need for more land (X_{11})	0.38	0.31	0.71
Need for more workers (X_{12})	0.04	0.07	0.52
Need for more oxen (X_{13})	0.80	0.64	1.81^{x}
Price security (X_{14})	0.12	0.10	0.39
Market and services (X_{15})	0.36	0.24	1.33
Number of observations	45	58	

Significance level of 1 percent (xxx), 5 percent (xx) and 10 percent (x).

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The above two tables simply indicate the potential power of each individual variable in discriminating among groups. The relative importance of each variable is, however, determined by the discriminant function by simultaneously entering all variables into the discriminant analysis. When the variables are standardized, the absolute size of the coefficients indicate the relative importance or the contribution of the associated variable.[17] The direction of association is shown by the sign of the standardized coefficients, which are normally the same with the sign of the unstandardized coefficients.[18] The value in each unstandardized coefficient is highly analogus to the regression coefficients in a multiple regression prediction equation, while the values in the corresponding standardized coefficient can be thought of as similar to Beta weights.

The set of 15 variables was entered simultaneously in obtaining a single discriminant function for each study area separately. The coefficients obtained by considering all the hypothesised socio-economic factors for Lume and Kewet woredas are presented in table 32 and table 34 respectively.

The discriminant function for Lume Woreda is significant at the 0.001 level as seen from the high λ^2 value. The implication of this is that there are distinct differences in farm household characteristics among borrowers and non-borrowers in the district. Inaddition, the low value of Lambda also indicates that the variables have a fairly good discriminating power. This fact is reinforced by the high cannonical correlation value (0.7531). This correlation is analogus to the squared product moment correlation and when squared, it gives the percent of variation explained between groups by the set of variables. In the case of Lume Woreda, the

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function explains 56.71 percent of the variations between the groups considered. Some variation remains unexplained, suggesting that some factors are not included in the model.

The extent of usefulness of a given discriminant function depends, not only upon the reasonableness of the variables selected and upon the percentage of discriminable variance for which this function accounts, but also upon the extent of separation among the groups for which its use gives rise. With respect to this criterion, the group means in the discriminant space are relatively far apart. The mean discriminant score of the borrower's group is 5.95 and for the non-borrower's group 14.25. Thus the groups are relatively distinct from each other.

In the discriminant function coefficients with positive sign indicate variables that contribute to credit use whereas those with negative signs correspond to variables that affect credit use negatively. The loadings of the function indicate that higher level of education, the use of improved technology, farm size, the need for more land inadequate market and extension services as well as product price security make the main contribution to discriminating between the two groups. Infact, Education, the use of improved technology, farm size, inadequate services and product price security contribute over 50 percent of the total discriminating power. An additional 25 percent is provided by age, the need for more oxen and workers. Other factors contribute considerably less and consequently are much less important in differentiating the credit users from non-users.

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TABLE 32

DISCRIMINANT ANALYSIS RESULTS FOR BORROWERS (LUME)

Variables	Standardized discriminant function coefficients.
Age	-0.1954
Farming experience	0.0070
Education	0.4295
Farm size	0.3598
Distance from extension office	0.0459
On-farm income	-0.0545
Off-farm income	-0.1059
Investment expenses	0.0504
Livestock	-0.0806
Improved technology	0.3907
Need for more land	0.3366
Need for more workers	0.1339
Need for more oxen	0.2537
Price security	0.3124
Market and service	0.3421
Constant term	-3.1619
Statistical results	
Group centroids	
Borrowers	5.9513
Non-borrowers	14.2528
Eigen value	1.3100
Cannonical correlation	0.7531
Wilk's Lambda	0.4329
X^2	77.4455

Significant at 0.001 level with 15 degrees of freedom.

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The negative coefficient for the variable age indicates that older farmers are associated with the non-borrowers group as expected. Theoretically it looks that older farmers have accumulated more asset and wealth relative to their operational requirements and thus have less need for financing outside the household. However, table 30 and table 31 have demonstrated that farmers with more useable land and higher income tend to use credit. Thus, older farmers have become non-borrowers not because of their accumulated wealth but perhaps, because their ability to undertake farm level activities must have diminished as they get older. This is particularly true for the Ethiopian farmer who is mostly near or at the subsistence level and, therefore, has the least capacity for accumulation. Moreover, if the farmers have less number of dependants, which is normally the case for older peasants, their credit demand would reduce as a result of the decrease in their consumption requirements. On the other hand farming experience is directly related to credit use. Those farmers who have managed their farms for a longer period of time are more likely to be borrowers. It suggests that more experienced farmers have realized the benefits from using agricultural credit and are willing to use credit. However, this variable is the least important of all the variables considered.

Higher level of education is related to credit use as seen from the high absolute size of the coefficient for this variable. Farmers with higher levels of education fall into the borrower's group as expected. The algebraic sign of the coefficient clearly suggests this. The finding is consistent with what was anticipated, namely, that education would enable farmers to recognize more readily opportunities to secure external

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financing to implement new and more profitable technology. This was confirmed by the highly significant difference in group means.

Although borrowers and non-borrowers did not show statistically significant difference in group means for the variable farm size, it was found that borrowers had more useable land than non-borrowers as indicated by the relatively high value of the coefficient. Farmers with higher farm size may be more inclined to borrow because of relatively higher production costs needed to operate the farms.

Distance from district extension office was entered into the analysis to capture borrowing costs.

It was found to be one of the least important variables in differentiating between the two groups considered. The positive coefficient simply suggests that borrowers live closer to the office than non-borrowers. Factors that could impede farmers from borrowing, which include the time and transportation costs of visiting the office, which is the source of institutional credit, are expected to be less for those who live closer to the office. In addition those who live closer to the office have relatively better access to information.

The use of improved technology is an important factor that discriminates between the two groups. As expected borrowers had showed considerably higher level of this variable when compared to the non-borrowers group. This result is substantiated by the fact that in Ethiopia agricultural credit is being channelled to farmers from formal institutions in the form of improved technology and hence credit users have obviously used improved technology.

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The variables designated as proxies for production limitations are found to be important in differentiating credit users from non-users. Borrowers are characterized as being highly concerned about product price security and adequacy and availability of market and extension services. The group also showed a strong desire for more land, oxen and workers. Although borrowers had higher level of investment expenses as indicated by the significant difference in group means it was not a powerful discriminating variable. Investment activities have been undertaken by both groups and hence it did not serve as a good discriminator.

The negative coefficients for off-farm income and livestock income suggest that farmers with higher levels of these variables have not used agricultural credit. The need for external assistance did not arise for such farmers. Both the t-ratios and the standardized coefficients showed that those variables have very little effect on credit use. The other variable, on farm income which is considered as an additional measure of wealth is also found to be less important in assigning farmers to the groups.

In the discriminant analysis we have considered 15 potential discriminating variables but we are not definitely sure whether all of them are valuable and necessary. Some of the variables may contribute little to the discriminant function, as is the case in multiple regression. This situation is the result of theoretical considerations which are not strong enough to specify the precise list of discriminating variables. Consequently, it becomes necessary to eliminate variables which are weak or poor discriminators from the analysis. Their presence only complicates the analysis and they may even increase the number of misclassifications.

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One way to eliminate unnecessary variables is to use a stepwise procedure to select the most useful discriminating variables. The stepwise procedure could work in the forward direction, which begins by selecting the variable which provides the greatest univariate discrimination and then pairs this first variable with each of the remaining variables, one at a time, to locate the combination which produces the greatest discrimination. The procedure can also work in the backward direction in which all the variable are initially considered to be "in" and the worst one is casted out at each step. In this way an optimal list of discriminating variables can be produced. The computer programme used to analyse this particular case study uses the backward procedure. The stepwise procedure must employ some measure of discrimination as the criterion for selection. Several alternative measures that maximizes group differences while minimizing variation within the groups are available.

Wilk's Lambda ( ) is used as a criterion to produce the optimal set of discriminating variables in this study.[19] This statistic takes into consideration both the differences between groups and the cohesiveness or homogeneity within groups. Lambda can be converted into an overall multivariate F - statistic for the test of group differences. It can also be transformed into a chi-square value. The larger the value of Lambda, the greater the within groups variations as a proportion of the total and the less successful is the discriminant function at separating the groups.

The results of this analysis indicated that a single discriminant function of only three variables, accounted for over 60 percent of the discriminable variance between the groups out of the initial list of 15 variables. The variables selected by the programme were - education, farm

size and the use of improved technology. To identify the most important variable out of the three variables selected the discriminant weights were standardized and the following discriminant function was produced.

$$D = -2.2643 + 0.7588\ X_3 + 0.8104X_{10} + 0.3775X_4$$

where:

X_3 = education, X_{10} = Improved technology, and X_4 = farm size.

The discriminant function shows that in terms of overall contribution to the discriminating power of the function, the relative order of importance of the variables is the use of improved technology, Education and farm size. The complete list of the variables included in the analysis and the relative decrease in Wilk's Lambda is given in the appendix table1.

The implication of this result is that in order to induce farmers to use agricultural credit their levels of education must be raised. Although it would be hard to increase the size of the farmers holdings, improved technology must exist so as to increase the demand for agricultural credit by peasant farmers. Hence policy makers should also be concerned about the availability of improved technology.

Like a standard regression analysis can be used for prediction purposes, the discriminant function was also used to assign each of the sampled farmers into the most likely group according to the set of characteristics associated with that household. The result is given in the following table.

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TABLE 33

CLASSIFICATION TABLE FOR FARMERS IN LUME DISTRICT.

Actual group \ Assigned group	Borrowers	Non-Borrowers	Total
Borrowers	59	2	61
Non-Borrowers	13	28	41
Total	72	30	102

The actual proportion of farmers correctly classified to the borrowers group was 96.72 percent. 68.29 percent of the non-borrowers were also correctly classified. This resulted in an overall correct classification of 85.3 percent of the farmers in the Woreda which is fairly a good result. The factors can, therefore, be employed with reasonable success to identify credit users from non-users.

The discriminant function fitted for Kewet Woreda is also significant. The χ^2 value incicate that there exist a distinct difference in farm household characteristics between borrowers and non-borrowers. However, the relatively high value of Wilk's Lambda and the low value of cannonical correlation suggest that the variables did not have high discriminating power. The degree of separation of the two groups as shown by the group means is also small. The group mean for the borrower's group is 1.5188 while it is 0.3530 for the other group. The proportion of the explained variation was only 37.22 percent suggesting that these could be some other factors characterizing borrowers and non-borrowers not included in the model.

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TABLE 34

DISCRIMINANT ANALYSIS FOR BORROWERS IN KEWET WOREDA

Variables	Standardized Discriminant Function Coefficients.
Age	-0.4459
Farming experience	0.0813
Education	0.3209
Farm size	0.5590
Distance from extension office	-0.2422
On-farm income	-0.2021
Off-farm income	0.0596
Investment expenses	0.4008
Livestock	-0.1633
Improved technology	0.3060
Need for more land	0.1388
Need for more workers	0.1929
Need for more oxen	0.2496
Price security	0.2501
Market and services	0.2663
Constant term	1.0170
Statistical results	
Group centroids:	
Borrowers	1.51876
Non-Borrowers	0.35302
Eigen Value	0.5926
Cannonical correlation	0.6101
Wilk's Lambda	0.6279
X^2	43.5125

Significant at 0.001 level with 15 degrees of freedom.

The magnitude of the discriminant function coefficients show that seven variables contribute most of the discriminating power of the function. Farm size, age, level of education, investment expenses,

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the use of improved technology, price security and the availability and adequacy of market and extension services contribute over 65 percent of the total discriminating power. Some 20 percent is contributed by variables like need for more oxen, distance from district extension office, on-farm income, and the need for more workers. The contribution of other factors is relatively small.

Farm size is the most important characteristic that differentiate borrowers from non-borrowers in Kewet Woreda. It explains nearly 15 percent of the discriminable variance. Borrowers have larger useable land than non-borrowers. Both the coefficient and the significant mean difference show the importance of this variable in discriminating between the groups. Farmers with larger operational area require relatively more production inputs and hence they need external fund to finance the cost of production.

The next important variable in terms of its contribution to the total discriminating power of the function is age. The result of the analysis suggest that older farmers are characterized as non-users (non-borrowers) of credit. The probable reason for the reduction in the demand for external funds by farmers as they advance in age is the decrease in the ability to farm. As the farmers advance in age their willingness to undertake intensive agricultural activities would deteriorate and hence they may not be compelled to borrow. In addition, risk factors like death and illness may prevent them from borrowing and prevent also lenders from lending.

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Farmers who took loans during the agricultural year considered are also differentiated from those who did not take loans by their higher level of investment expenses. Peasant who undertook such investment activities like the purchase of livestock and machinery or capital investments like the construction of roads, irrigation, wells, etc., are classified as borrowers. Such farmers have committed themselves to the farming operation to maintain a livelihood and, therefore, are ambitious to expand their agricultural production. Consequently they have become credit users since it is usually not possible to finance such expenditures from internal sources because of the low level of real income.

The use of improved technology, higher level of education, higher need for more oxen and better access to off-farm employment also characterize the borrowers. Some peasants indicated that they have purchased insecticide from the Woreda's Ministry of Agriculture office for the agricultural season considered. Hence the use of improved technology has become one of the variables used to differentiate borrowers from non-borrowers. Farmers who used credit have been also concerned about product price, the availability of market and extension services. They also live closer to the market and extension office.

The discriminant function fitted was also used to come up with a classification function for the groups considered. The classification table produced by the programme was less reliable this time. The actual proportion of farmers who are correctly assigned to the borrower's group and to the non-borrowers group are 73.33 and 75.86 percent respectively. As the variation between the groups that remained unexplained by the function is relatively high the overall correct classification produced by the discriminant function is only 74.8 percent.

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TABLE 35

CLASSIFICATION TABLE FOR FARMERS IN KEWET WOREDA.

Assigned Group / Actual Group	Borrowers	Non-Borrowers	Total
Borrowers	33	12	45
Non-Borrowers	14	44	58
Total	47	56	103

The stepwise procedure was also used to come up with a list of the most important discriminating variables for the Woreda. The results of this stepwise analysis indicated that out of the 15 variables considered only age, farm size and investment expense are the main contributors to the discriminable variance. The discriminant function produced using these variables is given as:

$$D = 0.5269 - 0.3278X_1 + 0.4490X_4 + 0.2795X_8$$

Where: X_1 = age, X_4 = farm size, and X_8 = investment expenses.

In terms of the total contribution to the discriminating power of the function, farm size is relatively more important than the other two variables. The order of importance of the other two variables is age and investment expenses. Nearly 30 percent of the total discriminating power of the function is accounted by those three variables. The result suggests that unless assistance is provided to farmers who wish to undertake construction works or other investment activities and who have relatively larger operational area, it would be difficult for them to increase their production.

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5.4. The Factors that Determine the Variations in Loan Size.

One of the objectives of this study is to examine the factors that affect the volume of credit taken per farmer for the borrowers' group alone and see if there is difference, with regard to some selected Socio-economic characteristics explaining the variation in loan size, between the two Woredas. Some variables are hypothesised to determine the loan size and multiple linear regression analysis is used to examine the effect of these variables on loan size. The basic model that is anticipated and that is estimated using ordinary least squares method is given as:

$$Ci = b_o + b_1X_1 + b_2X_2 + \ldots + b_nX_n + Ui$$

Where:

Ci = the amount of loan taken in kind or in cash for the 1984/85 crop season by each borrower.

$X_1, X_2, \ldots X_n$ = The explanatory variables.

$b_o, b_1, \ldots b_n$ = The regression coefficients.

Ui = The stochastic disturbance or error term.

5.4.1. The Explanatory Variables Included and the Expected Signs of the Regression Coefficients:

(1) Age of the Farmer (X_1)

As the household head advances in age, his ability to farm would diminish and hence his credit requirement is expected to decline. Thus a negative sign is anticipated from the regression coefficient for this variable.

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(2) Number of Family Members Helping on the Farm. (X_2)

The expected relationship between loan size and this variable is negative. If a farm household has more members of his family helping on the farm, the demand for external funds would decline. One possible reason for this can be the fact that the household would not face shortage of labour. If the household has such problems either he would use hired labour or try to solve the shortage of labour by organizing mutual aid teams both of which would require money. Another possible reason is that the farm household may be less inclined to use improved technology (pesticides and herbicides) because he can solve such problems through the use of family labour. In addition, the household's demand for consumption credit may decline.

(3) Farming Experience (X_3)

Another variable hypothesised to affect loan size is farming experience measured in years. A negative sign is expected on the regression cofficient primarily because of the assumption that the farmer has accumulated wealth over the years so that he become economically more independent.

(4) Level of Education (X_4)

A direct relationship between education and loan size is anticipated. Farmers with higher level of education are thought to have realized the, advantages gained from credit use than those who are illitrate and unable to bear the risk of borrowing.

(5) Farm Size. (X_5)

The larger the farm size of a household the larger would be the demand for external funds because more production costs are incurred and more inputs are required. The expected relationship between farm size and loan size is, therefore, positive.

(6) Distance From Extension Office. (X_6)

This variable is included to capture the borrowing costs incurred by the farmers to get loans. If the farmers' dewelling is far away from the office the contact with extension agents will be limited and hence farmers may not be aware of new production technologies offered in credit. Hence the demand for funds would decline and consequently an inverse relationship is expected.

(7) Investment Expense. (X_7)

If a farmer has undertaken some kind of investment activity, the demand for assistance would increase and so a positive relationship is again anticipated.

(8) On-farm Income. (X_8)

This variable refers to the total earnings of the farm household from farming activities i.e., from the sale of crops and livestocks plus monetary value of stored or consumed products obtained from the farm. As more income is generated from the farm the likelihood of a farmer to borrow more decreases. Therefore a negative relationship is expected.

(9) Off-farm Income. (X_9)

The variable refers to all income generated from either off-farm employment or from transfer payments. Income from off-farm employment would increase the farm household's internal liquidity providing more capital with which to undertake farm level activities. Because of alternative income generating opportunities available, farmers will be less eager to borrow. Hence the relationship is expected to be negative.

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(10) Credit Experience. (X_{10})

The number of years a farmer has been using credit is anticipated to have a positive relationship with the amount of loan taken. Through longer credit experiences the farmer has accumulated good-will and more confidence. moreover, lenders may also have bias towards such a person.

(11) Value of Livestock. (X_{11})

This is another proxy of accumulated wealth of a farm household. The amount of loan required by a farmer may be negatively related with the estimated value of livestock for the reason that the farmer can meet his financial obligations from internal sources. Livestock is an important source of finance in Ethiopia.

5.4.2 Empirical Results.

The results of the multiple linear regression analysis are summarized and are given in table 36. Separate regression equations were fitted for the two woredas. The overall regression for Lume Woreda was found to be significant at 5 percent level. However, the regression equation fitted for Kewet Woreda was less reliable as observed from the low value of the coefficient of determination (R^2). It was only significant at the 10 percent level. A comparison of the results of the regression analysis for the two Woredas indicate that the variation in loan size is explained by different sets of variables. Income (On-farm income and off-farm income), credit experience and value of livestock owned are significant determinants of loan size in Lume Woreda. On the other hand age and farm size together with off-farm income attempted to explain the variation in the amount of loan taken by the farmers in Kewet woreda.

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TABLE 36

REGRESSION ANALYSIS RESULTS

DEPENDENT VARIABLE: LOAN SIZE (BIRR)

Variable	Lume		Kewet	
	Coefficient	Standard error	Coefficient	Standard err.
- Age	2.2012	2.8475	4.8784^{x}	3.1968
- Family members helping on the farm	-10.5946	17.2630	-0.5279	11.5615
- Farming experience	0.3873	2.7799	-2.1516	3.1969
- Education	13.1844	18.5485	0.4317	17.7177
- Farm size	15.3940	20.9289	42.852^{xx}	18.9224
-Distance from extension office	0.5968	0.6483	0.1701	0.5003
- Investment expenses	0.0932	0.0836	0.0604	0.1206
- On-farm income	0.0638^{x}	0.0439	0.0360	0.0789
- Off-farm income	0.4604^{xxx}	0.1728	0.3817^{x}	0.2416
- Credit experience	7.8224^{xx}	3.7253	9.066	13.1697
- Value of Livestock	-0.0884^{xxx}	0.0360	-0.0340	0.0377
Constant	-102.8530		-145.9316	
F - ratio	2.800		1.841	
R^2	0.4365		0.3624	
$\bar{R}^2$	0.2806		0.0666	
Sample size	(61)		(45)	

Significance level of 1 percent (xxx), 5 percent (xx) and 10 percent (x).

Some of the independent variables have unexpected algebraic signs. The results of the regression analysis for Lume Woreda show that only six of the hypothesised variables have the expected sign. On the other hand seven regression coefficients have the anticipated sign in Kewet Woreda. One possible reason for the low proportion of the explained

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variation could be a result of the unexpected relationships between loan size and the anticipated variables.

The analysis shows that loan size and the variable age are directly related inspite of our expectation of an inverse relationship. This variable was entered into the analysis on the assumption that the farmers have accumulated wealth and hence have lower demand for funds. The result, however, suggest that if farmers borrow, they borrow more as they get older. The Ethiopian peasants are mainly subsistence farmers and have very little chance for accumulation. Farmers who have never been economically independant throughout their farming carrier tend to borrow more to meet their consumption needs. Older farmers are also socially respected in the traditional Ethiopian society and, therefore, have better reputability in the villages. Because of these and other factors older farmers tend to borrow more.

Another variable, that was hypothesised to affect loan size negatively is farming experience. But a direct relationship between loan size and this variable was realized for Lume Woreda. The implication of this result is that farmers with better farming experience have realized the merits of using agricultural credit and, hence, have demanded higher quantity of credit. As farmers in this Woreda have been exposed to the use of improved technology, which is provided in credit, for a long time they took higher amounts of loan. However, it had the anticipated sign for the relatively more traditional Kewet Woreda. Nevertheless, Both variables are not significant determinants of the loan size.

Income was also anticipated to influence the volume of loan inversely. Unfortunately it turned out to have a positive and significant

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impact upon loan size. Some explanations could be forwarded for this divergence. In the case of Lume Woreda, peasant farmers have been using improved technology for a long time. Hence, they are familiar with modern agricultural inputs. It is believed that the proper application of modern inputs will increase productivity. Therefore, the farmers have been tempted to absorb a larger quantity of credit anticipating increased production from the use of modern agricultural inputs, which are provided in credit. On the other hand, higher income must have motivated farmers in Kewet Woreda to become risk takers. Usually poor farmers are risk averters because they cannot withstand the variation in output as a result of natural and other factors. Hence, as their income increase, farmers in Kewet district tend to borrow more. In addition to these possibilities, farmers may also be in a better position to settle previous debts and to pay downpayments if their income increases. Settling previous loans will definately expand the potential credit sources for the borrower. Off-farm employment, which is an important source of off-farm income is also likely to broaden the scope of borrowing, as a result of wider experience and increased contact with credit agents.

Other variables such as number of family members helping on the farm, education, farm size, investment expenses, credit experience and value of livestock all had the expected relationship in both Woredas. However, as shown by table 36 and mentioned earlier farm size is the only significant determinant of loan size that has the anticipated relationship in Kewet Woreda. Greater credit experience and lower value of livestock have encouraged farmers in Lume Woreda to demand more external fund.

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Although it was specified that the volume of loan is jointly determined by the hypothesised independent variables not all the coefficients of these variables can be estimated with reasonable precision. The result of the analysis has, in fact, shown that explanatory power of the factors considered is not high as revelaad by the low values of R^{-2}. A possible explanation for this low value of the corrected coefficient of determination could be specification error. Thus, a step-wise regression was also attempted to see if the model can be improved by dropping-out some regressors whose coefficients are not significantly different from zero. An increase in $\bar{R}^{-2}$ can be an indicator of the "goodness of fit" of the equation. The programme selected only four variables for Lume Woreda and only three variables for Kewet Woreda.

For Lume Woreda

$$Y = 60.078 + \underset{(0.0366)}{0.076X_8} + \underset{(0.1507)}{0.469X_9} + \underset{(3.2131)}{9.069X_{10}} - \underset{(0.0325)}{0.078X_{11}}$$

$R^2 = 0.3672$ $\quad F = 8.125$

$R^{-2} = 0.3220$

where: Y = Loan size in Birr.

X_8 = On-farm income

X_9 = Off-farm income

X_{10} = Credit experience

X_{11} = Value of livestock

For Kewet Woreda

$$Y = -55.016 + \underset{(1.3882)}{2.329X_1} + \underset{(12.9812)}{39.552X_5} + \underset{(0.1963)}{0.278X_9}.$$

$R^2 = 0.2745$ $\quad F = 3.783$

$R^{-2} = 0.2019$

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where: Y = Loan size

X_1 = Age

X_5 = Farm size

X_9 = Off-farm income.

Figures in parenthesis are standard errors of coefficients.

Income, credit experience and estimated value of livestock are important determinants of loan size in Lume Woreda. However, the main factors explaining the variation in loan size in Kewet Woreda are age, farm size and off-farm income. The reduction in the value of R^2 as a result of the exclusion of several independent variables from the model is very low. This means that the contribution of the remaining independent variables towards explaining the variation in loan is very little. In addition, the improvement in the model is observed from the significant increase in the values of R^{-2}, the corrected coefficient of determination.

In summary, the results of this analysis show that the hypothesised variables contribute to the determination of loan size both in traditional and in technologically advanced regions. Although these results can not be conclusive, the main determinants of the volume of loan in a backward area are, age, farm size and off-farm income. On the other hand Income, credit experience and livestock are important determinants of loan size in areas where institutional credit facilities exist. However, to be more conclusive in this regard further research undertakings are essential.

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NOTES

[1]Marion Gross Sobol and M.K. Star, Statistics For Business and Economics; (New York: Mcgraw-Hill Inc., 1983), P.443.

[2]A linear Classification Procedure is optimal if the spread (variance) of the Independent Variables (the X'_s) in group one are the same as the spreads in group two and if the Interrelations (correlations) among the Independent Variables in group one are the same as the Interrelations in group two.

[3]Donald G. Morrison, " on the interpretation of Discriminant Analysis," Journal of Marketing Research, Vol. 6, May 1969, PP. 156-163.

[4]David Durand, "Risk Elements in Consumer Installment Financing," Cited in Journal of Development Studies, Vol.8(1),1971.

[5]U.K. Pandey and M.A. Muralidharan, " An Application of Discriminant Function in Agricultural Finance," Indian Journal of Agricultural Economics, Vol. 1, 1977, PP. 41-51.

[6]D.W. Bromley, " The use of Discriminant Analysis in Selecting Rural Development Strategies," American Journal of Agricultural Economics, Vol.53 1971. PP.319-322.

[7]Irma Adleman and C.T.Morris, " Performance Criteria For Evaluating Economic Development Potential: An Operational Approach," Quarterly Journal of Economics, Vol.82(2), 1968, PP.260-280.

[8]See for instance, Peter J. Heffernan and Stephen K. Pollard, OP. Cit. and Calvin Miller and Jerry R.Ladman, OP.Cit.

[9]The basic assumptions that the data should satisfy include:
a) The data cases should be members of two or more mutually exclusive groups.
b) The covariance matrices for each group must be approximately equal.
c) Each group has been drawn from a population with a multivariate normal distribution on the discriminating variables. For more details see William R.Klecka, Discriminant Analysis, SAGE publications, London, 1984. PP. 8-11 and Peter A. Lachenbruch, Discriminant Analysis, London, Hafner Press, 1975.

[10]Peter A. Lachenbrach, OP.Cit.

[11]James Press and Sandra Wilson, " Choosing Between Logistic Regression and Discriminant Analysis," Journal of American Statistical Association, Vol. 73(364), 1978, PP. 699-705.

[12] D.R. Krzanowski, " Discrimination and Classification Using Both Binary and Continuous Variables," Journal of American Statistical Association, Vol. 70, 1975, PP. 782-790.

[13] D.H. Moore, " Evaluation of Five Discrimination Procedured For Binary Variables," Journal of American Statistical Association, Vol. 68, 1973, PP.399-404.

[14] D.R. Crawley, " Logistic Discrimination as an Alternative to Fisher's Linear Discriminant Function," Cited in G.A.F. Seber, Multivariate Observations, (New York: John Wiley and Sons Inc., 1984), P.318.

[15] See for Instance, Press and Wilson, OP.Cit. and Bradley Efron, " The Efficiency of Logistic Regression Compared to normal Discriminant Analysis," Journal of American Statistical Association, Vol.70, 1975, PP. 892-898.

[16] A Farmer who had taken credit from any source, formal or informal and in any form, kind or cash for the 1984/85 crop season is regarded as a borrower; and if he had not taken loans he is considered as a non-borrower.

[17] The Variables are standardized if the original data all had standard deviation of 1.0 which could be obtained by converting the raw data into standard form which could be achieved from:

$$Z_i = \frac{X_i - \mu}{\sum_i}$$

[18] If the discriminant analysis is run with Unstandardized Variables it is easy to obtain the standardized coefficients (b_i^*) from the Unstandardized coefficients (b_j):

$$b_j^* = b_j \sqrt{\frac{W_{jj}}{n - g}} = b_j \sum_j$$

where: W_{jj} = The sum of square of the j^{th} variable. For more details see Donald G.Morrison, Op.Cit. and William R.Klecka, Op.Cit.

[19] Wilk's Lambda (Λ) is the ratio of within groups cross-products to the total cross-products along the discriminant function.

$$\Lambda = \frac{\text{Within groups cross product}}{\text{Total cross product.}}$$

$$= \frac{\sum_{i=1}^{N} \left(X_{Di} - \bar{X}_{D_G}\right)^2}{\sum_{i=1}^{N} \left(X_{Di} - \bar{X}_{D_T}\right)^2}$$

Chapter 6

Conclusions and Recommendations.

Agriculture contributes the largest single proportion to the Ethiopian Gross Domestic Product, employment and to exports from Ethiopia. The needs to increase the national levels of food production and raw material supply are some additional factors pointing to the importance of developing Ethiopia's agriculture, which requires an infusion of capital that can hardly be met by peasant farmers without some external assistance.

The focus of this study has been on agricultural credit use by subsistence farmers in two districts of Ethiopia. The case study undertaken in two Woredas of Shoa Administrative Region encompasses the responses of 205 private peasant farmers selected randomly from members of Peasant Associations. The main objectives of the study include the assessment of the level of agricultural credit use by peasant households; the identification of the main factors characterizing credit users (borrowers) and non-users (non-borrowers) and the determination of the factors that influence the volume of loan taken by the farmers.

An examination of the agricultural credit policies and programmes showed that agricultural credit has not been widely and efficiently used by peasant farmers. The agricultural credit policy adopted before the popular Rural Land Proclamation of March 1975, excluded peasant farmers from using credit facilities by putting several stringent conditions on them. Small farmers were unable to receive credit assistance from banks and other institutions because of the high collateral requirements demanded. Hence, they were not able to buy new technologies and improve their agricultural production. The policy served largely the interests

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of the landlords and commercial enterprises, who at that time were able to offer the collaterals needed to secure bank loans. In addition to the high collateral requirements needed, the practice of strict project appraisal methodology that requires capable management, the keeping of records and the like has obviously debared peasant farmers from using institutional credit facilities. Subsistence farmers were also disqualified from using credit facilities if they were not within a reasonable distance from banks' branch offices.

The feudalistic land tenure system also created a disincentive on the decision to adopt new technologies. The landlords were unwilling to participate in the cost of credit but took over the highest proportion of the output.

Although the AID Bank adopted a new credit policy in 1976, the majority of the small farmers have not been integrated into the agricultural credit programmes of the nation. Since the Peasant Associations Organization and Consolidation Proclamation number 71 of 1975, agricultural credit policy has been primarily used as an instrument to encourage and strengthen the socialized sector. Towards this end, agricultural credit institutions have given preferential treatment to state farms and cooperatives. While the contribution of state farms and cooperatives to the overall agricultural production has never been more than 10 percent and while the private peasants cultivate over 90 percent of the total cultivated land, over 90 percent of the institutional credit goes to state farms and cooperatives. The magnitude of assistance extended to private peasant farmers is negligible and insufficient as compared to the contribution of the sector to the overall agricultural production. The total amount of lending to this sector is completely inadequate both in absolute terms as well as

in relation to the amounts approved for state farms and cooperatives. The same applies to the distribution of inputs in credit. Total availability and proportionate distribution for the peasants need to be, therefore reconsidered.

The credit advanced to the rural people is mostly short-term production credit used mainly for input procurement that is payable in one crop year. Over 90 percent of the loans approved for cooperatives and state farms over the last few years are mostly short-term working capitals and inputs; fertilizer and improved seeds being the main production credits extended. Private peasants have also limited accesses only to short-term agricultural credits that help in crop production from the Ministry of Agriculture. However, if farmers are to escape the vicious circle of poverty, they will need to make larger and longer term investments in their properties. Investments of this magnitude and duration are necessary if peasants are to reorganize their production units and achieve higher and dynamic levels of production.

The results of the case study demonstrated that agricultural credit has been used as an important ingredient in the agricultural production process in Lume Woreda. Most of the sampled farmers in this district have used fertilizer and improved seeds that were provided by the Ministry of Agriculture in credit. Consequently the Ministry of Agriculture has become the most important source of credit for farmers in this Woreda, by providing over 70 percent of the total agricultural loans in the form of production inputs. On the other hand the use of credit in the overall agricultural production process by peasant farmers is limited in the district of Kewet. For the agricultural year under study, relatives

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and friends were found to be the only sources of credit. As a result credit has not been used to overcome problems of agricultural production. Rather, the loans obtained from relatives and friends were mainly used for the purchase of food, clothings and in some cases for the purchase of oxen.

One of the reasons for the intensive use of agricultural credit by farmers in Lume Woreda is their greater credit experience. Lume Woreda is adjacent to Ada District, which has been the site of many developmental activities. Therefore, farmers in Lume Woreda have been using fertilizer and improved seeds. Production credits (fertilizer, improved seeds and other loans) have been extended to those farmers for over a decade. Consequently the farmers in Lume district have greater credit experience and, thus, have understood the benefit of using agricultural credit. These farmers would also like such practices to continue in the future. Meanwhile, the financing of immediate consumption is the major reason for borrowing and hence borrowing is not, on the average, a continued and prolonged process for farmers in Kewet Woreda. The farmers, therefore, have less credit experience. In response to this fact, the farmers preferred cash from production credits.

One of the possible reasons for the low credit experience of the sampled farmers in Kewet woreda could be the unavailability of credit. Many farmers stated that even if they wanted to borrow and improve their agricultural production credit was not available in their locality. This result support the proposition that the traditional credit sources cannot provide the necessary fund in sufficient amount for an extended production process. Inaddition to the lack of credit facilities, fear of refusal is also a major impediment to credit use in the district. On the other hand, those farmers in Lume Woreda, who did not take agricultural loans during

the agricultural year studied , indicated that fear of repayment ability was the most important constraint to credit use. They were unable to withstand the variations in output as a result of the use of credit.

The conclusion is, therefore, that there is some degree of variation between the two Woredas with regard to agricultural credit use. The sources from which farmers obtain loans, the magnitude of the loans, the forms in which loans were received, and the purposes for which the loans have been used are in general different for the study areas. Because the farmers in Lume Woreda have realized the advantages of using improved technology and because they have relatively better access to the technology they have been using agricultural credit for production purposes. The implication of this is that if farmers are exposed to the positive returns from the use of improved technology, the demand for production credit will increase. But, the traditional or informal credit sources cannot provide the necessary funds in sufficient amount to enable peasants to purchase modern inputs. Therefore, institutional credit must be made available in adequate amount to accelerate the adoption of modern technology in traditional rural areas of the country.

The results of the discriminant analysis illustrate that borrowers (credit users) are strongly differentiated from non-borrowers (non-users of credit) by a set of characteristics. The variables employed in the analysis generally make the expected contribution to the discriminant function. Borrowers in Lume Woreda are significantly characterized by having higher educational level and farm size. They use more improved technology and are highly concerned about product price security as well as market and extension service availability. On the other end, non-borrowers are older in age and have more internal liquidity in their households to

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cover planned expenditures. The group of farmers who exceeded the borrowing threshold in Kewet Woreda have larger operational area and investment expenses. They use improved technology to some extent and are relatively more worried about product prices. Shortage of oxen is a serious impediment to increase production for the group. Non-borrowers are, however, characterized by being older in age and less educated. They live farther from extension offices and market centers. Their farm revenue is relatively high and have more livestock.

The empirical evidence of these results support the proposition that agricultural credit use is influenced by a set of economic and demographic characteristics. The proposition that the more educated and energetic farmers with larger operational area require external assistance to buy improved technology is asserted by the results. In addition, the results of the study demonstrate that in a region where the use of improved technology is not widely spread, farmers with higher income and wealth should have more internal liquidity to finance their expenditures. Thus, the demand for external assistance becomes limited. Unfortunately few farm-households are shown to be fortunate enough to have these characteristics in Ethiopia.

The results of the regression analysis illustrate that the determinants of loan size in Lume Woreda are generally different from those in Kewet Woreda. Although the hypothesised variables are jointly important in explaining the variation in loan size, only income, credit experience and livestock are significant variables in Lume Woreda. The most important determinants of loan size in Kewet Woreda are, however, age of the household head, farm size and to some extent off-farm income. The implications of this result is that greater credit experience and larger

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farm size together with higher farm revenue can influence the magnitude of loan that farmers demand. The introduction and use of non-traditional farming techniques will result in an increased demand for loanable funds which most peasants will be unable to provide from internal sources. The technological change with the associated increase in production expenditures will increase the demand for credit, and farmers who normally use credit will need larger loans while others will have to go into borrowing. Only those farmers who are uneducated; have less operational area and who are older in age will not feel the necessity to use agricultural credit.

In conclusion, it is self-evident that in order to make the most of investment opportunities in peasant agriculture, it is necessary to have a concerted agricultural policy of advisory services, provision of inputs and appropriate credit facilities. Therefore, the agricultural credit system can be strengthened if a number of preconditions in the economic, social and political fields are not overlooked. The analysis has helped to show that a proper understanding of the factors contributing to the levels of credit demand is essential before launching agricultural credit programmes. There is no pretense that this is a definitive work in the effort to study agricultural credit use in Ethiopia. Nevertheless, it can serve as a modest begining in the area. Moreover, although the results can be generalized only to the populations of the two Woredas, similarities do exist between tne two woredas and other regions of the country. Therefore, the implication of this study holds some relevance for a wider range of settings than simply the regions under study. It is therefore, possible to forward some policy recommendations, which can be substantiated through further research undertakings in the future.

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Recommendations.

1) The prospect of increasing production in the peasant sector depends, to a large extent, on raising the consumption of modern agricultural inputs, which in turn calls for an increased investment outlay. However, a traditional peasant society cannot generate the necessary capital for such an increased investment outlay. The results of this study have shown that the use of agricultural credit in the agricultural production process is unsatisfactory. The distribution of credit facilities (institutional credit facilities) has been skewed. While some regions have been provided with production credits for a long time, others have been excluded from credit programmes. All these imply that a good number of the rural population is unable to use modern agricultural inputs. It becomes, therefore, essential to extend credit facilities and increase the accessibility of credit to regions that did not so far receive such assistances in order to motivate farmers to use more non-traditional inputs and modern farming techniques. Increased accessibility of institutional credit would be obtained by either establishing local offices or by mandating others to serve these remote areas. It should, however, be noted that such new inputs must in themselves be sufficiently productive and profitable on the farmer's plots for them to be convinced of their use. The cost of production added must be offsetted by the value of the additional product obtained.

2) Preferential treatment is being given to the socialized sector in the supply of agricultural credit to encourage the expansion of this sector. It is quite understandable that the government wishes to strengthen the socialized sector and is acceptable from the long-term strategy of the government - that of socialist transformation of agriculture. But efforts

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to enforce such a policy may simply consume the limited resources of the country and inhibit the flow of resources to their most productive use. Purely from economic point of view, priority criteria should mainly emphasize on efficient utilization of agricultural credit. Thus, policies should be directed towards encouraging and fostering the development of the most efficient and productive sector. Unfortunately, the agricultural credit policy pursued does not seem to acknowledge this fact. Therefore, in light of the private peasants' contribution to the overall agricultural production, credit policies which ensure that the sector receives its due share of the credit resources available are urgently needed. Intermediate measures to supply agricultural credit to private peasants should be explored to help them to increase their agricultural production.

3) Agricultural credit has been used only to promote the use of modern imputs and new technologies to raise labour and land productivity. The credit granted to small farmers and even to state farms by the Ministry of Agriculture and the AID Bank annually is for short-term production purposes. This financing is, in fact, a necessary component of an agricultural development programme. The argument, however, is that emphasis is also necessary on long-term credit, on the ground that it can change the structure of production at the farm level as well as the economic environment in which the peasants operate. It gets at the cause of problems which keep the peasants tied to the vicious circle of poverty. Construction of irrigation and water systems, livestock purchases, construction of storage facilities and farm buildings, purchase of mechanical inputs, etc., cannot be financed out of one year's earnings.

4) A policy that aims at strengthening the agricultural credit system cannot overlook a number of economic, social and political factors which would affect the level of credit use. The productivity of credit can be significantly increased if a host of social, economic and political preconditions are met. Emphasis should, therefore, be placed on raising the level of education of the farmers: the timely provision of inputs; the establishment of an efficient system of pricing of agricultural products; and an effective arrangements for marketing of inputs and outputs. Above all, a well organized and satisfactorily operated agricultural extension service is essential. For an agricultural credit programme to be successful the provision of adequate production incentives, either in the form of enhanced producers prices or reduced input prices, is of fundamental importance.

5) Livestock production is one of the useful means of financing farm production in Ethiopia. The result of the study has, however, shown that shortage of oxen is a critical problem in the study areas that needs some considerations. Consequently, loans for the purchase of oxen must be made available in order to alleviate farmers from such limitations.

6) The demand for agricultural credit is indeed great, Owing to the limited resources we have, agriculture cannot continually and indefinitely receive outside funds. It is, therefore, unavoidable to provide for its own growth by mobilizing its own capital. Indeed, there is a dearth of information on farm level saving rendering it difficult to arrive at a precise conclusion. Nevertheless, the saving potential of farmers cannot be totally denied if their productivity is improved. Hence, emphasis must also be given to methods and mechanisms to mobilize that capital within the agrarian sector itself.

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7) Although building large agricultural credit institutions cannot be expected to be a panacea for increasing the supplies of funds to the levels needed for increasing agricultural output and productivity, improvement in the existing institutions must,however, be taken seriously. The expansion of the AID Bank in terms of resources and skilled manpower, so as to enable it to administer effectively the expanding credit programmes is necessary. In addition, the management of cooperatives and peasant associations will have to be trained in the principles of credit, conditions of credit provisions, supervisions of loans and in the mobilization of savings.

8) On top of these policy issues, more research undertakings are needed on rural credit use. The available information on farm credit is very scarce. Information on the productivity of credit, information on the adequacy of credit as well as on the effectiveness of existing credit programmes is missing. Thus more information is required on these and other aspects of agricultural credit use.

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APPENDIX 1

STEPWISE SELECTION OF VARIABLE FOR LOME WOREDA.

STEP	VARIABLES INCLUDED	WILK'S LAMBDA.
1	$X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$ ...	0.43298
2	$X_1, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.43299
3	$X_1, X_3, X_4, X_5, X_6, X_7, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15},$	0.43326
4	$X_1, X_3, X_4, X_5, X_7, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.43358
5	$X_1, X_3, X_4, X_7, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.43381
6	$X_1, X_3, X_4, X_7, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.43442
7	$X_1, X_3, X_4, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.43648
8	$X_1, X_3, X_4, X_{10}, X_{11}, X_{13}, X_{14}, X_{15}$	0.43798
9	$X_3, X_4, X_{10}, X_{11}, X_{13}, X_{14}, X_{15}$	0.44128
10	$X_3, X_4, X_{10}, X_{13}, X_{14}, X_{15}$	0.45197
11	$X_3, X_4, X_{10}, X_{14}, X_{15}$	0.46002
12	$X_3, X_4, X_{10}, X_{14},$	0.48973
13	X_3, X_4, X_{10}	0.48973

Where: X_1 = age, X_2 = farming experience, X_3 = farm size, X_5 = distance, X_6 = on-farm income, X_7 = off-farm income, X_8 = invostment expenses, X_9 = Livestock, X_{10} = improved technology, X_{11} = land, X_{12} = Workers, X_{13} = Oxen, X_{14} = price and X_{15} = market and extension services.

APPENDIX II.

STEPWISE SELECTION OF VARIABLES FOR KEWET WOREDA.

STEP	VARIABLES INCLUDED	WILK'S LAMBDA.
1	$X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$ ..	0.62785
2	$X_1, X_2, X_3, X_4, X_5, X_6, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.62917
3	$X_1, X_3, X_4, X_5, X_6, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.63044
4	$X_1, X_4, X_5, X_6, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}$	0.63166
5	$X_1, X_4, X_5, X_6, X_8, X_9, X_{10}, X_{12}, X_{13}, X_{14}, X_{15}$	0.63572
6	$X_1, X_4, X_5, X_6, X_8, X_{10}, X_{12}, X_{13}, X_{14}, X_{15}$	0.64132
7	$X_1, X_4, X_5, X_6, X_8, X_{10}, X_{13}, X_{14}, X_{15}$	0.64793
8	$X_1, X_4, X_5, X_8, X_{10}, X_{13}, X_{14}, X_{15}$	0.65812
9	$X_1, X_4, X_5, X_8, X_{10}, X_{13}, X_{14}$	0.66960
10	$X_1, X_4, X_8, X_{10}, X_{13}, X_{14}$	0.68338
11	$X_1, X_4, X_8, X_{10}, X_{14}$	0.69610
12	X_1, X_4, X_8, X_{10}	0.71180
13	X_1, X_4, X_8	0.72862

Where: X_1 = age, X_2 = farming experience, X_3 = education, X_4 = farm size.

X_5 = distance, X_6 = on farm income, X_7 = off-farm income.

X_8 = investment expenses X_9 = livestock, X_{10} = improved technology,

X_{11} = land, X_{12} = workers, X_{13} = oxen , X_{14} = price,

X_{15} = market and extension services.

DECLARATION

I, the undersigned declare that the thesis is my original work and has not been presented for a degree in any other University.

Name Assefa Admassie

Signature Assefa

Place Addis Ababa

Date of submission June 1987